



**MERC Consultants**  
environmental and conservation services

# Supporting Information for Screening for Appropriate Assessment Report

Department of the Environment, Climate and  
Communications: Geophysical Reconnaissance  
Survey in support of offshore renewable energy  
development

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## 1. Introduction

Ireland has moved to a plan-led approach to deliver our offshore wind targets. The Government is delivering our climate and energy ambitions for offshore wind energy through a number of overlapping phases:

- Phase One, which corresponds to the first offshore renewable electricity auction (ORESS 1)
- Phase Two, an accelerated work programme, focusing on near-term delivery based on technology with proven scalability in other jurisdictions, and which will procure the additional offshore wind capacity required to meet Government's 2030 target, and
- The fully plan-led Future Framework

Ireland's second offshore wind energy auction, ORESS 2.1 will be the first auction to take place in Phase Two and will procure up to 900 Megawatts of capacity from a State-selected designated area known as a Designated Maritime Area Plan (DMAP) off Ireland's south coast.

In support of ORESS 2.1, the Department of Environment Climate and Communications (DECC) is planning a Geophysical Reconnaissance Survey for indicatively 52 days. Specific dates are vessel schedule pending. Data acquired will be made publicly available to participants in the ORESS 2.1 energy auction process.

For this survey, DECC propose to use the Marine Institute R.V. *Tom Crean* to acquire and deliver new offshore geophysical data and knowledge. The primary objective of this survey is to gather data on the sub-surface geology within the upper 100 meters below the seabed. This information will be crucial in assessing the suitability of marine areas for potential offshore wind and grid infrastructure development within the South Coast DMAP.

The area that will be surveyed is a subsection of that outlined in Fig. 1, and will be refined pending the DMAP area published (currently anticipated March 2024). It extends from the 75m bathymetry contour offshore to the 10m bathymetry contour and/or to approximately 300m from the coastline to the western extent, and 7.5km from land on the eastern extent.

The coastal area incorporated in the Cork Harbour approaches is to facilitate potential acquisition of baseline geophysical data in support of power cable routing for grid connection to offshore wind infrastructure. The final survey configuration and plan will be informed by the draft DMAP establishment process ongoing presently.

When considering offshore renewable projects, ground conditions play a pivotal role in determining costs, design, schedules, construction methodologies, health and safety measures, and potential environmental impacts. Thus, understanding these conditions is essential for project viability.

This document constitutes Supporting Information for Screening for Appropriate Assessment (SISAA) to assist the Competent Authority in undertaking a screening exercise for Appropriate Assessment (AA). The screening exercise will aim to assess, in view of the best scientific knowledge, if the proposed project, individually or in combination with other plans or projects, is likely to significantly affect any European sites, considering their conservation objectives.

## 2. Statement of authority

This report was prepared by Louise Scally and Nick Pfeiffer of MERC Consultants. MERC are a specialist marine ecological survey and consultancy firm. Core staff have more than 60 years of combined experience and specialist knowledge in relation to Irish aquatic habitats and species in addition to the assessment and management of conservation interests. MERC were responsible for preparing the [NPWS national monitoring of marine Annex I habitats](#) for compliance under Article 17 of the EU Habitats Directive in the period 2015-2019. In this context MERC were responsible for the assessment and reporting of marine Annex I habitats in Ireland and were the authors of all Article 17 reports and overarching site monitoring reports. MERC are currently engaged in conducting surveys and preparing the relevant reports for the current (2022-2025) monitoring cycle.

In addition to their scientific expertise MERC have an in-depth knowledge of Irish and European Environmental legislation and policy. In 2011 MERC prepared the text describing Activities Requiring Consent (ARCs) for inclusion in a handbook detailing the regulatory framework for all developments within designated sites in Ireland on behalf of the National Parks and Wildlife Service. They have also produced numerous Conservation Management Plans for the same department. To-date MERC have conducted in excess of 200 ecological reports in support of Appropriate Assessment under Article 6(3) of the EU Habitats Directive.

**Louise Scally MCIEEM** is a professional marine ecologist with a wide range of experience in the field of conservation biology, marine habitat mapping and ecology. She completed a M.Sc. in ecology and taxonomy at Trinity College Dublin in 1989 and a Ph.D. in taxonomy also at Trinity College Dublin in 2001. She is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). For the last 20 years she has specialised in the ecology of marine ecosystems. She has specialised in the assessment of benthic habitats with a focus on intertidal and subtidal reef habitats and sensitive seabed species and habitats. Over the last 15 years she has conducted extensive marine monitoring surveys and assessments of EU Habitats Directive marine Annex I habitats and their associated species within European sites in Ireland to assist Ireland in complying with monitoring obligations under the EU Habitats Directive .

**Nick Pfeiffer MCIEEM** is a professional marine ecologist with a wide range of experience in the ecology, survey, and monitoring of marine habitats and species in Ireland. He completed a Diploma in Science at Galway Regional Technical College in 1987 and a B.Sc. in Biological Sciences at Plymouth University in 1989. He has extensive experience in the monitoring of benthic habitats and species in Ireland and was lead scientist for the mapping of sensitive subtidal species across a range of European sites in Ireland from 2006 to 2010. Over the last 30 years he has also specialised in the ecology of marine fish, and in this regard, provides expertise and review services with respect to assessment of anthropogenic impacts on shellfish, pelagic and demersal species. In this regard he has acted as a lead auditor for the Aquaculture Stewardship Council (ASC) and Marine Stewardship Council (MSC).

## 3. Methods

### 3.1. Guidelines and legislation

This report has been prepared with reference to the following European Directives, national legislation and guidance on the appropriate assessment of projects and plans with regard to the implementation of the provisions of Article 6(3) and (4) of the EU Habitats Directive 92/43/EEC.

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna. Official Journal of the European Communities.
- Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version).
- European Communities (Birds and Natural Habitats) Regulations 2011. SI No. 477 of 2011.
- Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. European Commission 2018. 7621 final. Office for Official Publications of the European Communities, Luxembourg.
- Assessment of plans and projects in relation to Natura 2000 sites-Methodological Guidance on the provisions of Articles 6(3) and (4) of the Habitats Directive 92/43/EEC 2021/C 437/01- Publication office of the EU (europa.eu).
- Appropriate Assessment Screening for Development Management. OPR Practice Note PN01. Office of the Planning Regulator. March 2021.
- Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters. Department of Arts, Heritage and the Gaeltacht, 2014.
- Relevant case law.

### 3.2. Description of the proposed project and its associated scope of works

A description of the proposed project was compiled and is set out in section 4. The description details all works required to carry out the proposed project.

To fully understand the receiving environment, relative to project related effects, the literature consulted included the available National Parks and Wildlife Service (NPWS) data sources for all European sites within the Zone of Influence (Zoi) of the proposed project (see section 3.3 for methods used to determine the Zoi). This included the individual site synopsis for the relevant European sites, conservation objectives and GIS layers (habitats and species). Further data was obtained from the following sources (non-exhaustive):

- Biodiversity Data Centre species maps.
- Irish Whale and Dolphin Group live sightings.
- ObSERVE Aerial Surveys
- INFOMAR Seabed and sediment data.

### 3.3. Impact Assessment approach

The zone of influence (Zoi) of a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. In the context of Appropriate Assessment Screening, the Zoi is the area over which a plan or project could affect the receiving environment such that it could potentially have significant effects on the conservation status of European Sites. Within the Zoi those receptors that are sensitive to change must be identified and considered.

To define the Zol of a project, the potential for project related effects on sensitive receptors must first be established. For this purpose, a **Source-Path-Receptor (SPR)** model was applied. The SPR model is a well-established model frequently applied to the analysis of project related impacts on ecosystems and is the one which we have applied to the assessment of the proposed project.

Using this approach all elements of the proposed project were reviewed to assess potential pathways and receptors which might be affected so that a Zol could be established. This process involved the following steps:

- The identification of sources of potential impacts and their pathways from the proposed project site to European Sites.
- Consideration of sensitive receptors and their dependent ecosystems within the aforementioned European sites.
- Identifying and characterising project related impacts and their likely effects, direct, indirect and cumulative on the identified sensitive receptors.

Once the Zol was established, the following steps were taken to assess the potential for likely significant effects on sensitive receptors:

1. The scale and scope of the project was examined.
2. A desk review of the available literature describing the habitats and species known to occur at the proposed project site and surrounding area was undertaken.
3. Any project related activities likely to affect migratory or highly mobile species was considered.
4. Any use of the proposed project site by mobile species that make regular movements to, from, or across the site was assessed.
5. An assessment was carried out of the key ecological processes and species activity periods including seasonal variations in distribution, abundance and activity.

### 3.4. Review of European sites

Once the Zol of the proposed project was determined, European sites within this Zol were documented and an analysis of the sensitivity of ecological receptors therein was conducted. In determining the sensitivity of ecological receptors consideration was given to the scale, scope and location of the proposed project relative to the aforementioned receptors.



## 4. Scope of works

### 4.1. overview

In support of ORESS 2.1, the Department of Environment Climate and Communications (DECC) is planning a Geophysical Reconnaissance Survey to take place between May to September 2024, for approximately 52 days. Specific dates are vessel schedule pending. Data acquired will be made publicly available to participants in the ORESS 2.1 energy auction process.

The reconnaissance survey data collected by this initial and future survey works will provide information in the upper 100 m of sub-surface geology, to inform the potential suitability of marine areas for possible offshore wind and grid infrastructure development, should these areas be identified as suitable for offshore wind and/or grid development within the final South Coast DMAP.

The proposed broad geophysical target survey area is 475,408 Hectares. It encompasses an area from the nearshore out to the 75m contour stretching from approximately 8km east of Carnsore Point off the Wexford coast, west to Oyster Haven, County Cork (figure 1).

A suite of mapping instruments will be used in this geophysical reconnaissance survey. This includes multibeam, sub bottom profiler, deployment of a day or Hammon grab, side scan sonar, a sparker system and if further penetration is required, an air gun source. These will provide appropriate datasets for the various sub-bottom requirements for a ground investigation for offshore wind development. The type of sub-bottom profiler and sparker system to be used to investigate the geology will be determined by a number of factors including:

- Depth of interest below seafloor.
- Nature of shallow soil or rock that are likely to be encountered.
- Desired resolution of the data that are to be used for mapping the shallow materials.

Hence, it is common to utilise a combination of sub-bottom acoustic profilers to image the various depths of interest for engineering. The zones of interest would typically include:

- Shallow sub-seafloor (0-5 m) for inter-array and export cable protection or burial depths.
- Intermediate sub-seafloor (5-10 m) for anchoring and small structure foundations.
- Deeper sub-seafloor: (10-100 m) for large structures (e.g., piled foundations).

The acquisition of deeper sub seafloor geophysical data will be acquired utilising a sparker system and /or air gun to penetrate to the required depth of up to 100m.

See Table 1 for proposed equipment and specifications.

**Table 1.** Acoustic and benthic sampling equipment proposed to be operated on board the R.V. Tom Crean

<b>Acoustic survey equipment</b>				
<b>Equipment</b>	<b>Model</b>	<b>Deployment</b>	<b>Company</b>	<b>Sound Pressure Level re 1 µPA in water @ 1m from source</b>
Multibeam Echo sounder	EM2040 (200,300 & 400kHz)	Retractable hull mount	Kongsberg Maritime	210
Sparker System & 48 channel hydrophone array	Dura-speak seismic sound source 300Hz to 1.2kHz	Towed system	Subsea Tehnologies	226
Sparker (backup)	Geospark 200	Towed system	Geus	223
Sub-bottom Profiler	Knudsen 3250 CHIRP (3.5-12kHz)	Vessel mount	Knudsen	223
Mini air-gun	Mini G Gun	Towed system	Sercel	230
Side scan Sonar	4205 sidescan 300 to 900 kHz	Towed system	Edgetech	228
<b>Benthic sampling equipment</b>				
Day Grab	N/A	Overboard	N/A	N/A
Hammon Grab	N/A	Overboard	N/A	N/A

Towed equipment will be restricted to a single 48 channel hydrophone and tail buoy, active streamer length approximately 150m, total towed instrumentation length approximately 200m. This will slightly restrict vessel manoeuvrability.

The reconnaissance data collected by the proposed survey will provide information in the upper 100m of sub-surface geology, to inform the potential suitability of marine areas for possible offshore wind and grid infrastructure development, should these areas be identified as suitable for offshore wind and/or grid development within the final South Coast Designated Maritime Area Plan (DMAP).

Details of the survey vessel and proposed equipment to be used are detailed in section 4.2-4.8.

