



PSE Kinsale Energy Limited

Kinsale Area Decommissioning Project

Kinsale Area Installations: End of Operations Seabed Survey

Screening for Appropriate Assessment and Article 12 Assessment

November 2022

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1 INTRODUCTION

1.1 Background and document purpose

PSE Kinsale Energy Limited (Kinsale Energy) is applying for consent to undertake a survey at sites associated with the Kinsale Head, Ballycotton and Southwest Kinsale fields (Petroleum Lease area No.1), and the Seven Heads field (Seven Heads Petroleum Lease) in the North Celtic Sea Basin. The survey will be undertaken in offshore waters, at a distance of at least 33km from the nearest coast (Figure 1.1).

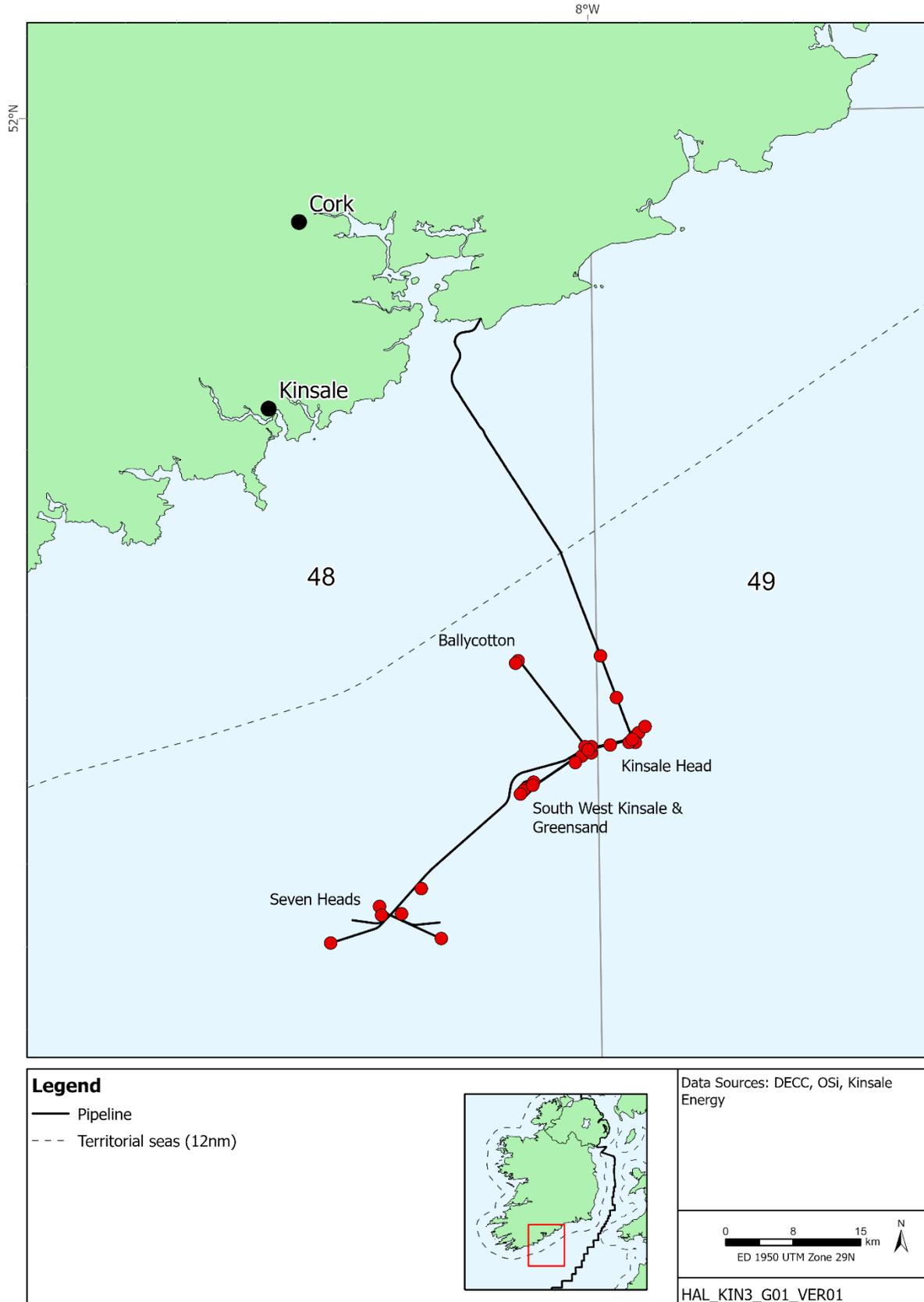
Kinsale Energy has progressed with the decommissioning of the Kinsale Area gas fields and facilities (incorporating the Kinsale Head gas fields and facilities and the Seven Heads gas field and facilities) as the fields have come to the end of their productive life. In keeping with lease obligations, Decommissioning Plans and related Environmental Impact Assessment Report (EIAR) and Appropriate Assessment (AA) screening reports were prepared and were submitted to the Department of Environment, Climate and Communications (formerly the Department of Communications, Climate Action & Environment). Application no. 3 has been submitted to cover the remaining works to be consented as part of the decommissioning programme, the decommissioning of the Kinsale Head and Seven Heads pipelines. Together the decommissioning of the entirety of the Kinsale Area gas fields and facilities is collectively referred to as the Kinsale Area Decommissioning Project (KADP).

Following completion of the decommissioning activities it is proposed that an end of operations seabed survey is undertaken. The survey is intended to fulfil the obligations of a number of permits for use and discharge of added chemicals (PUDACs)¹ and to provide a post-decommissioning baseline by revisiting those stations sampled during the pre-decommissioning survey in 2017.

An application for consent for the survey has been made, accompanied by this Screening for Appropriate Assessment report and an EIA screening report. The survey will include the use of equipment (e.g. grab sampler, drop down camera) to characterise the fauna and seabed sediment character and chemistry at selected seabed stations (more detail is provided in Section 2). The survey will take approximately two to three days and is planned for Q1/Q2 2023 following the completion of decommissioning works.

¹ PUDACs covering the disconnection of subsea infrastructure including pipelines and umbilicals, Kinsale Alpha and Bravo well plug and abandonment, Kinsale platform removal, and the plug and abandonment of wells associated with the other Kinsale Head and Seven Heads fields.

Figure 1.1: Location of the end of operations sample stations in relation to the decommissioned Kinsale Area infrastructure



1.2 Legislative background and AA process

The EU Habitats Directive (92/43/EEC) requires that Member States contribute to the creation of a coherent ecological network of sites through the identification and designation of Special Areas of Conservation (SAC) relating to those habitats and species listed in Annex I and Annex II of the Directive respectively. The EU Birds Directive (2009/147/EC) requires the protection of bird species listed in Annex I of that Directive, and regularly occurring migratory species, including the use of conservation measures through the designation of Special Protection Areas (SPAs). SACs and SPAs are collectively part of the Natura 2000 network. The relevant conservation agencies responsible for site selection designate sites on the basis of the presence of relevant qualifying habitats and species, and conservation objectives are set to maintain or, where relevant, restore, the features to a favourable conservation status. The requirements of the *EC Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora* (the “Habitats and Species Directive”); and *EC Council Directive 2009/147/EC* (the “Bird Directive”) have been implemented through the *European Communities (Birds and Natural Habitats) Regulations 2011* (as amended).

Article 6(3) of the Habitats Directive indicates that, “*Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4², the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*”

The Competent Authority (in this case the GeoScience Regulation Office of the Petroleum Affairs Division of the Department of Communications, Climate Action & Environment) must therefore undertake an AA where likely significant effects are identified for qualifying interests of a relevant site from activities not directly connected with the management of the site. This requirement and the process by which such a consideration is made, is outlined in the *European Communities (Birds and Natural Habitats) Regulations 2011*, and in guidance at a European (European Commission 2021a) and national (OPR 2021) level. The key stages of the AA process are listed below and shown in Figure 1.2.

Stage 1: Screening for appropriate assessment. To assess, in view of best scientific knowledge, and in view of relevant site conservation objectives, if the project, individually or in-combination with another plan or project, is likely to have a significant effect on any Natura 2000 site.

Stage 2: Appropriate Assessment. Required if it cannot be excluded, on the basis of objective information, that the project, individually or in-combination with other plans or projects, will not have a significant effect on a Natura 2000 site. Where there are adverse impacts, an assessment of the potential mitigation of those impacts will be made. The appropriate assessment must include a final determination by the competent authority as to whether or not a proposed development would adversely affect the integrity of a Natura 2000 site. In order to reach a final determination, the consenting authority must undertake

² Article 6(4) relates to plans or projects which must be undertaken despite identification of an assessment determining a negative effect on a given site due to imperative reasons of overriding public interest (IROPI), including those of a social or economic nature. Suitable compensatory measures are required to maintain the coherence of the network should such a case be made.

examination, analysis and evaluation, followed by findings, conclusions and a final determination. The appropriate assessment must contain complete, precise and definitive findings and conclusions, and may not have lacunae or gaps.

Stage 3: Assessment of alternative solutions. This process examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of the Natura 2000 site.

Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain. An assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed.

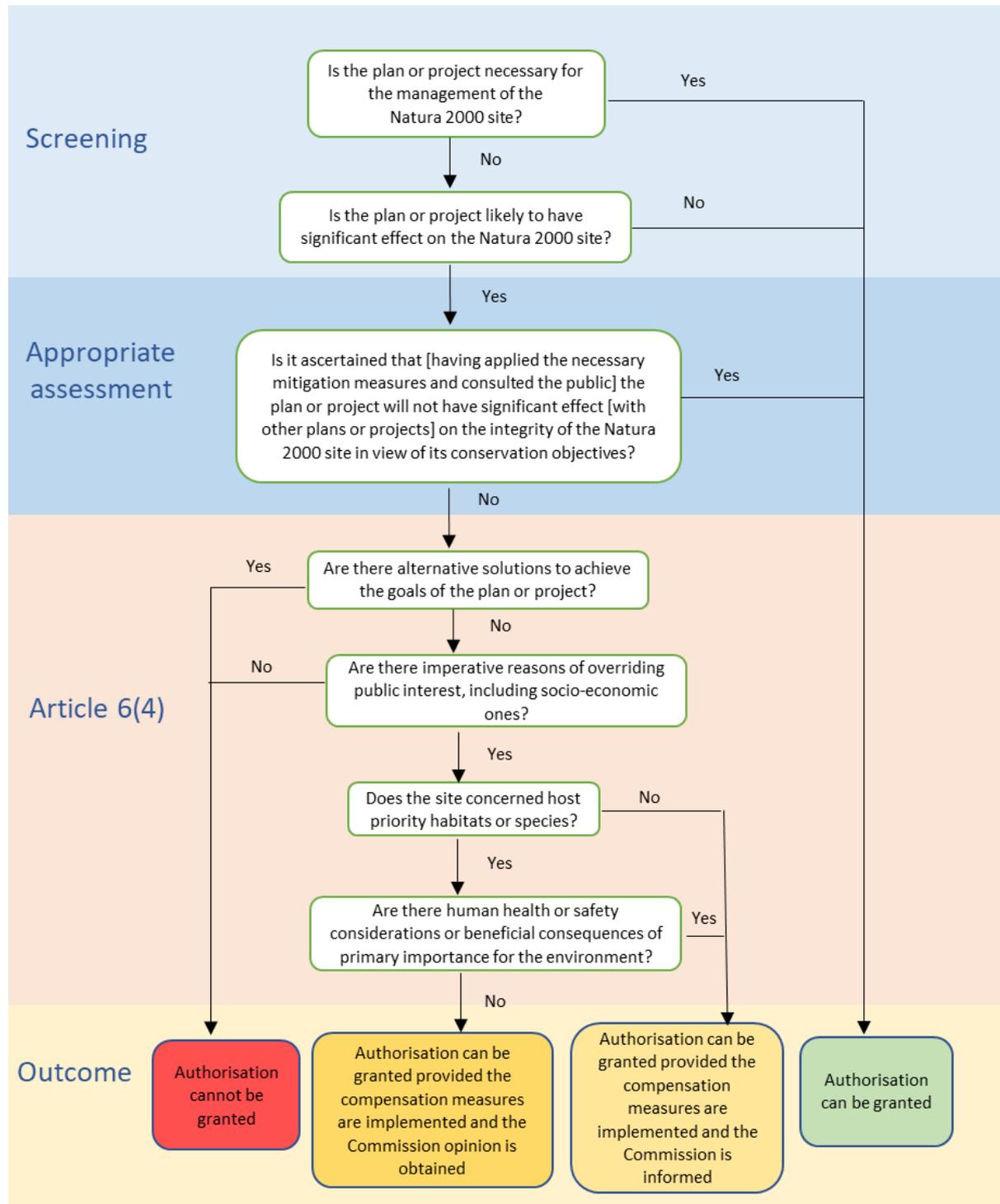
As the project is not directly connected with the management of a Natura 2000 site, a screening exercise (Stage 1) has been undertaken to consider the potential for likely significant effects to arise in relation to Natura 2000 sites from activities associated with the proposed survey scope as defined in Section 2, including in-combination with other plans or programmes. The approach taken to screening has been to:

- Define the location and nature of the proposed activities, together with their potential to result in likely significant effects on European sites
- Identify all relevant European sites and their qualifying interests with the potential to be affected by the proposed survey activities
- Screen the relevant sites for the likelihood of significant effects that could result from the activities, based on the nature and scale of potential effects, including in-combination with other marine activities
- Conclude whether likely significant effects have been identified

1.2.1 Annex IV Species Screening Assessment

In addition to the requirement to consider the potential for effects on Natura 2000 Sites under Article 6 of the Habitats Directive (above), the Directive and transposing legislation, the *European Communities (Birds and Natural Habitats) Regulations 2011* (as amended), requires consideration of the potential effects on species listed under Annex IV of the Directive (termed Annex IV species). Under Article 12, Annex IV species are afforded strict protection throughout their range, both inside and outside of designated protected areas. The potential for interaction with Annex IV species and related effects are considered in Section 6 of this document.

