MERC Consultants
environmental and conservation services

Natura Impact Statement

North Atlantic Shipwreck Survey

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1. Introduction

SalvOcean Ltd (SAL) is a limited liability company established in the United Kingdom with a USA subsidiary; specifically inaugurated as a project manager company to enable execution of marine surveys, salvage recoveries from shipwrecks, submerged ordnance handling and disposal, environmental impact surveys, and marine operations within the oil, gas, and renewables sectors on behalf of their clients.

SalvOcean also operates in unison with academia, providing facilities onboard their vessels to allow for further scientific research into marine biology, ocean health and risks posed to the environment from potentially polluting shipwrecks.

SalvOcean wish to carry out non-intrusive subsea surveys on two shipwrecks (MV Accra and the SS City of Simla), hereafter referred to as the "proposed project". The SS City of Simla lies within Irelands Exclusive Economic Zone (EEZ) and currently designated Irish Continental Shelf Maritime Boundary (CSMB), the MV Accra lies within Irelands CSMB (Figure 1).

A Supporting Information for Screening for Appropriate Assessment (SISAA) report for the proposed project was prepared to assist the Competent Authority, in undertaking a screening exercise for Appropriate Assessment. The SISAA (MERC, 2025) concluded that the proposed project may give rise to significant adverse effects on the conservation objectives of a number of European sites without mitigation. Accordingly, it is concluded that Appropriate Assessment of the proposed project is required. This document represents a Natura Impact Statement (NIS) for the proposed project.

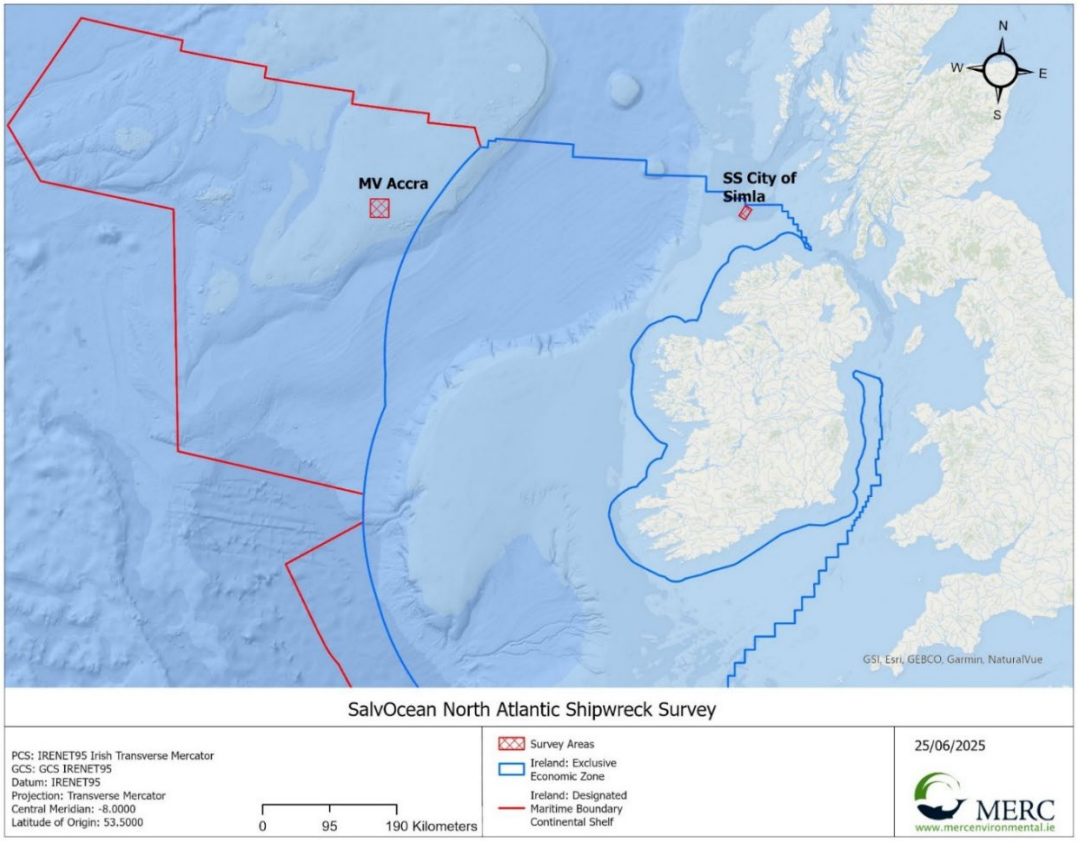

Figure 1 Proposed project site.

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 is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). 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. 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, *inter alia*, 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 significantly affecting Natura 2000 sites; Methodological Guidance on the provisions of Articles 6(3) and (4) of the Habits Directive 92/43/EEC. European Commission, 2002;
- 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.

4. Proposed survey work

4.1 Overview

The proposed project consists of a non-intrusive survey of two wreck sites as listed in Table 1. One wreck site (MV Accra) lies outside of Ireland's EEZ, but within the boundaries of the CSMB. The second wreck site (SS City of Simla) lies within the boundaries of Ireland's EEZ and CSMB. Both wreck sites are outside of Ireland's 12-mile territorial and 24-mile contiguous zones (Figure 1).

The timing for carrying out the survey works at both wreck sites will ideally occur between March and November due to this being the best seasonal weather. Surveys will run simultaneously as opposed to being individual operations and operate on a 24-hour basis.

Table 1. Proposed survey elements

Survey type	Wreck	
	MV Accra (NA/C7-D)	SS City of Simla (NA/CI-E)
Side Scan Sonar (SSS) survey	√	√
Multibeam echosounder (MBES) Survey	√	√
Sub-bottom profile (SBP) survey	√	√
Photogrammetry survey	√	√
Environmental survey	√	√
Hydrocarbon leak detection survey	√	√
Cultural heritage assessment survey	√	√

MV Accra (NA/C7-D)

The MV Accra is considered to be most likely positioned approximately 410km northwest of Annagh Head, Co. Mayo. The vessel was sunk due to a single torpedo strike and has never previously been located. However, a detailed analysis of the sinking event has been carried out and a subsequent target box for subsea surveys has been developed.

Table 2. MV Accra known details

Year of loss	1940	
GPS / PA	PA	
Position (Decimal degrees)	55.6671577°N -16.4670974°W	
Water depth	450 meters (estimated)	
SSS Target box area	678 sqkm	
Estimated target box coordinates	NE corner	55.7960844N -16.2840706W
	SE corner	55.5636285N -16.2383094W
	SW corner	55.5372053N -16.6481826W
	NW corner	55.7694260N -16.6963327W
Estimated time for SSS	297 – hours / 12.4 -days (maximum)	
Estimated time for residual surveys	7 - days	

SS City of Simla (NA/C1-E)

The SS City of Simla is positioned approximately 72km northwest of Malin Head, Co. Donegal. The vessel was sunk due to torpedo strikes. The wreck is split into two sections and the location of the main body of the wreck is known. However, the location of the stern section (approx. 50 meters in length) has not been located to date. The purpose of this survey is to locate the missing stern section and to obtain detailed photogrammetry of both sections of the wreck.

Table 3. SS City of Simla known details

Year of loss	1940	
GPS / PA	GPS main body / PA missing stern section	
Position	55.9362568°N -8.1649909°W	
Water depth	175 meters	
SSS Target box area	178 sqkm	
Estimated target box coordinates	NE corner	55.9423227N -8.0739340W
	SE corner	55.8141417N -8.2192833W
	SW corner	55.8646599N -8.3613375W
	NW corner	55.9930073N -8.2162692W
Estimated time for SSS	120 – hours / 5 - days (maximum)	

4.2 Survey equipment

A suite of mapping instruments will be used for the survey as detailed in Table 4. Details of the survey vessel and proposed equipment to be used are listed in Table 4 and described in section 4.2.1-4.2.5. Survey operations at each of the two wreck sites remain consistent. However, where a wreck is deemed as a Position Approximate (PA), then a Side Scan Survey (SSS) will be carried out to first locate the wreck prior to commencing a detailed survey. Where SSS is required, it shall be conducted within the predetermined ‘target boxes’, see Table 2 and Table 3.

Table 4. Equipment specification and sound pressure levels*

Equipment	Model	Deployment	Company	Sound Pressure Level Source Level (dB re 1 µPa)
Survey vessel	Glomar supporter or similar	Ocean Surface	Bharati Shipyard Goa, India	165–175
Vessel DP	DP2 Kongsberg Kpos 21	Hull mounted	Kongsberg	178
Acoustic Transponders	EdgeTech CAT Coastal Acoustic Transponder	Equipment mounted	EdgeTech	192
Obstacle Avoidance Sonars	Teledyne	Equipment mounted	Teledyne	160 to 180
Underwater Navigational Signals	Sonardyne Compatt 6 8300-3111 (USBL)	Equipment mounted	Sonardyne	187-196
Work Class ROV	Millennium® Plus Work Class ROV	Launched from Vessel	Oceaneering	130-160
Work Class ROV	Schilling Robotics HD Work Class ROV	Launched from Vessel	Schilling	130-160
Side Scan Sonar	EdgeTech 4200 Series	Towed System	EdgeTech	195-205
MBES	Sonic-V Series 2020,2022,2024,2025	Hull mounted	R2 Sonic	196-224
Ultra-High Resolution MBES	Teledyne RESON SeaBat® 7125	ROV Mounted	Teledyne	196-224
Sub Bottom Profiler	EdgeTech 3300	Hull Mounted	Hull Mounted	167-175
Sub Bottom Profiler	Immomar - Standard ROV	ROV mounted	Innomar Technologie	240

* While SalvOcean cannot categorically state it will be the exact models as listed, should alternatives be utilised then the sound pressure levels will fall within the parameters detailed in this table.