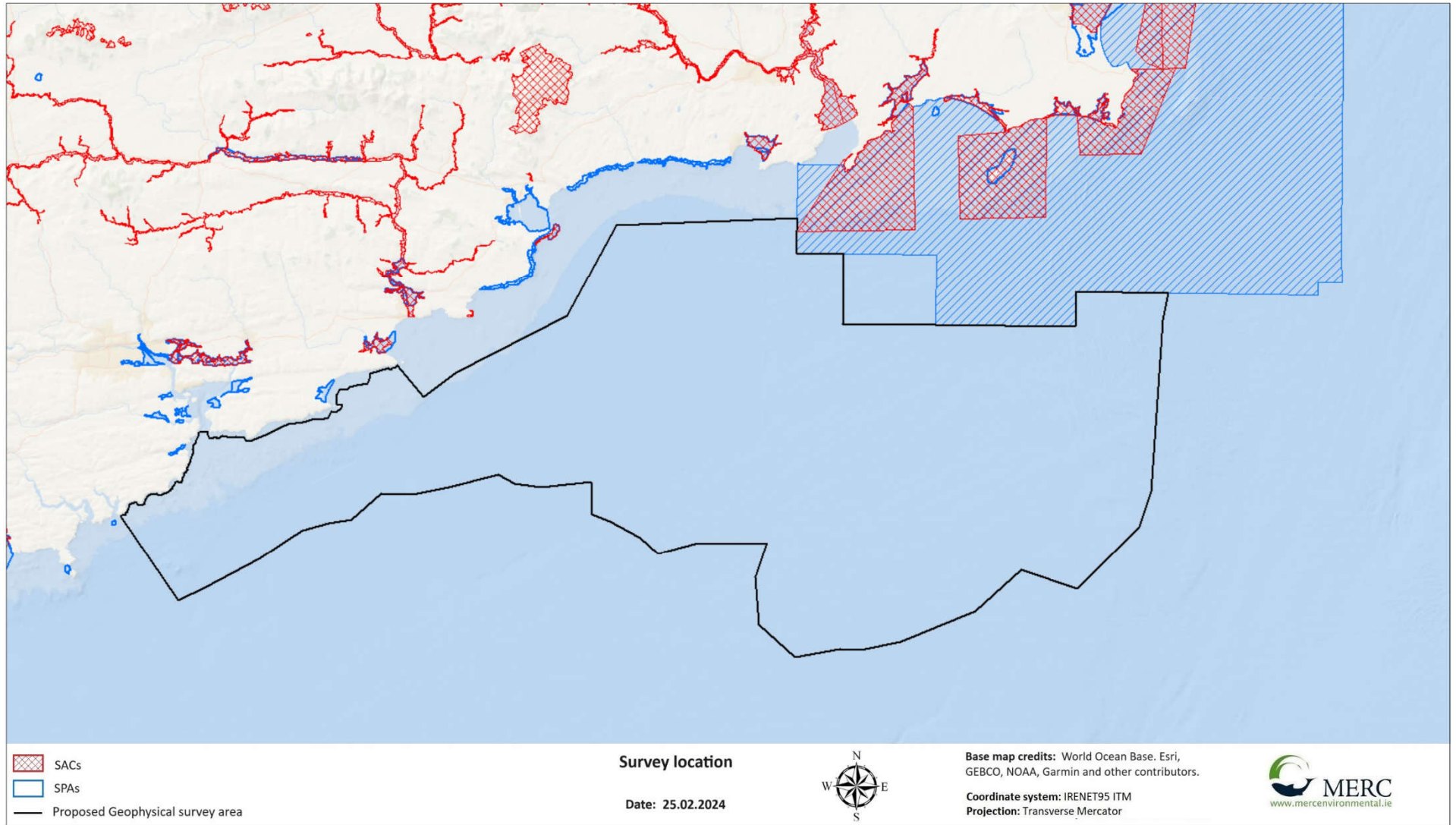


Fig. 1. Overview of proposed survey location relative to European sites

## 4.2. Survey vessel

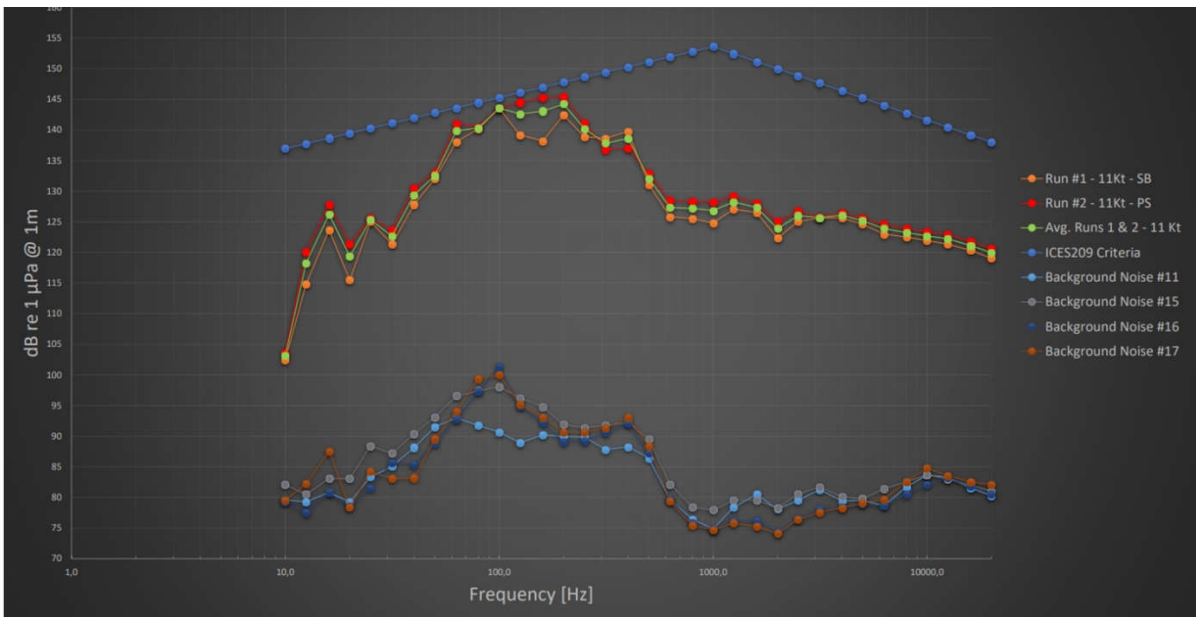
The Irish multi-purpose marine research vessel, the *RV Tom Crean*, will be used for the proposed surveys (figure 2). The *RV Tom Crean* was commissioned in 2022 and was designed as a silent research vessel, in order to meet the stringent criteria of the ICES 209 noise standard for fisheries research. The vessel specifications are given in Table 2 and the noise profile at a range of speeds given in Figures 3 to 5.



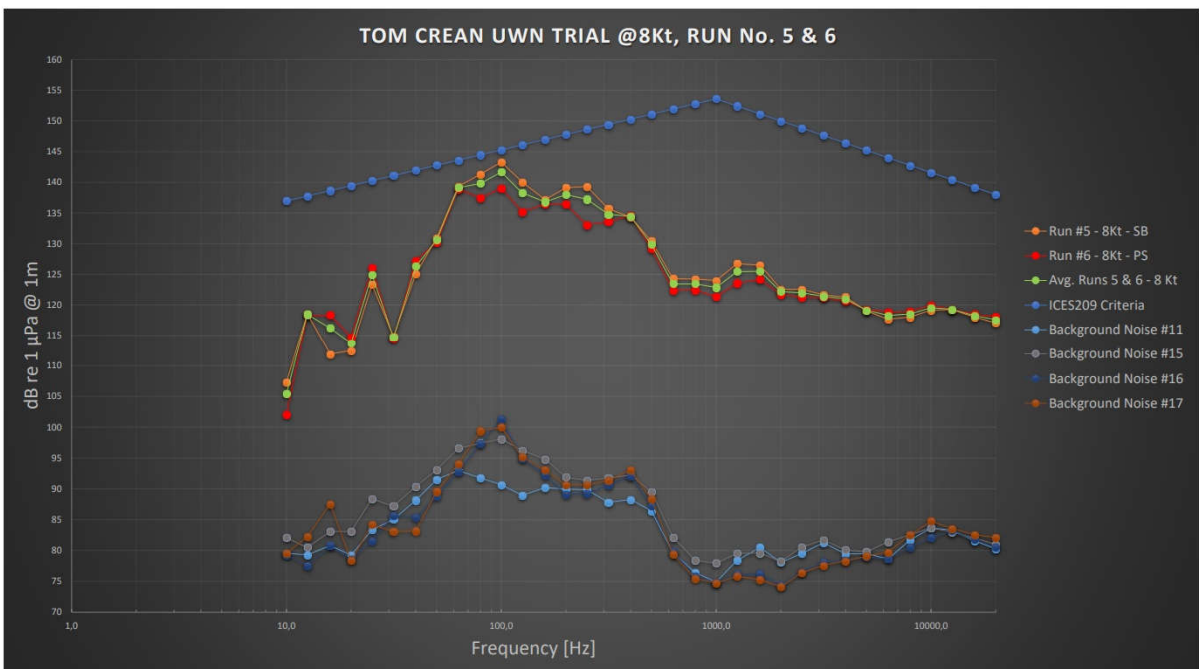
**Fig. 2.** R.V. Tom Crean

**Table 2.** RV Tom Crean: Vessel specifications

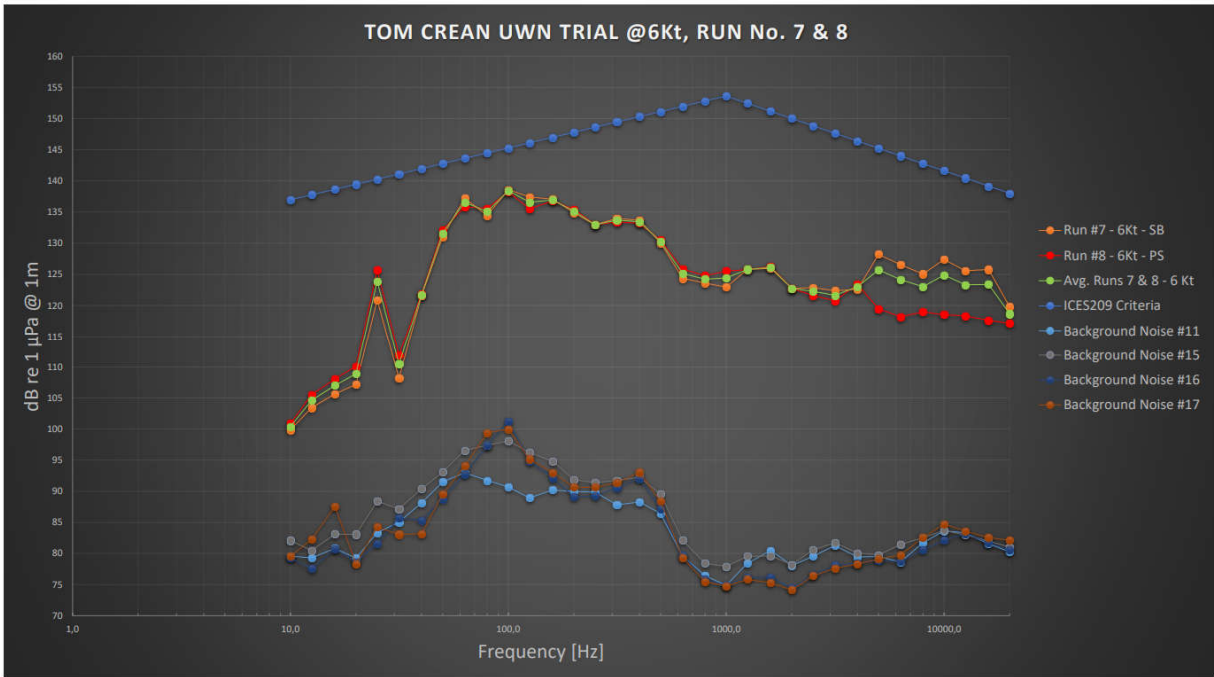
<b>Vessel size</b>	
Vessel length	52.8m
Beam	14m
Draught	5.2m (maximum)
Tonnage (GRT)	1935 Tonnes
<b>Main diesel generators</b>	
Make	Mitsubishi
Type	S16R-(Z3)MPTAW
Number and power	2 x ~1437kW
Speed	1500 rpm
Mounting	Double resilient
Exhaust silencers	SCR system with 45dB(A) attenuation
<b>Auxiliary diesel generators</b>	
Make	Scania
Type	DI 13-91 M
Power	426 kWm
Speed	1500 rpm
Mounting	Resilient
Exhaust silencers	At least 25 dB(A)
<b>Propulsion motor</b>	
Make	Indar
Type	Squirrel cage – Induction motor IMU-710-X/8
Power	2000 kW at 179rpm
Rated frequency	12.6 Hz



**Fig. 3.** (Run ID no. 1 and 2). Main verification at 11Kt distance corrected and averaged  
Distance correction is based on derived correction factors from the transmission loss function.



**Fig. 4.** Run Id no. 5 and 6 at 8Kt distance corrected and averaged.  
Distance correction is based on derived correction factors from the transmission loss function.



**Fig. 5.** Run Id No. 7 and 8 at 6Kt distance corrected and averaged. Distance correction is based on derived correction factors from the transmission loss function.

### 4.3. Multibeam echosounder

A multibeam echosounder (MBES) is a type of sonar frequently used to map bathymetry. It operates by emitting an acoustic wave in a fan shape beneath the point of its transceiver attached to the hull of the vessel. The time it takes for the sound waves to bounce off the seabed and return to the transceiver is used to calculate the water depth within the arc of the fan. The proposed MBES operates at a sound pressure level of 210 dB re 1μPa at 1m with a peak frequency between 200-400 kHz.

### 4.4. Sparker system and hydrophone array

A sparker is a device used for sub-seabed investigations where deeper acoustic penetration is required. It is generally more powerful than a Sub-bottom profiler and used to explore very coarse/compacted sea beds. The sound source is generated by an electrical arc that creates a bubble. As it collapses the bubble produces a broad band (500 Hz – 4 kHz) omnidirectional pulse which penetrates a few hundred meters into the subsurface. Hydrophone arrays towed near the acoustic source receive the returning signals.

### 4.5. Mini airgun

A mini airgun emits a blast of compressed air resulting in an acoustic signal consisting of an initial high-amplitude pressure pulse followed by a decaying series of “bubble pulses” formed by oscillations of the resulting air bubble.

### 4.6. Sub-bottom profiler

A Sub-bottom profiler employs an acoustic signal, to provide the information required to identify and measure marine sediment layers that exist below the sediment/water interface. The proposed equipment comprises a Knudsen Chirp system which transmit a sweep of frequencies (e.g. 2-10 kHz) in a single pulse.

Depending on the profile of the seabed (rock, sand, mud etc.) and level of compaction, the energy reflected back can be related to the sub-bottom composition.

#### 4.7. Side scan

Side scan Sonar (SSS) is another device that transmits sound pulses that provide the information required to map the seabed. It differs from MBES in that SSS has a finer beam width and smaller footprint to MBES and therefore higher resolution. It is generally towed behind the vessel very close to the seabed and emits fan-shaped acoustic pulses directed down toward the seafloor which are recorded as a series of cross-tracks. The sound frequencies used by side-scan sonar range generally range from 100 to 1000kHz; higher frequencies yielding better resolution but less range.

#### 4.8. Day grab and Hammon Grab

A day grab is an instrument used for sampling soft seabed sediments. When deployed overboard it is lowered on a winch to the seabed where the jaws open to take a small (approx. 15L) sample of the surface sediment (top 20cm). A Hammon grab is a very similar type of sampler, but the jaw mechanism is slightly different which allows it to sample coarser sediments (e.g. gravel and shelly sediments). The samples retained can then be analysed to obtain an overview of the sediment fauna, and particle size. Both samplers are routinely used for surveillance monitoring to support a number of EU Directives such as the Habitats Directive and Water Framework Directive.

### 5. Receiving environment

The proposed broad geophysical target survey area is 475,408 Hectares. It encompasses an area from the nearshore out to the 75m contour stretching from approximately 8km east of Carnsore Point off the Wexford coast, west to Oyster Haven, County Cork (figure 1).

There is no spatial overlap between the proposed project area and any Special Area of Conservation (SAC). Shipek samples, collected through the INFOMAR programme, show a range of different sediment types throughout the area ranging from muddy sand, through sand, gravelly muddy sand, sandy gravel and gravelly mud.

A mosaic of different sediment types are recorded for this area. Shallow sublittoral sand and shallow sublittoral coarse sediment dominate the area is the deeper (>40m) sections of the proposed survey area. Closer inshore, a greater range of habitats are present which includes the aforementioned habitats in mosaic with shallow sublittoral mixed sediment and shallow sublittoral rock and biogenic reef. No sensitive subtidal habitats are recorded for the proposed project area.

While there is no spatial overlap with any Special Protect Area (SPA), this area provides foraging habitat for seabird species likely to be connected to nearby SPAs, such as those at Seas off Wexford SPA, Saltee Islands SPA, Keeragh Islands SPA and Lady's Island Lake SPA and more distant SPAs within foraging range of the proposed project site.

Data derived from the IWDG live sightings database and the ObSERVE aerial survey programme indicates a diverse range of marine mammals utilise this area of the coast. There are records for frequent live sightings of Common dolphin (*Delphinus delphis*), Common Porpoise (*Phocoena phocoena*), Fin Whale (*Balaenoptera physalus*), Humpback Whale (*Megaptera novaeangliae*), Minke Whale (*Balaenoptera*

*acutorostrata*) and Grey Seal (*Halichoerus grypus*) within the ZOI of the proposed project. While occasional records for live sightings of additional cetacean species including Bottle-nosed Dolphin (*Tursiops truncatus*) and Risso's Dolphin (*Grampus griseus*) are also available.

The survey area and surrounding waters provides foraging habitat for marine mammals associated with adjacent SACs including Grey Seal, Harbour Seal and Common Porpoise. Due to the distance from shore (minimum of 300m) it is considered unlikely that otter (*Lutra lutra*) utilise the proposed project area.



## 6. Zone of Influence

The first step in screening for appropriate assessment is to identify which European sites are likely to be within the Zol of the proposed project and thereby have the potential to be affected by project related impacts. This was carried out by applying the SPR model. The proposed scope of the surveys and type of equipment to be used, to include the use of the vessels required for deployment, are described in section 4. This information was reviewed to establish if a source/pathway existed and if so, what sensitive receptors might be affected

The determination of the Zol was based on the scale and scope of the project, hydrological corridors of connectivity (direct and indirect source-path-receptor links) and potential cumulative impacts for the duration of the proposed project, see Table 3.