Figure 1.2: Consideration of a plan or project affecting a Natura 2000 site



Source: European Commission (2021a)

2 PROJECT DESCRIPTION

As noted in Section 1, Kinsale Energy is progressing the decommissioning of the Kinsale area gas fields and facilities. Two applications have been made and approved in relation to the decommissioning of the Kinsale area facilities which were each accompanied by an Environmental Impact Assessment Report and Appropriate Assessment screening. These applications covered; facilities preparation, well plug and abandonment, platform topsides and subsea structure removal (application no. 1); and jacket removal (application no. 2). A third application was submitted in October 2021³ which covers the remaining works associated with the overall KADP, which are the decommissioning of all Kinsale Head and Seven Heads pipelines and umbilicals by leaving them *in situ*, and the use of engineering materials (rock placement) to protect the pipelines and umbilicals. Decommissioning activities associated with the first two consent applications has already commenced or has been completed, and includes platform and subsea well decommissioning, the removal of pipeline spool pieces and umbilical jumpers, which connected these to infrastructure subsea, and platform removal.

Following the decommissioning of the pipelines, subject to approval, and surveys to chart the final locations of the umbilicals and pipelines, it is proposed that the end of operations survey associated with this application will be undertaken. The objective of this survey is to fulfil the monitoring requirements set out in PUDACs which were granted for various aspects of the KADP. The sample stations have been selected to fulfil those requirements, and also to revisit stations sampled in the 2017 pre-decommissioning survey (Table 2.2).

2.1 Survey activity and equipment

The survey will be undertaken over approximately two to three days and involve a Day grab or equivalent seabed sampling equipment and a drop down camera. The grab sampler collects sediment samples with a surface area of 0.1m² for faunal analysis and sediment particle size and chemical analyses. The approach to sample collection and analysis will be consistent with OSPAR Agreement 2017-02.

It is proposed that the survey will revisit the 31 sample stations surveyed in 2017, and collect an addition two samples from stations at the former Kinsale Alpha and Bravo platform locations (Figure 2.1, Table 2.2). Two replicates will be collected at each sample station. A drop down camera will also be used at each station to collect seabed imagery.

Table 2.1: Summary of survey equipment

Survey component	Potential equipment	Operating frequency	Objectives
Seabed sampling	Day grab (or equivalent) Drop down camera	-	To characterise seabed fauna, sediment type and chemistry (metals and hydrocarbons).

³ <https://www.gov.ie/en/publication/58f06-decommissioning-of-certain-facilities-within-the-kinsale-area-gas-fields/>

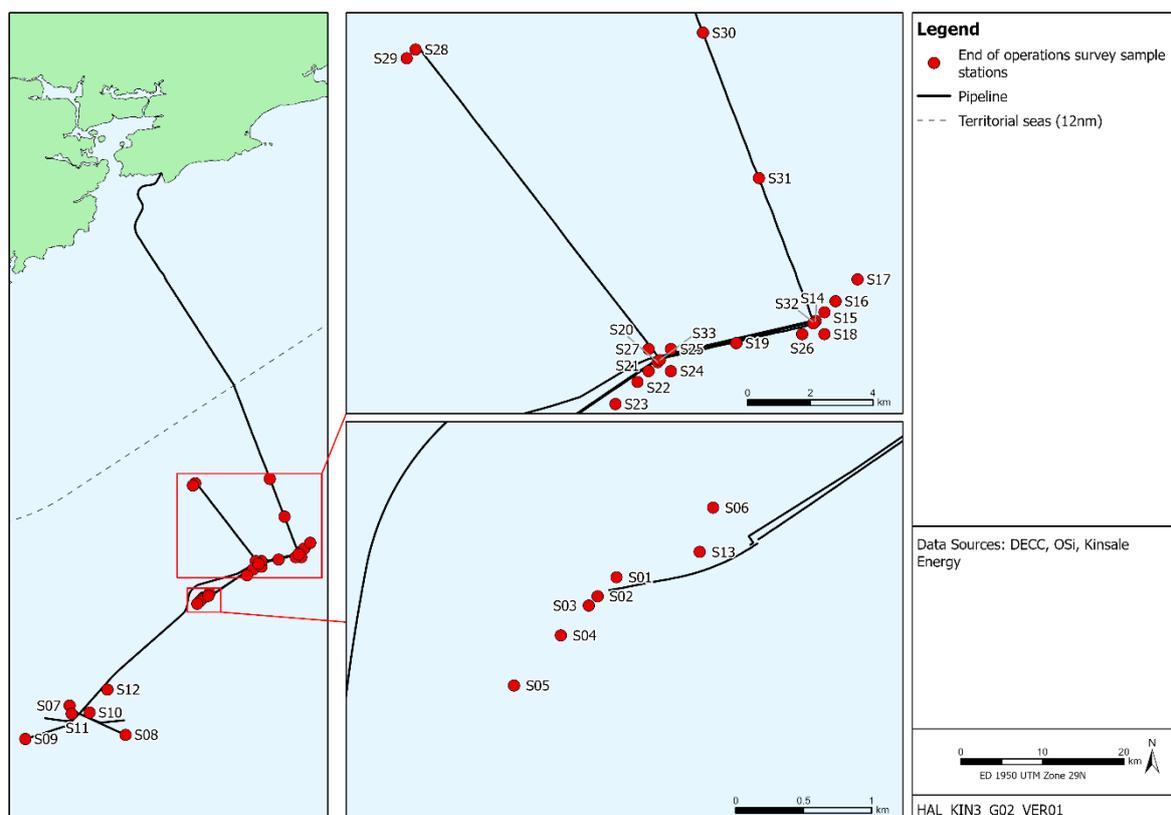
Survey component	Potential equipment	Operating frequency	Objectives
Other acoustic equipment used for safe vessel operation, or operation of survey equipment deployed from the vessel			
USBL	Representative equipment, e.g. Sonardyne Wideband Sub-Mini 6 Plus (WSM6+) with Sonardyne ranger USBL hull unit	20-40kHz	Required for acoustic positioning of survey equipment.

2.2 Vessel

The vessel to complete the survey programme has not yet been confirmed. For the purposes of this assessment, a representative vessel has been assumed e.g. RV Tom Crean or equivalent.

There will be no significant discharges from the survey vessel, and any discharge would be consistent with obligations under MARPOL⁴ as implemented in Ireland, which effectively prevent pollution from such sources. In view of the scale and duration of the survey these are not considered to be significant and are not considered further

Figure 2.1: Proposed end of operations survey sampling locations



⁴ Following the guidance set out in EC (2021), compliance with MARPOL is a statutory requirement and forms a generic component of the project and is not a specific form of mitigation.

Table 2.2: Proposed Sample Stations

Station	Easting (m)	Northing (m)
S01	561790.00	5686385.00
S02	561650.00	5686243.00
S03	561586.00	5686175.00
S04	561380.00	5685953.00
S05	561035.00	5685583.00
S06	562500.00	5686900.00
S07	545376.00	5673015.00
S08	552230.00	5669410.00
S09	539935.00	5668899.00
S10	547809.00	5672163.00
S11	545610.00	5672000.00
S12	550000.00	5675000.00
S13	562402.10	5686572.00
S14	573515.10	5691779.00
S15	573797.60	5692061.00
S16	574151.50	5692415.00
S17	574856.90	5693120.00
S18	573798.10	5691355.00
S19	570985.90	5691069.00
S20	568478.10	5690456.00
S21	568194.40	5690172.00
S22	567840.40	5689819.00
S23	567133.50	5689112.00
S24	568901.60	5690173.00
S25	568903.50	5690880.00
S26	573087.90	5691355.00
S27	568194.70	5690877.00
S28	560761.80	5700494.00
S29	560480.00	5700213.00
S30	569927.00	5701037.00
S31	571707.70	5696366.00
S32	573444.00	5691708.00
S33	568548.00	5690527.00

Notes: all coordinates in ED50 (UTM zone 29N), all sample stations have the same location as those sampled in 2017, other than S32 and S33

3 IDENTIFICATION OF RELEVANT NATURA 2000 SITES

3.1 Overview

Relevant Natura 2000 sites were considered for inclusion/exclusion in the screening process with respect to whether an impact pathway could be identified between the features for which they are designated and the proposed survey activities described in Section 2. The identification of potential impacts from the survey and relevant sites is based on:

- the nature and scale of the proposed survey,
- the sources of potential effect from the survey activities and their likely spatial footprint,
- identification of those qualifying interests of Natura 2000 sites which are sensitive to the sources of potential effect,
- the relative location of relevant Natura 2000 sites and their qualifying interests (including where mobile species may be located beyond site boundaries, e.g. when foraging), to the spatial footprint of effect.

3.2 Site selection process

Guidance from the Office of the Planning Regulator (OPR 2021) recommends that the identification of any Natura 2000 site which might be affected by any plan or project should be evaluated on a case-by-case basis. All sites should be selected for inclusion in screening if they are partially or wholly within or immediately adjacent to a SAC or SPA, with all other sites identified using the Source-Pathway-Receptor (S-P-R) model, that is, that a source of effect from the proposed project (e.g. underwater noise) could impact a qualifying interest a relevant Natura 2000 site which is vulnerable to that source of effect via some pathway (e.g. via water bodies, through interaction with migratory routes or foraging areas).

This AA screening has identified Natura 2000 sites which could be affected by the survey based on the nature and scale of the proposed survey programme (Section 2), its sources of potentially significant effect (Section 3.3), an understanding of the nature and scale of such effects (Section 3.4), and the potential for interaction between relevant qualifying interests and these effects (Section 3.5). Combined, these reflect the zone of influence of the project, which varies for each relevant site or site qualifying interest. The sites identified for screening are assessed for the likelihood for significant negative direct, indirect and in-combination effects in Section 4.

3.3 Sources of potential effect

In respect of the proposed survey, the main sources of potential effect relevant to Natura 2000 sites and their qualifying interests arise from:

- physical presence of the survey vessel,
- physical disturbance from grab sample collection,
- underwater noise from the vessel and positioning equipment (USBL).

The evidence base for the sources of potential effect are considered in turn below against major groups of receptors for which there is considered to be a potential interaction, which are primarily marine mammals, birds and fish, and seabed habitats. The evidence is then considered against the potential presence of qualifying interests to allow identification of the relevant Natura 2000 sites.

3.4 Evidence base for the nature and scale of potential effects

3.4.1 Physical presence of the survey vessel

Birds

The Kinsale Area may support important numbers of birds at certain times of the year including overwintering birds and those foraging from coastal SPAs. Therefore, the presence and/or movement of the survey vessel could temporarily disturb birds from relevant SPA sites.

Physical disturbance of seaduck and other waterbird flocks by the survey vessel is unlikely although such disturbance can result in repeated disruption of bird feeding, loafing and roosting. For example, large flocks of common scoter were observed being put to flight at a distance of 2km from a 35m vessel, though smaller flocks were less sensitive and put to flight at a distance of 1km (Kaiser 2002, also see Schwemmer *et al.* 2011). Larger vessels would be expected to have an even greater disturbance distance (Kaiser *et al.* 2006). Mendel *et al.* (2019) further note behavioural response in red-throated diver within 5km of ships. Divers and sea ducks have been assessed as being the most sensitive species groups to disturbance from boat traffic. Whilst displacement effects for divers have been detected at greater distances (e.g. 5-7km, Webb 2016; significant changes noted at 10-16.5km, Mendel *et al.* 2019), this relates to the construction and operation of offshore wind farms which have a much larger spatial and temporal footprint than the proposed survey activities. Fliessbach *et al.* (2019) reported maximum escape distances for individual birds in response to vessels to be 3.2km for common scoter, with other sea ducks, divers, red-breasted merganser and cormorant all ≥ 1.5 km; consequently, these are the species considered to be sensitive to vessel disturbance for the purposes of this assessment. It is noted that flock escape distances for all the aforementioned species were 1.2km or less. Considering the evidence, for divers, sea ducks and other species identified as most sensitive to vessel disturbance, a 4km displacement buffer is considered to be appropriate. Similarly, such species generally forage in coastal waters of ≤ 20 m depth (Fox *et al.* 2003), which limit their potential to interaction with the offshore aspects of the proposed survey which would take place in deeper waters.

Certain seabird species (e.g. gulls, fulmar, kittiwake) are generally considered to be less sensitive to shipping activities (Garthe & Hüppop 2004, Fliessbach *et al.* 2019), with others such as razorbill, cormorant and guillemot regarded to have moderate sensitivity (Fliessbach *et al.* 2019, also see MMO 2018).