4.2.1 Survey vessel

As a survey vessel will be chartered, the specific vessel cannot be confirmed at this stage. However, the below vessel specification can be used as an 'example' vessel for the survey phase.

Glomar Supporter **MMSI: 352110000** **Call sign: 3EKK8** **IMO Number: 9344227** **Flag: Panama**	
Length OA	60.00m
Beam	15.20m
Draft Max (Loaded)	5.00m
Classification (RINA)	*C X SUPPLY VESSEL; FIRE-FIGHTING SHIP – 1 – WATER-SPRAYING; UNRESTRICTED NAVIGATION* *X AUT-UMS X DYNAPOS DP2; SPS*
DP Type	DP2 – Kongsberg Kpos 21

4.2.2 Multibeam echosounder

A multibeam echosounder (MBES) is a type of sonar, frequently used to map bathymetry, and is also used to provide the data required to map shipwrecks. 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 depths within the arc of the fan. The proposed MBES operates at a sound pressure level of 196-224 dB re 1µPa at 1m. Typical peak frequency is between 200-400 kHz.

4.2.3 .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 an EdgeTech 3300 Hull mounted system, operating at a sound pressure level of 165-175 dB re 1µPa at 1m.

4.2.4 Side scan sonar

Side scan sonar (SSS) is another device that transmits sound pulses that is frequently used to map the seabed and in the detection of submerged objects such as shipwrecks. It differs from MBES in that SSS has a finer beam width and smaller footprint to MBES and therefore higher resolution. It will be towed behind the vessel very close to the seabed. SSS 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 generally range from 100 to 1000kHz; higher frequencies yielding better resolution but less range. The proposed EdgeTech SSS to be used operates at 195-205 dB re 1µPa at 1m.

4.2.5 Additional acoustic transponders

A number of additional transponders, as given in Table 3, will be required to aid position fixing of the equipment deployed. All transponders operate by emitting and receiving acoustic signals and measuring time to calculate distance and direction by analysing the returning signal.

4.3 Survey campaign

4.3.1 Routing and planned schedule

The current proposed mobilisation port is Aberdeen, Scotland. However, options closer to the operational areas are currently being considered.

The planned routing of the survey vessel after departure from mobilisation port will be over the north coast of Scotland before engaging at site NA/C7-D (MV Accra), once operations are completed the vessel will then transit due east to the second wreck site NA/C1-E (SS City of Simla).

4.3.2 Hull mounted MBES and SSS

Wreck sites deemed Position Approximate (PA) will require the 'scanning' of a predetermined target box to locate the actual shipwreck within. The most efficient method identified for carrying out the scans is by means of a hull mounted MBES system. The hull mounted dual-head MBES system will allow the seabed to be scanned at a vessel speed of 4.5 knots.

To aid in identifying further anomalies, a towed side scan sonar (SSS) system will be utilised at the same time as the MBES.

4.3.3 General visual inspection of the wreck

A video survey will be conducted at the shipwreck and close vicinities. The adjacent areas will be surveyed to confirm the location of debris, fishing nets etc.

4.3.4 Digital video acquisition

One or several cameras, mounted on a ROV, will be used to record the visual monitoring of the wrecks and adjacent areas during the surveys.

4.3.5 Multi Beam Echo Sounder survey

The MBES will acquire data continuously during the survey. The MBES settings shall be optimised to provide the best profile quality and ensure the ping interval is set to achieve the required sounding density. It would be expected to achieve a density of 2-3 soundings for each cell at a ping rate of 10 Hz. This provides a real-time DTM so the data density can be reviewed. The ping rate can subsequently be increased or decreased as required.

4.3.6 Sub Bottom Profiler survey

Where necessary, a SBP survey will be carried out.

4.3.7 Hydrocarbon Leak Detection survey

Where considered necessary, a hydrocarbons/HNS survey will be carried out at the wreck site. As hydrocarbons can be considered as lighter in weight than seawater, such substances if emitting from a

shipwreck can be detected using the ROV's OAS. A suitable grid will be overlaid on the survey navigation screen to allow the ROV to make passes across the wreck while detecting for emissions.

4.3.8 Photogrammetry survey

Photogrammetry of each wreck will be carried out by collecting imagery of the wrecks and their environ by a ROV mounted SubSLAM X2 system, an underwater camera system.

5. Screening assessment

A SISAA report was prepared (MERC, 2025) to assist the Competent Authority, in undertaking a screening exercise for Appropriate Assessment (AA). The SISAA concluded that "*the proposed project may give rise to significant effects on the conservation objectives of a number of European sites without mitigation"*. Accordingly, it concluded that Appropriate Assessment of the proposed project was required.

All SACs that were screened in for appropriate assessment, are given in Table 5. Additional sites within the UK, "screened in" as they are within a Management Unit for a qualifying cetacean, are also given. All SPAs screened in are given in Table 6.

The QI's and SCI's for all sites screened in are given in appendix 1.

Table 5. European sites and relevant QIs screened in. *MU = Management Unit for the QI species.

			NA/C1-E (SS City of Simla)		NA/C7-D (MV Accra)	
Site code	**Site name**	**Qualifier for screening in**	**Distance (km)* to SAC**	**Wreck site Inside/outside MU for HP or BND**	**Distance (km) to SAC**	**Wreck site Inside/outside MU for HP or BND****
133	Donegal Bay (Murvagh) SAC	Harbour seal (*Phoca vitulina*)	210	N/A	517	N/A
147	Horn Head and Rinclevan SAC	Grey seal (*Halichoerus grypus*)	71	N/A	514	N/A
190	Slieve Tooey/Tormore Island/Loughros Beg Bay SAC	Grey seal (*Halichoerus grypus*)	122	N/A	477	N/A
191	St. John's Point SAC	Bottlenose dolphin (*Tursiops truncatus*)	165	Inside "Oceanic Waters" MU for BND	495	Outside all MU's
197	West of Ardara/Maas Road SAC	Harbour seal (*Phoca vitulina*)	119	N/A	486	N/A
241	Lough Swilly SAC	Harbour porpoise (*Phocoena phocoena*)	89	Inside West Scotland MU for HP	555	Outside all MU's
278	Inishbofin and Inishshark SAC	Grey seal (*Halichoerus grypus*)	286	N/A	430	N/A
328	Slyne Head Islands SAC	Bottlenose dolphin (*Tursiops truncatus*)	311	Inside "Oceanic Waters" MU		Outside all MU's
		Grey seal (*Halichoerus grypus*)		N/A	446	N/A
458	Killala Bay/Moy Estuary SAC	Harbour seal (*Phoca vitulina*)	194	N/A	478	N/A
495	Duvillaun Islands SAC	Bottlenose dolphin (*Tursiops truncatus*)	235	Inside "Oceanic Waters" MU		Outside all MU's
		Grey seal (*Halichoerus grypus*)		N/A	411	N/A
507	Inishkea Islands SAC	Grey seal (*Halichoerus grypus*)	229	N/A	408	N/A
622	Ballysadare Bay SAC	Harbour seal (*Phoca vitulina*)	180	N/A	498	N/A
627	Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC	Harbour seal (*Phoca vitulina*)	175	N/A	492	N/A
1141	Gweedore Bay and Islands SAC	Harbour porpoise (*Phocoena phocoena*)	79	Inside West Scotland MU for HP	491	Outside all MU's
2074	Slyne Head Peninsula SAC	Bottlenose dolphin (*Tursiops truncatus*)	310	Inside "Oceanic Waters" MU	449	Outside all MU's

			NA/C1-E (SS City of Simla)		NA/C7-D (MV Accra)	
Site code	**Site name**	**Qualifier for screening in**	**Distance (km)* to SAC**	**Wreck site Inside/outside MU for HP or BND**	**Distance (km) to SAC**	**Wreck site Inside/outside MU for HP or BND****
2165	Lower River Shannon SAC	Bottlenose dolphin (*Tursiops truncatus*)	408	Inside "Oceanic Waters" MU	519	Outside all MU's
2283	Rutland Island and Sound SAC	Harbour seal (*Phoca vitulina*)	97	N/A	487	N/A
2327	Belgica Mound Province SAC	Bottlenose dolphin (*Tursiops truncatus*)	536	Inside "Oceanic Waters" MU		Outside all MU's
		Harbour porpoise (*Phocoena phocoena*)		Not within a MU for HP	529	Outside all MU's
2329	South-West Porcupine Bank SAC	Bottlenose dolphin (*Tursiops truncatus*)	626	Inside "Oceanic Waters" MU	408	Outside all MU's
2998	West Connaught coast SAC	Bottlenose dolphin (*Tursiops truncatus*)	210	Inside "Oceanic Waters" MU		Outside all MU's
		Harbour porpoise (*Phocoena phocoena*)		Not within a MU for HP	404	Outside all MU's
3001	Porcupine Bank Canyon SAC	Bottlenose dolphin (*Tursiops truncatus*)	594	Inside "Oceanic Waters" MU	373	Outside all MU's
UK0030393	Inner Hebrides and the Minches	Harbour porpoise (*Phocoena phocoena*)	92	Inside " West Scotland" MU	592	Outside all MU's
UK0030383	Skerries and Causeway	Harbour porpoise (*Phocoena phocoena*)	113	Inside " West Scotland" MU	613	Outside all MU's

Table 6. SCI species screened in.