**Table 3.** Source-Path-Receptor matrix

Element	Potential Source (pressure)	Path	Receptor	Area of impact (Direct)
Vessel presence	Disturbance, harm or injury as a result of vessel operations	Water, air	Marine mammals, Birds, fish	Negligible (see section 8.2.1. for rationale)
Vessel	Accidental spillage of hydrocarbons	water	Benthic habitats, Marine mammals, Birds, fish	N/A Vessel compliant with MARPOL regulations*
Vessel	Introduction of Invasive Alien species (IAS)	water	Benthic habitats, fish	N/A Vessel compliant with MARPOL regulations**
Multibeam echosounder	Disturbance, harm or injury as a result of underwater noise	water	Marine mammals, Birds, fish	<b>Marine mammals:</b> 3km to include area of impact identified for <b>cumulative TTS***</b> (See section 8.2.2. for details). <b>Fish:</b> 14km to include area of impact identified for <b>behavioural response</b> (See section 8.2.2. for details). <b>Birds:</b> Negligible (see section 8.2.2. for details)
Sparker System & hydrophone array	Disturbance, harm or injury as a result of underwater noise	water	Marine mammals, Birds, fish	
Sparker (backup)	Disturbance, harm or injury as a result of underwater noise	water	Marine mammals, Birds, fish	
Sub-Bottom Profiler	Disturbance, harm or injury as a result of underwater noise	water	Marine mammals, Birds, fish	
Mini airgun	Disturbance, harm or injury as a result of underwater noise	water	Marine mammals, Birds, fish	
Side scan Sonar	Disturbance, harm or injury as a result of underwater noise	water	Marine mammals, Birds, fish	
Benthic sampling (Day grab or Hammon grab)	Physical damage/ Sediment disturbance	water	Benthic invertebrates	Direct area of impact (<0.5m) plus 15m sediment dispersion area. (see section 8.2.3. for details)

\* The RV Tom Crean is covered by MARPOL regulations. The MARPOL Convention is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. The Convention includes regulations aimed at preventing and minimizing pollution from ships – both accidental pollution

and that from routine operations - and currently includes six technical Annexes. Special Areas with strict controls on operational discharges are included in most Annexes.

**\*\*The dumping of ballast water and fouling of vessel hulls are considered to be the main vectors for the spread of IAS in marine environments. The MARPOL convention, includes annexes governing the management of ballast water and the anti-fouling of hulls. The RV Tom Crean is governed by MARPOL regulations and as such the vessel takes all actions required to prevent the introduction of IAS.**

**\*\*\*Temporary Threshold Shift.**

Based on the area of impact for the individual project components, documented in Table 3, it is concluded that the proposed project has a maximum direct area of impact extending to 14 km (For fish) from the outermost boundary of the geophysical survey area.

With due regard to mobile species that may be transiting through or using the potential area of impact, including breeding seabirds and **Annex II marine mammals**, the ZoI of the project is taken to include all European sites where the potential for either a direct or indirect connection between such species and these sites is possible. There is no potential for impact (no SPR link) to any SAC that does not have a direct connection to the marine. Therefore SACs designated for terrestrial habitats and species, or freshwater habitats upstream of a hydrological gradient are considered outside of the ZoI.

## 7. European sites

The maximum area of direct impact is estimated to be 14 km (in the case of fish). However, indirect impacts may extend to greater distances in the case of European sites for which mobile species are included as a Qualifying Interest (QI).

Based on the identified sources of impact, there is no potential for adverse effects on the Conservation Objectives of any habitats (including marine habitats) or any species, with the exception of marine mammals or species with a marine phase in their life cycle, within a number of these SACs

Similarly, there is no potential for adverse effects on wintering waterbirds or the wetland and waterbirds habitat which form a SCI for SPAs. Therefore sites designated solely for waterbirds or species (e.g. Chough) without a reliance on marine habitats, are considered to be outside of the ZoI.

Seabirds foraging ranges are well studied and vary widely between species (see appendix 13.1). There are likely to be a range of **breeding** seabird species associated with SPAs adjacent to the proposed project site, or within foraging range of it. Site specific surveys of the proposed project area for seabirds have not been undertaken. However, for seabird species during the summer breeding months, the zone of influence is considered to extend to all those SPAs within foraging range of the proposed project site. We have undertaken a screening exercise using the mean max foraging distances published in Woodward *et al.* (2019). This brings in a large number of SPAs for those species with a wide foraging range such as Manx Shearwater, Gannet and Fulmar. The screening exercise was undertaken using ArcGIS and the results are presented in Appendix 13.1.

The foraging ranges for Grey seal can be large, travelling up to several hundred kilometres from their breeding areas (Kiely *et al.*, 2000) while the foraging distance travelled by Harbour seals is generally less, it can also extend for 100's of kilometres (Vance *et al.*, 2021, Carter, *et al.*, 2022 ). Harbour porpoise and Bottlenose dolphin are wide ranging and highly mobile, although some populations do appear to be relatively site faithful. However, it can be assumed they travel many 100's of kilometres depending on prey

availability and distribution. It is not appropriate to give definitive foraging areas for any of the aforementioned species. However, given the scale and scope of the project and the small zone of impact relative to marine mammals and relatively low magnitude of impact we have assumed a ZoI of 100km for these four species recognising that their foraging ranges are potentially greater. See appendix 13.2, which lists all SAC and their QIs within a 100km radius of the proposed project site.

Table 4 shows all European sites within the ZoI which been further assessed here i.e. the sites contain habitats or species which are considered to be sensitive receptors.

**Table 4.** European sites within the ZoI (100km) which have been screened for further assessment.

See appendix 13.2 for QIs and SCIs of all European sites within a 100km radius of the proposed project site.

*Distances (Hydrological for SACs, As the Crow flies for SPAs) \*Fish refers to Lamprey, salmon and shad species.*

European site	Distance (nearest point) to Site	SPR link & species/habitat with potential for impact	Screened in/out for further assessment
<b>SACs</b>			
Buckroney-Brittis Dunes and Fen SAC	97	No sensitive receptors	Screened out
Kilpatrick Sandhills SAC	84	No sensitive receptors	Screened out
Cahore Polders and Dunes SAC	63	No sensitive receptors	Screened out
Kilmuckridge-Tinnaberna Sandhills SAC	57	No sensitive receptors	Screened out
Raven Point Nature Reserve SAC	42	No sensitive receptors	Screened out
Slaney River Valley SAC	40	Fish, Harbour seal, otter	Screened in
Blackwater Bank SAC	31	No sensitive receptors	Screened out
Long Bank SAC	31	No sensitive receptors	Screened out
Carnsore Point SAC	19.5	No sensitive receptors	Screened out
Saltee Islands SAC	11.5	Grey seal	Screened in
Lady's Island Lake SAC	24	No sensitive receptors	Screened out
Tacumshin Lake SAC	25	No sensitive receptors	Screened out
Hook Head SAC	Adjoining	No sensitive receptors	Screened out
Ballyteige Burrow SAC	25.1	No sensitive receptors	Screened out
Bannow Bay SAC	20	No sensitive receptors	Screened out
River Barrow and River Nore SAC	13.7	Fish, otter	Screened in
Tramore Dunes and Backstrand SAC	8.4	No sensitive receptors	Screened out
Helvick Head SAC	6.8	No sensitive receptors	Screened out
Ardmore Head SAC	5.9	No sensitive receptors	Screened out
Blackwater River (Cork/Waterford) SAC	7.2	Fish, otter	Screened in
Ballymacoda (Clonpriest and Pillmore) SAC	3	No sensitive receptors	Screened out
Great Island Channel SAC	11.4	No sensitive receptors	Screened out
Courtmacsherry Estuary SAC	21.2	No sensitive receptors	Screened out
Clonakilty Bay SAC	33.7	No sensitive receptors	Screened out
Kilkeran Lake and Castlefreke Dunes SAC	44.3	No sensitive receptors	Screened out
Lough Hyne Nature Reserve & Environs SAC	64.2	No sensitive receptors	Screened out
Roaringwater Bay and Islands SAC	72	Harbour porpoise, Grey seal, otter	Screened in
Barleycove to Ballyrisode Point SAC	95.6	No sensitive receptors	Screened out
Three Castel Head to Mizan Head SAC	102	No sensitive receptors	Screened out
<b>SPAs</b>			
Wicklow Head SPA	111	Seabirds within foraging range	Screened in
Cahore Marshes SPA	62	No sensitive receptors	Screened out
The Raven SPA	39	Seabirds within foraging range	Screened in
Wexford Harbour and Sloba SPA	33	Seabirds within foraging range	Screened in
Seas off Wexford SPA	Adjoining	Seabirds within foraging range	Screened in

Lady's Island Lake SPA	24	Seabirds within foraging range	Screened in
Tacumshin Lake SPA	25	No sensitive receptors	Screened out
Saltee Islands SPA	19.2		Screened in
Ballyteige Burrow SPA	26	No sensitive receptors	Screened out
Keeragh Islands SPA	23		Screened in
Bannow Bay SPA	19	No sensitive receptors	Screened out
Tramore Backstrand SPA	8.2	No sensitive receptors	Screened out
Mid-Waterford Coast SPA	7.3	Seabirds within foraging range	Screened in
Dungarvan Harbour SPA	8.4	No sensitive receptors	Screened out
Helvick Head to Ballyquin SPA	6.8	Seabirds within foraging range	Screened in
Blackwater Estuary SPA	8.7	No sensitive receptors	Screened out
Ballymacoda Bay SPA	2.4	Seabirds within foraging range	Screened in
Ballycotton Bay SPA	1.4	Seabirds within foraging range	Screened in
Cork Harbour SPA	1.1	Seabirds within foraging range	Screened in
Sovereign Islands SPA	1.0	Seabirds within foraging range	Screened in
Old Head of Kinsale SPA	10	Seabirds within foraging range	Screened in
Courtmacsherry Bay SPA	17.5	No sensitive receptors	Screened out
Seven Heads SPA	20	No sensitive receptors	Screened out
Clonakilty Bay SPA	31	No sensitive receptors	Screened out
Galley Head to Duneen Point SPA	32	No sensitive receptors	Screened out
Sheep's Head to Toe Head SPA	58	No sensitive receptors	Screened out
Beara Peninsula SPA	96	No sensitive receptors	Screened out

## 8. Impact prediction

This section identifies and considers potential impacts; direct and indirect, on **the conservation status of the QIs and SCIs for all sites within the ZoI by reference to their defined attributes, measures and targets as set out by NPWS in the relevant site specific Conservation objectives for each site.**

The results of the SPR analysis (Table 3) indicated that impacts resulting from the potential for vessel noise and disturbance and underwater noise associated with the deployment of acoustic instrumentation had the potential to impact marine mammals, birds and fish. These potential impacts are further assessed in section 8.1 below. Direct and indirect impacts related to the project are discussed in section 8.2. Cumulative impacts are considered under section 9.

### 8.1. Review of sources of impact

#### 8.1.1. Noise

Vessels produce what is referred to as non-pulse (non-impulsive) sounds with acoustic characteristics represented by single or multiple discrete sound events within 24 hrs with a continuous sound event without a rapid pulse rise time. MBES, sparkers and airguns and sub-bottom profilers all produce pulsed (impulsive) sounds. Sound waves, from such sources, dissipate through the water with distance from the source. While local oceanographic conditions affect the path of the sound and its transmission.

**Marine mammal** sensory systems are adapted to life in the water or, in the case of seals, both in water and on land. Marine mammals rely on sound to navigate, to communicate with one another and to sense and interpret their surroundings. Behavioural responses of marine mammals to a sound are known to be strongly influenced by the context of the event and individual factors such as the animal's experience, motivation, conditioning and activity (Nowacek *et al*, 2007, Southall *et al*, 2007, 2019) and Wartzok, *et al* 2003). Healthy new-born and younger animals may have the greatest hearing sensitivity while individual hearing ability declines progressively with age and prior exposure to harmful sound levels, disease, etc.

Such features and variability may also require consideration in the case-specific assessment of impact on marine mammals from introduced sound sources (NPWS 2014).

Marine mammals are generally divided into different functional hearing groups as shown in Table 5.

**Table 5.** Marine mammal functional hearing groups (after NPWS, 2014)

	Low frequency	Mid frequency	High Frequency	Pinnipeds (Underwater)
<b>Range</b>	7 Hz-22 kHz	150 Hz-160 kHz	200 Hz-180 kHz	75 Hz-75 kHz
<b>Examples species</b>	Minke whale Humpback whale	Bottlenose dolphin	Harbour porpoise	Grey seal Harbour seal

**Otter (*Lutra lutra*)** hearing is not adapted to water and functional hearing in otters in water is poorly known. Voight *et al* 2019 reported that their hearing range in air is within the range of 200 Hz to 32 kHz, with lowest thresholds around 4 kHz. Stepien (2020) reported behaviour changes in *lutra lutra* underwater at frequencies of both 1Khz and 14KHz,

**Fish** are susceptible to underwater noise due to anthropogenic sources, which have been shown to cause widespread effects on fish. It has the potential to alter an individual’s physiology, causing stress, and shifts in hearing thresholds in a number of species (Smith *et al.*, 2004; Wysocki *et al.*, 2006). While exposure to very intense sounds (e.g. seismic guns) may result in mortal injuries, less intense sounds that are detectable by fishes may affect their behaviour, causing them to move away from their migration routes or leave favoured habitats (Normandeau Associates, Inc., 2012). Hearing range and sensitivity varies considerably among fish species depending on the hearing mechanism of the species e.g. whether a swim bladder is involved in the hearing mechanism or not. Furthermore, within that class, some species with a swim bladder are sound pressure-sensitive at higher frequencies while others having a swim bladder are not e.g. Atlantic salmon (Hawkins, 1978).

The U.S. National Marine Fisheries Service (NMFS, 2018), as well as other agencies, currently uses 150 dB re 1 µPa (rms) as the sound pressure level that may result in onset of behavioural effects (Caltrans, 2015). Sound pressure above the 150 dB<sub>rms</sub> level are expected to cause temporary changes in behaviour and these might include startle responses, feeding disruption, area avoidance, etc. Popper *et al* (2014).

Popper *et al* (2014) gives guidelines for estimating the effects of continuous noise sources on a range of potential injuries and behavioural responses in fish. Table 6 provides the guidelines for fish such as Atlantic salmon.

**Table 6.** Recommended guidelines for shipping and other continuous sources.

Fish type	Mortality and potential mortal injury	Recoverable injury	TTS	Masking	Behaviour
Swim bladder not involved in hearing (particle motion detection) e.g. Atlantic salmon	(N) Low (I) Low (F) Low	(N) Low (I) Low (F) Low	(N) Moderate (I) Low (F) Low	(N) High (I) High (F) Moderate	(N) Moderate (I) Moderate (F) Low
Relative risk given has high, moderate or low relative to distance from the sound source. N = near, I = Intermediate, F = Far					

To better inform the potential for noise associated impacts as a result of the proposed project, on the marine mammal and fish community of the receiving environment, a noise modelling and environmental risk report was commissioned by the Marine Institute. This report (Thomsen *et al*, 2023) is provided as a separate appendix to this report. The report focused on two species; minke whale (*Balaenoptera acutorostrata*) and Atlantic herring (*Clupea harengus*) in order to provide representative data on the possible effects on baleen whales and fishes where the swim bladder is involved in hearing (primarily pressure detection).

### 8.1.2. Benthic habitats and associated species

Benthic habitats and their associated species can be impacted by direct physical damage and/or sediment mobilisation. The extent to which sediments will mobilise is dependent on the nature of the sediment (coarse sediments settle out rapidly following disturbance), the exposure of the site (sediments in exposed sites will frequently be subject to natural disturbance due to wave action), the tidal regime of the area (tide swept sediments are generally devoid of “fines”). The impact of sediment mobilisation on benthic habitats and their constituent species is dependent on the sensitivity of those species to burial and smothering resulting from sediment mobilisation and transport. The species found in exposed sediments are generally robust specialists capable of withstanding disturbance and smothering. The impacts of physical disturbance on the species associated with highly exposed coarse sediments are generally low and greatest in areas of low natural disturbance where the species present are less well adapted to withstand physical stress.

On the other hand, the epifaunal species associated with geogenic and biogenic reef habitat, while able to withstand natural exposure from wave and swell action, are generally sensitive to abrasion and damage.

## 8.2. Assessment of Impact

An assessment of impact on the QIs and SCIs of all European sites within the ZoI is provided below and summarised in table 11.