<p>Criterion used: Screen in relevant SPAs for seabirds, for which a moderately sensitive qualifying interest (e.g. razorbill, cormorant and guillemot) could theoretically be present in the survey area based on available foraging range data (e.g. Woodward <i>et al.</i> 2019).</p>

Marine mammals

The primary source of potential physical effect from a vessel in relation to marine mammals is collision. Worldwide, collisions with vessels are a potential source of mortality to marine mammals, primarily cetaceans. Whales are occasionally reported to be struck and killed by ships, especially by fast-moving ferries, but smaller cetacean species and seals can also be impacted by propeller strikes from smaller vessels. In the UK certain areas experience very high densities of commercial and recreational shipping traffic, some of which may also be frequented by large numbers of marine mammals; despite this, relatively few deaths are recorded as results of collisions (Hammond *et al.* 2008). Between 2000 and 2009, only 11

out of 1,100 post-mortems on harbour porpoises and common dolphins identified collision as the cause of death (UKMMAS 2010).

Criterion used: Screen in relevant SACs for marine mammal species where the site boundary overlaps the proposed survey area, and for pinnipeds screen in any site within foraging range (50km for harbour seal and 100km for grey seal, see Section 3.4.1). Cetaceans are not central-place foragers, and attributing any animals to a specific SAC is challenging. For the purposes of this assessment, cetaceans which are qualifying interests of all SACs within the relevant management units as defined by IAMMWG (2021) have been used.

3.4.2 Underwater noise

The proposed survey will not use any airgun sources, or lower amplitude sources associated with geophysical survey. Noise will be generated from the USBL system used to position the drop down camera. This and the vessel are the only two potential noise sources considered to be relevant to this assessment. While no high amplitude sources will be used, studies on the potential effects of underwater noise from marine survey have tended to focus on seismic survey using airgun arrays. Such studies have informed the evidence base presented below, noting that the noise associated with the proposed survey will be significantly less than these.

Birds

Information on the underwater hearing abilities of diving birds and evidence of the effects of underwater anthropogenic noise is very limited. While no seismic or other high intensity impulsive noise sources are proposed for the survey, study has tended to concentrate on these. Therefore, the following information is drawn in part from such studies as context to the much lower amplitude noise sources (vessel, USBL) associated with this survey.

Deeper-diving species which spend longer periods of time underwater (e.g. auks) may be most at risk of exposure, but all species which routinely submerge in pursuit of prey and benthic feeding opportunities in marine and estuarine habitats may be exposed to anthropogenic noise. A list of relevant species is provided in Table 3.1.

Tests of hearing in a range of diving species suggest a hearing range of approximately 500Hz to 4kHz, with similar results obtained in air and underwater (Crowell 2014, Crowell *et al.* 2015, Hansen *et al.* 2017). McCauley (1994) inferred from vocalisation ranges that the threshold of perception for low frequency seismic noise in some species (e.g. penguins, considered as a possible proxy for auk species) would be high, hence individuals might be adversely affected only in close proximity to the source.

With the exception of Pichegru *et al.* (2017), which relates to penguins, there are no published reports of changes in abundance or distribution of diving birds concurrent with seismic or other acoustic survey activity. A study investigated seabird abundance in Hudson Strait (Atlantic seaboard of Canada) during seismic surveys over three years (Stemp 1985). Comparing periods of shooting and non-shooting, no significant difference was observed in abundance of thick-billed murre (Brünnich's guillemot), or fulmar or kittiwake.

While seabird responses to approaching vessels are highly variable (e.g. Fliessbach *et al.* 2019), flushing disturbance would be expected to displace most diving seabirds from close proximity to the survey vessel and noise producing equipment, thereby limiting their exposure to the highest sound pressures generated. Similarly, any behavioural disturbance of seabirds due to the survey activities is most likely to be temporary displacement

associated with the physical presence of the vessel, comparable to that experienced by routine shipping traffic.

These data are limited, but the observed regions of greatest hearing sensitivity for cormorants in water and other diving birds in air are above those low frequencies (i.e. <500Hz) which dominate and propagate most widely from geological survey. While there is some evidence of noise-induced changes in the distribution and behaviour of diving birds in response to impulsive underwater noise, these have been temporary and may be a direct disturbance or reflect a change in prey distribution during that period (possibly as a result of seismic activities).

Table 3.1: Migratory and/or Annex I diving bird species considered potentially vulnerable to underwater noise effects

<p>Divers and grebes Great northern diver <i>Gavia immer</i> Red-throated diver <i>Gavia stellata</i> Black-throated diver <i>Gavia arctica</i> Little grebe <i>Tachybaptus ruficollis</i> Great crested grebe <i>Podiceps cristatus</i> Slavonian grebe <i>Podiceps auritus</i></p> <p>Seabirds Manx shearwater <i>Puffinus puffinus</i> Gannet <i>Morus bassanus</i> Cormorant <i>Phalacrocorax carbo carbo</i> Shag <i>Phalacrocorax aristotelis</i> Guillemot <i>Uria aalge</i> Razorbill <i>Alca torda</i> Puffin <i>Fratercula arctica</i></p>	<p>Diving ducks Pochard <i>Aythya ferina</i> Tufted duck <i>Aythya fuligula</i> Scaup <i>Aythya marila</i> Eider <i>Somateria mollissima</i> Long-tailed duck <i>Clangula hyemalis</i> Common scoter <i>Melanitta nigra</i> Velvet scoter <i>Melanitta fusca</i> Goldeneye <i>Bucephala clangula</i> Red-breasted merganser <i>Mergus serrator</i> Goosander <i>Mergus merganser</i></p>
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Note: Includes species which are known to engage in pursuit diving or benthic feeding in marine, coastal and estuarine waters at least during part of the year.

Marine mammals

Research on the effects of anthropogenic noise sources on marine mammals has concentrated on seismic survey (e.g. Thompson *et al.* 2013, Sarnocińska *et al.* 2020), and to a more limited extent, other geophysical survey (e.g. sub-bottom profilers); information specifically on the potential effects of USBL is lacking.

Recent investigation of the source levels of a variety of high-resolution geophysical survey (HRGS) sources (Crocker & Fratantonio 2016, Crocker *et al.* 2019), combined with preliminary results of emitted sound fields, have provided evidence to support the conclusion of very low risk of significant effects from non-airgun HRGS sources, with received levels dropping to below that which might be expected to cause behavioural disturbance within a few hundred metres of the source (Halvorsen & Heaney 2018). The comparatively smaller sound source (~191dB re 1µPa @1m) and operating frequency (20-30kHz) of USBL suggests that any effect on marine mammals would be less still than HRGS sources.

Noise from the presence and movement of the survey vessel could potentially disturb marine mammals foraging within or close to sites for which they are a qualifying feature. Reported responses include avoidance, interrupted foraging behaviour, changes in swimming speed, direction and surfacing patterns, and alteration of the intensity and frequency of calls (review in Erbe *et al.* 2019). Chronic exposure has also been linked to an increase in stress-related

hormones (Rolland *et al.* 2012). Harbour porpoises, white-sided dolphins and minke whales have been shown to respond to survey vessels by moving away from them, while white-beaked dolphins have shown attraction (Palka & Hammond 2001). A study on captive harbour porpoises in a semi-natural net-pen complex in a Danish canal, recorded their behaviour while simultaneously measuring underwater noise of vessels passing the enclosure; reaction to noise was defined to occur when a highly stereotyped 'porpoising' behaviour was observed. Porpoising occurred in response to almost 30% of vessel passages; the most likely behavioural trigger were medium- to high- frequency components (0.25-63kHz octave bands) of vessel noise, while low- frequency components of vessel noise and additional pulses from echo-sounders could not explain the results (Dyndo *et al.* 2015). A tagging study of a small number of free-ranging porpoises in Danish coastal waters estimated that porpoises encountered vessel noise 17-89% of the time (from evaluation of the wideband sound and movement tag recordings). Occasional high-noise levels (coinciding with a fast ferry) were associated with vigorous fluking, bottom diving, interrupted foraging and even cessation of echolocation, leading to significantly fewer prey capture attempts at received levels greater than 96dB re 1 mPa (16 kHz third-octave, Wisniewska *et al.* 2018).

More evidence is available on bottlenose dolphins, especially for coastal populations. Shore-based monitoring of the effects of boat activity on the behaviour of bottlenose dolphins off the US South Carolina coast, indicated that slow moving, large vessels, like ships or ferries, appeared to cause little to no obvious response in bottlenose dolphin groups (Mattson *et al.* 2005). Pirotta *et al.* (2015) used passive acoustic techniques to quantify how boat disturbance affected bottlenose dolphin foraging activity in the inner Moray Firth. The presence of moving motorised boats appeared to affect bottlenose dolphin buzzing activity (foraging vocalisations), with boat passages corresponding to a reduction by almost half in the probability of recording a buzz. The boat effect was limited to the time where a boat was physically present in the sampled area and visual observations indicated that the effect increased for increasing numbers of boats in the area (Pirotta *et al.* 2013). Dolphins appeared to temporarily interrupt their activity when disturbed, staying in the area and quickly resuming foraging as the boat moved away.

Fish

Studies of fish mortality or behavioural response to noise have tended to focus on geological seismic survey using airgun arrays, and while the proposed survey will generate significantly less noise than these, these studies have relevance to the consideration of potential noise effects on fish and are therefore summarised here.

Fish exhibit large variation in their response to sound, largely due to the great diversity in anatomical features, hearing physiology and behaviour; all species respond to particle motion, but several have adaptations that make them sensitive also to the pressure component of sound. Most species can detect sounds from <50Hz to a few hundred Hz, with some extending this range to approximately 500Hz (e.g. cod, saithe), and those with specialisations to be sensitive to sound pressure being able to detect sounds up to several kHz (e.g. herring) (review in Hawkins & Popper 2017). There is no evidence of mortality or potential mortal injury to fish from ship noise (Popper *et al.* 2014). Slabbekoorn *et al.* (2019) note that there are few good case-studies in the peer-reviewed literature that report on the impact of a seismic survey on the behavioural response of free-ranging fish or the direct impact on local fisheries. Existing studies do not yield completely coherent results but suggest that fish could stop foraging and move down in the water column. Such temporary displacement and/or altered feeding behaviour are likely to be responsible for the reduced catches reported in some circumstances.

Potential effects on migratory diadromous fish is an area of significant interest for which empirical evidence is still limited, especially as salmonids and eels are sensitive to particle motion (not sound pressure) (Gill & Bartlett 2010). Atlantic salmon *Salmo salar* have been shown through physiological studies to respond to low frequency sounds (below 380Hz), with best hearing at 160Hz (threshold 95 dB re 1 μ Pa). Harding *et al.* (2016) note a lower sensitivity at 100Hz than previously reported (Hawkins & Johnstone 1978), and greater sensitivity at frequencies of >200Hz, with evidence of some response at 400-800Hz. However, the authors qualify their results with differences in methodological approach, and the use of fish maintained in tanks receiving low frequency ambient sound within the greatest range of sensitivity (<300Hz) for some time in advance of the experiments taking place. The ability of salmon to respond to sound pressure is regarded as relatively poor with a narrow frequency span, a limited ability to discriminate between sounds, and a low overall sensitivity relative to other fish species (Hawkins & Johnstone 1978, Harding *et al.* 2016). A recent study of the hearing ability of sea lamprey (*Petromyzon marinus*) reported that, consistent with fish lacking a swim bladder, sea lamprey showed a limited sensitivity to sound, with juveniles detecting tones of 50-300Hz, but not higher frequencies (Mickle *et al.* 2019). Injury threshold criteria have been suggested by Popper *et al.* (2014), with the criteria for mortality and potential injury for species lacking a swim bladder being $L_{p,pk} > 213$ dB re 1 μ Pa and for all other groups, $L_{p,pk} > 207$ dB re 1 μ Pa. Teague & Clough (2011) indicate that shad may be able to detect ultrasound at frequencies of up to 180kHz, with a preliminary exposure trial of twaite shad eliciting significant reactions at sound frequencies of between 30 and 60kHz.

Criterion used: Screen in any SAC and SPA with qualifying interests which are noise sensitive (marine mammals, migratory fish, diving birds) either where the site boundary is within 15km of the survey area or where foraging ranges may bring such qualifying interests to within this distance. For cetaceans, screen in any SAC within the relevant management unit (after IAMMWG 2021) where the survey is proposed to take place.

3.4.3 Physical disturbance

Physical effects of seabed disturbance may include mortality to benthic fauna as a result of physical trauma and smothering by re-suspended sediment. The duration of effects on benthic community structure are related to individual species' biology and to successional development of community structure. The majority of seabed species recorded from the European continental shelf are known or believed to have short lifespans (a few years or less) and relatively high reproductive rates, indicating the potential for rapid population recovery, typically between 1 to 5 years (Jennings & Kaiser 1998).

The relatively impoverished heterogeneous benthic habitats of the Kinsale area reflect the dynamic nature of the sedimentary environment; such habitats have a low sensitivity to physical damage at the scale of benthic sampling (amounting to 0.1m² per grab sample). Moreover, multiple seabed surveys have reported no indication of Annex I or other sensitive habitats or species present.

Criterion used: In view of the nature of the sampling equipment to be used, screen in any SAC or SPA within 500m of a sampling station.

3.5 Relevant sites

Natura 2000 sites (Special Areas of Conservation, SACs and Special Protection Areas, SPAs) have been identified on the basis that they could have a potential interaction with the

survey activities, using the criteria outlined in Section 3.4. These are presented in Figures 3.1 and 3.2.