Species	Foraging range (km)	NA/C1-ESS City of Simla	NA/C7-DMV Accra	SPA
Kittiwake	156.1	71	N/A	Horn Head to Fanad Head SPA
		84	N/A	West Donegal Coast SPA
Fulmar	542.3	66	N/A	Tory Island SPA
		71	N/A	Horn Head to Fanad Head SPA
		84	N/A	West Donegal Coast SPA
		255	N/A	Clare Island SPA
		391	N/A	Kerry Head SPA
		426	N/A	Saltee Islands SPA
		442	N/A	Iveragh Peninsula SPA
		470	N/A	Puffin Island SPA
		479	N/A	Skelligs SPA
Guillemot	73.2	71	N/A	Horn Head to Fanad Head SPA
Razorbill	88.7	66	N/A	Tory Island SPA
		71	N/A	Horn Head to Fanad Head SPA
		84	N/A	West Donegal Coast SPA
Puffin	137.1	66	N/A	Tory Island SPA
Lesser black-backed gull	127	73	N/A	Inishbofin, Inishdooey and Inishbeg SPA
Manx shearwater	1346.8	254	665	North-West Irish Sea SPA
		291	440	Cruagh Island SPA
		443	522	Blasket Islands SPA
		470	555	Puffin Island SPA
		477	571	Deenish Island and Scariff Island SPA
		479	555	Skelligs SPA
		390	702	Seas off Wexford SPA
Storm petrel	336	195	N/A	Illanmaster SPA
		196	N/A	Stags of Broad Haven SPA
		222	N/A	Inishglora and Inishkeeragh SPA
		234	N/A	Duvillaun Islands SPA

6. Impact assessment

The SISAA identified the following as having the potential for likely significant effects.

- Disturbance, harm or injury as a result of vessel operations on marine mammals and birds.
- Disturbance & displacement by underwater noise with the potential for adverse effects on seabirds and marine mammals.

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.**

6.1 Review of sources of impact

6.1.1 Vessel disturbance and collision risk

The presence of vessels in an area also has the potential to lead to disturbance to marine mammals and birds. Although, depending on the location, these species may also become habituated to vessel presence.

The risk of collision causing injury to marine mammals is a directly related to the speed and size of the vessel. A vessel poses a higher risk when traveling at a higher speed, because higher speeds result in a stronger impact (i.e., higher force) and increase the risk of serious blunt force trauma (Wang *et al*., 2007). Smaller vessels, generally capable of higher speeds, also represent a collision risk. However, Wang *et al* note that according to impact and momentum physics, speed is more important than ship size in determining a lethal injury.

6.1.2 Noise disturbance and displacement

Marine mammals: 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, Wartzok, *et al* 2003 and NOAA, 2024). Such features and variability may also require consideration in the case-specific assessment of impact on marine mammals from introduced sound sources (NPWS 2014).

Seabirds: The impacts of underwater noise on diving seabirds is poorly understood and there is a paucity of data on the potential effects of underwater noise on diving seabirds. Recent reviews (e.g. Hartley Anderson Limited. 2020, Harding, 2022) have noted that evidence of harm to diving seabirds as a result of underwater noise is limited, but some studies have shown behavioural effects in diving seabirds. Research suggests (Yelverton *et al*. 1973, Cooper 1982, Stemp 1985, Danil & St Leger 2011) that likely impacts would be confined to areas within very close proximity of very high-amplitude low-frequency underwater noise (10's of metres) to the sound source. These studies relate to the use of explosives and there is a paucity of data on the effects of other forms of acoustic instrumentation including multibeam and mini-airguns.

Very high-amplitude low-frequency underwater noise may result in acute trauma to diving birds, with several studies reporting mortality of diving birds in close proximity (i.e. tens of metres) to underwater

explosions (Yelverton *et al*. 1973, Stemp 1985 and Danil K and St. Leger JA. 2011). Some studies (Cooper J. 1982) reported mortality in Penguins resulting from blasting, but details of the nature of the noise sources and distance to the species are lacking. Others (Danil K and St. Leger JA. 2011) reported mortality in diving seabirds associated with underwater detonation exercises. However, again the distance and profile of the blast is not documented. (Stemp, 1985) reported no significant difference in the abundance of thick-billed murre (Brünnich's guillemot) during seismic surveys using explosives and air guns) over 3 years. Stemp (1985) reported some mortality of birds in close proximity to explosive charges (up to 11 meters), but none associated with airguns.

The existing reviews recommend the need for dedicated research on the impacts of underwater noise from various sound sources on diving seabirds, while also suggesting a range of potential mitigations in the interim.

6.2 Assessment of Likely Significant effects (LSEs)

An assessment of LSEs on the QIs and SCIs of all European sites within the ZoI is provided below.

6.2.1 Vessel disturbance, vessel noise and collision risk

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. 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. The effects of non-impulsive sound on marine mammals is well documented and depending on its nature and intensity such underwater noise has the potential to disturb or injure marine mammals and potentially birds.

Fishing vessel activity is a common feature of the area within and surrounding the MUL area. The noise levels contributed by the survey vessel would be within the background level of underwater noise in this area and marine mammals would be habituated to such levels of noise.

Collision risk is considered negligible as the vessel will be moving at very slow speed during survey operations and therefore does not pose a significant collision risk.

The vessel presence may cause disturbance to seabirds, should they be foraging in the area at the same time as the proposed survey. However, given the large expanses of alternative available foraging habitat and the limited scale and duration of the proposed project no adverse effects on the conservation objectives of seabirds which form a SCI for any SPA are considered likely.

Conclusion: Vessel collision, disturbance and noise, with the potential to lead to LSEs on seabirds and marine mammals within or associated with any European site, is considered highly unlikely.

6.2.2 Equipment noise

Cetaceans

Underwater noise can lead to disturbance, harm or injury to cetaceans depending on the type and frequency of the noise and distance of the receptor.

Cetacean sensory systems are adapted to life in the water. They rely on sound to navigate, to communicate with one another and to sense and interpret their surroundings. Behavioural responses of marine mammals, including cetaceans, 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 (Southall *et al*, 2007). Such features and variability may also require consideration in the case-specific assessment of impact on marine mammals from introduced sound sources (NPWS 2014). Sound waves dissipate through the water with distance from the source. While local oceanographic conditions affect the path of the sound and its transmission.

Depending on the exposure levels from underwater noise, auditory injury to marine mammals can occur. This may result in temporary loss in hearing sensitivity, known as **Temporary Threshold Shift (TTS)** or more permanent damage, known as **Permanent Threshold Shift (PTS)**. The potential for auditory injury is related to the noise frequency relative to the hearing bandwidth of the marine mammal and is also influenced by the duration of exposure. The level of impact on an individual is a function of the **Sound Exposure Level (SEL)** that an individual receives as a result of underwater noise.

Table 7 details the various functional groups relative to hearing for the majority of cetaceans encountered in Irish waters.

Table 7. Cetacean functional groups relative to hearing at different sound frequencies

Low frequency 7 Hz-22 kHz	**Mid-frequency** 150 Hz-160 kHz	**High frequency** 200 Hz–180 kHz
Baleen whales	Most toothed whales, dolphins	Certain toothed whales, porpoise
Species- Ireland Humpback whale Blue whale Fin whale Sei whale Minke whale	**Species– Ireland** Sperm whale Killer whale Long-finned pilot whale Beaked whale species Dolphin species	**Species– Ireland** Pygmy sperm whale Harbour porpoise

Southall *et al* (2007) describes the sound pressure levels associated with the various functional groups as detailed in Table 8. This has been revised (Southall *et al,* 2019) to further refine functional hearing groups but similar injury criteria as relevant to the proposed project apply.

Table 8. Sound pressure levels associated with Temporary Threshold Shift (TTS) and Permanent Threshold Shift (PTS)

Functional group	**Injury Criteria (based on single pulse)**	
	TTS	**PTS**
Low frequency cetaceans	224dB re: 1µPa (peak)	230dB re: 1µPa (peak)
Mid frequency cetaceans	224dB re: 1µPa (peak)	230dB re: 1µPa (peak)
High frequency cetaceans	224dB re: 1µPa (peak)	230dB re: 1µPa (peak)
Pinnipeds (in water)	212dB re: 1µPa (peak)	218 dB re: 1µPa (peak)

The Sound Pressure Source Levels (dB re 1 µPa) of the various survey instruments are within the hearing range of Bottlenose dolphin and Harbour porpoise. While the sound will rapidly dissipate from source, thereby contributing to a very limited ZoI, it has the potential to lead to temporary disturbance. While any such disturbance would be highly unlikely to lead to LSEs on the Conservation Objectives of

these species within any European site, mitigation to avoid disturbance to these species is proposed out of an abundance of caution and in line with MARA practices.

Conclusion: While impacts on the conservation objectives of harbour porpoise and bottlenose dolphin, due to underwater noise, are considered highly unlikely, mitigation to avoid LSEs have been proposed.