### 8.2.1. Vessel disturbance and vessel noise

The R.V. Tom Crean has been designed as a silent research vessel, in order to meet the stringent criteria of the ICES 209 noise standard. As such vessel noise will be at a level below which impacts on either fish or marine mammals would occur. The south east coast of Ireland, where the proposed survey will occur, is a relatively busy shipping area with freight, fishing and leisure craft having a constant presence. The noise levels contributed by the R.V Tom Crean would be well below the background level of underwater noise in this area and marine mammals and fish would be habituated to such levels of noise.

Disturbance due to the presence of the vessel would not significantly contribute to the overall vessel traffic in this area which marine mammals and fish would be habituated to. While disturbance to grey or harbour seal haul out sites may occur should the vessel be close to (<1km) of haul-out sites, there are no haul out sites within 19km of the proposed project area.

Temporary disturbance to seabirds, should they be foraging in the area at the same time as the proposed survey, may occur. However, given the scale of the available foraging habitat, the magnitude of the disturbance would not have the potential to impact their fitness, and therefore does not have the potential to lead to any population-level effects at the SPAs or other adjacent colonies.

There are no haul out sites for either grey or harbour seal within close proximity to the proposed project area. The nearest haul out sites, for grey seal, are on the Saltee Islands (within Saltee Islands SAC). These haul out sites are over 19km from the nearest point of the proposed project. The nearest haul out sites for harbour seal are within the Slaney River Valley SAC, greater than 40km from the proposed project area.

Disturbance to fish or seabirds within or associated with any European site is not considered possible.

8.2.2. Acoustic surveys

Marine mammals

The noise modelling and environmental risk assessment (Thomsen *et al*, 2023) carried out for the proposed project indicated that the use of the sparker would have a limited area of impact on minke whales, and therefore other marine mammals with a functional hearing range that includes all or part of the frequency range emitted by the sparker (e.g. Bottlenose dolphin, Harbour porpoise, Grey and Harbour seal and otter). The results (Table 7) indicated that the impact distance from source would be a maximum of 1.1km relative to a behavioural response and 0.9km relative to cumulative TTS.

With regard to the use of the mini-airgun, the results (Table 8) show that area of impact would increase to 1.9km relative to behavioural response and 2.9km relative to cumulative TTS with an impact area of 19.7km.

**Table 7.** Threshold distances and impact areas obtained for the minke whale, resulting from operation of sparker in the study area. (from Thomsen *et al*, 2023).

Impact on minke whales when the sparker is on operation			
Noise effect	Average distance all transects [km]	Max. distance [km]	Impact area [km <sup>2</sup> ]
Behavioural response	0.9	1.1	2.7
TTS single strike	0.1	0.1	0.03
TTS cumulative	0.9	1.1	2.5
PTS single strike	0.1	0.1	0.03
PTS cumulative	0.2	0.2	0.12

**Table 8.** Threshold distances and impact areas obtained for the minke whale, resulting from operation of mini airgun in the study area. (from Thomsen *et al*, 2023).

Impact on minke whales when the mini airgun is on operation			
Noise effect	Average distance all transects [km]	Max. distance [km]	Impact area [km <sup>2</sup> ]
Behavioural response	1.4	1.9	6.3
TTS single strike	0.1	0.1	0.03
TTS cumulative	2.5	2.9	19.7
PTS single strike	0.1	0.1	0.03
PTS cumulative	0.3	0.3	0.3

There are no European sites designated for Bottlenose dolphin within the Zol (100km) of the proposed project.

The sites with marine mammal QIs within the Zol are:

- Roaringwater Bay and Islands SAC: Harbour porpoise, Grey seal and Otter,
- Slaney River Valley SAC: Harbour seal and Otter,

- Saltee Islands SAC: Grey seal
- River Barrow and River Nore SAC: Otter
- Blackwater River (Cork/Waterford) SAC: Otter

See Appendix 13.2 for all European sites and their QIs within the ZOI of the proposed project.

### Grey seal, Common Seal and Harbour Porpoise

Taking a worst case scenario for the use of the mini air-gun, the mini-air gun has the potential to lead to TTS over a distance of 2.9km from source. TTS has the potential to lead to disturbance and injury to an animal. With regard to PTS, the data indicates a potential range of 0.3km for cumulative PTS.

**Grey seal** are a QI for Saltee Islands SAC and Roaringwater Bay and Islands SAC and are present within these SACs throughout the year during all aspects of its annual life cycle. While it is recognised that individual grey seals associated with either of these sites may use the proposed project area for foraging, noise related impacts leading to behavioural/foraging disturbance to grey seal within these SACs are not considered possible due to the distance of the proposed survey and its ZOI relative to underwater noise and the large area of available foraging habitat. While use of the mini-air gun has the potential to lead to TTS over a distance of 2.9km from source, it is considered that, due to the distance of Saltee Islands SAC (15km) and Roaringwater and Bay Islands SAC (48km) from the proposed survey area, no noise related barriers would result that could impact the targets set for the conservation objectives for this species within the site. The source path receptor link being considered too weak for any potential for impact.

As such, impacts on grey seal associated with more distant European sites are similarly not considered possible.

Even in the absence of the measures recommended in the Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (NPWS, 2014), the proposed surveys are not likely to give rise to significant effects on any European Site designated for grey seal. Disturbance due to underwater noise from the use of acoustic equipment on grey seal within any European site is not considered possible.

**Harbour seal** (*Phoca Vitulina*) in Slaney River Valley SAC (40km distant to the proposed survey area) are present within this SAC throughout the year during all aspects of its annual life cycle. Their foraging territory is likely to extend well beyond the boundary of this SAC.

While it is recognised that individual harbour seals associated with Slaney River Valley SAC may use the proposed project area for foraging, noise related impacts leading to behavioural/foraging disturbance to harbour seal within the SAC are not considered possible due to the distance of the proposed survey and its ZOI relative to underwater noise and large area of available foraging habitat. While use of the mini-air gun has the potential to lead to TTS over a distance of 2.9km from source, it is not possible that, due to the distance of Slaney River Valley SAC (17km) from the proposed survey area, noise related barriers would result that could impact the targets set for the conservation objectives for this species within the site. The source path receptor link being considered too weak for any potential for impact.

As such, impacts on harbour seal associated with more distant European sites are similarly not considered possible.



Even in the absence of the measures recommended in the Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (NPWS, 2014), the proposed surveys are not likely to give rise to significant effects on any European Site designated for harbour seal. Disturbance due to underwater noise from the use of acoustic equipment on harbour seal within any European site is not considered possible.

**Harbour porpoise** (*Phocoena phocena*) breeds annually in Ireland, predominantly during the months of May-September. The principal calving period in Irish waters is thought to occur in the months of May and June although it may extend throughout the summer months and early autumn. Mating commonly occurs several weeks after the calving season. There is currently no detailed information available on individual or group movements by harbour porpoise within or into/out of Roaringwater Bay and Islands SAC, nor is it known whether individuals/groups of the species demonstrate any faithfulness to the site. However, the consistent annual and seasonal occurrence of the species at the site, its occurrence during the calving/breeding period and density/population estimates available to date all indicate the importance of this coastal site for the species (NPWS, 2011).

While it is recognised that harbour porpoise associated with Roaringwater Bay and Islands SAC may use the proposed project area for foraging, noise related impacts leading to disturbance to harbour porpoise would not be significant due to the large area of available foraging habitat and distance of Roaringwater Bay and Islands SAC (48km) from the proposed survey area. While use of the mini-air gun has the potential to lead to TTS over a distance of 2.9km from source, it is considered that, due to the distance of Roaringwater Bay and Islands SAC (48Km) from the proposed survey area, noise related barriers would not result in impacts to the targets set for the conservation objectives for this species within the site. The source path receptor link being considered too weak for any potential for impact.

As such, impacts on harbour porpoise associated with more distant European sites are similarly not considered possible.

Even in the absence of the measures recommended in the Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (NPWS, 2014), the proposed surveys are not likely to give rise to significant effects on any European Site designated for harbour porpoise. Disturbance due to underwater noise from the use of acoustic equipment on harbour porpoise within any European site is not considered possible.

## Fish

With regard to Atlantic Herring, the noise modelling and environmental risk assessment (Thomsen *et al*, 2023) carried out for the proposed project indicated that the use of the sparker would result in a distance of impact of 1.0km, relative to behavioural response from source, with a cumulative PTS of only 0.1km. While the use of the mini air-gun (Table 10) would result in a far greater area of impact with regard to a behavioural response distance (13.6km) but with the same cumulative PTS of 0.1km (Table 11).

**Table 9.** Threshold distances and impact areas obtained for the Atlantic herring, resulting from operation of the sparker in the study area.

Impact on herring when the sparker is on operation			
Noise effect	Average distance all transects [km]	Max. distance [km]	Impact area [km <sup>2</sup> ]
Behavioural response	0.8	1.0	2.2
TTS single strike	0.1	0.1	0.03
TTS cumulative	0.1	0.1	0.03
PTS single strike	0.1	0.1	0.03
PTS cumulative	0.1	0.1	0.03

**Table 10.** Threshold distances and impact areas obtained for the Atlantic herring, resulting from operation of the mini air-gun in the study area.

Impact on herring when the mini airgun is on operation			
Noise effect	Average distance all transects [km]	Max. distance [km]	Impact area [km <sup>2</sup> ]
Behavioural response	12.1	13.6	460.5
TTS single strike	0.1	0.1	0.03
TTS cumulative	0.6	0.7	1.1
PTS single strike	0.1	0.1	0.03
PTS cumulative	0.1	0.1	0.03

Atlantic Herring is being used as a proxy for Atlantic Salmon and Twaite Shad in the present case as both species have swim bladders and it is considered here that they would be likely to have similar behaviour responses. The Slaney River Valley SAC and the Blackwater River (Cork/Waterford) SAC are designated for Atlantic Salmon and Twite Shad. The River Barrow and River Nore SAC is also designated for Twite Shad. All sites are within the ZOI of the proposed project.

Depending on the time of year, inward migrating salmon returning to their natal rivers will have entered the river once suitable conditions allow. Where conditions are not suitable for upstream migration, they are generally understood to congregate along the coast, frequently in estuaries and nearby sea areas awaiting favourable conditions. Inbound fish are generally not foraging during this time and while the migration path would likely include some of the area where the proposed survey work is due to be carried out, it is highly unlikely that adult (returning) salmon will be impacted by the proposed acoustic survey work due to limited spatial and temporal overlap considering both the modelled zone of influence for all acoustic devices together with the present level of knowledge in relation to salmon migration paths.

With respect to outbound salmon smolts, the same logic is applied – Irish salmon are known to swim generally northwards once they have entered the sea as Atlantic salmon feeding grounds are known to be located along oceanic polar fronts close to Greenland, Iceland and the Faeroe Islands. For outward migrating fish from Irish Sea rivers, studies (Rikardsen, *et al.* 2021) have shown movements to be most likely in a northerly direction through the Irish Sea. However, it is likely that fish from Irish south coast rivers, as well as possibly out migrating smolts from UK/French/Spanish catchments, may pass through the area of the proposed surveys. However, spatial and temporal overlap between proposed survey work and smolt migration are considered highly unlikely to impact Atlantic salmon smolts due to limited spatial and temporal overlap, taking account of the modelled zone of influence for all acoustic devices and available (published) knowledge in relation to salmon migration paths.

Impacts on the conservation objectives of Atlantic salmon and Twite Shad in any European site are not considered possible.

Sea lamprey possess neither swim bladders nor lateral lines and functional hearing in sea lamprey is poorly understood. However, one available published study in the literature suggests that sea lamprey can detect frequencies in the range of 50–300 Hz (Mickle *et al*, 2018). In this study, sea lamprey detected tones of 50–300 Hz with equal sensitivity, but did not detect sounds above 300 Hz.

Sea lamprey at sea are highly mobile, spending their adult life attached to a host species as a parasitic organism. They are known to prefer shallow coastal waters, where they may attach to host fish species. They are a common and frequently recorded ecto-parasite on basking shark *Cetorhinus maximus*.

The Slaney River Valley SAC, The River Barrow and River Nore SAC and the Blackwater River (Cork/Waterford) SAC are all designated for lamprey and within the ZoI of the proposed project. Some spatial and/or temporal overlap between migrating sea lamprey and the proposed survey may occur. However, considering the lack of a swim bladder, available knowledge in relation to sound detection ability together with habitat preferences, life history and behaviour, risks to both lamprey are highly unlikely to be significant for this species, particularly factoring in the limited spatial and temporal aspects of the survey.

Impacts on the conservation objectives of Lamprey in any European site are not considered possible

### Otters

Otter hearing is not adapted for life underwater however, one study did record behavioural responses in otters in experimental trials. While otters utilise the marine environment for foraging, they would not be impacted by the proposed project as they are known to forage close inshore, generally less than 100m. Although records for otter 2-300m from shore have been recorded in the UK this is considered to be an unusual occurrence. East of Knockadoon Head the proposed project area is between 6 and 30km from the shore. West of Knockadoon Head to Oyster Haven it is closer to the shore but never less than 300m at any point. Therefore, otter foraging habitat would be outside of the underwater noise range modelled for the proposed project by Thomsen *et al* 2020.

Impacts on the conservation objectives of otter in any European site are not considered possible

### Birds

It is recognised in the literature that the impact of underwater noise on diving seabirds is poorly known. Therefore it is not possible to estimate underwater noise disturbance or injury to diving seabirds. However, it is considered that any seabirds present in the area would be temporarily displaced by the presence of the vessel and the effects therefore, would be the same as vessel displacement i.e. as few seabirds would be present, impacts on their fitness will not lead to any population-level effects at the SPAs or other adjacent colonies.

Impacts on the conservation objectives of birds which form a SCI for any European site are not considered possible

#### 8.2.3. Benthic habitats

The use of direct sampling methods i.e. the use of a day grab or hammon grab will be limited to soft sediments (day grab) and coarse sediments (hammon grab). The foot print of both grabs is extremely small (0.5m<sup>2</sup>) and the penetration depth very low (approx. 20cm). Both samplers are designed for collecting

sediment types of varying degrees of coarseness. They are not designed for and therefore, will not be deployed on, reef habitats.

The subtidal sediment habitat within the area of the proposed survey area, where the grab samplers will be deployed, is comprised of sands, coarse sediments and mixed sediment. The habitat in this area is considered to represent an exposed environment comprised of robust specialists capable of withstanding disturbance and smothering. Any disturbance caused by grab sampling would be undetectable within days. Benthic species damage would be negligible due to the scale of sampling and would not have the potential to significantly impact the community types present. There are no species communities recorded for this area that are known to be sensitive to physical damage/abrasion or disturbance.

Impacts on benthic species or communities are not considered possible.

Table 11 presents a summary of the potential for impact on the QIs or SCIs of all European where a SPR link was identified.