No Natura 2000 sites are located within the survey area, and few are within those distances noted in the criteria set out in Section 3.4. No SACs or SPAs were identified to be relevant to the consideration of physical effects from grab and camera sampling as all are too distant (the closest site is Old Head of Kinsale SPA, 33km away). The identification of sites has therefore concentrated on the potential for relevant mobile species (seabirds, marine mammals and fish) which are qualifying interests of Natura 2000 sites, to interact with the survey area and its wider footprint of effect.

An overview of the current understanding of the foraging ranges of relevant species is given below. While these may indicate a theoretical interaction between a site feature and the survey area, there is an important distinction to be made between a potential interaction with site features and the potential for likely significant effects (i.e. those which could undermine a site's conservation objectives), which are considered further in Section 4.

3.5.1 SACs

Marine mammals

Relevant SACs in Ireland for which an interaction is considered possible include those for harbour porpoise, grey seal and harbour seal.

The harbour porpoise is the most abundant and widespread species occurring around the Irish coast, commonly seen in shallow coastal waters in the summer, although surveys suggest highest densities along the south coast occur in autumn (Marine Institute 2013). They move further offshore in the spring; although the details of this migration are uncertain, it may be linked to calving (DCENR 2015). Harbour porpoise are generally less often encountered in the Celtic Sea than in the Irish Sea, although it may be that this is a result of lower survey effort and higher sea states off the south coast (Wall *et al.* 2013). In both the Celtic Sea Herring Assessment Survey (CSHAS) and selected Irish Whale and Dolphin Group (IWDG) casual sightings data, harbour porpoise are the second most frequently sighted toothed cetacean, seen both close to shore and in offshore waters. A comparison of the results of the broad-scale SCANS and SCANS-II surveys (SCANS-II 2008) indicate there has been a general shift to the southwest and an increase in the harbour porpoise population in the region over the period between the surveys. Two strata surveyed for marine mammals as part of the ObSERVE programme are relevant to the survey area, which took place across summer and winter 2015 and 2016. These are Stratum 4, and Stratum 8 which was only surveyed in summer and winter 2016, and covered 9,506km² of coastal waters off the south and south-west coasts. For the area relevant to the proposed survey, predicted distribution maps from the ObSERVE programme suggest the presence of higher densities of harbour porpoise in summer than in winter (relative to other surveyed areas for each species).

SACs for harbour porpoise represent areas supporting persistently higher densities of animals relative to elsewhere in their range (e.g. Heinänen & Skov 2015). Harbour porpoise are a highly mobile, wide-ranging species; while some individuals using designated SACs will exhibit a degree of site fidelity, they are not central place foragers like seals or breeding seabirds and will travel and forage over a large area. While harbour porpoise using more distant SACs are less likely to occur in the Kinsale Area, their broad-scale movements are poorly understood, and so a precautionary approach has been taken to screen in any SACs occurring within the same management unit as the Kinsale Area. The Kinsale Area lies within the large Celtic and Irish Seas harbour porpoise management unit, which

encompasses the majority of coastal waters of Ireland, in addition to those of Wales, south-west and north-west England and south-west Scotland (IAMMWG 2015).

While bottlenose dolphins are also known to occur in the wider Kinsale Area (e.g. Rogan *et al.* 2018), there are no SACs where this species is a qualifying feature within the relevant management unit of Offshore Channel, Celtic Sea & South West England.

Grey seals occupy haul-outs along the Irish coast, to which they return to rest, breed and rear young. Breeding in Ireland generally takes place between September and December (Cronin *et al.* 2011). Grey seals favour exposed rocky shores, sand-bars or sea caves, with easy access to deep water for breeding and the largest colonies are found on exposed islands off the west and southwest coasts. The closest major colony to the survey area is at Roaringwater Bay, 75km away. They are a designated feature of the Roaringwater Bay and Islands SAC, where a permanent population of up to 150 individuals is estimated (NWPS website). The total grey seal population of Ireland has been estimated at between 5,500 and 7,000 individuals (Ó Cadhla *et al.* 2008) and Duck & Morris (2013) estimated that 9% were present along the Co. Cork coast. Grey seal densities at sea are highest in coastal waters, particularly close to colonies and haul-outs, but individuals may undertake foraging excursions up to 100km offshore (Jones *et al.* 2015). Distances travelled by seals tagged on Great Blasket Island in Co. Kerry by Cronin *et al.* (2011) were variable. It was found that larger seals spent longer foraging at sea but travelled shorter distances, while smaller seals were found to travel as far as the Western Isles of Scotland, utilising haul-out sites along the way. The seals were found to spend more time at sea during the summer.

Marine usage maps for the UK and Ireland based on extensive tagging data suggest a very low occurrence of grey seals in the Kinsale Area, with animals present in waters around the south coast of Ireland focused off southwest Cork and southeast Wexford (Jones *et al.* 2015). Grey seals were observed in five of the 11 annual CSHAS from 2008-2018, comprising 14 sightings of single seals, most of which were close to the coast (e.g. O'Donnell *et al.* 2018).

Harbour seals are generally found in more sheltered areas, again predominantly along the west coast. Females pup in June or July, and the annual moult takes place in July and August, so harbour seals tend to be at or near haul-outs through the summer (Cronin *et al.* 2008, Rakka & Minto 2015).

Harbour seals rarely forage far from their haul-out, with surveys in southwest Ireland suggesting they generally stay within 20km of their haul-out (Cronin *et al.* 2008), although longer distances do occur (e.g. Jones *et al.* 2015 noted that only 3% of tagged harbour seals foraged further than 50km) and foraging behaviour seems to vary with geographical location. The Irish population of harbour seal was estimated at 3,000-4,150 individuals (DCENR 2015) and Duck & Morris (2013) estimated 13% of the total population were present along the County Cork coast.

Marine usage maps for the UK and Ireland based on extensive tagging data suggest a very low occurrence of harbour seals in the Kinsale Area, with animals present in waters around the south coast of Ireland focused off southwest Cork and Kerry (Jones *et al.* 2015). No confirmed harbour seal sightings occurred off the south coast of Ireland in any of the 11 annual CSHAS.

The above evidence of at-sea distribution of seals suggests that the survey area is not within the normal foraging range of either species; however, taking a precautionary approach, and considering that data are subject to uncertainty, sites for grey and harbour seal were

screened in for further consideration on the basis of whether they are within 100km and 50km of the survey area respectively.

Fish

Of those fish listed under Annex II of the EC Habitats Directive, those relevant to potential sources of effect identified for the survey are Atlantic salmon, sea lamprey, river lamprey and twaite shad, as these are migratory and spend part of their life cycle at sea. These are likely to have a widespread and transient presence offshore, and therefore any sites located along the Cork, Waterford and Wexford coasts where the aforementioned species are a qualifying interest have been screened in for further assessment. Sites with the freshwater pearl mussel listed as a qualifying interest were also included, as Atlantic salmon forms a critical part of their lifecycle.

Table 3.2: SACs identified for further consideration

Site code	Site name	Relevant qualifying interests
IE0000101	Roaringwater Bay and Islands SAC	Harbour porpoise
		Grey seal
IE0002172	Blasket Islands SAC	Harbour porpoise
IE0003000	Rockabill to Dalkey Island SAC	Harbour porpoise
IE0002171	Bandon River SAC	Freshwater pearl mussel
IE0002170	Blackwater River (Cork/Waterford) SAC	Freshwater pearl mussel
		Atlantic salmon
		Sea lamprey
		River lamprey
IE0002162	River Barrow and River Nore SAC	Twaite shad
		Freshwater pearl mussel
		Atlantic salmon
		Sea lamprey
IE0002137	Lower River Suir SAC	River lamprey
		Twaite shad
		Freshwater pearl mussel
		Atlantic salmon
IE0000781	Slaney River Valley SAC	Sea lamprey
		River lamprey
		Twaite shad
		Freshwater pearl mussel
UK0030396	Bristol Channel Approaches / Dynesfeydd Môr Hafren	Harbour porpoise
UK0030398	North Anglesey Marine / Gogledd Môn Forol	Harbour porpoise
UK0030397	West Wales Marine / Gorllewin Cymru Forol	Harbour porpoise
UK0030399	North Channel	Harbour porpoise

3.5.2 SPAs

Waterbirds

Physical disturbance of seaduck and other waterbird flocks by the survey vessel is unlikely because of the coastal nature of the foraging activities of waterbirds which limits the potential for interaction between such qualifying interests and the survey.

Seabirds

Information on the foraging movements of a number of seabird species has increased in recent years, mainly due to advances in satellite and other tracking technologies (e.g. Langston *et al.* 2013, Wakefield *et al.* 2015, 2017, Thaxter *et al.* 2014, 2018, Cleasby *et al.* 2015, 2020, Bogdanova *et al.* 2017, Carter *et al.* 2016, Edwards *et al.* 2016, Votier *et al.* 2017). There is generally limited information on foraging areas used by species from particular colonies and to help address this, Thaxter *et al.* (2012) reported on representative breeding season foraging ranges for a range of species, which were recently updated by Woodward *et al.* (2019).

Table 3.3 provides indicative foraging ranges (mean and mean maximum) travelled for a range of seabird species from a breeding colony to a foraging area, which have been used to identify relevant sites on the basis that related qualifying interests could interact with the proposed survey area. The mean maximum foraging range value has been used here to show possible connectivity to breeding colony SPAs, but bird density will not be continuous throughout this range. Other ways of representing foraging ranges (e.g. the mean, or percentage foraging area derived from kernel analyses) may therefore provide more useful information, where available. Whilst applying mean maximum foraging radius would encompass the majority of a population's home-range area, the overall size of the predicted foraging areas around the colony would potentially make it too large to be a useful management tool, without further refinement using habitat and bathymetric data (Soanes *et al.* 2016). Similarly, the assumption that seabirds are uniformly distributed out to some threshold distance from their colonies, such as their putative maximum foraging range, is unrealistic. Seabird density declines with distance from the colony with density-dependent competition, coastal morphology and habitat preferences (Wakefield *et al.* 2017), for example oceanographic features at which seabirds preferentially forage including shelf-edge fronts, upwelling and tidal-mixing fronts, offshore banks and internal waves, regions of stratification, and topographically complex coastal areas subject to strong tidal flow (Cox *et al.* 2018), resulting in highly non-uniform distributions. While Critchley *et al.* (2018) used a distance-weighted foraging radius approach to project distributions at sea for a wide range of seabird species during the breeding season, the authors recognised the limitations of not considering environmental variables that contribute to such non-uniform distributions noted above.

The selection of all sites within the mean maximum foraging range of the survey area is a useful but simplistic approach to identifying relevant sites. The approach taken here has been to review the initial selection of sites on this basis, and exclude those for which an interaction would be unrealistic, which primarily relates to sites for which fulmar has been identified as a qualifying interest in sites to the far north and west of Ireland. Fulmar are a highly pelagic seabird, and are highly unlikely to move large distances over land which could bring them to within the survey area. The potential mean maximum foraging range for this species has therefore been applied across the marine area, including where birds could move around headlands.

Table 3.3: Indicative breeding season foraging ranges

Species	Mean maximum ¹ (km)	Mean ² (km)	Confidence ³
Eider	21.5	3.2 ± 4.2	Poor
Red-throated diver	9	4.5	Low
Fulmar	542.3±657.9	134.6 ± 90.1	Good
Manx shearwater	1346.8±1018.7	136.1 ± 88.7	Moderate
Leach's storm petrel	n/a	657	Moderate
Gannet	315.2±194.2	120.4 ± 50	Highest
Cormorant	25.6 ± 8.3	7.1 ± 3.8	Moderate
Shag	13.2 ± 10.5	9.2 ± 4.9	Highest
Arctic skua	n/a	2 ± 0.7	Poor
Great skua	443.3 ± 487.9	67 ± 31.5	Uncertain
Black-headed gull	18.5	7	Uncertain
Common gull	50	n/a	Poor
Mediterranean gull	20	11.5	Uncertain
Herring gull	58.8 ± 26.8	14.9 ± 7.5	Good
Lesser black-backed gull	127 ± 109	43.3 ± 18.4	Highest
Kittiwake	156.1 ± 144.5	54.7 ± 50.4	Good
Sandwich tern	34.3 ± 23.2	9 ± 9.2	Moderate
Roseate tern	12.6 ± 10.6	4.1 ± 2.6	Moderate
Common tern	18.0 ± 8.9	6.4 ± 4.5	Good
Arctic tern	25.7 ± 14.8	6.1 ± 4.4	Good
Little tern	5	3.5	Moderate
Guillemot	73.2 ± 80.5 (55.5 ± 39.7) ⁴	33.1 ± 36.5 (23.9 ± 21.1) ⁴	Highest
Razorbill	88.7 ± 75.9 (73.8 ± 48.4) ⁴	61.3 ± 33.4 (31.2 ± 17.3) ⁴	Good
Puffin	137.1 ± 128.3 (119.6 ± 131.2) ⁴	62.4 ± 34.4 (48.1 ± 28.3) ⁴	Good

Source: Woodward et al. (2019). Notes: 1. The maximum range reported in each study averaged across studies. 2. The mean foraging range reported for each colony averaged across all colonies. For tracking studies, this was typically the mean foraging range from all central place foraging trips assessed at the colony. 3. Confidence levels were assigned as follows: highest (based on >5 direct studies with low variation between sites); good highest (based on >5 direct studies with wider variation between sites); moderate (between 2-5 direct studies); low (indirect measures or only one direct tracking study); uncertain (survey-based estimates); poor (few survey estimates or speculative data available). 4. May be affected by unusually high foraging ranges from Fair Isle due to reduced prey availability in study year. Ranges excluding Fair Isle data also provided.