Pinnipeds

Underwater noise resulting from the proposed survey has the potential to lead to disturbance to Harbour seal should they be within the ZoI of the survey during operations. The foraging range of harbour seal is currently believed to be up to 273km (Carter *et al*, 2022). The nearest site designated for harbour seal to the proposed project site is Rutland Island and Sound SAC, which is 97km distant at its nearest point. It is considered that, as the Conservation Objectives for harbour seal in Ireland are relevant to the species **within their site** and as the distance from the proposed project area to the nearest site is 97km away, the ZoI caused by artificial barriers (acoustic noise) will not extend to this site or any additional site designated for this species. Therefore, no potential for impact on the Conservation Objectives for harbour seal within their site/s is likely. However, with due regard to MARA practices and out of an abundance of caution, mitigation to ensure the proposed surveys do not give rise to LSEs on any European Site designated for harbour seal, mitigation is proposed.

Similarly for Grey seal, while disturbance to the species may occur should they be utilising the waters around either of the proposed MUL areas during survey operations, adverse effects on their conservation objectives within any European site are not considered possible. The nearest European site designated for Grey seal to the MUL area is Horn Head and Rinclevan SAC, which is 71Km away. However, with due regard to MARA practices and out of an abundance of caution, mitigation to ensure the proposed surveys do not give rise to LSEs on any European Site designated for harbour seal, mitigation is proposed.

Conclusion: While impacts on the conservation objectives of Grey seal and Harbour seal due to underwater noise, are considered highly unlikely, mitigation to avoid LSEs have been proposed.

Seabirds

It is recognised that diving birds can be sensitive to disturbance from underwater noise and fatalities can occur at close distance. However, flushing disturbance can be expected to displace these diving seabirds from close proximity to the survey vessel and any towed equipment, thereby limiting their exposure to the highest sound pressures generated. The likelihood of these birds being in the vicinity of a noise generating operation is low due to the surface activity associated with such operations disturbing the birds prior to commencement of the underwater noise. There is a low likelihood of interaction between the sound source and diving birds due to the relatively short exposure time, the temporary nature of the survey work, the mobile nature of the birds and the displacement of most diving species due to flushing disturbance. Therefore, it is considered that underwater noise would be unlikely to have a significant effect on diving seabirds in the vicinity of the survey area.

Conclusion: Impacts on the conservation objectives of any SPA designated for seabirds is not considered possible.

7. In-combination effects

7.1 Approach to the assessment of in-combination effects

While a single project or plan may not, in itself, lead to a significant effect on the conservation objectives of a site, a combination of projects within a localised area may cause a significant effect on a site. Therefore, the cumulative impacts must be taken into consideration when assessing the possible impacts of a project.

Potential project related impacts were identified in the SISAA, and included potential pressures resulting from: vessel presence and underwater noise. The SISAA did not identify any additional projects with the potential to act in-combination with the proposed project and thereby generate additional underwater noise and vessel disturbance.

MARA has developed a stepwise approach for identifying in-combination plans and projects, as such, using professional and scientific judgement, the key steps for assessing cumulative effects employed were as follows:

- Defining the Cumulative Effects Spatial Scope (CESS)
- Defining the Cumulative Effects Temporal Scope (CETS)
- Impact identification
- Pathway identification
- Prediction
- Identification of Plans or Projects that could act in combination
- Screening Stage Cumulative Effects Assessment conclusion
- Managing cumulative impacts identified - to be carried out as part of Stage 2 AA process

For the proposed project the CESS has been defined as 5 km from the boundary of the proposed MUL area for each wreck site and the CETS as 3 years. The definition of the CESS is based on acoustic survey equipment effective deterrence ranges as per JNCC Guidance on Assessing the Significance of Noise Disturbance against Harbour Porpoise SACs Conservation Objectives (JNCC, 2020) and the CETS is the Maritime Usage Licence period.

Using the above 8 step approach, and following a search of relevant databases undertaken on June 30th, 2025, no projects have been identified as being within the CESS of the MUL area. In addition, no plans, that could contribute to negative effects, in-combination with the proposed project, were identified.

7.2 Assessment of In-combination effects

A review of the MARA website for current licence applications proposed or determined does not indicate any additional projects, for the MUL area, that could act in combination with the proposed project with regard to cumulative effects. Similarly no plans for the proposed MUL area or its environs were identified.

Therefore it is concluded that the proposed project does not have the potential to act in-combination with other projects and plans that could result in LSEs on the conservation objectives of any European site.

8. Mitigation measures

8.1 Bottlenose dolphin and Harbour porpoise

NPWS (2014) provides guidance to manage the risk to marine mammals from man-made sound sources in Irish waters. This document provides guidance and mitigation measures to address key potential sources of anthropogenic sound that may impact negatively on marine mammals in Irish waters. The mitigation methods should follow the guidance prescribed by the National Parks and Wildlife Service. Specifically, in relation to Geophysical acoustic surveys, such as proposed in this project, the guidance set out in NPWS (2014), as stated below, should be fully implemented.

1. A qualified and experienced marine mammal observer (MMO) shall be appointed to monitor for marine mammals and to log all relevant events using standardised data forms (Appendix 6, NPWS, 2014).
2. Unless information specific to the location and/or plan/project is otherwise available to inform the mitigation process (e.g., specific sound propagation and/or attenuation data) and a distance modification has been agreed with the Regulatory Authority, acoustic surveying using the above equipment shall not commence if marine mammals are detected within a 500m radial distance of the sound source intended for use, i.e., within the Monitored Zone.

Pre-Start Monitoring

3. Sound-producing activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.
4. An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break (see below). It shall only proceed on positive confirmation with the MMO.
5. In waters up to 200m deep, the MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.
6. This prescribed Pre-Start Monitoring shall subsequently be followed by a Ramp-Up Procedure which should include continued monitoring by the MMO.

Ramp-up Procedure

7. In commencing an acoustic survey operation using the proposed acoustic equipment, the following Ramp-up Procedure (i.e., “soft-start”) must be used, including during any testing of acoustic sources, where the output peak sound pressure level from any source exceeds 170 dB re: 1µPa @1m:

   (a) Where it is possible according to the operational parameters of the equipment concerned, the device’s acoustic energy output shall commence from a lower energy start-up (i.e., a peak sound pressure level not exceeding 170 dB re: 1µPa @1m) and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20 minutes.

(b) This controlled build-up of acoustic energy output shall occur in consistent stages to provide a steady and gradual increase over the ramp-up period.

(c) Where the acoustic output measures outlined in steps (a) and (b) are not possible according to the operational parameters of any such equipment, the device shall be switched "on" and "off" in a consistent sequential manner over a period of 20 minutes prior to commencement of the full necessary output.

8. In all cases where a Ramp-Up Procedure is employed the delay between the end of ramp-up and the necessary full output must be minimised to prevent unnecessary high-level sound introduction into the environment.
9. Once the Ramp-Up Procedure commences, there is no requirement to halt or discontinue the procedure at night-time, nor if weather or visibility conditions deteriorate nor if marine mammals occur within a 500m radial distance of the sound source, i.e., within the Monitored Zone.

Line Changes

10. Where the duration of a survey line or station change will be greater than 40 minutes the activity shall, on completion of the line/station being surveyed, either

(a) shut down and undertake full Pre-Start Monitoring, followed by a Ramp-Up Procedure for recommencement, or

(b) undergo a major reduction in seismic energy output to a lower energy state[1] where the output peak sound pressure level from any operating source is 165-170 dB re: 1µPa @1m, and then undertake a full Ramp-Up Procedure for recommencement.

11. Where the duration of a survey line or station change will be less than 40 minutes the activity may continue as normal (i.e., under full seismic output)

Breaks in sound output

12. If there is a break in sound output for a period greater than 30 minutes (e.g., due to equipment failure, shut-down, survey line or station change) then all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) must be undertaken.

13. For higher output survey operations which have the potential to produce injurious levels of underwater sound (see sections 2.4, 3.2) as informed by the associated risk assessment, there is likely to be a regulatory requirement to adopt a shorter 5–10-minute break limit after which period all Pre-Start Monitoring and a subsequent Ramp-up Procedure (where appropriate following Pre-Start Monitoring) shall recommence as for start-up.

Reporting

14. Full reporting on MMO operations and mitigation undertaken must be provided to the Regulatory Authority as outlined in Appendix 6 of NPWS (2014).

8.2 Mitigation measures: Grey seal and Harbour seal,

In line with the guidance to manage the risk to marine mammals (NPWS, 2014), the mitigation proposed in section 8.1 for Cetacean species are also proposed for grey and harbour seal.

[1] *It is important that this significant reduction in sound output is to a minimum point (i.e., minimum peak sound pressure level) that in theory remains audible above most ambient sound and shipping noise and yet is also consistent with the Ramp-up Procedure.*

9. Transboundary effects

Transboundary effects refer to significant effects that a proposed development in one country may have on the environment of another. The United Nations Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment in a Transboundary Context, (referred to as the 'Espoo Convention') adopted in 1991 documents the requirement to consider transboundary impacts. The Espoo Convention requires that assessments are extended across borders between Parties of the Convention when a planned activity may cause significant adverse transboundary impacts.

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. No potential for effects on European sites associated with other EU countries were identified.

10. Residual impacts

No residual impacts of the proposed project have been identified or are considered possible.

11. Assessment of impacts with mitigation

This NIS considered that LSE's on the conservation objectives of any European site, as a result of the proposed project, to be highly unlikely. However, mitigation was proposed for Bottlenose dolphin, Harbour porpoise, Grey seal and Harbour seal out of an abundance of caution and in-line with MARA practices. Table 9 provides an assessment of the proposed project with mitigation.