**Table 11.** Summary of assessment of potential for impact.

<b>Slaney River Valley SAC</b>		
<b>Attribute</b>	<b>Potential for impact</b>	<b>Assessment</b>
Estuaries [1130]	Habitat outside of Zol.	No likely significant effects
Mudflats and sandflats not covered by seawater at low tide [1140]	Habitat outside of Zol	No likely significant effects
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	Habitat outside of Zol	No likely significant effects
Mediterranean salt meadows (Juncetalia maritimi) [1410]	Habitat outside of Zol	No likely significant effects
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]	Habitat outside of Zol	No likely significant effects
Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	Habitat outside of Zol	No likely significant effects
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0]	Habitat outside of Zol	No likely significant effects
<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	Species outside of Zol	No likely significant effects
<b><i>Petromyzon marinus</i> (Sea Lamprey) [1095]. Species within Zol</b>		
Distribution: extent of anadromy: Greater than 75% of main stem length of rivers accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Population structure of juveniles: At least three age/size groups present	No project related activity has the potential to impact population structure.	No likely significant effects
Juvenile density in fine sediment: Juvenile density at least 1/m <sup>2</sup>	No project related activity has the potential to impact juvenile density.	No likely significant effects
Extent and distribution of spawning habitat: No decline in extent and distribution of spawning beds. Improved dispersal of spawning beds into areas upstream of barriers	No project related activity has the potential to impact spawning habitat.	No likely significant effects
Availability of juvenile habitat: More than 50% of sample sites positive	No project related activity has the potential to impact juvenile habitat.	No likely significant effects
<b><i>Lampetra fluviatilis</i> (River Lamprey) [1099]. Species within Zol</b>		

Distribution: extent of anadromy: Greater than 75% of main stem length of rivers accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Population structure of juveniles: At least three age/size groups of river lamprey present	No project related activity has the potential to impact population structure.	No likely significant effects
Juvenile density in fine sediment: Mean catchment juvenile density of river lamprey at least 2/m <sup>2</sup>	No project related activity has the potential to impact juvenile density.	No likely significant effects
Extent and distribution of spawning habitat: No decline in extent and distribution of spawning beds.	No project related activity has the potential to impact spawning habitat.	No likely significant effects
Availability of juvenile habitat: More than 50% of sample sites positive	No project related activity has the potential to impact juvenile habitat.	No likely significant effects
<b><i>Alosa fallax</i> (Twaite Shad) [1103]. Species within Zol</b>		
Distribution: extent of anadromy: Greater than 75% of main stem length of rivers accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Population structure- age classes: More than one age class present	No project related activity has the potential to impact population structure.	No likely significant effects
Extent and distribution of spawning habitat: No decline in extent and distribution of spawning beds.	No project related activity has the potential to impact spawning habitat.	No likely significant effects
Water quality-oxygen levels: No lower than 5mg/l	No project related activity has the potential to impact water quality	No likely significant effects
Spawning habitat quality: Filamentous algae; macrophytes; sediment: Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth	No project related activity has the potential to impact spawning habitat quality	No likely significant effects
<b><i>Salmo salar</i> (Atlantic Salmon). Only in freshwater. Species within Zol</b>		
Distribution: extent of anadromy: 100% of river channels down to second order accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Adult spawning fish: Conservation Limit (CL) for each system consistently exceeded	No project related activity has the potential to impact conservation limits	No likely significant effects
Salmon fry abundance: Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	No project related activity has the potential to impact Salmon fry abundance	No likely significant effects
Out-migratory smolt abundance: No significant decline	No project related activity has the potential to impact out-migratory smolt abundance	No likely significant effects
Number and distribution of redds: No decline in number of spawning redds due to anthropogenic causes	No project related activity has the potential to impact redds number or distribution	No likely significant effects

Water quality: At least Q4 at all sites sampled by EPA	No project related activity has the potential to impact water quality	No likely significant effects
<b><i>Phoca vitulina</i> (Harbour Seal) [1365]. Species within Zol</b> <b>NOTE: Conservation objectives apply only to this species <u>within</u> the site (Slaney River Valley SAC)</b>		
<b>Access to suitable habitat:</b> Species range within the site should not be restricted by artificial barriers to site use	The Zol caused by artificial barriers (acoustic noise) do not extend to this site. The source path receptor link is therefore too weak to cause impacts on the species range <b>within</b> the site.	No likely significant effects
<b>Breeding behaviour:</b> The breeding sites should be maintained in a natural condition	Distance to breeding sites <b>within</b> the site too distant from the proposed survey area for any impact to occur.	No likely significant effects
<b>Moulting behaviour:</b> The moult haul-out sites should be maintained in a natural condition	No project related activity has the potential to impact moult haul-outs sites due to the distance of the proposed project area to these sites.	No likely significant effects
<b>Resting behaviour:</b> The resting haul-out sites should be maintained in a natural condition	No project related activity has the potential to impact rest haul-outs sites due to the distance of the proposed project area to these sites.	No likely significant effects
<b>Disturbance:</b> Human activities should occur at levels that do not adversely affect the harbour seal population at the site	No project related activity has the potential to lead to disturbance of the harbour seal population at the site due to the distance of the proposed project area to the site.	No likely significant effects
<b><i>Lutra lutra</i> (Otter) 1355. Species within Zol</b>		
Distribution: No significant decline	No project related activity has the potential to lead to a decline in otter distribution.	No likely significant effects
Extent of terrestrial habitat: No significant decline. Area mapped and calculated as 64.7ha above high water mark (HWM); 453.4ha along river banks/ around ponds	No project related activity has the potential to lead to impacts on the extent of terrestrial habitats.	No likely significant effects
Extent of marine habitat: No significant decline. Area mapped and calculated as 534.7ha	No project related activity has the potential to lead to impacts on the extent of marine habitats.	No likely significant effects
Extent of freshwater (river) habitat: No significant decline. Length mapped and calculated as 264.1km	No project related activity has the potential to lead to impacts on the extent of freshwater habitats.	No likely significant effects
Extent of freshwater (lake/lagoon) habitat: No significant decline. Area mapped and calculated as 0.4ha	No project related activity has the potential to lead to impacts on the extent of lake/lagoon habitats.	No likely significant effects
Couching sites and holts: No significant decline	No potential for impact. All project related activities fully marine.	No likely significant effects.
Fish biomass available: No significant decline	No impacts on fish biomass have been identified.	No likely significant effects
Barriers to connectivity: No significant decline	No barriers to connectivity are possible.	No likely significant effects
<b>Saltee Islands SAC</b>		
Mudflats and sandflats not covered by seawater at low tide [1140]	Habitat outside of Zol	No likely significant effects
Large shallow inlets and bays [1160]	Habitat outside of Zol	No likely significant effects

Reefs [1170]	Habitat outside of Zol	No likely significant effects
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	Habitat outside of Zol	No likely significant effects
Submerged or partially submerged sea caves [8330]	Habitat outside of Zol	No likely significant effects
<b>Halichoerus grypus (Grey Seal) [1364]. Species within Zol. NOTE: Conservation objectives apply only to this species within the site (Saltee Islands SAC)</b>		
<b>Access to suitable habitat:</b> Species range within the site should not be restricted by artificial barriers to site use	Artificial barriers resulting from the use of acoustic equipment including a mini air gun are not considered possible due to the distance of the proposed project to Saltee Islands SAC (15km minimum distance) short term duration of these surveys (52 days for entire survey but considerably less for the use of the mini-air gun should it be required) and limited range (2.9km for TTS).	No likely significant effects
<b>Breeding behaviour:</b> The breeding sites should be maintained in a natural condition	The use of acoustic survey equipment does not have the potential to effect breeding sites and hence breeding behaviour due to the distance of the breeding sites to the proposed project area.	No likely significant effects
<b>Moulting behaviour:</b> The moult haul-out sites should be maintained in a natural condition	The proposed project does not have the potential to impact moult haul-out sites. No survey activity will take place close to moult haul-out sites. The minimum distance to moult haul-out sites is 19km within the Saltee Islands SAC which has its site boundary 15km north of the proposed survey area.	No likely significant effects
<b>Resting behaviour:</b> The resting haul-out sites should be maintained in a natural condition	The proposed project does not have the potential to impact the rest haul-out sites. No rest haul-out sites within 19km of the proposed project area.	No likely significant effects
<b>Population composition:</b> The grey seal population occurring within this site should contain adult, juvenile and pup cohorts annually	N/A. The proposed project does not have the potential to impact population structure.	No likely significant effects
<b>Disturbance:</b> Human activities should occur at levels that do not adversely affect the grey seal population at the site	The survey vessel and associated acoustic surveys may have the potential to temporarily cause disturbance to foraging grey seals. However the temporary nature and distance to Saltee Islands SAC (15km) would result in too weak a SPR link to lead to significant disturbance.	No likely significant effects
<b>River Barrow and River Nore SAC</b>		
Estuaries [1130]	Habitat outside of Zol	No likely significant effects
Mudflats and sandflats not covered by seawater at low tide [1140]	Habitat outside of Zol	No likely significant effects
Reefs [1170]	Habitat outside of Zol	No likely significant effects
Salicornia and other annuals colonising mud and sand [1310]	Habitat outside of Zol	No likely significant effects
Atlantic salt meadows (Glauco-Puccinellietalia maritima) [1330]	Habitat outside of Zol	No likely significant effects



Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	Habitat outside of Zol	No likely significant effects
Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]	Habitat outside of Zol	No likely significant effects
European dry heaths [4030]	Habitat outside of Zol	No likely significant effects
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]	Habitat outside of Zol	No likely significant effects
Petrifying springs with tufa formation ( <i>Cratoneurion</i> ) [7220]	Habitat outside of Zol	No likely significant effects
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	Habitat outside of Zol	No likely significant effects
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0]	Habitat outside of Zol	No likely significant effects
<i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016]	Species outside of Zol	No likely significant effects
<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	Species outside of Zol	No likely significant effects
<i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]	Species outside of Zol	No likely significant effects
<i>Lampetra planeri</i> (Brook Lamprey) [1096]	Species outside of Zol	No likely significant effects
<b><i>Petromyzon marinus</i> (Sea Lamprey) [1095]. Species within Zol.</b>		
Distribution: extent of anadromy: Greater than 75% of main stem length of rivers accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Population structure of juveniles: At least three age/size groups present	No project related activity has the potential to impact population structure.	No likely significant effects
Juvenile density in fine sediment: Juvenile density at least 1/m <sup>2</sup>	No project related activity has the potential to impact juvenile density.	No likely significant effects
Extent and distribution of spawning habitat: No decline in extent and distribution of spawning beds.	No project related activity has the potential to impact spawning habitat.	No likely significant effects
Availability of juvenile habitat: More than 50% of sample sites positive	No project related activity has the potential to impact juvenile habitat.	No likely significant effects
<b><i>Lampetra fluviatilis</i> (River Lamprey) [1099]. Species within Zol.</b>		
Distribution: extent of anadromy: Greater than 75% of main stem length of rivers accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects

Population structure of juveniles: At least three age/size groups of river lamprey present	No project related activity has the potential to impact population structure.	No likely significant effects
Juvenile density in fine sediment: Mean catchment juvenile density of river lamprey at least 2/m <sup>2</sup>	No project related activity has the potential to impact juvenile density.	No likely significant effects
Extent and distribution of spawning habitat: No decline in extent and distribution of spawning beds.	No project related activity has the potential to impact spawning habitat.	No likely significant effects
Availability of juvenile habitat: More than 50% of sample sites positive	No project related activity has the potential to impact juvenile habitat.	No likely significant effects
<b><i>Alosa fallax</i> (Twaite Shad) [1103]. Species within Zol.</b>		
Distribution: extent of anadromy: Greater than 75% of main stem length of rivers accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Population structure- age classes: More than one age class present	No project related activity has the potential to impact population structure.	No likely significant effects
Extent and distribution of spawning habitat: No decline in extent and distribution of spawning beds.	No project related activity has the potential to impact spawning habitat.	No likely significant effects
Water quality-oxygen levels: No lower than 5mg/l	No project related activity has the potential to impact water quality	No likely significant effects
Spawning habitat quality: Filamentous algae; macrophytes; sediment: Maintain stable gravel substrate with very little fine material, free of filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth	No project related activity has the potential to impact spawning habitat quality	No likely significant effects
<b><i>Salmo salar</i> (Atlantic Salmon). Only in freshwater. Species within Zol.</b>		
Distribution: extent of anadromy: 100% of river channels down to second order accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Adult spawning fish: Conservation Limit (CL) for each system consistently exceeded	No project related activity has the potential to impact conservation limits	No likely significant effects
Salmon fry abundance: Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	No project related activity has the potential to impact Salmon fry abundance	No likely significant effects
Out-migratory smolt abundance: No significant decline	No project related activity has the potential to impact out-migratory smolt abundance	No likely significant effects
Number and distribution of redds: No decline in number of spawning redds due to anthropogenic causes	No project related activity has the potential to impact redds number or distribution	No likely significant effects
Water quality: At least Q4 at all sites sampled by EPA	No project related activity has the potential to impact water quality	No likely significant effects
<b><i>Lutra lutra</i> (Otter) 1355. Species within Zol.</b>		

Distribution: No significant decline	No project related activity has the potential to lead to a decline in otter distribution.	No likely significant effects
Extent of terrestrial habitat: No significant decline. Area mapped and calculated as 122.8ha above high water mark (HWM); 1136.0ha along river banks / around pond	No project related activity has the potential to lead to impacts on the extent of terrestrial habitats.	No likely significant effects
Extent of marine habitat: No significant decline. Area mapped and calculated as 857.7ha	No project related activity has the potential to lead to impacts on the extent of marine habitats.	No likely significant effects
Extent of freshwater (river) habitat: No significant decline. Length mapped and calculated as 616.6km	No project related activity has the potential to lead to impacts on the extent of freshwater habitats.	No likely significant effects
Extent of freshwater (lake) habitat: No significant decline. Area mapped and calculated as 2.6ha	No project related activity has the potential to lead to impacts on the extent of lake habitats.	No likely significant effects
Couching sites and holts: No significant decline	No potential for impact. All project related activities fully marine.	No likely significant effects
Fish biomass available: No significant decline	No impacts on fish biomass have been identified.	No likely significant effects
Barriers to connectivity: No significant decline	No barriers to connectivity are possible.	No likely significant effects
<b>Blackwater River (Cork/Waterford SAC)</b>		
Estuaries [1130]	Habitat outside of Zol	No likely significant effects
Mudflats and sandflats not covered by seawater at low tide [1140]	Habitat outside of Zol	No likely significant effects
Perennial vegetation of stony banks [1220]	Habitat outside of Zol	No likely significant effects
Salicornia and other annuals colonising mud and sand [1310]	Habitat outside of Zol	No likely significant effects
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330]	Habitat outside of Zol	No likely significant effects
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	Habitat outside of Zol	No likely significant effects
Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]	Habitat outside of Zol	No likely significant effects
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	Habitat outside of Zol	No likely significant effects
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0]	Habitat outside of Zol	No likely significant effects
<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	Species outside of Zol	No likely significant effects