The mean maximum foraging range for Manx shearwater is large (1,346.8 ± 1,018.7km), which when applied as a means to identify sites for consideration in the screening results in a broad range of sites being selected as far south as northern Spain (Figure 3.3). While the putative mean maximum foraging range of this species could theoretically result in individuals from very distant sites coming within the survey area, evidence suggests substantial variation in trip distance and range. For example, trips may vary by life stage (Fayet *et al.* 2015), and be substantially less during the chick-rearing period compared to the incubation period (Dean *et al.* 2015; however, note regular far-ranging activity presented in Wischnewski *et al.* 2019). Tracks (Wischnewski *et al.* 2019, Fayet *et al.* 2015) and density distributions (Dean *et al.* 2012, 2015, Fayat *et al.* 2015) suggest that for UK and Irish colonies studied, longer trips were to offshore waters of the North Atlantic, with higher levels of activity closer to colonies (note the ten-fold difference in mean (136.1±88.7km) and mean maximum (1,346.8 ± 1,018.7km) foraging range).

On the basis of this evidence, it is considered that the sites for Manx shearwater that are most relevant to this screening assessment are Saltee Islands SPA, Puffin Island SPA, Skelligs SPA, Blasket Island SPA, Lambay Island SPA, Deenish Island and Scariff Island SPA, Skomer, Skokholm and the Seas off Pembrokeshire SPA, Aberdaron Coast and Bardsey Island SPA, Copeland Islands SPA, and the Irish Sea SPA (and by association those SPAs related to this offshore aggregation which may include sites in Ireland, Northern Ireland, Scotland, Wales and England⁵, some of which are already listed).

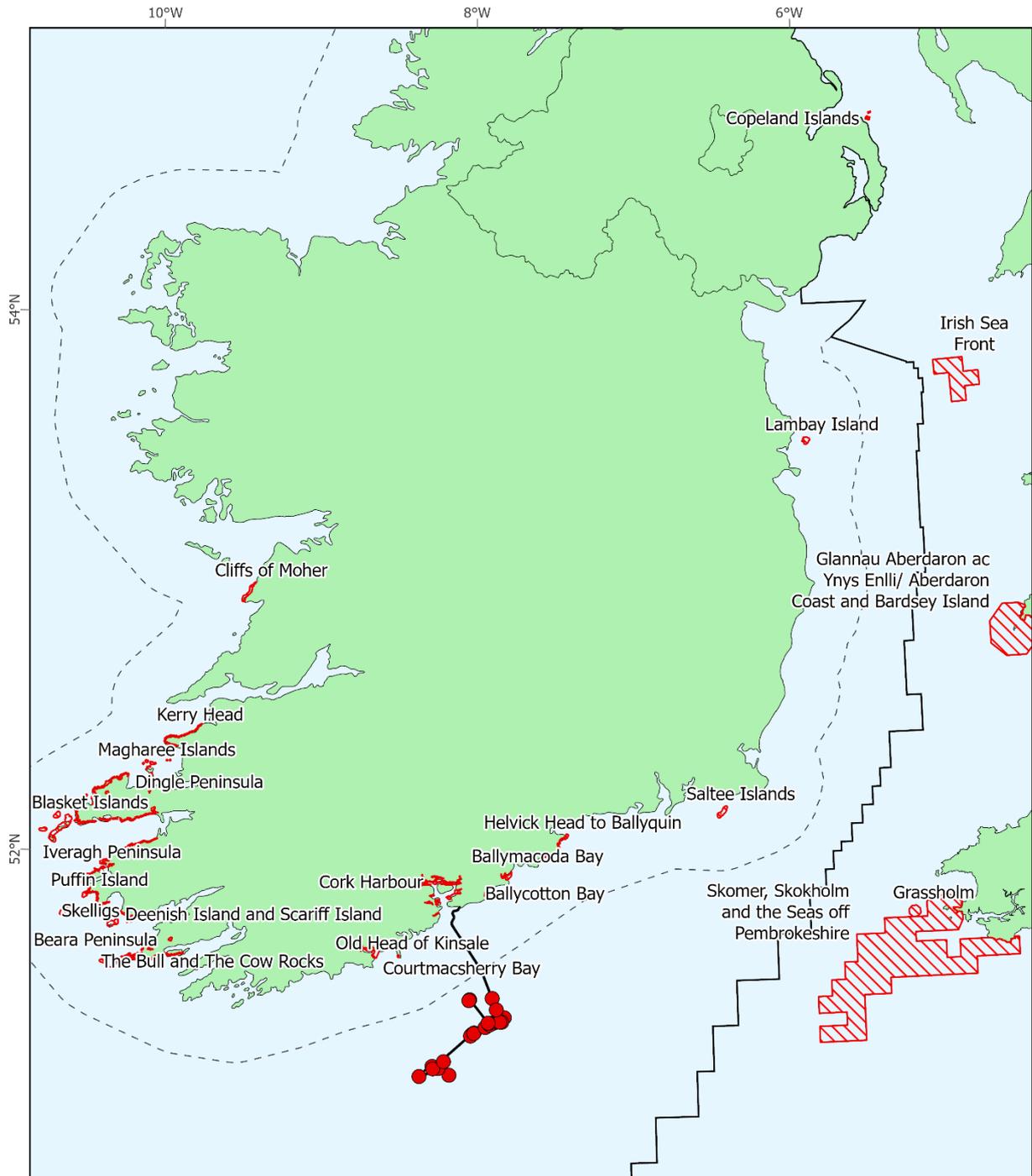
Table 3.4: SPAs identified for further consideration

Site code	Site name	Relevant qualifying interests	Diving species potentially sensitive to underwater noise?
IE0004002	Saltee Islands	Northern fulmar	N
		Lesser black-backed gull	N
		Northern gannet	Y
		Atlantic puffin	Y
		Black-legged kittiwake	N
IE0004003	Puffin Island	Northern fulmar	N
		Manx shearwater	Y
		Storm petrel	N
IE0004005	Cliffs of Moher	Northern fulmar	N
IE0004007	Skelligs	Northern fulmar	N
		Manx shearwater	Y
		Northern gannet	Y
		Storm petrel	N
IE0004008	Blasket Islands	Northern fulmar	N
		Manx shearwater	Y
		Storm petrel	N
IE0004021	Old Head of Kinsale	Black-legged kittiwake	N
		Common guillemot	Y
IE0004022	Ballycotton Bay	Lesser black-backed gull	N
IE0004023	Ballymacoda Bay	Lesser black-backed gull	N
IE0004219	Courtmacsherry Bay	Common gull	N
IE0004030	Cork Harbour	Lesser black-backed gull	N
		Common gull	N
IE0004066	The Bull and The Cow Rocks	Northern gannet	Y
		Storm petrel	N
IE0004069	Lambay Island	Northern fulmar	N
IE0004125	Magharee Islands	Storm petrel	N
IE0004153	Dingle Peninsula	Northern fulmar	N
IE0004154	Iveragh Peninsula	Northern fulmar	N
		Black-legged kittiwake	N
IE0004155	Beara Peninsula	Northern fulmar	N
IE0004175	Deenish Island and Scariff	Northern fulmar	N

⁵ <https://data.jncc.gov.uk/data/0032da71-db02-44b5-b4e1-022d77ef7ee3/irish-sea-front-sas-departmental-brief.pdf>

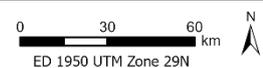
Site code	Site name	Relevant qualifying interests	Diving species potentially sensitive to underwater noise?
	Island	Manx shearwater	Y
		Storm petrel	N
IE0004189	Kerry Head	Northern fulmar	N
IE0004192	Helvick Head to Ballyquin	Black-legged kittiwake	N
UK9014051	Skomer, Skokholm and the Seas off Pembrokeshire	Manx shearwater	Y
		Storm petrel	N
UK9014041	Grassholm	Northern gannet	Y
UK9013121	Aberdaron Coast and Bardsey Island	Manx shearwater	Y
UK9020291	Copeland Islands	Manx shearwater	Y
UK9020328	Irish Sea Front	Manx shearwater	Y

Figure 3.1: SPAs identified for further assessment



- Legend**
- End of operations survey sample stations
 - Pipeline
 - ▨ SPA
 - - - Territorial seas (12nm)

Data Sources: DECC, OSI, Kinsale Energy, NPWS, JNCC
 Contains public sector data from © JNCC 2022. Contains OS data © Crown Copyright and database right 2016



HAL_KIN3_G11_VER01

Figure 3.2: SACs identified for further assessment

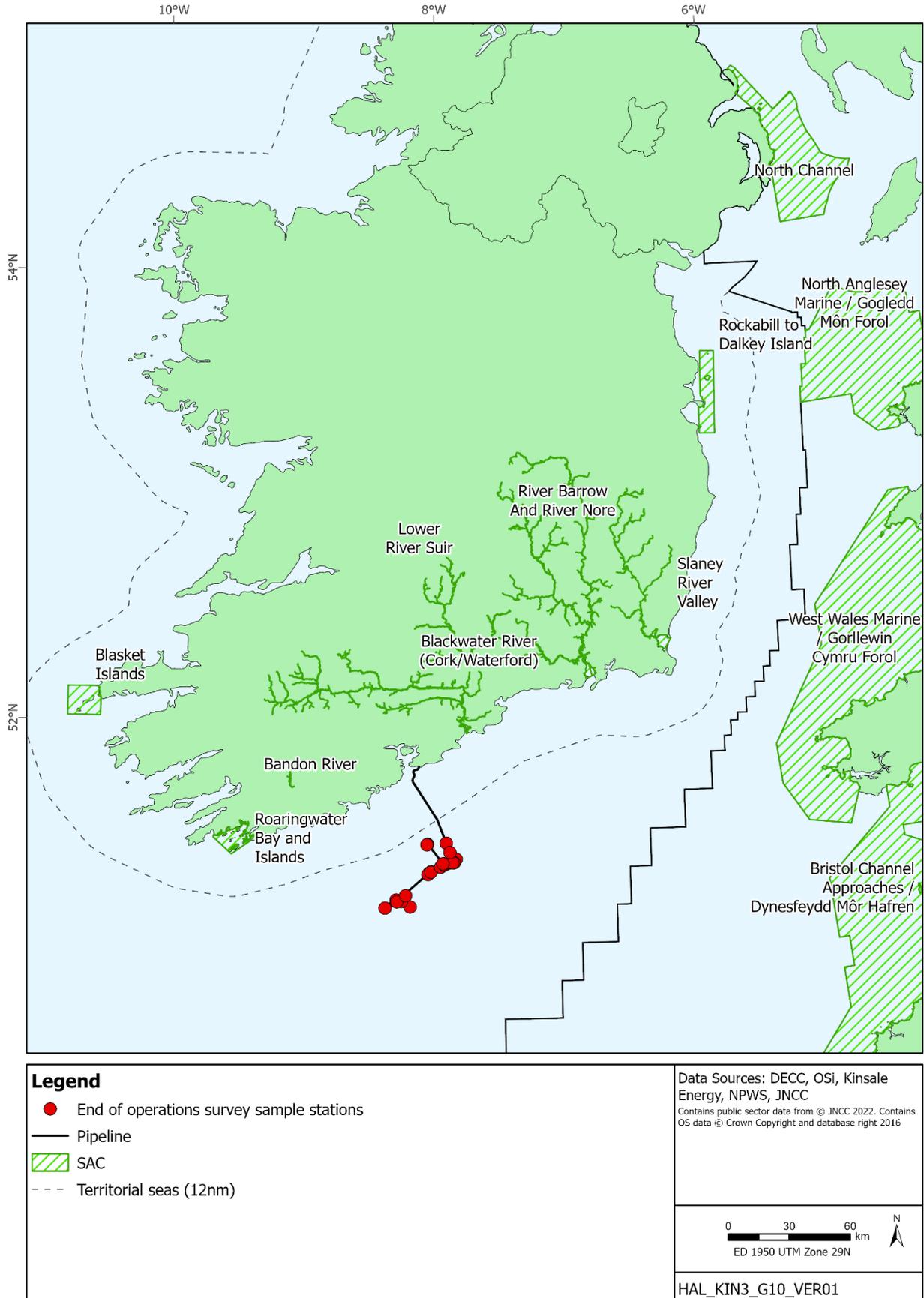
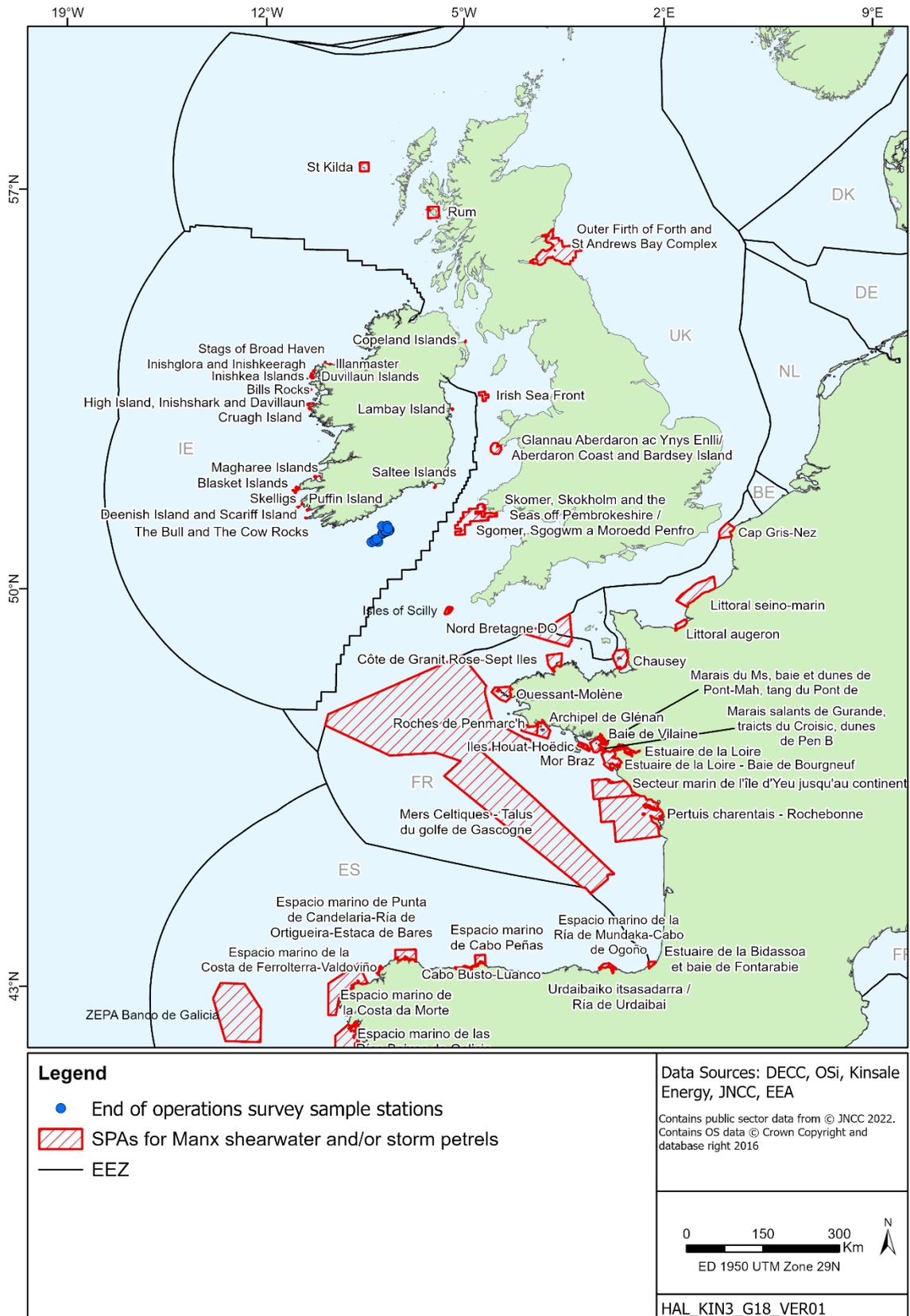