Table 9. Assessment of Likely significant effects with mitigation

* Where Conservation Objective attributes and targets are not defined for a site, the same attributes and targets developed for other sites were applied.

Qualifying SPA	Attribute	Target	Potential for LSEs
***Phoca vitulina* (Harbour Seal) [1365]**			
Donegal Bay (Murvagh) SAC West of Ardara/Maas Road SAC Killala Bay/Moy Estuary SAC Ballysadare Bay SAC Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC Rutland Island and Sound SAC	**Access to suitable habitat**: Species range within the site should not be restricted by artificial barriers to site use	The acoustic noise generated by the project, does not have the potential to create artificial barriers which would restrict the species range within any of the SACs listed in column 1. The MUL area is too far distant from these sites for acoustic noise to travel.	**No**
	Breeding behaviour: The breeding sites should be maintained in a natural condition	The proposed project does not have the means to alter the natural condition of breeding sites. The SPR link is too weak between the any of the SACs listed in column 1 and the MUL area.	**No**
	Moulting behaviour: The moult haul-out sites should be maintained in a natural condition	The proposed project area is at a minimum distance of 97km from the nearest moult haul-out site (Rutland Island and Sound SAC). Therefore there is no potential for project induced effects on moult haul-out sites for this species at any European site.	**No**
	Resting behaviour: The resting haul-out sites should be maintained in a natural condition	The proposed project area is at a minimum distance of 97km from the nearest resting-haul-out site (Rutland Island and Sound SAC). Therefore there is no potential for project induced effects on moult haul-out sites for this species at any European site.	**No**
	Disturbance: Human activity should occur at levels that do not adversely affect the harbour seal population at the site	The proposed project area is at a minimum distance of 97km from the nearest SAC designated for this species (Rutland Island and Sound SAC). Therefore there is no potential for project related human disturbance within this site or any SAC designated for Harbour seal.	**No**
***Halichoerus grypus* (Grey Seal) [1364]**			
Horn Head and Rinclevan SAC Slieve Tooey/Tormore Island/Loughros Beg Bay SAC Inishbofin and Inishshark SAC Inishkea Islands SAC Slyne Head Islands SAC Duvillaun Islands SAC	**Access to suitable habitat**: Species range within the site should not be restricted by artificial barriers to site use	The acoustic noise generated by the project, does not have the potential to create artificial barriers which would restrict the species range within any of the SACs listed in column 1. The MUL area is too far distant from these sites for acoustic noise to travel.	**No**
	Breeding behaviour: The breeding sites should be maintained in a natural condition	The proposed project does not have the means to alter the natural condition of breeding sites. The SPR link is too weak between the any of the SACs listed in column 1 and the MUL area.	**No**

Qualifying SPA	Attribute	Target	Potential for LSEs
	Moulting behaviour: The moult haul-out sites should be maintained in a natural condition	The proposed project area is at a minimum distance of 71km from the nearest moult haul-out site (Horn Head and Rinclevan SAC). Therefore, there is no potential for project induced effects on moult haul-out sites for this species at any European site.	**No**
	Resting behaviour: The resting haul-out sites should be maintained in a natural condition	The proposed project area is at a minimum distance of 71km from the nearest resting-haul-out site (Horn Head and Rinclevan SA,). Therefore, there is no potential for project induced effects on moult haul-out sites for this species at any European site.	**No**
	Population composition: The grey seal population occurring within this site should contain adult, juvenile and pup cohorts annually	The proposed project does not have the means to alter the annual population cohorts within any SAC.	**No**
	Disturbance: Human activities should occur at levels that do not adversely affect the grey seal population at the site	The proposed project area is at a minimum distance of 71km from the nearest SAC designated for this species (Horn Head and Rinclevan SA). Therefore there is no potential for project related human disturbance within this site or any SAC designated for Grey seal.	**No**
Tursiops truncatus* (Common Bottlenose Dolphin) [1349]			
St. John's Point SAC Slyne Head Islands SAC Duvillaun Islands SAC Slyne Head Peninsula SAC Lower River Shannon SAC Belgica Mound Province SAC South-West Porcupine Bank SAC Porcupine Bank Canyon SAC West Connaught coast SAC	**Access to suitable habitat:** Species range within the site should not be restricted by artificial barriers to site use	The acoustic noise generated by the project, does not have the potential to create artificial barriers which would restrict the species range within any of the SACs listed in column 1. The MUL area is too far distant from these sites for acoustic noise to travel.	**No**
	Disturbance: Human activities should occur at levels that do not adversely affect the Bottlenose Dolphin population at the site	The proposed project area is at a minimum distance of 165km from the nearest SAC designated for this species (St. John's Point SAC). Therefore, there is no potential for project related human disturbance within this site or any SAC designated for Common Bottlenose Dolphin.	**No**
Phocoena phocoena* (Harbour Porpoise) [1351]			
Lough Swilly SAC Gweedore Bay and Islands SAC	**Access to suitable habitat:** Species range within the site should not be restricted by artificial barriers to site use	The acoustic noise generated by the project, does not have the potential to create artificial barriers which would restrict the species range within any of the SACs listed in column 1. The MUL area is too far distant from these sites for acoustic noise to travel.	**No**
Inner Hebrides and the Minches (UK Site) Skerries and Causeway (NI Site)	**CO: To maintain (or restore where appropriate) Harbour Porpoise to favourable condition**	The proposed project area is at a minimum distance of 114km from the nearest Scottish or Northern Ireland site designated for this species (Skerries and Causeway SAC). Therefore, there is no potential	**No**

Qualifying SPA	Attribute	Target	Potential for LSEs
		to effect the Conservation objective of Harbour porpoise within these sites.	
Conservation objective: To restore the Favourable conservation condition of the species listed below, which are defined by the following list of attributes and targets. **Note:** The attributes and targets for this Conservation objective are identical for each of the species listed below. **Fulmar (*Fulmarus glacialis*) [A009], Kittiwake (*Rissa tridactyla*) [A188], Guillemot (*Uria aalge)* [A199], Razorbill (*Alca torda*) [A200], Puffin (*Fratercula arctica*) [A204], Manx Shearwater (*Puffinus puffinus*) [A013] and Storm Petrel (*Hydrobates pelagicus*) [A014], Lesser Black-backed Gull (Larus fuscus) [A183].**			
Attribute and target		**Target**	**Potential for LSEs**
Breeding population size: Long term SPA population trend is stable or increasing		The proposed project does not have the means to alter the breeding population of this species within the SPAs listed in column 1.	
Productivity rate: Sufficient to maintain a stable or increasing population		The proposed project does not have the means to impact productivity rate of this species for any of the SPAs listed in column 1.	
Distribution- extent of available nesting options within the SPA: Sufficient availability of suitable nesting sites throughout the SPA to maintain a stable or increasing population		The proposed project will not impact available nesting options. The MUL is offshore with no spatial overlap with any SPA.	
Forage spatial distribution, extent, abundance and availability: Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target		Other then temporary disturbance to foraging, in the open ocean with abundant foraging locations, the proposed project does not have the potential to impact the location, or area of foraging habitat or impact forage biomass in any way.	
Disturbance at the breeding site: Disturbance occurs at levels that do not significantly impact on birds at the breeding site		The proposed project will not impact breeding sites. The MUL is offshore with no spatial overlap with any SPA.	
Disturbance at areas ecologically connected to the colony: Disturbance occurs at levels that do not significantly impact on breeding population		The proposed project does not have the potential to impact the breeding population in any way. THE SPR link is too weak.	
Barriers to connectivity: Barriers do not significantly impact the population's access to the SPA or other ecologically important sites outside the SPA		The project does not have the potential to create access barriers to any SPA	

12. Conclusion

This assessment is based on complete, precise and definitive findings in the light of the best scientific knowledge. It objectively concludes that provided the mitigation measures described in this document are fully implemented, **no adverse effects on the integrity** of any European site will occur.

13. References

Biodiversity Data Centre (2024) Maps. Available at: https://maps.biodiversityireland.ie/Map. Accessed 2.06.2025.

Carter MID, Boehme L, Cronin MA, Duck CD, Grecian WJ, Hastie GD, Jessopp M, Matthiopoulos J, McConnell BJ, Miller DL, Morris CD, Moss SEW, Thompson D, Thompson PM and Russell DJF (2022). Sympatric Seals, Satellite Tracking and Protected Areas: Habitat-Based Distribution Estimates for Conservation and Management. Front. Mar. Sci. 9:875869. doi: 10.3389/fmars.2022.875869.

Cooper J. 1982. Methods of reducing mortality of seabirds caused by underwater blasting. Cormorant 10, 109-113.

Danil K, St. Leger JA. 2011. Seabird and dolphin mortality associated with underwater detonation exercises. Marine Technology Society Journal 45, 89-95.

European Marine Observation and Data Network (EMODnet). Available at: https://emodnet.ec.europa.eu/en/seabed-habitats. Accessed 11.06.2025.

INFOMAR Seabed and sediment data. Available at: https://www.infomar.ie/maps/interactive-maps/seabed-and-sediment. Accessed 24/06/2025.

JNCC, 2020 - JNCC (2020). Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England, Wales & Northern Ireland). JNCC Report No. 65.JNCC, 2020 - JNCC (2020). Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England, Wales & Northern Ireland). JNCC Report No. 65.

NPWS (2014). Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters. Department of arts, Heritage and the Gaeltacht.

National Oceanic and Atmospheric Administration (2024). Update to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0) [Report]. - Silver Spring: National Marine Fisheries Service, 2024.