<i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]	Species outside of Zol	No likely significant effects
<b><i>Petromyzon marinus</i> (Sea Lamprey) [1095]. Species within Zol.</b>		
Distribution: extent of anadromy: Greater than 75% of main stem length of rivers accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Population structure of juveniles: At least three age/size groups present	No project related activity has the potential to impact population structure.	No likely significant effects
Juvenile density in fine sediment: Juvenile density at least 1/m <sup>2</sup>	No project related activity has the potential to impact juvenile density.	No likely significant effects
Extent and distribution of spawning habitat: No decline in extent and distribution of spawning beds.	No project related activity has the potential to impact spawning habitat.	No likely significant effects
Availability of juvenile habitat: More than 50% of sample sites positive	No project related activity has the potential to impact juvenile habitat.	No likely significant effects
<b><i>Lampetra fluviatilis</i> (River Lamprey) [1099]. Species within Zol.</b>		
Distribution: Access to all watercourses down to second order streams.	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Population structure of juveniles: At least three age/size groups of river lamprey present	No project related activity has the potential to impact population structure.	No likely significant effects
Juvenile density in fine sediment: Mean catchment juvenile density of river lamprey at least 2/m <sup>2</sup>	No project related activity has the potential to impact juvenile density.	No likely significant effects
Extent and distribution of spawning habitat: No decline in extent and distribution of spawning beds.	No project related activity has the potential to impact spawning habitat.	No likely significant effects
Availability of juvenile habitat: More than 50% of sample sites positive	No project related activity has the potential to impact juvenile habitat.	No likely significant effects
<b><i>Alosa fallax</i> (Twaite Shad) [1103]. Species within Zol.</b>		
Distribution: extent of anadromy: Greater than 75% of main stem length of rivers accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Population structure- age classes: More than one age class present	No project related activity has the potential to impact population structure.	No likely significant effects
Extent and distribution of spawning habitat: No decline in extent and distribution of spawning beds.	No project related activity has the potential to impact spawning habitat.	No likely significant effects
Water quality-oxygen levels: No lower than 5mg/l	No project related activity has the potential to impact water quality	No likely significant effects
Spawning habitat quality: Filamentous algae; macrophytes; sediment: Maintain stable gravel substrate with very little fine material, free of	No project related activity has the potential to impact spawning habitat quality	No likely significant effects

filamentous algal (macroalgae) growth and macrophyte (rooted higher plants) growth		
<b>Salmo salar (Atlantic Salmon). Only in freshwater. Species within Zol.</b>		
Distribution: extent of anadromy: 100% of river channels down to second order accessible from estuary	No project related activity has the potential to impact accessibility to rivers.	No likely significant effects
Adult spawning fish: Conservation Limit (CL) for each system consistently exceeded	No project related activity has the potential to impact conservation limits	No likely significant effects
Salmon fry abundance: Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 min sampling	No project related activity has the potential to impact Salmon fry abundance	No likely significant effects
Out-migratory smolt abundance: No significant decline	No project related activity has the potential to impact out-migratory smolt abundance	No likely significant effects
Number and distribution of redds: No decline in number of spawning redds due to anthropogenic causes	No project related activity has the potential to impact redds number or distribution	No likely significant effects
Water quality: At least Q4 at all sites sampled by EPA	No project related activity has the potential to impact water quality	No likely significant effects
<b>Lutra lutra (Otter) 1355. Species within Zol.</b>		
Distribution: No significant decline	No project related activity has the potential to lead to a decline in otter distribution.	No likely significant effects
Extent of terrestrial habitat: No significant decline. Area mapped and calculated as 103ha above high water mark (HWM); 1165.7ha along river banks/ around ponds	No project related activity has the potential to lead to impacts on the extent of terrestrial habitats.	No likely significant effects
Extent of marine habitat: No significant decline. Area mapped and calculated as 647.2ha	No project related activity has the potential to lead to impacts on the extent of marine habitats.	No likely significant effects
Extent of freshwater (river) habitat: No significant decline. Length mapped and calculated as 599.54km	No project related activity has the potential to lead to impacts on the extent of freshwater habitats.	No likely significant effects
Extent of freshwater (lake) habitat: No significant decline. Area mapped and calculated as 5.06ha	No project related activity has the potential to lead to impacts on the extent of lake habitats.	No likely significant effects
Couching sites and holts: No significant decline	No potential for impact. All project related activities fully marine.	No likely significant effects
Fish biomass available: No significant decline	No impacts on fish biomass have been identified.	No likely significant effects
Barriers to connectivity: No significant decline	No barriers to connectivity are possible.	No likely significant effects
<i>Lampetra planeri</i> (Brook Lamprey) [1096]	Species outside of Zol	No likely significant effects
<i>Trichomanes speciosum</i> (Killarney Fern) [1421]	Species outside of Zol	No likely significant effects
<b>Roaringwater Bay and Islands SAC</b>		

Large shallow inlets and bays [1160]	Habitat outside of Zol	No potential for impact
Reefs [1170]	Habitat outside of Zol	No potential for impact
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	Habitat outside of Zol	No potential for impact
European dry heaths [4030]	Habitat outside of Zol	No potential for impact
Submerged or partially submerged sea caves [8330]	Habitat outside of Zol	No potential for impact
<b><i>Phocoena phocoena</i> (Harbour Porpoise) [1351]. Species within Zol. NOTE: Conservation objectives apply only to this species <u>within</u> the site (Roaringwater Bay &amp; Islands SAC)</b>		
Access to suitable habitat: Species range within the site should not be restricted by artificial barriers to site use	Artificial barriers resulting from the proposed surveys do not have the potential to impact the range of harbour porpoise within this site. The range of any artificial barriers created is too far distant (at least 72km) from the site for the potential for any impact on species range within the site.	No likely significant effects
Disturbance: Human activities should occur at levels that do not adversely affect the harbour porpoise community at the site	Due to the distance of the proposed surveys from the site there is no potential for any project related activities to lead to disturbance to harbour porpoise within the site.	No likely significant effects
<b><i>Lutra lutra</i> (Otter) [1355]. Species within Zol.</b>		
Distribution: No significant decline	No project related activity has the potential to lead to a decline in otter distribution.	No likely significant effects
Extent of terrestrial habitat: No significant decline. Area mapped and calculated as 171ha above high water mark (HWM); 3ha along river banks/ around ponds	No project related activity has the potential to lead to impacts on the extent of terrestrial habitats.	No likely significant effects
Extent of marine habitat: No significant decline. Area mapped and calculated as 1562ha	No project related activity has the potential to lead to impacts on the extent of marine habitats.	No likely significant effects
Extent of freshwater (river) habitat: No significant decline. Length mapped and calculated as 0.74km	No project related activity has the potential to lead to impacts on the extent of freshwater habitats.	No likely significant effects
Couching sites and holts: No significant decline	No potential for impact. All project related activities fully marine.	No likely significant effects
Fish biomass available: No significant decline	No impacts on fish biomass have been identified.	No likely significant effects
Barriers to connectivity: No significant decline	No barriers to connectivity have been identified.	No likely significant effects
<b><i>Halichoerus grypus</i> (Grey Seal) [1364]. Species within Zol. NOTE: Conservation objectives apply only to this species <u>within</u> the site (Roaringwater Bay &amp; Islands SAC)</b>		
Access to suitable habitat: Species range within the site should not be restricted by artificial barriers to site use	Artificial barriers resulting from the use of acoustic equipment including a mini air gun are not considered possible due to the distance of the proposed project to Roaringwater Bay and Islands SAC (72 km minimum distance) short term duration of these surveys (52 days for entire survey but considerably less for the use of the mini-air gun should it be required) and limited range (2.9km for TTS).	No likely significant effects

<p><b>Breeding behaviour:</b> The breeding sites should be maintained in a natural condition</p>	<p>The proposed survey area is too far distant (at least 72km) to effect breeding sites within this SAC.</p>	<p>No likely significant effects</p>
<p><b>Moulting behaviour:</b> The moult haul-out sites should be maintained in a natural condition</p>	<p>The proposed project does not have the potential to impact moult haul-out sites.</p>	<p>No likely significant effects</p>
<p><b>Resting behaviour:</b> The resting haul-out sites should be maintained in a natural condition</p>	<p>The proposed project does not have the potential to impact the rest haul-out sites.</p>	<p>No likely significant effects</p>
<p><b>Population composition:</b> The grey seal population occurring within this site should contain adult, juvenile and pup cohorts annually</p>	<p>The proposed project does not have the potential to impact population structure within this site.</p>	<p>No likely significant effects</p>
<p><b>Disturbance:</b> Human activities should occur at levels that do not adversely affect the grey seal population at the site</p>	<p>Due to the distance of the proposed surveys from the site there is no potential for any project related activities to lead to disturbance to the grey seal population within the site.</p>	<p>No likely significant effects</p>

### 8.3. Summary

Appendix 13.2 provides a list of all European sites and their QIs or SCIs assessed. Those where a Source Path receptor link was established were further assessed for potential for impact. Based on the rationale provided in section 8.2 no impacts, as a result of project related activities, on any of the QIs or SCIs for any of these sites are considered possible as the scale and scope of the project and its associated magnitude is considered too small for any potential for impact.



## 9. In-combination impacts

### 9.1. Approach to identification of in-combination effects

While a single development may not in itself cause a significant impact on the conservation objectives of a site, a combination of projects within a localised area may cause a negative impact on a site. Therefore, the cumulative impacts of a project or plan in association with other projects and plans must be taken into consideration when assessing the possible impacts of a development.

Potential project related impacts were identified in section 6 (table 3) of this SISAA, and included potential pressures resulting from: vessel presence, acoustic surveys and benthic surveys. Additional projects identified as having potential to act in-combination with the proposed project are considered to be those projects most likely to contribute to these pressures and generate additional underwater noise, vessel disturbance and impacts on benthic habitats.

The following approach has been taken to the identification of cumulative impacts has been taken:

- The geographic boundaries of the proposed project as clearly set out in section 4 were reviewed.
- As the proposed project is solely marine based, a search for projects with a marine component or the ability to impact the marine environment through a SPR link were considered relative to the potential for cumulative effects. In this regard all additional projects within 100km of the proposed project area were considered in this review. This is considered to be reasonable and appropriate relative to the scale and scope of the proposed project.
- The search was focused on applications listed on the websites of the Maritime Area Regulatory Authority (MARA) for post 17<sup>th</sup> July 2023 applications and the Foreshore unit of the Department of Housing Local Government and Heritage for applications pre 17<sup>th</sup> July 2023. Further information available through the Department of Agriculture, Food and the Marine with regard to foreshore functions relating to fishery harbour centres, aquaculture and sea-fishing and the EPA regarding Dumping at Sea (DAS) permits were examined.
- Projects with the potential to impact the structure and function of all European sites within the Zol of the proposed project were identified.
- An assessment of the magnitude and /or extent of the identified likely cumulative effects was carried out.
- The significance of any impact identified was determined

### 9.2. Assessment of In-combination effects

Table 12 presents a list of projects identified through searches of the aforementioned databases which it is considered may have the potential to act in combination with the proposed project.

**Table 12.** Search of additional projects within or adjacent to Zol

Project No.	Application licence no.	Applicant	Description	Location	Project scope	Potential for cumulative impact
1	FS007616	Ruby Offshore Energy Ltd	Site Investigation for Offshore Wind Farm, off the coast of Counties Wexford, Waterford, Cork	Spatial overlap	All of these proposed projects have the same or very similar scope i.e. to carry out site investigations for proposed windfarms or connecting cable corridors. These surveys may include: geophysical, geotechnical, wind resource & metocean surveys together with information to support appropriate assessment and environmental impact assessment i.e. Benthic ecology, bird and marine mammal surveys	<p>All of these projects include elements with similar underwater noise, marine vessel disturbance and benthic sampling potential impacts.</p> <p>Due to the scale, magnitude and lack of any identified impacts on benthic habitats associated with the proposed project, it is considered that there is no potential for combined impacts with any of these additional projects.</p> <p>It is intended that the proposed project will be conducted in advance of any further consent of permission that may be given to any currently submitted or future foreshore applications in the Celtic Sea. Therefore there is no potential for temporal overlap.</p> <p>As such no potential for impact with project numbers 1 to 21 are considered possible.</p>
2	FS007471	Floating Cork Offshore Wind Ltd	Site Investigations for proposed Offshore Wind Farm, off County Cork	Spatial overlap		
3	FS007661	EirGrid	Offshore Renewable Grid Infrastructure – Waterford and Wexford	Spatial overlap		
4	FS007660	EirGrid	Site Investigations to inform Offshore Renewable Grid Infrastructure, Co Cork	Spatial overlap		
5	FS007555	Sure Partners Ltd.	Site surveys at the Foreshore Licence Area as part of an ongoing survey schedule for Arklow Bank Wind Park to maintain up to date baseline information for the site.	>60km north		
6	FS007318	RWE Renewables Ireland East Celtic Ltd:	Site Investigations for proposed East Celtic Offshore Wind Park, off Counties Wexford and Waterford	Spatial overlap		
7	FS007445	Blackwater OWL Offshore Wind Ltd.	Marine Surveys off the coast of Wexford	Spatial overlap		
8	FS007074	Farraige Renewables Ltd	Site Investigations for proposed offshore wind farm, off County Wexford	>20km north		
9	FS007472	Mac Lir Offshore Wind Ltd.	Site Investigations for proposed Offshore Wind Farm, off Counties Wexford, Wicklow and Dublin	>50km north		
10	FS006982	Energia	Application for Site Investigation Licence for Windfarm off Helvick Head	Spatial overlap		

11	FS007384	Celtic Horizon Offshore Wind Farm Ltd	Site Investigations for proposed Offshore Wind Farm, off Counties Wexford and Waterford	Spatial overlap		
12	FS007464	Bore Array Ltd	Site Investigation for Bore Array Offshore Wind Farm, off Co. Wexford	Spatial overlap		
13	FS007488	Celtic Offshore Renewable Energy	Site Investigations for proposed Offshore Wind Farm, off Counties Wexford and Waterford	Spatial overlap		
14	FS007621	Péarla Offshore Wind Ltd.	Site Investigations For Export Cable Corridor For A Proposed Offshore Wind Project	Spatial overlap		
15	FS007135	ESB Wind Development Ltd.	Site investigations off the coast of Wexford	>44km north		
16	FS007588	Wicklow Sea Wind Ltd	Site Investigations for Cable Route off County Wicklow	>90km north		
17	FS007436	Voyage Offshore Array Ltd.	Site Investigations for proposed Offshore Wind Farm, off Counties Waterford and Wexford	Spatial overlap		
18	FS007431	Tulca Offshore Array Ltd:	Site Investigations for proposed Offshore Wind Farm, off County Cork	Spatial overlap		
19	FS007575	Kinsale Offshore Wind Ltd:	Site Investigations for Export Cable Corridor for proposed Offshore Wind Farm, off County Cork	Spatial overlap		
20	FS007354	Kinsale Offshore Wind Ltd	Site Investigations for the proposed Kinsale Project offshore wind farm, off County Cork	Spatial overlap		
21	FS006983	Celtic sea array	Geophysical, Geotechnical and Environmental Site Investigation works	Spatial overlap		
22	LIC230013.	Port of Waterford	Geotechnical investigation required to support the design of a proposed 250m Offshore Renewable Energy (ORE)	>27km north	Detailed project description is not available but the mapping indicates a very localised project upstream of a	It is considered that the there is no potential for combined impacts with this project due to the weak SPR links upstream of a hydrological gradient,

			capable quay extension in the River Suir at the Port of Waterford, Belview, Co. Kilkenny		hydrological gradient within the River Suir at Bellview, Co. Kilkenny	distance and likely magnitude of LIC230013.
23	IC230019	Doyle Shipping Group	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.	>8km	Detailed project description is not available but the mapping indicates a very localised project upstream of a hydrological gradient at Cobh.	It is considered that there is no potential for combined impacts with this project due to the weak SPR links upstream of a hydrological gradient, distance and likely magnitude of IC230019.
24	LIC230017	Microsoft Ireland Operations Ltd.	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.	Spatial overlap	Detailed project description is not available.	Mapping indicates a limited scale of surveys will be required to lay a fibre optic cable. The scale of surveys required to determine ground conditions for laying fibre optic cables, which require a very narrow cable trench, is highly unlikely to act in combination with the proposed project in any way.
25	FS007363	Uisce Éireann	ADCP Surveys at Cork Harbour	Spatial overlap	Detailed project description is not available.	ADCPs are placed on the seabed to gather tidal information in trawl resistant frames. Previous assessments of ADCP deployments around the coast of Ireland have not identified any potential for impact associated with such deployments. As such no potential for in-combination effects is considered possible.

No projects have been identified in table 12 that could lead to in-combination impacts with the proposed project.

***Additional activities with the potential for combination impacts***

Vessel traffic is a constant feature of the area within and surrounding the proposed licence area. Both commercial freight and fishing vessels make use of the area. The level of additional vessel noise/disturbance associated with proposed bathymetric survey or the vessel will not contribute significantly to the prevailing background noise levels and will be of a short and temporary duration (approximately 52 days). Therefore no in-combination effects are considered likely as a result of vessel noise or disturbance.

No SPR link, other than the production of wastewater, has been found to connect terrestrial projects to the Zol of the survey area. It is considered that waste and storm water discharges from the emissions points identified on the EPA database would be well dispersed in the wider marine environment and would not have the potential to interact with the proposed project activities. Furthermore, no waste impacts are associated with the proposed project therefore no potential for cumulative effects is possible.

Given the scale of dredge spoil dumping, it's strict regulation and distance from the proposed project it is considered that the SPR link would be too weak for any possible interaction.

No other marine projects have been identified for the proposed project area that could serve to lead to cumulative impacts.

Due to recent policy changes it has been confirmed that any project planned will not now be permitted in advance of the project proposed here. Therefore, there is no potential for temporal overlap. Furthermore, given the lack of any risk of noise impact associated with the proposed project, the potential for downstream (e.g. recurring, repetitive) impacts resulting from additional projects that might be consented would be negligible.

Based on an assessment of the projects identified above, no potential for in-combination impacts has been identified.