Figure 3.3: Sites identified using Manx shearwater mean maximum foraging range



4 SCREENING FOR LIKELY SIGNIFICANT EFFECTS

The sources of potentially significant effect from proposed survey activities considered relevant to the screening (i.e. where there is a recognised pathway for interaction with features subject to protection under the Birds and Habitats Directives) are the production of underwater noise and the physical presence/disturbance by the survey vessel. Section 4.1 links the sources of potentially significant effect to individual sites and their relevant qualifying features. The potential for likely significant effects on the qualifying interests of the sites identified is considered in Section 4.2. Appendix 1 provides, for all sites listed in Table 4.1, tabulations of the site information (relevant qualifying interests, qualifying interests with a foreseeable interaction with the survey area, summary Conservation Objectives), the closest distance to the survey and a consideration of site interest features against potential sources of likely significant effect.

4.1 Consideration of potential sources of effect

Table 4.1 shows the individual sites and their relevant qualifying features linked to the sources of potentially significant effect from the proposed survey activities. Those sites identified are then considered in Section 4.2.

Table 4.1: Sites identified for further consideration

Site code	Site name	Relevant qualifying interests	Physical presence	Underwater noise
SACs				
IE0000101	Roaringwater Bay and Islands SAC	Harbour porpoise	✓	✓
		Grey seal	✓	✓
IE0002172	Blasket Islands SAC	Harbour porpoise	✓	✓
IE0003000	Rockabill to Dalkey Island SAC	Harbour porpoise	✓	✓
IE0002171	Bandon River SAC	Freshwater pearl mussel	✓	✓
IE0002170	Blackwater River (Cork/Waterford) SAC	Freshwater pearl mussel	✓	✓
		Atlantic salmon	✓	✓
		Sea lamprey	✓	✓
		River lamprey	✓	✓
		Twaite shad	✓	✓
IE0002162	River Barrow and River Nore SAC	Freshwater pearl mussel	✓	✓
		Atlantic salmon	✓	✓
		Sea lamprey	✓	✓
		River lamprey	✓	✓
		Twaite shad	✓	✓
IE0002137	Lower River Suir SAC	Freshwater pearl mussel	✓	✓
		Atlantic salmon	✓	✓
		Sea lamprey	✓	✓
		River lamprey	✓	✓
		Twaite shad	✓	✓

Site code	Site name	Relevant qualifying interests	Physical presence	Underwater noise
IE0000781	Slaney River Valley SAC	Freshwater pearl mussel	✓	✓
		Atlantic salmon	✓	✓
		Sea lamprey	✓	✓
		River lamprey	✓	✓
		Twaite shad	✓	✓
UK0030396	Bristol Channel Approaches SAC	Harbour porpoise	✓	✓
UK0030398	North Anglesey Marine SAC	Harbour porpoise	✓	✓
UK0030397	West Wales Marine SAC	Harbour porpoise	✓	✓
UK0030399	North Channel SAC	Harbour porpoise	✓	✓
SPAs				
IE0004002	Saltee Islands SPA	Northern fulmar	✓	✗
		Lesser black-backed gull	✓	✗
		Northern gannet	✓	✓
		Atlantic puffin	✓	✓
		Black-legged kittiwake	✓	✗
IE0004003	Puffin Island SPA	Northern fulmar	✓	✗
		Manx shearwater	✓	✓
		Storm petrel	✓	✗
IE0004005	Cliffs of Moher SPA	Northern fulmar	✓	✗
IE0004007	Skelligs SPA	Northern fulmar	✓	✗
		Manx shearwater	✓	✓
		Northern gannet	✓	✓
		Storm petrel	✓	✗
IE0004008	Blasket Islands SPA	Northern fulmar	✓	✗
		Manx shearwater	✓	✓
		Storm petrel	✓	✗
IE0004021	Old Head of Kinsale SPA	Black-legged kittiwake	✓	✗
		Common guillemot	✓	✓
IE0004022	Ballycotton Bay SPA	Lesser black-backed gull	✓	✗
IE0004023	Ballymacoda Bay SPA	Lesser black-backed gull	✓	✗
IE0004219	Courtmacsherry Bay SPA	Common gull	✓	✗
IE0004030	Cork Harbour SPA	Lesser black-backed gull	✓	✗
		Common gull	✓	✗
IE0004066	The Bull and The Cow Rocks SPA	Northern gannet	✓	✓
		Storm petrel	✓	✗
IE0004069	Lambay Island SPA	Northern fulmar	✓	✗
IE0004125	Magharee Islands SPA	Storm petrel	✓	✗
IE0004153	Dingle Peninsula SPA	Northern fulmar	✓	✗
IE0004154	Iveragh Peninsula SPA	Northern fulmar	✓	✗

Site code	Site name	Relevant qualifying interests	Physical presence	Underwater noise
		Black-legged kittiwake	✓	✗
IE0004155	Beara Peninsula SPA	Northern fulmar	✓	✗
IE0004175	Deenish Island and Scariff Island SPA	Northern fulmar	✓	✗
		Manx shearwater	✓	✓
		Storm petrel	✓	✗
IE0004189	Kerry Head SPA	Northern fulmar	✓	✗
IE0004192	Helvick Head to Ballyquin SPA	Black-legged kittiwake	✓	✗
UK9014051	Skomer, Skokholm and the Seas off Pembrokeshire SPA	Manx shearwater	✓	✓
		Storm petrel	✓	✗
UK9014041	Grassholm SPA	Northern gannet	✓	✓
UK9013121	Aberdaron Coast and Bardsey Island	Manx shearwater	✓	✓
UK9020291	Copeland Islands	Manx shearwater	✓	✓
UK9020328	Irish Sea Front	Manx shearwater	✓	✓

4.2 Screening for likely significant effects

On the basis of the evidence presented in Sections 3 and 4 and the information given in Appendix 1, the potential for likely significant effects on the qualifying interests of the relevant sites (Table 4.1) is assessed below.

4.2.1 Physical presence of the survey vessel

Birds

The physical presence of the survey vessel may potentially cause displacement and/or other behavioural responses in birds. Most species from relevant SPAs within foraging range of the survey area have been judged to have a low to moderate sensitivity to disturbance by shipping traffic; these include northern gannet, fulmar, common guillemot, kittiwake, Manx shearwater and gulls (Garthe & Hüppop 2004, MMO 2008, Fließbach *et al.* 2019). While rafting birds which are qualifying interests of sites may move in response to vessels in transit, such effects would be of low magnitude, short duration and transient, and will represent negligible additional disturbance over other vessel traffic including that of fishing, cargo and tanker traffic. For example, a shipping study based on Automatic Identification System (AIS) data completed for IOSEA4 (DCENR 2011) indicated that generally up to 300-750 vessels per year were present in waters off the south coast of Ireland and in the vicinity of the survey area (see other data sources including MMO 2014 and subsequent data updates, and EMODnet 2019⁶).

⁶ <https://www.emodnet-humanactivities.eu/search-results.php?dataname=Vessel+Density+> and <https://www.emodnet-humanactivities.eu/search-results.php?dataname=Route+density+%28source%3A+EMSA%29>

Physical disturbance of seaduck and other waterbird flocks by vessel traffic is considered unlikely given the coastal nature of the foraging activities of waterbirds, and the distance of the survey from the coast (~33km).

In view of the available evidence on the potential for the survey activities to generate disturbance to qualifying bird interests of relevant sites for which a potential interaction was identified, **significant effects are not considered to be likely for any of the qualifying interests of relevant SPAs (Table 4.1).**

Fish and Marine Mammals

The physical presence of the vessel may influence the distribution and movements of sensitive species in the water column, specifically protected migratory fish (Atlantic salmon, sea lamprey, river lamprey, twaite shad) and marine mammals (harbour porpoise and grey seal). As hearing specialists, any displacement of marine mammals is most likely associated with acoustic disturbance, which is discussed below in Section 4.2.2. There may also be responses from marine mammals and fish to the general physical presence of vessels (Sparling *et al.* 2015), along with the risk of collisions from vessels in transit. However, the temporary presence of the vessel (three days) is anticipated to cause no more than temporary and localised low-level behavioural responses similar to those from wider vessel traffic in the area (as noted above), and **will not result in likely significant effects for any relevant Annex II marine mammal or migratory fish species associated with relevant SACs (Table 4.1).**

4.2.2 Underwater noise

Noise sources and propagation

The noise sources associated with the survey are those from the vessel, and the Ultra-Short Baseline (USBL) acoustic system used to position the drop down camera.

The propagation of sound in the marine environment is complex and has been the subject of considerable research (e.g. Wang *et al.* 2014). Once a sound is emitted, its characteristics will be altered with distance from source. Changes will affect the amplitude of the signal and its frequency content and, in the case of impulsive sounds, the injurious elements will be reduced through propagation (i.e. pulse duration increases and rise-time decreases with distance). The main process that reduces the amplitude of the sound wave as it propagates is geometrical spreading; while a host of other processes come into play (e.g. reflection, refraction, scattering, reverberation and absorption), many of which are dependent on environmental conditions. The effect of frequency-dependent absorption loss is small on lower frequency sources (e.g. <0.3dB/km at 4kHz), which contributes to seismic survey noise being detectable by hydrophones hundreds of km from the source, but acts to rapidly attenuate higher frequency sources (e.g. 36dB/km at 100kHz) (Francois & Garrison 1982).

The USBL system consists of a multi-element transducer mounted on the hull of a vessel and a transponder attached to the equipment, in this case, the drop down camera. The hull-mounted transducer emits an acoustic pulse that is detected by the transponder, which replies with its own acoustic pulse, and its position is subsequently determined from the range and angle of the pulse as received by the transducer. USBL equipment is widely used by offshore commercial and research vessels where positional accuracy of survey equipment is critical. The emitted pulses will be short pulse width 'pings', approximately in the range of 20-40kHz and with a source level of up to ~196dB re 1µPa @1m⁷.

⁷ Based on manufacturer technical data

In generic terms, underwater noise emitted by small leisure craft and vessels <50m tends to have a source level of 160-175 dB re 1 μ Pa@1m, and with greater sound energy in relatively higher frequency (above 1kHz) when compared to large ships; support and supply vessels (50-100m) are expected to have source levels in the range 165-180dB re 1 μ Pa@1m range and with most energy in lower frequencies (OSPAR 2009). For the purpose of this noise assessment, the offshore survey vessel is assumed to be of 50-100m in length. Veirs *et al.* (2016) estimated sound characteristics for a wider variety of ships (from pleasure craft to container ships) in transit across the Haro Strait (west coast of North America). Median received levels of ship noise within the study area were measured to be most elevated above ambient noise at the lower frequencies (20-30dB from 100-1,000Hz), and to a lesser extent also at higher frequencies (5-13dB from 10-40kHz).