Nowacek, D. P., Thorne, L. H., Johnston, D. W. and Tyack,P. L. (2007). Responses of cetaceans to anthropogenic noise. Mammal Review37(2):81-115.

ObSERVE Aerial Surveys for Seabirds and Cetaceans in the Irish Atlantic Margin. Available at: https://maps.biodiversityireland.ie/Dataset/322. Accessed 26.06.2025

Southall, B. L., Bowles, A. E., Ellison, W. T., Finneran, J. J., Gentry, R. L., Greene., C. R. Jr., Kastak, D., Ketten, D. R., Miller, J. H., Nachtigall, P. E., Richardson, W. J., Thomas, J. A., and Tyack, P. L. (2007). Marine mammal noise exposure criteria: Initial scientific recommendations. Aquatic Mammals 33(4): 411-521.

Southall, B., Finneran, J., Reichmuth, C., Nachtigall, P., Ketten, D., Bowles, A., Ellison. W., Nowacek, D., Tyack, P. (2019). Marine Mammal Noise Exposure Criteria. Updated Scientific Recommendations for Residual Hearing Effects. Aquatic Mammals. 45. 125-232. 10.1578/AM.45.2.2019.12nd shipboard surveys. Final report published 29 September 2023. 64 pp. https://www.tiho-hannover.de/itaw/scans-iv-survey

Stemp R. 1985. Observations on the effects of seismic exploration on seabirds. In: Greene GD, Engelhardt FR, Paterson RJ (eds) Proceedings of the workshop on effects of explosives use in the marine environment, Halifax, Canada, 29-31 January, 1985.

Wang, C., Lyons, S. B., Corbett, J. J., and Firestone, J. (2007). Using ship Speed and Mass do Describe Potential Collision Severity with Whales: an Application of the Ship Traffic, Energy and Environment Model (STEEM) [Report by the University of Delaware]. https://tethys.pnnl.gov/sites/default/files/publications/Wang-et-al-2007.pdf

Wartzok, D., Popper, A. N., Gordon, J., & Merrill, J. (2004). Factors affecting the responses of marine mammals to acoustic disturbance. Marine Technology Society Journal 37: 6-15.

Woodward, I., Thaxter, C.B., Owen, E., and Cook, A.S.C.P. 2019. Desk-based revision of seabird foraging ranges used for HRA screening. BTO research report number 724.

Yelverton JT, Richmond DR, Fletcher ER, Jones RK. 1973. Safe distances from underwater explosions for mammals and birds. Report to the Defence Nuclear Agency. National Technical Information Service, US Department of Commerce, 64pp.

Appendix 1

European site	
Donegal Bay (Murvagh) SAC	**Screened in**
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside ZoI
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside ZoI
Dunes with *Salix repens* ssp. argentea (Salicion arenariae) [2170]	QI outside ZoI
Humid dune slacks [2190]	QI outside ZoI
Phoca vitulina (Harbour Seal) [1365]	QI within ZoI
Horn Head and Rinclevan SAC	**Screened in**
Embryonic shifting dunes [2110]	QI outside ZoI
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	QI outside ZoI
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside ZoI
Dunes with *Salix repens* ssp. argentea (Salicion arenariae) [2170]	QI outside ZoI
Humid dune slacks [2190]	QI outside ZoI
Machairs (* in Ireland) [21A0]	QI outside ZoI
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]	QI outside ZoI
Vertigo geyeri (Geyer's Whorl Snail) [1013]	QI outside ZoI
Halichoerus grypus (Grey Seal) [1364]	QI within ZoI
Petalophyllum ralfsii (Petalwort) [1395]	QI outside ZoI
Najas flexilis (Slender Naiad) [1833]	QI outside ZoI
Slieve Tooey/Tormore Island/Loughros Beg Bay SAC	**Screened in**
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside ZoI
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	QI outside ZoI
Mediterranean salt meadows (Juncetalia maritimi) [1410]	QI outside ZoI
Embryonic shifting dunes [2110]	QI outside ZoI
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	QI outside ZoI
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside ZoI
Decalcified fixed dunes with *Empetrum nigrum* [2140]	QI outside ZoI
Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]	QI outside ZoI
Dunes with *Salix repens* ssp. argentea (Salicion arenariae) [2170]	QI outside ZoI
Humid dune slacks [2190]	QI outside ZoI
Alpine and Boreal heaths [4060]	QI outside ZoI
Blanket bogs (* if active bog) [7130]	QI outside ZoI
Vertigo angustior (Narrow-mouthed Whorl Snail) [1014]	QI outside ZoI
Lutra lutra (Otter) [1355]	QI outside ZoI
Halichoerus grypus (Grey Seal) [1364]	QI within ZoI
St. John's Point SAC	**Screened in**
Large shallow inlets and bays [1160]	QI outside ZoI
Reefs [1170]	QI outside ZoI
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside ZoI
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]	QI outside ZoI

Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]	QI outside ZoI
Alkaline fens [7230]	QI outside ZoI
Limestone pavements [8240]	QI outside ZoI
Submerged or partially submerged sea caves [8330]	QI outside ZoI
Euphydryas aurinia (Marsh Fritillary) [1065]	QI outside ZoI
Tursiops truncatus (Common Bottlenose Dolphin) [1349]	QI within ZoI
West of Ardara/Maas Road SAC	**Screened in**
Estuaries [1130]	QI outside ZoI
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside ZoI
Large shallow inlets and bays [1160]	QI outside ZoI
Annual vegetation of drift lines [1210]	QI outside ZoI
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	QI outside ZoI
Mediterranean salt meadows (Juncetalia maritimi) [1410]	QI outside ZoI
Embryonic shifting dunes [2110]	QI outside ZoI
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	QI outside ZoI
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside ZoI
Decalcified fixed dunes with *Empetrum nigrum* [2140]	QI outside ZoI
Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]	QI outside ZoI
Dunes with *Salix repens* ssp. argentea (Salicion arenariae) [2170]	QI outside ZoI
Humid dune slacks [2190]	QI outside ZoI
Machairs (* in Ireland) [21A0]	QI outside ZoI
Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]	QI outside ZoI
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]	QI outside ZoI
Northern Atlantic wet heaths with *Erica tetralix* [4010]	QI outside ZoI
European dry heaths [4030]	QI outside ZoI
Alpine and Boreal heaths [4060]	QI outside ZoI
Juniperus communis formations on heaths or calcareous grasslands [5130]	QI outside ZoI
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]	QI outside ZoI
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]	QI outside ZoI
Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]	QI outside ZoI
Blanket bogs (* if active bog) [7130]	QI outside ZoI
Depressions on peat substrates of the Rhynchosporion [7150]	QI outside ZoI
Alkaline fens [7230]	QI outside ZoI
Vertigo geyeri (Geyer's Whorl Snail) [1013]	QI outside ZoI
Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]	QI outside ZoI
Euphydryas aurinia (Marsh Fritillary) [1065]	QI outside ZoI
Salmo salar (Salmon) [1106]	QI outside ZoI
Lutra lutra (Otter) [1355]	QI outside ZoI
Phoca vitulina (Harbour Seal) [1365]	QI within ZoI
Petalophyllum ralfsii (Petalwort) [1395]	QI outside ZoI
Najas flexilis (Slender Naiad) [1833]	QI outside ZoI
Lough Swilly SAC	**Screened in**
Estuaries [1130]	QI outside ZoI

Coastal lagoons [1150]	QI outside ZoI
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	QI outside ZoI
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]	QI outside ZoI
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	QI outside ZoI
Phocoena phocoena (Harbour Porpoise) [1351]	QI within ZoI
Lutra lutra (Otter) [1355]	QI outside ZoI
Inishbofin and Inishshark SAC	**Screened in**
Coastal lagoons [1150]	QI outside ZoI
Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]	QI outside ZoI
Northern Atlantic wet heaths with *Erica tetralix* [4010]	QI outside ZoI
European dry heaths [4030]	QI outside ZoI
Halichoerus grypus (Grey Seal) [1364]	QI within ZoI
Slyne Head Islands SAC	**Screened in**
Reefs [1170]	QI outside ZoI
Tursiops truncatus (Common Bottlenose Dolphin) [1349]	QI within ZoI
Halichoerus grypus (Grey Seal) [1364]	QI within ZoI
Killala Bay/Moy Estuary SAC	**Screened in**
Estuaries [1130]	QI outside ZoI
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside ZoI
Annual vegetation of drift lines [1210]	QI outside ZoI
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside ZoI
Salicornia and other annuals colonising mud and sand [1310]	QI outside ZoI
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	QI outside ZoI
Embryonic shifting dunes [2110]	QI outside ZoI
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	QI outside ZoI
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside ZoI
Humid dune slacks [2190]	QI outside ZoI
Vertigo angustior (Narrow-mouthed Whorl Snail) [1014]	QI outside ZoI
Petromyzon marinus (Sea Lamprey) [1095]	QI outside ZoI
Phoca vitulina (Harbour Seal) [1365]	QI within ZoI
Duvillaun Islands SAC	**Screened in**
Tursiops truncatus (Common Bottlenose Dolphin) [1349]	QI within ZoI
Halichoerus grypus (Grey Seal) [1364]	QI within ZoI
Inishkea Islands SAC	**Screened in**
Machairs (* in Ireland) [21A0]	QI outside ZoI
Halichoerus grypus (Grey Seal) [1364]	QI within ZoI
Petalophyllum ralfsii (Petalwort) [1395]	QI outside ZoI
Ballysadare Bay SAC	**Screened in**
Estuaries [1130]	QI outside ZoI
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside ZoI
Embryonic shifting dunes [2110]	QI outside ZoI
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	QI outside ZoI
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside ZoI
Humid dune slacks [2190]	QI outside ZoI
Vertigo angustior (Narrow-mouthed Whorl Snail) [1014]	QI outside ZoI