## 10. Transboundary effect

Transboundary effects relate to the likelihood of significant effects on a site which is part of the Natura 2000 network but outside our national boundaries. This SISAA has determined the ZOI of the proposed project and concluded no potential for impacts alone or in-combination with other projects or plans on any European site. Therefore, transboundary impacts are not considered possible.

Since 1 January 2021 nature conservation areas in the UK (including Northern Ireland) are no longer part of the Natura 2000 network. On this basis, the nearest European sites outside of Ireland's national boundaries are on mainland Europe.

## 11. Conclusion

Following a review of the proposed project, information to support a screening assessment, following the guidelines of *Assessment of plans and projects significantly affecting Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC* has been prepared.

The assessment concludes that, even in the absence of the measures recommended in the *Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (NPWS, 2014)*, the proposed project will not give rise to significant effects on any European site. Accordingly, it is concluded that an Appropriate Assessment of the proposed project is not required.

***It should be noted that a separate Annex IV Risk Assessment has been prepared for this project (MERC, 2024). The Annex IV risk assessment has separately considered the potential for impacts on all Annex IV species that may have the potential to be impacted by the proposed project.***

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## 13. Appendices

### 13.1. Foraging ranges for breeding seabirds

*\*After Woodward et al. (2019).*

Species	Foraging Range - Mean Max (km)*	SPAs where species is qualifying feature
Kittiwake	156.1	Wicklow Head SPA
		Saltee Islands SPA
		Ireland's Eye SPA
		Howth Head Coast SPA
		Lambay Island SPA
		Helvick Head to Ballyquin SPA
Gannet	315.2	Saltee Islands SPA
		The Bull and The Cow Rocks SPA
		Skelligs SPA
Fulmar	542.3	Saltee Islands SPA
		Lambay Island SPA
		Puffin Island SPA
		Skelligs SPA
		Deenish Island and Scariff Island SPA
		Beara Peninsula SPA
		Blasket Islands SPA
		Iveragh Peninsula SPA
		Dingle Peninsula SPA
		Kerry Head SPA
		Cliffs of Moher SPA
Cormorant	25.6	The Raven SPA
		Wexford Harbour and Slobs
Shag	13.2	NA
Guillemot	73.2	Saltee Islands SPA
		Ireland's Eye SPA
Razorbill	88.7	Saltee Islands SPA
		Ireland's Eye SPA
		Lambay Island SPA
Puffin	137.1	Saltee Islands SPA
		Lambay Island SPA
Black-headed gull	18.5	Wexford Harbour and Slobs SPA
Roseate tern	12.6	NA
Common tern	18	NA
Arctic tern	25.7	Lady's Island Lake SPA
Sandwich tern	34.3	Lady's Island Lake SPA
Red-throated diver	9	The Raven SPA
Herring gull	58.8	Saltee Islands SPA
		The Murrough SPA
Little tern	5	NA
Lesser black-backed gull	127	Ballymacoda Bay SPA
		Lambay Island SPA
		Saltee Islands SPA
		Poulaphouca Reservoir SPA
		Wexford Harbour and Slobs SPA
Manx shearwater	1346.8	Deenish Island and Scariff Island SPA
		Skelligs SPA

		Puffin Island SPA
		Basket Islands SPA
		Cruagh Island SPA
Storm petrel	336	The Bull and The Cow Rocks SPA
		Deenish Island and Scariff Island SPA
Great black-backed gull	73	NA
Common gull	50	NA
Med gull	20	NA
Great skua	443.3	NA
Arctic skua	NA	NA

## 13.2. All European Sites assessed (QIs and SCIs)

Appendix 13.2. All European sites within the Zol of the proposed project considered for further assessment in this report on the basis of having sensitive receptors with the potential for impact.

European site	QI Screening Assessment
<b>Buckroney-Brittis Dunes and Fen SAC</b>	<b>Screened out for further assessment</b>
Annual vegetation of drift lines [1210]	QI outside of Zol
Perennial vegetation of stony banks [1220]	QI outside of Zol
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> ) [2150]	QI outside of Zol
Dunes with <i>Salix repens</i> ssp. <i>argentea</i> ( <i>Salicion arenariae</i> ) [2170]	QI outside of Zol
Humid dune slacks [2190]	QI outside of Zol
Alkaline fens [7230]	QI outside of Zol
<b>Kilpatrick Sandhills SAC</b>	<b>Screened out for further assessment</b>
Annual vegetation of drift lines [1210]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> ) [2150]	QI outside of Zol
<b>Cahore Polders and Dunes SAC</b>	<b>Screened out for further assessment</b>
Annual vegetation of drift lines [1210]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
Humid dune slacks [2190]	QI outside of Zol
<b>Kilmuckridge-Tinnaberna Sandhills SAC</b>	<b>Screened out for further assessment</b>
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
Kilmuckridge-Tinnaberna Sandhills SAC	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
<b>Raven Point Nature Reserve SAC</b>	<b>Screened out for further assessment</b>
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Annual vegetation of drift lines [1210]	QI outside of Zol
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
Dunes with <i>Salix repens</i> ssp. <i>argentea</i> ( <i>Salicion arenariae</i> ) [2170]	QI outside of Zol
Humid dune slacks [2190]	QI outside of Zol
<b>Slaney River Valley SAC</b>	<b>Screened in for further assessment</b>
Estuaries [1130]	QI outside of Zol
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330]	QI outside of Zol
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	QI outside of Zol

Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation [3260]	QI outside of Zol
Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	QI outside of Zol
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]	QI outside of Zol
<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	QI outside of Zol
<i>Petromyzon marinus</i> (Sea Lamprey) [1095]	QI within Zol
<i>Lampetra planeri</i> (Brook Lamprey) [1096]	QI outside of Zol
<i>Lampetra fluviatilis</i> (River Lamprey) [1099]	QI within Zol
<i>Alosa fallax fallax</i> (Twaite Shad) [1103]	QI within Zol
<i>Salmo salar</i> (Salmon) [1106]	QI within Zol
<i>Lutra lutra</i> (Otter) [1355]	QI within Zol
<i>Phoca vitulina</i> (Harbour Seal) [1365]	QI within Zol
<b>Blackwater Bank SAC</b>	<b>Screened out for further assessment</b>
Sandbanks which are slightly covered by sea water all the time [1110]	QI outside of Zol
<b>Long Bank SAC</b>	<b>Screened out for further assessment</b>
Sandbanks which are slightly covered by sea water all the time [1110]	QI outside of Zol
<b>Carnsore Point SAC</b>	<b>Screened out for further assessment</b>
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Reefs [1170]	QI outside of Zol
<b>Saltee Islands SAC</b>	<b>Screened in for further assessment</b>
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Large shallow inlets and bays [1160]	QI outside of Zol
Reefs [1170]	QI outside of Zol
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside of Zol
Submerged or partially submerged sea caves [8330]	QI outside of Zol
<i>Halichoerus grypus</i> (Grey Seal) [1364]	QI within Zol
<b>Lady's Island Lake SAC</b>	<b>Screened out for further assessment</b>
Coastal lagoons [1150]	QI outside of Zol
Reefs [1170]	QI outside of Zol
Perennial vegetation of stony banks [1220]	QI outside of Zol
<b>Tacumshin Lake SAC</b>	<b>Screened out for further assessment</b>
Coastal lagoons [1150]	QI outside of Zol
Annual vegetation of drift lines [1210]	QI outside of Zol
Perennial vegetation of stony banks [1220]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
<b>Hook Head SAC</b>	<b>Screened out for further assessment</b>
Large shallow inlets and bays [1160]	QI outside of Zol
Reefs [1170]	QI outside of Zol
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside of Zol
<b>Ballyteige Burrow SAC</b>	<b>Screened out for further assessment</b>
Estuaries [1130]	QI outside of Zol
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Coastal lagoons [1150]	QI outside of Zol
Annual vegetation of drift lines [1210]	QI outside of Zol
Perennial vegetation of stony banks [1220]	QI outside of Zol
Salicornia and other annuals colonising mud and sand [1310]	QI outside of Zol

Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330]	QI outside of Zol
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	QI outside of Zol
Mediterranean and thermo-Atlantic halophilous scrubs ( <i>Sarcocornetea fruticosi</i> ) [1420]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> ) [2150]	QI outside of Zol
Humid dune slacks [2190]	QI outside of Zol
<b>Bannow Bay SAC</b>	<b>Screened out for further assessment</b>
Estuaries [1130]	QI outside of Zol
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Annual vegetation of drift lines [1210]	QI outside of Zol
Perennial vegetation of stony banks [1220]	QI outside of Zol
Salicornia and other annuals colonising mud and sand [1310]	QI outside of Zol
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330]	QI outside of Zol
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	QI outside of Zol
Mediterranean and thermo-Atlantic halophilous scrubs ( <i>Sarcocornetea fruticosi</i> ) [1420]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
<b>River Barrow and River Nore SAC</b>	<b>Screened in for further assessment</b>
Estuaries [1130]	QI outside of Zol
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Reefs [1170]	QI outside of Zol
Salicornia and other annuals colonising mud and sand [1310]	QI outside of Zol
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritima</i> ) [1330]	QI outside of Zol
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	QI outside of Zol
Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]	QI outside of Zol
European dry heaths [4030]	QI outside of Zol
Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels [6430]	QI outside of Zol
Petrifying springs with tufa formation ( <i>Cratoneurion</i> ) [7220]	QI outside of Zol
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	QI outside of Zol
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0]	QI outside of Zol
<i>Vertigo moulinsiana</i> (Desmoulin's Whorl Snail) [1016]	QI outside of Zol
<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	QI outside of Zol
<i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]	QI outside of Zol
<i>Petromyzon marinus</i> (Sea Lamprey) [1095]	QI within of Zol
<i>Lampetra planeri</i> (Brook Lamprey) [1096]	QI within of Zol
<i>Lampetra fluviatilis</i> (River Lamprey) [1099]	QI within of Zol
<i>Alosa fallax fallax</i> (Twait Shad) [1103]	QI within of Zol
<b>Tramore Dunes and Backstrand SAC</b>	<b>Screened out for further assessment</b>
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Annual vegetation of drift lines [1210]	QI outside of Zol
Perennial vegetation of stony banks [1220]	QI outside of Zol
Salicornia and other annuals colonising mud and sand [1310]	QI outside of Zol

Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330]	QI outside of Zol
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
<b>Helvick Head SAC</b>	<b>Screened out for further assessment</b>
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside of Zol
European dry heaths [4030]	QI outside of Zol
<b>Ardmore Head SAC</b>	<b>Screened out for further assessment</b>
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside of Zol
European dry heaths [4030]	QI outside of Zol
<b>Blackwater River (Cork/Waterford) SAC</b>	<b>Screened in for further assessment</b>
Estuaries [1130]	QI outside of Zol
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Perennial vegetation of stony banks [1220]	QI outside of Zol
Salicornia and other annuals colonising mud and sand [1310]	QI outside of Zol
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330]	QI outside of Zol
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	QI outside of Zol
Water courses of plain to montane levels with the <i>Ranuncion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260]	QI outside of Zol
Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0]	QI outside of Zol
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0]	QI outside of Zol
<i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]	QI outside of Zol
<i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092]	QI outside of Zol
<i>Petromyzon marinus</i> (Sea Lamprey) [1095]	QI within of Zol
<i>Lampetra planeri</i> (Brook Lamprey) [1096]	QI within of Zol
<i>Lampetra fluviatilis</i> (River Lamprey) [1099]	QI within of Zol
<i>Alosa fallax fallax</i> (Twait Shad) [1103]	QI within of Zol
<i>Salmo salar</i> (Salmon) [1106]	QI within of Zol
<i>Lutra lutra</i> (Otter) [1355]	QI within of Zol
<i>Trichomanes speciosum</i> (Killarney Fern) [1421]	QI outside of Zol
<b>Ballymacoda (Clonpriest and Pillmore) SAC</b>	<b>Screened out for further assessment</b>
Estuaries [1130]	QI outside of Zol
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Salicornia and other annuals colonising mud and sand [1310]	QI outside of Zol
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330]	QI outside of Zol
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	QI outside of Zol
<b>Great Island Channel SAC</b>	<b>Screened out for further assessment</b>
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330]	QI outside of Zol
<b>Courtmacsherry Estuary SAC</b>	<b>Screened out for further assessment</b>
Estuaries [1130]	QI outside of Zol
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Annual vegetation of drift lines [1210]	QI outside of Zol
Perennial vegetation of stony banks [1220]	QI outside of Zol
Salicornia and other annuals colonising mud and sand [1310]	QI outside of Zol
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330]	QI outside of Zol

Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
<b>Clonakilty Bay SAC</b>	<b>Screened out for further assessment</b>
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Annual vegetation of drift lines [1210]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
Atlantic decalcified fixed dunes ( <i>Calluno-Ulicetea</i> ) [2150]	QI outside of Zol
<b>Kilkeran Lake and Castlefreke Dunes SAC</b>	<b>Screened out for further assessment</b>
Coastal lagoons [1150]	QI outside of Zol
Embryonic shifting dunes [2110]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
<b>Lough Hyne Nature Reserve &amp; Environs SAC</b>	<b>Screened out for further assessment</b>
Large shallow inlets and bays [1160]	QI outside of Zol
Reefs [1170]	QI outside of Zol
European dry heaths [4030]	QI outside of Zol
Submerged or partially submerged sea caves [8330]	QI outside of Zol
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [91E0]	QI outside of Zol
<b>Roaringwater Bay and Islands SAC</b>	<b>Screened in for further assessment</b>
Large shallow inlets and bays [1160]	QI outside of Zol
Reefs [1170]	QI outside of Zol
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside of Zol
European dry heaths [4030]	QI outside of Zol
Submerged or partially submerged sea caves [8330]	QI outside of Zol
<i>Phocoena phocoena</i> (Harbour Porpoise) [1351]	QI within of Zol
<i>Lutra lutra</i> (Otter) [1355]	QI within of Zol
<i>Halichoerus grypus</i> (Grey Seal) [1364]	QI within of Zol
<b>Barleycove to Ballyrisode Point SAC</b>	<b>Screened out for further assessment</b>
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside of Zol
Perennial vegetation of stony banks [1220]	QI outside of Zol
<i>Salicornia</i> and other annuals colonising mud and sand [1310]	QI outside of Zol
Atlantic salt meadows ( <i>Glauco-Puccinellietalia maritimae</i> ) [1330]	QI outside of Zol
Mediterranean salt meadows ( <i>Juncetalia maritimi</i> ) [1410]	QI outside of Zol
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	QI outside of Zol
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside of Zol
European dry heaths [4030]	QI outside of Zol
<i>Petalophyllum ralfsii</i> (Petalwort) [1395]	QI outside of Zol
<b>Three Castel Head to Mizan Head SAC</b>	<b>Screened out for further assessment</b>
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside of Zol
European dry heaths [4030]	QI outside of Zol
<b>Wicklow Head SPA</b>	<b>Screened in for further assessment</b>
Kittiwake ( <i>Rissa tridactyla</i> ) [A188]	SCI within Zol
<b>Cahore Marshes SPA</b>	<b>Screened out for further assessment</b>