Cavitation noise commonly arises at speeds between 8 and 12 knots and grows in amplitude with increasing speed; its frequency spectrum is broad with dominant frequencies above a few hundred Hz. In addition to vessels in transit, cavitation noise is important when vessels are operating under high load conditions (high thrust) and when dynamic positioning (DP) systems are in use. For example, the use of thrusters for DP has been reported to result in increased sound generation of ~10dB compared to the same vessel in transit: measurements at 600m range to an offshore supply vessel of 79m length recorded broadband SPL (18-3,000Hz) of 148.0dB re 1 μ Pa (root-mean-squared, rms) when in DP mode, compared to 135.5dB re 1 μ Pa rms when in transit at a speed of 10 knots (Rutenko & Ushchikovskii 2015).

Acoustic modelling in support of oil & gas operations have shown that across a variety of vessels, activities and localities, exposure to sound pressure level (SPL) above >180 dB re 1 μ Pa rms is highly unlikely; SPL >160 dB re 1 μ Pa rms are encountered only within the immediate vicinity of the activity (<50m) while SPL >120 dB re 1 μ Pa rms are encountered up to a few kilometres (Neptune LNG 2016, Fairweather 2016, Owl Ridge Natural Resource Consultants 2016).

Marine mammals

Marine mammals, for which sound is fundamental across a wide range of critical natural functions, show high sensitivity to underwater sound. Generally, the severity of effects tends to increase with increasing exposure to noise with both sound intensity and duration of exposure being important. A distinction can be drawn between effects associated with physical (including auditory) injury and effects associated with behavioural disturbance. With respect to injury, risk from an activity can be assessed using threshold criteria of sound levels, with the most recent criteria presented in Southall *et al.* (2019). Auditory capabilities, and in particular the range of frequencies over which sensitivity is greatest, varies between species and criteria are assigned to functional hearing groups with accompanying injury criteria. Table 4.2 provides details of the relevant marine mammals listed by functional hearing group, their estimated hearing range and recommended injury criteria, defined as the sound level at which a permanent threshold shift (PTS; permanent hearing damage) is estimated to occur.

Table 4.2: Marine mammal auditory injury criteria to pulsed sounds by functional hearing group

Functional hearing group (species relevant to the Kinsale area)	Estimated hearing range (region of greatest sensitivity) [frequency of peak sensitivity]	Proposed injury (PTS onset) threshold criteria to impulsive noise (dB re 1µPa, peak, unweighted)
Very high frequency cetaceans Harbour porpoise (<i>Phocoena phocoena</i>)	275Hz to 160kHz (12kHz to 140kHz) [105kHz]	202
Phocid seals in water Grey seal (<i>Halichoerus grypus</i>) Harbour seal (<i>Phoca vitulina</i>)	50Hz to 86kHz (1.9kHz to 30kHz) [13kHz]	218

Source: Southall et al. (2019). Notes: The region of greatest sensitivity represents parameters f1 and f2, which are the bounds of the flat, central portion of the frequency-weighting curve region; the frequency of peak sensitivity represents parameter f0.

Of the species likely to occur in the survey area, the harbour porpoise has the lowest threshold criteria for the onset of PTS at 202dB re 1µPa. Given the source characteristics and evidence of propagation presented above, the potential sources in the planned Kinsale survey (vessel and USBL) will not generate source levels of this amplitude. For all other species/functional hearing groups, the risk is lower still. Therefore, **the risk of injury to marine mammals which are qualifying interests of relevant SACs (Section 4.1) is considered to be negligible, and significant effects for any of the relevant qualifying marine mammal features (Table 4.1) are not considered to be likely.**

Underwater noise from the survey vessel could potentially cause behavioural disturbance of marine mammals present in the area. Reported responses include avoidance, changes in swimming speed, direction and surfacing patterns, alteration of the intensity and frequency of calls (review Erbe *et al.* 2019). Harbour porpoises and minke whales have been shown to respond to survey vessels by moving away from them, while some other species, such as common dolphins, have shown attraction (Palka & Hammond 2001).

While there is potential for some behavioural disturbance of cetaceans in response to survey vessel noise, the area of potential disturbance will be highly localised (i.e. within a few hundred metres radius), in an open sea habitat (i.e. with movement of animals not restricted by geographic features such as a shoreline), transient and of short overall duration. The increase in underwater noise from the survey vessel activities, relative to existing levels in the wider area from other shipping and fisheries, is expected to be negligible.

The waters off the south coast of Ireland support a high diversity of cetaceans, and the wider Kinsale-Ballycotton-Seven Heads area may occasionally experience temporarily high localised densities of some species (primarily common dolphins) during the period April-December. However, considering the acoustic characteristics of the potential sources and their propagation, the relevant evidence of effects on marine mammals from vessel noise and the proportionally lower potential for effects of the USBL compared with seismic or other impulsive noise sources which will not be used, in addition to the small spatial footprint and short duration (see Section 2.2) of the planned survey, **the risk of behavioural disturbance to any species of marine mammal which is a qualifying interest of a relevant SAC (Section 4.1) is considered to be extremely low, and significant effects for relevant qualifying marine mammal features (Table 4.1) are not considered to be likely.**

The risk of negative effects on marine mammals is considered to be sufficiently low that no mitigation measures are necessary. The planned survey does not include seismic sources

(such as airguns, sparkers or boomers) and the location of the offshore survey area is such that it is not necessary to adhere to the DAHG Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (DAHG 2014). This is reflective of the low risk to marine life posed by the potential equipment and the survey environment not being of high sensitivity.

Fish

Fish exhibit large variation in their response to sound, largely due to the great diversity in anatomical features, hearing physiology and behaviour; all species respond to particle motion, but several have adaptations that make them sensitive also to the pressure component of sound. Most species can detect sounds from <50Hz to a few hundred Hz, with some extending this range to approximately 500Hz (e.g. cod, saithe), and those with specialisations to be sensitive to sound pressure being able to detect sounds up to several kHz (e.g. herring) (review in Hawkins & Popper 2017). Broadly applicable sound exposure criteria have been published (Popper *et al.* 2014); the criteria for mortality and potential injury from seismic survey noise for species lacking a swim bladder (sensitive to particle motion only) is >213dB re 1 μ Pa (peak) and for all other groups is >207dB re 1 μ Pa (peak).

There have been numerous reviews of the effects of anthropogenic sound on fish (e.g. Popper *et al.* 2014, Hawkins *et al.* 2015, Slabbekoorn *et al.* 2019). Of relevance is Carroll *et al.* (2017), who present a systematic and critical review of scientific studies investigating the impacts of low-frequency sound on marine fish, with a focus on seismic surveys. Of studies investigating adult/juvenile fish mortality and physical injury, the majority showed no effects, some reported temporary hearing loss and one observed long-term hearing damage; none showed mortality. Of six studies investigating mortality of fish eggs or larvae, none reported mortality at realistic known exposure levels. Behavioural effects are the most studied aspect, numbering 15 studies, with most being laboratory or caged field experiments. Startle/alarm responses, avoidance of the sound source or changes in vertical or horizontal distribution were widely reported, while several studies reported no significant response or conflicting results. Observed responses were temporary, and fish returned to pre-exposure behaviour typically within less than an hour of the last exposure. The majority of studies of effects on catch rates or abundance report no effect or conflicting results, although in some cases reduced trawl and/or longline catch occurred; where effects have been reported, these are most likely due to changes in fish distribution and behaviour, such as vertical movements.

Given the reported hearing ranges of fish, it is anthropogenic sound sources generating high amplitude low-frequency noise (i.e. seismic airgun surveys, along with percussive pile-driving and explosions) which are of primary concern to fish; the operating frequency of the USBL is above the hearing range of fish, and noise sources for the vessel and USBL are well below the exposure criteria for mortality or injury. Therefore, **the risk of injury to any fish species which is a qualifying interest of a relevant SAC (Table 4.1) is considered to be extremely remote and significant effects are not considered to be likely.**

Given the limited and variable evidence of behavioural responses of fish to high amplitude low-frequency seismic survey noise, the comparative characteristics of the potential sources in the planned survey (vessel noise and USBL), in addition to the relatively small spatial footprint and short duration of the planned survey, **the risk of significant effects on any fish species which is a qualifying interest of a relevant SAC (Table 4.1) due to behavioural disturbance is considered to be extremely low and significant effects are not considered to be likely.**

Diving birds

Information on the underwater hearing abilities of diving birds and evidence of the effects of underwater anthropogenic noise is very limited. Deeper-diving species which spend longer periods of time underwater (e.g. auks) may be most at risk of exposure, but all species which routinely submerge in pursuit of prey and benthic feeding opportunities in marine and estuarine habitats (i.e. also including divers *Gavia spp.*, grebes, diving ducks, cormorant, shag, gannet, and Manx shearwater) may be exposed to anthropogenic noise.

While seabird responses to approaching vessels are highly variable (e.g. Fließbach *et al.* 2019), flushing disturbance would be expected to displace most diving seabirds from close proximity to the survey vessel, thereby limiting their exposure to vessel or USBL noise. Similarly, any behavioural disturbance of seabirds due to the survey activities is most likely to be temporary displacement associated with the physical presence of the vessel, comparable to that experienced by routine shipping traffic.

While acknowledging limited data and the importance of the survey area to several species of diving birds (i.e. guillemot and razorbill), a consideration of the lack of reported effects of seismic survey on diving birds (see Section 3.4.2), the comparatively lower amplitude and higher frequency source characteristics of the vessel and USBL noise sources in the planned survey, in addition to its small spatial footprint and short duration, leads to the conclusion that **there would be no likely significant effect on relevant SPAs which include diving birds as qualifying interests (Table 4.1).**

4.3 In-combination effects

Sources of potential in-combination effects included a range of other activities which take place within the wider Kinsale area, including fisheries and shipping, for which the addition of a vessel for up to three days, is not considered to represent a significant source of in-combination effect.

Two Foreshore Licences have been applied for in relation to offshore wind farm site investigation work in the territorial waters off Cork (see Section 3.3), however, both are located entirely within territorial waters and there will be no spatial overlap with the proposed Kinsale end of operations survey. The indicative schedule in their respective applications suggest activities starting in 2021, or likely taking place 2020-2023. As neither application has been approved, there is the potential for the timescale within which works take place to be later than proposed. There is the potential for interaction between the timings of these surveys and work associated with the proposed survey, but the duration and scale of the survey campaign are such that there is considerable scope to avoid interactions.

The wind farm proposals associated with the site investigations are at a conceptual stage. No consent application for either development has been made, and no approvals have been granted.

There is the potential for future development associated with the Barryroe oil discovery. While a number of recent surveys have been completed to inform appraisal well drilling, applications relating to the appraisal or any development of the field are yet to be made and any interaction with the end of operations survey is not expected.

Kinsale Energy will maintain awareness and dialogue with the developers of both wind farms, and any further proposals in relation to the Barryroe field, to ensure that activities do not proceed in a manner which could lead to in-combination effects.

5 AA SCREENING STATEMENT AND CONCLUSIONS

This Screening for Appropriate Assessment has been prepared according to the process and requirements outlined in the *European Communities (Birds and Natural Habitats) Regulations 2011* and the Habitats Directive, and is consistent with European (European Commission 2021a) (see Figure 1.2 of this document) and national (OPR 2021) guidance, and relevant case law. The screening assessment was carried out in accordance with best published scientific knowledge, and taking into consideration each of the relevant sites' conservation objectives, to ascertain if the proposed survey, on its own or in-combination with any other known plan or project, would be likely to have a significant effect on any of the relevant Natura 2000 sites. For the avoidance of doubt, it is confirmed that measures intended to avoid or reduce impacts on any European Site were not considered as part of the screening assessment carried out.

The conclusion of the Screening for Appropriate Assessment is that the activities associated with the proposed survey (see Section 2) will not result in any likely significant effects (either alone or in-combination with other plans or projects) on the features or conservation objectives of any relevant Natura 2000 site (see Section 3). This conclusion is based on objective scientific evidence and there is no reasonable scientific doubt in relation to this conclusion.

6 ARTICLE 12 ASSESSMENT

6.1 Relevant Annex IV species

Under Article 12 of the Habitats Directive, Annex IV species are afforded strict protection throughout their range, both inside and outside of designated protected areas. Those Annex IV species (cetaceans) that could potentially occur within the survey area are listed (Table 6.1) and described below.