Phoca vitulina (Harbour Seal) [1365]	QI within ZoI
Cummeen Strand/Drumcliff Bay (Sligo Bay) SAC	**Screened in**
Estuaries [1130]	QI outside ZoI
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside ZoI
Embryonic shifting dunes [2110]	QI outside ZoI
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	QI outside ZoI
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside ZoI
Juniperus communis formations on heaths or calcareous grasslands [5130]	QI outside ZoI
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]	QI outside ZoI
Petrifying springs with tufa formation (Cratoneurion) [7220]	QI outside ZoI
Vertigo angustior (Narrow-mouthed Whorl Snail) [1014]	QI outside ZoI
Petromyzon marinus (Sea Lamprey) [1095]	QI outside ZoI
Lampetra fluviatilis (River Lamprey) [1099]	QI outside ZoI
Phoca vitulina (Harbour Seal) [1365]	QI within ZoI
Gweedore Bay and Islands SAC	**Screened in**
Coastal lagoons [1150]	QI outside ZoI
Reefs [1170]	QI outside ZoI
Perennial vegetation of stony banks [1220]	QI outside ZoI
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside ZoI
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	QI outside ZoI
Mediterranean salt meadows (Juncetalia maritimi) [1410]	QI outside ZoI
Embryonic shifting dunes [2110]	QI outside ZoI
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	QI outside ZoI
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside ZoI
Decalcified fixed dunes with *Empetrum nigrum* [2140]	QI outside ZoI
Atlantic decalcified fixed dunes (Calluno-Ulicetea) [2150]	QI outside ZoI
Dunes with *Salix repens* ssp. argentea (Salicion arenariae) [2170]	QI outside ZoI
Humid dune slacks [2190]	QI outside ZoI
Machairs (* in Ireland) [21A0]	QI outside ZoI
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]	QI outside ZoI
European dry heaths [4030]	QI outside ZoI
Alpine and Boreal heaths [4060]	QI outside ZoI
Juniperus communis formations on heaths or calcareous grasslands [5130]	QI outside ZoI
Euphydryas aurinia (Marsh Fritillary) [1065]	QI outside ZoI
Phocoena phocoena (Harbour Porpoise) [1351]	QI within ZoI
Lutra lutra (Otter) [1355]	QI outside ZoI
Petalophyllum ralfsii (Petalwort) [1395]	QI outside ZoI
Najas flexilis (Slender Naiad) [1833]	QI outside ZoI
Slyne Head Peninsula SAC	**Screened in**
Coastal lagoons [1150]	QI outside ZoI
Large shallow inlets and bays [1160]	QI outside ZoI
Reefs [1170]	QI outside ZoI
Annual vegetation of drift lines [1210]	QI outside ZoI
Perennial vegetation of stony banks [1220]	QI outside ZoI
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	QI outside ZoI

Mediterranean salt meadows (Juncetalia maritimi) [1410]	QI outside ZoI
Embryonic shifting dunes [2110]	QI outside ZoI
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	QI outside ZoI
Machairs (* in Ireland) [21A0]	QI outside ZoI
Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae) [3110]	QI outside ZoI
Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea [3130]	QI outside ZoI
Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. [3140]	QI outside ZoI
European dry heaths [4030]	QI outside ZoI
Juniperus communis formations on heaths or calcareous grasslands [5130]	QI outside ZoI
Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites) [6210]	QI outside ZoI
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]	QI outside ZoI
Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*) [6510]	QI outside ZoI
Alkaline fens [7230]	QI outside ZoI
Tursiops truncatus (Common Bottlenose Dolphin) [1349]	QI within ZoI
Petalophyllum ralfsii (Petalwort) [1395]	QI outside ZoI
Najas flexilis (Slender Naiad) [1833]	QI outside ZoI
Lower River Shannon SAC	**Screened in**
Sandbanks which are slightly covered by sea water all the time [1110]	QI outside ZoI
Estuaries [1130]	QI outside ZoI
Mudflats and sandflats not covered by seawater at low tide [1140]	QI outside ZoI
Coastal lagoons [1150]	QI outside ZoI
Large shallow inlets and bays [1160]	QI outside ZoI
Reefs [1170]	QI outside ZoI
Perennial vegetation of stony banks [1220]	QI outside ZoI
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	QI outside ZoI
Salicornia and other annuals colonising mud and sand [1310]	QI outside ZoI
Atlantic salt meadows (Glauco-Puccinellietalia maritimae) [1330]	QI outside ZoI
Mediterranean salt meadows (Juncetalia maritimi) [1410]	QI outside ZoI
Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]	QI outside ZoI
Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae) [6410]	QI outside ZoI
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae) [91E0]	QI outside ZoI
Margaritifera margaritifera (Freshwater Pearl Mussel) [1029]	QI outside ZoI
Petromyzon marinus (Sea Lamprey) [1095]	QI outside ZoI
Lampetra planeri (Brook Lamprey) [1096]	QI outside ZoI
Lampetra fluviatilis (River Lamprey) [1099]	QI outside ZoI
Salmo salar (Salmon) [1106]	QI outside ZoI
Tursiops truncatus (Common Bottlenose Dolphin) [1349]	QI within ZoI
Lutra lutra (Otter) [1355]	QI outside ZoI
Rutland Island and Sound SAC	**Screened in**
Coastal lagoons [1150]	QI outside ZoI
Large shallow inlets and bays [1160]	QI outside ZoI

Reefs [1170]	QI outside ZoI
Annual vegetation of drift lines [1210]	QI outside ZoI
Embryonic shifting dunes [2110]	QI outside ZoI
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	QI outside ZoI
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	QI outside ZoI
Humid dune slacks [2190]	QI outside ZoI
Phoca vitulina (Harbour Seal) [1365]	QI within ZoI
Belgica Mound Province SAC	**Screened in**
Reefs [1170]	QI outside ZoI
Tursiops truncatus (Common Bottlenose Dolphin) [1349]	QI within ZoI
Phocoena phocoena (Harbour Porpoise) [1351]	QI outside ZoI
South-West Porcupine Bank SAC	**Screened in**
Reefs [1170]	QI outside ZoI
Tursiops truncatus (Common Bottlenose Dolphin) [1349]	QI within ZoI
West Connaught coast SAC	**Screened in**
Tursiops truncatus (Common Bottlenose Dolphin) [1349]	QI within ZoI
Phocoena phocoena (Harbour Porpoise) [1351]	QI outside ZoI
Porcupine Bank Canyon SAC	**Screened in**
Reefs [1170]	QI outside ZoI
Tursiops truncatus (Common Bottlenose Dolphin) [1349]	QI within ZoI
UK sites within relevant Management Units	
Inner Hebrides and the Minches	**Screened in**
Skerries and Causeway	**Screened in**
Horn Head to Fanad Head SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI within ZoI
Cormorant (*Phalacrocorax carbo*) [A017]	QI outside ZoI
Shag (*Phalacrocorax aristotelis*) [A018]	QI outside ZoI
Barnacle Goose (Branta leucopsis) [A045]	QI outside ZoI
Peregrine (*Falco peregrinus*) [A103]	QI outside ZoI
Kittiwake (*Rissa tridactyla*) [A188]	QI within ZoI
Guillemot (*Uria aalge)* [A199]	QI within ZoI
Razorbill (*Alca torda*) [A200]	QI within ZoI
Chough (*Pyrrhocorax pyrrhocorax*) [A346]	QI outside ZoI
Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	QI outside ZoI
Tory Island SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI within ZoI
Corncrake (*Crex crex*) [A122]	QI outside ZoI
Razorbill (*Alca torda*) [A200]	QI within ZoI
Puffin (*Fratercula arctica*) [A204]	QI within ZoI
Clare Island SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI within ZoI
Shag (*Phalacrocorax aristotelis*) [A018]	QI outside ZoI
Common Gull (*Larus canus*) [A182]	QI outside ZoI
Kittiwake (*Rissa tridactyla*) [A188]	QI outside ZoI
Guillemot (*Uria aalge*) [A199]	QI outside ZoI
Razorbill (*Alca torda*) [A200]	QI outside ZoI
Chough (*Pyrrhocorax pyrrhocorax*) [A346]	QI outside ZoI
West Donegal Coast SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI within ZoI
Cormorant (*Phalacrocorax carbo*) [A017]	QI outside ZoI
Shag (*Phalacrocorax aristotelis*) [A018]	QI outside ZoI