Wigeon ( <i>Anas penelope</i> ) [A050]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Greenland White-fronted Goose ( <i>Anser albifrons flavirostris</i> ) [A395]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>The Raven SPA</b>	<b>Screened in for further assessment</b>
Red-throated Diver ( <i>Gavia stellata</i> ) [A001]	SCI outside of Zol
Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]	SCI within Zol
Common Scoter ( <i>Melanitta nigra</i> ) [A065]	SCI outside of Zol
Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	SCI outside of Zol
Sanderling ( <i>Calidris alba</i> ) [A144]	SCI outside of Zol
Greenland White-fronted Goose ( <i>Anser albifrons flavirostris</i> ) [A395]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Wexford Harbour and slob SPA</b>	<b>Screened in for further assessment</b>
Little Grebe ( <i>Tachybaptus ruficollis</i> ) [A004]	SCI outside of Zol
Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005]	
Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]	
Grey Heron ( <i>Ardea cinerea</i> ) [A028]	SCI outside of Zol
Bewick's Swan ( <i>Cygnus columbianus bewickii</i> ) [A037]	SCI outside of Zol
Whooper Swan ( <i>Cygnus cygnus</i> ) [A038]	SCI outside of Zol
Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046]	SCI outside of Zol
Shelduck ( <i>Tadorna tadorna</i> ) [A048]	SCI outside of Zol
Wigeon ( <i>Anas penelope</i> ) [A050]	SCI outside of Zol
Teal ( <i>Anas crecca</i> ) [A052]	SCI outside of Zol
Mallard ( <i>Anas platyrhynchos</i> ) [A053]	SCI outside of Zol
Pintail ( <i>Anas acuta</i> ) [A054]	SCI outside of Zol
Scaup ( <i>Aythya marila</i> ) [A062]	SCI outside of Zol
Goldeneye ( <i>Bucephala clangula</i> ) [A067]	SCI outside of Zol
Red-breasted Merganser ( <i>Mergus serrator</i> ) [A069]	SCI outside of Zol
Hen Harrier ( <i>Circus cyaneus</i> ) [A082]	SCI outside of Zol
Coot ( <i>Fulica atra</i> ) [A125]	SCI outside of Zol
Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Knot ( <i>Calidris canutus</i> ) [A143]	SCI outside of Zol
Sanderling ( <i>Calidris alba</i> ) [A144]	SCI outside of Zol
Dunlin ( <i>Calidris alpina</i> ) [A149]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157]	SCI outside of Zol
Curlew ( <i>Numenius arquata</i> ) [A160]	SCI outside of Zol
Redshank ( <i>Tringa totanus</i> ) [A162]	SCI outside of Zol
Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179]	SCI within Zol
Lesser Black-backed Gull ( <i>Larus fuscus</i> ) [A183]	SCI within Zol
Little Tern ( <i>Sterna albifrons</i> ) [A195]	SCI within Zol
Greenland White-fronted Goose ( <i>Anser albifrons flavirostris</i> ) [A395]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol



<b>Seas off Wexford SPA</b>	<b>Screened in for further assessment</b>
Red-throated Diver ( <i>Gavia stellata</i> ) [A001]	SCI within Zol
Fulmar ( <i>Fulmarus glacialis</i> ) [A009]	SCI within Zol
Manx Shearwater ( <i>Puffinus puffinus</i> ) [A013]	SCI within Zol
Gannet ( <i>Morus bassanus</i> ) [A016]	SCI within Zol
Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]	SCI within Zol
Shag ( <i>Phalacrocorax aristotelis</i> ) [A018]	SCI within Zol
Common Scoter ( <i>Melanitta nigra</i> ) [A065]	SCI within Zol
Mediterranean Gull ( <i>Larus melanocephalus</i> ) [A176]	SCI within Zol
Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179]	SCI within Zol
Lesser Black-backed Gull ( <i>Larus fuscus</i> ) [A183]	SCI within Zol
Herring Gull ( <i>Larus argentatus</i> ) [A184]	SCI within Zol
Kittiwake ( <i>Rissa tridactyla</i> ) [A188]	SCI within Zol
Sandwich Tern ( <i>Sterna sandvicensis</i> ) [A191]	SCI within Zol
Roseate Tern ( <i>Sterna dougallii</i> ) [A192]	SCI within Zol
Common Tern ( <i>Sterna hirundo</i> ) [A193]	SCI within Zol
Arctic Tern ( <i>Sterna paradisaea</i> ) [A194]	SCI within Zol
Little Tern ( <i>Sterna albifrons</i> ) [A195]	SCI within Zol
Guillemot ( <i>Uria aalge</i> ) [A199]	SCI within Zol
Razorbill ( <i>Alca torda</i> ) [A200]	SCI within Zol
Puffin ( <i>Fratercula arctica</i> ) [A204]	SCI within Zol
<b>Lady's Island Lake SPA</b>	<b>Screened in for further assessment</b>
Gadwall ( <i>Anas strepera</i> ) [A051]	SCI within Zol
Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179]	SCI within Zol
Sandwich Tern ( <i>Sterna sandvicensis</i> ) [A191]	SCI within Zol
Roseate Tern ( <i>Sterna dougallii</i> ) [A192]	SCI within Zol
Common Tern ( <i>Sterna hirundo</i> ) [A193]	SCI within Zol
Arctic Tern ( <i>Sterna paradisaea</i> ) [A194]	SCI within Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Tacumshin Lake SPA</b>	<b>Screened out for further assessment</b>
Little Grebe ( <i>Tachybaptus ruficollis</i> ) [A004]	SCI outside of Zol
Bewick's Swan ( <i>Cygnus columbianus bewickii</i> ) [A037]	SCI outside of Zol
Whooper Swan ( <i>Cygnus cygnus</i> ) [A038]	SCI outside of Zol
Wigeon ( <i>Anas penelope</i> ) [A050]	SCI outside of Zol
Gadwall ( <i>Anas strepera</i> ) [A051]	SCI outside of Zol
Teal ( <i>Anas crecca</i> ) [A052]	SCI outside of Zol
Pintail ( <i>Anas acuta</i> ) [A054]	SCI outside of Zol
Shoveler ( <i>Anas clypeata</i> ) [A056]	SCI outside of Zol
Tufted Duck ( <i>Aythya fuligula</i> ) [A061]	SCI outside of Zol
Coot ( <i>Fulica atra</i> ) [A125]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Saltee Islands SPA</b>	<b>Screened in for further assessment</b>
Fulmar ( <i>Fulmarus glacialis</i> ) [A009]	SCI within Zol

Gannet ( <i>Morus bassanus</i> ) [A016]	SCI within Zol
Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]	SCI within Zol
Shag ( <i>Phalacrocorax aristotelis</i> ) [A018]	SCI within Zol
Lesser Black-backed Gull ( <i>Larus fuscus</i> ) [A183]	SCI within Zol
Herring Gull ( <i>Larus argentatus</i> ) [A184]	SCI within Zol
Kittiwake ( <i>Rissa tridactyla</i> ) [A188]	SCI within Zol
Guillemot ( <i>Uria aalge</i> ) [A199]	SCI within Zol
Razorbill ( <i>Alca torda</i> ) [A200]	SCI within Zol
Puffin ( <i>Fratercula arctica</i> ) [A204]	SCI within Zol
<b>Ballyteige Burrow SPA</b>	<b>Screened out for further assessment</b>
Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046]	SCI outside of Zol
Shelduck ( <i>Tadorna tadorna</i> ) [A048]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Keeragh Islands SPA</b>	<b>Screened in for further assessment</b>
Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]	SCI within Zol
<b>Bannow Bay SPA</b>	<b>Screened out for further assessment</b>
Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046]	SCI outside of Zol
Shelduck ( <i>Tadorna tadorna</i> ) [A048]	SCI outside of Zol
Pintail ( <i>Anas acuta</i> ) [A054]	SCI outside of Zol
Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Knot ( <i>Calidris canutus</i> ) [A143]	SCI outside of Zol
Dunlin ( <i>Calidris alpina</i> ) [A149]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157]	SCI outside of Zol
Curlew ( <i>Numenius arquata</i> ) [A160]	SCI outside of Zol
Redshank ( <i>Tringa totanus</i> ) [A162]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Tramore Backstrand SPA</b>	<b>Screened out for further assessment</b>
Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Dunlin ( <i>Calidris alpina</i> ) [A149]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157]	SCI outside of Zol
Curlew ( <i>Numenius arquata</i> ) [A160]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Mid-Waterford Coast SPA</b>	<b>Screened in for further assessment</b>
Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]	SCI within Zol

Peregrine ( <i>Falco peregrinus</i> ) [A103]	SCI outside of Zol
Herring Gull ( <i>Larus argentatus</i> ) [A184]	SCI within Zol
Chough ( <i>Pyrrhocorax pyrrhocorax</i> ) [A346]	SCI outside of Zol
<b>Dungarvan Harbour SPA</b>	<b>Screened out for further assessment</b>
Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005]	SCI outside of Zol
Light-bellied Brent Goose ( <i>Branta bernicla hrota</i> ) [A046]	SCI outside of Zol
Shelduck ( <i>Tadorna tadorna</i> ) [A048]	SCI outside of Zol
Red-breasted Merganser ( <i>Mergus serrator</i> ) [A069]	SCI outside of Zol
Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Knot ( <i>Calidris canutus</i> ) [A143]	SCI outside of Zol
Dunlin ( <i>Calidris alpina</i> ) [A149]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157]	SCI outside of Zol
Curlew ( <i>Numenius arquata</i> ) [A160]	SCI outside of Zol
Redshank ( <i>Tringa totanus</i> ) [A162]	SCI outside of Zol
Turnstone ( <i>Arenaria interpres</i> ) [A169]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Helvick Head to Ballyquin SPA</b>	<b>Screened in for further assessment</b>
Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]	SCI within Zol
Peregrine ( <i>Falco peregrinus</i> ) [A103]	QI outside of Zol
Herring Gull ( <i>Larus argentatus</i> ) [A184]	SCI within Zol
Kittiwake ( <i>Rissa tridactyla</i> ) [A188]	SCI within Zol
Chough ( <i>Pyrrhocorax pyrrhocorax</i> ) [A346]	SCI outside of Zol
<b>Blackwater Estuary SPA</b>	<b>Screened out for further assessment</b>
Wigeon ( <i>Anas penelope</i> ) [A050]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Dunlin ( <i>Calidris alpina</i> ) [A149]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157]	SCI outside of Zol
Curlew ( <i>Numenius arquata</i> ) [A160]	SCI outside of Zol
Redshank ( <i>Tringa totanus</i> ) [A162]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Ballymacoda Bay SPA</b>	<b>Screened in for further assessment</b>
Wigeon ( <i>Anas penelope</i> ) [A050]	SCI outside of Zol
Teal ( <i>Anas crecca</i> ) [A052]	SCI outside of Zol
Ringed Plover ( <i>Charadrius hiaticula</i> ) [A137]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Sanderling ( <i>Calidris alba</i> ) [A144]	SCI outside of Zol
Dunlin ( <i>Calidris alpina</i> ) [A149]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157]	SCI outside of Zol

Curlew ( <i>Numenius arquata</i> ) [A160]	SCI outside of Zol
Redshank ( <i>Tringa totanus</i> ) [A162]	SCI outside of Zol
Turnstone ( <i>Arenaria interpres</i> ) [A169]	SCI outside of Zol
Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179]	SCI outside of Zol
Common Gull ( <i>Larus canus</i> ) [A182]	SCI within Zol
Lesser Black-backed Gull ( <i>Larus fuscus</i> ) [A183]	SCI within Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Ballycotton Bay SPA</b>	<b>Screened in for further assessment</b>
Teal ( <i>Anas crecca</i> ) [A052]	SCI outside of Zol
Ringed Plover ( <i>Charadrius hiaticula</i> ) [A137]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157]	SCI outside of Zol
Curlew ( <i>Numenius arquata</i> ) [A160]	SCI outside of Zol
Turnstone ( <i>Arenaria interpres</i> ) [A169]	SCI outside of Zol
Common Gull ( <i>Larus canus</i> ) [A182]	SCI within Zol
Lesser Black-backed Gull ( <i>Larus fuscus</i> ) [A183]	SCI within Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Cork Harbour SPA</b>	<b>Screened in for further assessment</b>
Little Grebe ( <i>Tachybaptus ruficollis</i> ) [A004]	SCI outside of Zol
Great Crested Grebe ( <i>Podiceps cristatus</i> ) [A005]	SCI outside of Zol
Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]	SCI within Zol
Grey Heron ( <i>Ardea cinerea</i> ) [A028]	SCI outside of Zol
Shelduck ( <i>Tadorna tadorna</i> ) [A048]	SCI outside of Zol
Wigeon ( <i>Anas penelope</i> ) [A050]	SCI outside of Zol
Teal ( <i>Anas crecca</i> ) [A052]	SCI outside of Zol
Pintail ( <i>Anas acuta</i> ) [A054]	SCI outside of Zol
Shoveler ( <i>Anas clypeata</i> ) [A056]	SCI outside of Zol
Red-breasted Merganser ( <i>Mergus serrator</i> ) [A069]	SCI outside of Zol
Oystercatcher ( <i>Haematopus ostralegus</i> ) [A130]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Grey Plover ( <i>Pluvialis squatarola</i> ) [A141]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Dunlin ( <i>Calidris alpina</i> ) [A149]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157]	SCI outside of Zol
Curlew ( <i>Numenius arquata</i> ) [A160]	SCI outside of Zol
Redshank ( <i>Tringa totanus</i> ) [A162]	SCI outside of Zol
Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179]	SCI outside of Zol
Common Gull ( <i>Larus canus</i> ) [A182]	SCI within Zol
Lesser Black-backed Gull ( <i>Larus fuscus</i> ) [A183]	SCI within Zol
Common Tern ( <i>Sterna hirundo</i> ) [A193]	SCI within Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Sovereign Islands SPA</b>	<b>Screened in for further assessment</b>
Cormorant ( <i>Phalacrocorax carbo</i> ) [A017]	SCI within Zol

<b>Old Head of Kinsale SPA</b>	<b>Screened in for further assessment</b>
Kittiwake ( <i>Rissa tridactyla</i> ) [A188]	SCI within Zol
Guillemot ( <i>Uria aalge</i> ) [A199]	SCI within Zol
<b>Courtmacherry Bay SPA</b>	<b>Screened out for further assessment</b>
Great Northern Diver ( <i>Gavia immer</i> ) [A003]	SCI outside of Zol
Shelduck ( <i>Tadorna tadorna</i> ) [A048]	SCI outside of Zol
Wigeon ( <i>Anas penelope</i> ) [A050]	SCI outside of Zol
Red-breasted Merganser ( <i>Mergus serrator</i> ) [A069]	SCI outside of Zol
Golden Plover ( <i>Pluvialis apricaria</i> ) [A140]	SCI outside of Zol
Lapwing ( <i>Vanellus vanellus</i> ) [A142]	SCI outside of Zol
Dunlin ( <i>Calidris alpina</i> ) [A149]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Bar-tailed Godwit ( <i>Limosa lapponica</i> ) [A157]	SCI outside of Zol
Curlew ( <i>Numenius arquata</i> ) [A160]	SCI outside of Zol
Black-headed Gull ( <i>Chroicocephalus ridibundus</i> ) [A179]	SCI outside of Zol
Common Gull ( <i>Larus canus</i> ) [A182]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Seven Heads SPA</b>	<b>Screened out for further assessment</b>
Chough ( <i>Pyrrhocorax pyrrhocorax</i> ) [A346]	SCI outside of Zol
<b>Clonakilty Bay SPA</b>	<b>Screened out for further assessment</b>
Shelduck ( <i>Tadorna tadorna</i> ) [A048]	SCI outside of Zol
Dunlin ( <i>Calidris alpina</i> ) [A149]	SCI outside of Zol
Black-tailed Godwit ( <i>Limosa limosa</i> ) [A156]	SCI outside of Zol
Curlew ( <i>Numenius arquata</i> ) [A160]	SCI outside of Zol
Wetland and Waterbirds [A999]	SCI outside of Zol
<b>Galley Head to Duneen Point SPA</b>	<b>Screened out for further assessment</b>
Chough ( <i>Pyrrhocorax pyrrhocorax</i> ) [A346]	SCI outside of Zol
<b>Sheep's Head to Toe Head SPA</b>	<b>Screened out for further assessment</b>
Peregrine ( <i>Falco peregrinus</i> ) [A103]	SCI outside of Zol
Chough ( <i>Pyrrhocorax pyrrhocorax</i> ) [A346]	SCI outside of Zol
<b>Beara Peninsula SPA</b>	<b>Screened out for further assessment</b>
Fulmar ( <i>Fulmarus glacialis</i> ) [A009]	SCI outside of Zol
Chough ( <i>Pyrrhocorax pyrrhocorax</i> ) [A346]	SCI outside of Zol

### 13.3. Noise modelling and environmental risk assessment of a geophysical survey and its impact on herring and minke whales in Irish coastal waters

Provided as a separate document.