Peregrine (*Falco peregrinus*) [A103]	QI outside ZoI
Herring Gull (*Larus argentatus*) [A184]	QI outside ZoI
Kittiwake (*Rissa tridactyla*) [A188]	QI within ZoI
Razorbill (*Alca torda*) [A200]	QI within ZoI
Chough (*Pyrrhocorax pyrrhocorax*) [A346]	QI outside ZoI
Irelands Eye SPA	**Screened in**
Cormorant (*Phalacrocorax carbo*) [A017]	QI outside ZoI
Herring Gull (*Larus argentatus*) [A184]	QI outside ZoI
Kittiwake (*Rissa tridactyla*) [A188]	QI outside ZoI
Guillemot (*Uria aalge*) [A199]	QI outside ZoI
Razorbill (*Alca torda*) [A200]	QI outside ZoI
Kerry Head SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI within ZoI
Chough (*Pyrrhocorax pyrrhocorax*) [A346]	QI outside ZoI
Saltee Islands SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI within ZoI
Gannet (*Morus bassanus*) [A016]	QI outside ZoI
Cormorant (*Phalacrocorax carbo*) [A017]	QI outside ZoI
Shag (*Phalacrocorax aristotelis*) [A018]	QI outside ZoI
Lesser Black-backed Gull (*Larus fuscus*) [A183]	QI outside ZoI
Herring Gull (*Larus argentatus*) [A184]	QI outside ZoI
Kittiwake (*Rissa tridactyla*) [A188]	QI outside ZoI
Guillemot (*Uria aalge*) [A199]	QI outside ZoI
Razorbill (*Alca torda*) [A200]	QI outside ZoI
Puffin (*Fratercula arctica*) [A204]	QI outside ZoI
Iveragh Peninsula SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI within ZoI
Peregrine (*Falco peregrinus*) [A103]	QI outside ZoI
Kittiwake (*Rissa tridactyla*) [A188]	QI outside ZoI
Guillemot (*Uria aalge*) [A199]	QI outside ZoI
Chough (*Pyrrhocorax pyrrhocorax*) [A346]	QI outside ZoI
Puffin Island SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI within ZoI
Manx Shearwater (*Puffinus puffinus*) [A013]	QI within ZoI
Storm Petrel (*Hydrobates pelagicus*) [A014]	QI outside ZoI
Lesser Black-backed Gull (*Larus fuscus*) [A183]	QI outside ZoI
Razorbill (*Alca torda)* [A200]	QI outside ZoI
Puffin (*Fratercula arctica*) [A204]	QI outside ZoI
Skelligs SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI within ZoI
Manx Shearwater (*Puffinus puffinus*) [A013]	QI within ZoI
Storm Petrel (*Hydrobates pelagicus*) [A014]	QI outside ZoI
Gannet (*Morus bassanus*) [A016]	QI outside ZoI
Kittiwake (*Rissa tridactyla*) [A188]	QI outside ZoI
Guillemot (*Uria aalge*) [A199]	QI outside ZoI
Puffin (*Fratercula arctica*) [A204]	QI outside ZoI
Inishbofin, Inishdooey and Inishbeg SPA	**Screened in**
Barnacle Goose (*Branta leucopsis*) [A045]	QI outside ZoI
Corncrake (*Crex crex*) [A122]	QI outside ZoI
Common Gull (*Larus canus*) [A182]	QI outside ZoI
Lesser Black-backed Gull (*Larus fuscus*) [A183]	QI within ZoI
Arctic Tern (*Sterna paradisaea*) [A194]	QI outside ZoI
North-West Irish Sea SPA	**Screened in**
Red-throated Diver (*Gavia stellata*) [A001]	QI outside ZoI

Great Northern Diver (*Gavia immer*) [A003]	QI outside ZoI
Fulmar (*Fulmarus glacialis*) [A009]	QI outside ZoI
Manx Shearwater (*Puffinus puffinus*) [A013]	QI within ZoI
Cormorant (*Phalacrocorax carbo*) [A017]	QI outside ZoI
Shag (*Phalacrocorax aristotelis*) [A018]	QI outside ZoI
Common Scoter (*Melanitta nigra*) [A065]	QI outside ZoI
Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	QI outside ZoI
Common Gull (*Larus canus*) [A182]	QI outside ZoI
Lesser Black-backed Gull (*Larus fuscus*) [A183]	QI outside ZoI
Herring Gull (*Larus argentatus*) [A184]	QI outside ZoI
Great Black-backed Gull (*Larus marinus*) [A187]	QI outside ZoI
Kittiwake (Rissa tridactyla) [A188]	QI outside ZoI
Roseate Tern (*Sterna dougallii*) [A192]	QI outside ZoI
Common Tern (*Sterna hirundo*) [A193]	QI outside ZoI
Arctic Tern (*Sterna paradisaea*) [A194]	QI outside ZoI
Guillemot (*Uria aalge*) [A199]	QI outside ZoI
Razorbill (*Alca torda*) [A200]	QI outside ZoI
Puffin (*Fratercula arctica*) [A204]	QI outside ZoI
Little Gull (*Hydrocoloeus minutus*) [A862]	QI outside ZoI
Little Tern (*Sternula albifrons*) [A885]	QI outside ZoI
Cruagh Island SPA	**Screened in**
Manx Shearwater (*Puffinus puffinus*) [A013]	QI within ZoI
Barnacle Goose (*Branta leucopsis*) [A045]	QI outside ZoI
Blasket Islands SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI outside ZoI
Manx Shearwater (*Puffinus puffinus*) [A013]	QI within ZoI
Storm Petrel (*Hydrobates pelagicus*) [A014]	QI outside ZoI
Shag (*Phalacrocorax aristotelis*) [A018]	QI outside ZoI
Lesser Black-backed Gull (*Larus fuscus*) [A183]	QI outside ZoI
Herring Gull (*Larus argentatus*) [A184]	QI outside ZoI
Kittiwake (*Rissa tridactyla*) [A188]	QI outside ZoI
Arctic Tern (*Sterna paradisaea*) [A194]	QI outside ZoI
Razorbill (*Alca torda*) [A200]	QI outside ZoI
Puffin (*Fratercula arctica*) [A204]	QI outside ZoI
Chough (*Pyrrhocorax pyrrhocorax*) [A346]	QI outside ZoI
Deenish Island and Scariff Island SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI outside ZoI
Manx Shearwater (*Puffinus puffinus*) [A013]	QI within ZoI
Storm Petrel (*Hydrobates pelagicus*) [A014]	QI outside ZoI
Lesser Black-backed Gull (*Larus fuscus*) [A183]	QI outside ZoI
Arctic Tern (*Sterna paradisaea*) [A194]	QI outside ZoI
Fulmar (*Fulmarus glacialis*) [A009]	QI outside ZoI
Manx Shearwater (*Puffinus puffinus*) [A013]	QI outside ZoI
Storm Petrel (*Hydrobates pelagicus*) [A014]	QI outside ZoI
Lesser Black-backed Gull (*Larus fuscus*) [A183]	QI outside ZoI
Arctic Tern (*Sterna paradisaea*) [A194]	QI outside ZoI
Seas off Wexford SPA	**Screened in**
Red-throated Diver (*Gavia stellata*) [A001]	QI outside ZoI
Fulmar (*Fulmarus glacialis*) [A009]	QI outside ZoI
Manx Shearwater (*Puffinus puffinus*) [A013]	QI within ZoI
Gannet (*Morus bassanus*) [A016]	QI outside ZoI
Cormorant (*Phalacrocorax carbo*) [A017]	QI outside ZoI
Shag (*Phalacrocorax aristotelis*) [A018]	QI outside ZoI
Common Scoter (*Melanitta nigra*) [A065]	QI outside ZoI

Mediterranean Gull (*Larus melanocephalus*) [A176]	QI outside ZoI
Black-headed Gull (*Chroicocephalus ridibundus*) [A179]	QI outside ZoI
Lesser Black-backed Gull (*Larus fuscus*) [A183]	QI outside ZoI
Herring Gull (*Larus argentatus*) [A184]	QI outside ZoI
Kittiwake (*Rissa tridactyla*) [A188]	QI outside ZoI
Roseate Tern (*Sterna dougallii*) [A192]	QI outside ZoI
Common Tern (*Sterna hirundo*) [A193]	QI outside ZoI
Arctic Tern (*Sterna paradisaea*) [A194]	QI outside ZoI
Guillemot (*Uria aalge)* [A199]	QI outside ZoI
Razorbill (*Alca torda*) [A200]	QI outside ZoI
Puffin (*Fratercula arctica*) [A204]	QI outside ZoI
Sandwich Tern (*Thalasseus sandvicensis*) [A863]	QI outside ZoI
Little Tern (*Sternula albifrons*) [A885]	QI outside ZoI
Illanmaster SPA	**Screened in**
Storm Petrel (*Hydrobates pelagicus*) [A014]	QI within ZoI
Stags of Broad Haven SPA	**Screened in**
Storm Petrel (*Hydrobates pelagicus*) [A014]	QI within ZoI
Leach's Storm-petrel (*Hydrobates leucorhous*) [A854]	QI outside ZoI
Inishglora and Inishkeeragh SPA	**Screened in**
Storm Petrel (*Hydrobates pelagicus*) [A014]	QI within ZoI
Cormorant (*Phalacrocorax carbo*) [A017]	QI outside ZoI
Shag (*Phalacrocorax aristotelis*) [A018]	QI outside ZoI
Barnacle Goose (B*ranta leucopsis*) [A045]	QI outside ZoI
Lesser Black-backed Gull (*Larus fuscus*) [A183]	QI outside ZoI
Herring Gull (*Larus argentatus*) [A184]	QI outside ZoI
Arctic Tern (*Sterna paradisaea*) [A194]	QI outside ZoI
Duvillaun Islands SPA	**Screened in**
Fulmar (*Fulmarus glacialis*) [A009]	QI outside ZoI
Storm Petrel (*Hydrobates pelagicus*) [A014]	QI within ZoI
Barnacle Goose (*Branta leucopsis*) [A045]	QI outside ZoI