Table 6.1: Annex IV species relevant to the survey and wider Kinsale area

Group	Common Name	Scientific Name	Habitats Directive Annex (es)
Cetaceans	Harbour porpoise	<i>Phocoena phocoena</i>	II and IV
	Common dolphin	<i>Delphinus delphis</i>	IV
	Bottlenose dolphin	<i>Tursiops truncatus</i>	II and IV
	Risso's dolphin	<i>Grampus griseus</i>	IV
	Killer whale	<i>Orcinus orca</i>	IV
	Striped dolphin	<i>Stenella coeruleoalba</i>	IV
	Northern right whale	<i>Eubalaena glacialis</i>	IV
	Blue whale	<i>Balaenoptera musculus</i>	IV
	Atlantic white-sided dolphin	<i>Lagenorhynchus acutus</i>	IV
	White-beaked dolphin	<i>Lagenorhynchus albirostris</i>	IV
	Long-finned pilot whale	<i>Globicephala melas</i>	IV
	Northern bottlenose whale	<i>Hyperoodon ampullatus</i>	IV
	Minke whale	<i>Balaenoptera acutorostrata</i>	IV
	Humpback whale	<i>Megaptera novaeangliae</i>	IV
	Fin whale	<i>Balaenoptera physalus</i>	IV
Sei whale	<i>Balaenoptera borealis</i>	IV	
Marine Reptiles - Turtles	Leatherback turtle	<i>Dermochelys coriacea</i>	IV
	Loggerhead turtle	<i>Caretta caretta</i>	IV
	Kemp's Ridley turtle	<i>Lepidochelys kempii</i>	IV
	Hawksbill turtle	<i>Eretmochelys imbricata</i>	IV
	Green turtle	<i>Chelonia mydas</i>	IV

There are several key data resources on the species composition and relative abundance of the marine mammal fauna in the area around Kinsale and the wider Celtic Sea. The annual Celtic Sea Herring Acoustic Surveys (CSHAS) cover waters off the south coast of Ireland, typically over a three week period each October and extends from 2-3km off the coast to over 100km offshore (e.g. O'Donnell *et al.* 2017, 2020). Dedicated marine mammal observers recorded sightings when light and environmental conditions permitted; combined data from 13 years of surveys from 2008-2020 are provided in Table 6.2. Data from the Irish Whale and Dolphin Group's (IWDG) casual database and other sources over the period 2005-2011 were synthesised by Wall *et al.* (2013), which includes an assessment of the seasonal occurrence of the most commonly sighted species; the IWDG casual sightings data

Species	J	F	M	A	M	J	J	A	S	O	N	D
Risso's dolphin	-	-	-	4	4	3	3	3	4	4	4	-
Minke whale	-	-	4	3	3	3	3	3	2	2	2	4
Humpback whale	3	4	-	4	4	4	3	3	3	3	2	3
Fin whale	4	4	-	-	4	4	3	3	3	2	2	3

Source: Wall et al. (2013) and S. Berrow, IWDG (pers. comm. May 2018) (see additional references provided in text below for additional further information) Notes: Information on seasonal abundance of cetaceans is limited, so this table should be regarded as indicative of general trends. Abundance has been ranked from 1-4, where 1 is "very abundant" and 4 is "low abundance". '-' means no sightings were recorded in that month and/or abundance is considered likely to be extremely low.

Two strata surveyed for marine mammals as part of the ObSERVE programme are relevant to the proposed survey area. These are Stratum 4 (as described above) and Stratum 8, which was only surveyed in summer and winter 2016, and covered 9,506km² of coastal waters off the south and south-west coasts. Cetacean sightings and abundance estimates in these two strata are summarised in Table 6.4.

For Stratum 4 (offshore), the abundance of bottlenose, common and unidentified dolphins was considerably higher in winter. The opposite was observed for harbour porpoise, which were by far the most abundant species recorded in Stratum 4 in summer. In Stratum 8 (coastal), both harbour porpoise and all species of dolphin showed higher abundance in summer. Minke whale abundance was estimated to be similar across two summer and one winter surveys, although the number of sightings was low. Within Stratum 8, minke whales were not seen in the winter survey, but observed 20 times in summer, with sightings clustered off the south-west coast. There were very few sightings of pinnipeds off the south coast of Ireland, with those few being clustered in the south-west and south-east, distant from the survey area.

Predicted distribution maps suggested the presence of higher densities of harbour porpoise in summer, bottlenose dolphin in winter, and common dolphin in winter (relative to other surveyed areas for each species). Predicted densities of minke whale are higher in summer than winter, with waters off the south-west coast appearing to be of higher importance.

The ObSERVE aerial survey data provide a greater level of quantification and seasonal information on cetaceans than was previously available for waters off the south coast of Ireland. These new data confirm the high diversity of cetacean species off the south coast, along with the seasonal patterns for the area which previous data had suggested.

Table 6.4: Cetacean sighting numbers and abundance estimates for waters south of Ireland from the ObSERVE aerial surveys in 2015 and 2016

Species & season	Stratum 4 (offshore)		Stratum 8 (coastal)	
	N groups (mean group size)	Abundance; density (CV)	N groups (mean group size)	Abundance; density (CV)
Harbour porpoise				
Summer 2015	41 (1.2)	14,190; 0.227 (27.4)	-	-
Winter 2015-16	11 (1.3)	3,752; 0.060 (41.3)	-	-
Summer 2016	42 (1.3)	14,196; 0.227 (37.2)	8 (1.6)	1,977; 0.208 (62.6)
Winter 2016-17	0 (na)	na	3 (1)	568; 0.060 (73.2)

Species & season	Stratum 4 (offshore)		Stratum 8 (coastal)	
	N groups (mean group size)	Abundance; density (CV)	N groups (mean group size)	Abundance; density (CV)
Bottlenose dolphin¹				
Summer 2015	7 (6)	3,885; 0.062 (64.3)	-	-
Winter 2015-16	26 (2.9)	6,217; 0.098 (28.4)	-	-
Summer 2016	17 (4)	5,549; 0.088 (47.7)	39 (7.2)	11,266; 1.161 (59.9)
Winter 2016-17	91 (7.8)	58,647; 0.929 (22.3)	17 (3.8)	3,322; 0.342 (47.6)
Common dolphin and common/striped dolphin²				
Summer 2015	3 (4.5)	2,554; 0.041 (73.8)	-	-
Winter 2015-16	45 (8.9)	40,027; 0.639 (51.5)	-	-
Summer 2016	0	na	5 (5.2)	1,319; 0.139 (45.5)
Winter 2016-17	0	na	2 (4.0)	779; 0.082 (76.0)
Risso's dolphin^{1, 3}				
Summer 2015	0	na	-	-
Winter 2015-16	1 (1)	40; 0.001 (101.6)	-	-
Summer 2016	2 (10)	809; 0.013 (94.8)	3 (7.7)	549; 0.057 (50.9)
Winter 2016-17	0	na	0	na
Unidentified dolphin¹				
Summer 2015	19 (4.9)	4,814; 0.076 (43.9)	-	-
Winter 2015-16	92	27,348; 0.433 (39.0)	-	-
Summer 2016	27 (3.3)	4,982; 0.079 (37.2)	57 (6.2)	10,047 (45.0); 1.035
Winter 2016-17	107 (7.1)	38,413; 0.608 (20.9)	28 (3.5)	4,142 (41.4); 0.427
Minke whale				
Summer 2015	4 (1.0)	836 (66.6); 0.013	-	-
Winter 2015-16	4 (1.0)	751 (64.8); 0.012	-	-
Summer 2016	4 (1.0)	761 (63.3); 0.012	20 (1.0)	2,242 (66.1); 0.236
Winter 2016-17	0	na	0	na
Fin whale^{1, 3}				
Summer 2015	0	na	-	-
Winter 2015-16	0	na	-	-
Summer 2016	0	na	0	na
Winter 2016-17	0	na	1 (2.0)	33 (98.4); 0.003

Notes. ¹ Abundance estimates for these species are uncorrected for detection probability and are therefore likely to be underestimates. ² Includes a small number of sightings where the two species could not be differentiated; as Strata 4 and 8 are restricted to shelf waters and striped dolphins favour deeper waters, the values presented here can be assumed to be almost exclusively common dolphins. ³ The abundance estimates for Risso's dolphin and fin whale are based on very few sightings, are highly uncertain and should be interpreted with caution. Abundance estimates are rounded to the nearest whole number; CV rounded to 2 decimal places.

Source: Rogan et al. (2018).

Harbour porpoise

The harbour porpoise is the most abundant and widespread species occurring around the Irish coast, commonly seen in shallow coastal waters in the summer, although surveys suggest highest densities along the south coast occur in autumn (Marine Institute 2013). They move further offshore in the spring; although the details of this migration are uncertain, it may be linked to calving (DCENR 2015). Harbour porpoise are generally less often encountered in the Celtic Sea than in the Irish Sea, although it may be that this is a result of lower survey effort and higher sea states off the south coast (Wall *et al.* 2013). In the CSHAS data (Table 6.1), harbour porpoise were the second most frequently sighted toothed cetacean, seen both close to shore and in offshore waters. A comparison of the results of the broad-scale SCANS and SCANS-II surveys (SCANS-II 2008) indicate there has been a general shift to the southwest and an increase in the harbour porpoise population in the region over the period between the surveys. Harbour porpoise are a designated feature within the Roaringwater Bay and Islands SAC, ~75km to the north west of the survey area, with a population that has been consistently estimated at between 150-160 individuals (Berrow *et al.* 2014).

Common dolphin

The common dolphin is Ireland's most common dolphin species and it is most abundant off the south and southwest coasts, where they are often seen in very large groups. They tend to move east over the winter, with sightings off County Cork at their greatest between September and January (Berrow *et al.* 2010). Common dolphins were, by a large margin, the most frequently observed and numerous species during the recent CSHAS (Table 6.1). Common dolphins typically move further offshore in the summer and are seen in large groups, moving to inshore waters in autumn, probably linked to the presence of large numbers of schooling pelagic fish (Marine Institute 2013).

Bottlenose dolphin

Bottlenose dolphins are present in the Celtic Sea and there is a small semi-resident population present at Cork Harbour, where six individuals have been repeatedly sighted (Ryan *et al.* 2010), with larger numbers visiting the area during the summer. The species is more commonly seen off the west coasts of the country, with sightings peaking in summer (Berrow *et al.* 2010). Photo-identification data from groups of bottlenose dolphins at several locations around the coast of Ireland have revealed movement of animals between sites separated by 130-650km over durations of 26-760 days, providing evidence that many individuals should be considered highly mobile and transient (O'Brien *et al.* 2009).

Other dolphins

Risso's dolphin are occasionally observed in the wider area, most commonly in the summer months and within a few kilometres of the coast (Wall *et al.* 2013). One Risso's dolphin was recorded outside Cork Harbour during the 2014 CSHAS (Nolan *et al.* 2014), while none were seen off the south coast of Ireland in 2016-2020. A small number of killer whales have been recorded off the south coast, primarily during summer (Wall *et al.* 2013). Records of other toothed cetacean species off the south coast (i.e. white-beaked dolphin *Lagenorhynchus albirostris* and long-finned pilot whale *Globicephala melas*) are very rare and these species would be highly unlikely to be present in proximity to the survey area.

Baleen whales

Baleen whales are sighted along the south coast of Ireland primarily from late summer through autumn. Minke whales are observed in most months of the year, but are most frequently seen from April to November (Berrow *et al.* 2010). The larger fin and humpback whales are regularly observed in small numbers both close to the coast and further offshore, primarily in autumn and winter when these waters are a known foraging ground (Marine Institute 2013). Fin whales sightings peak in November (Berrow *et al.* 2010, Whooley *et al.* 2011), and they were the most frequently sighted and most numerous baleen whale in the CSHAS data (Table 8.1). Photo-identification data were collected from whale-watching vessels over 79 trips from 2003-2008, which resulted in the identification of 62 individual fin whales, of which 11 were sighted across multiple years (Whooley *et al.* 2011). Ryan *et al.* (2016) analysed several hundred humpback whale sightings from the IWDG casual database collected from 1999-2013, revealing an annual easterly movement along the southern coast; most sightings in the survey area occurred from October-December.

Turtles

Five species of marine turtle have been recorded in the seas around Ireland and the UK: leatherback turtle (*Dermochelys coriacea*), loggerhead turtle (*Caretta caretta*), Kemp's ridley turtle (*Lepidochelys kempii*), green turtle (*Chelonia mydas*) and hawksbill turtle (*Eretmochelys imbricata*). The leatherback turtle is the largest of the marine turtles and is the only species of turtle to have developed adaptations to cold water (Goff & Stenson 1988). The species is covered under Annex IV of the Habitats Directive (see Section 3.2.7).

A significant majority of turtle sightings recorded in Irish waters are of the leatherback turtle (King & Berrow 2009), which migrates into the waters of the Celtic and Irish Seas in response to the distribution of the gelatinous zooplankton which make up their favoured diet (Doyle *et al.* 2008, Fossette *et al.* 2010). Tagging studies show that they migrate across the Atlantic from the eastern American mainland and the Caribbean (Hays *et al.* 2004, Doyle *et al.* 2008). Sightings in the wider region are concentrated off the south and west of Ireland, the southwest of England and the west coast of Wales. Most sightings occur in the summer, peaking in August (Penrose & Gander 2016). The 2014 Celtic Sea Herring Acoustic Survey (Cronin & Barton 2014) made four sightings of leatherback turtle, three of them approximately 70km south of Cork Harbour, although no confirmed sightings of this species were made in subsequent surveys (O'Donnell *et al.* 2016, 2017, 2018, 2019, 2020). Aerial surveys for the ObSERVE project from 2015-2016 recorded a handful of leatherback turtle sightings at the southern limits of Irish offshore waters in summer; none were observed in the survey area (Rogan *et al.* 2018).

6.2 European Protected Species Risk Assessment

Section 3.2 identified and described the main sources of potential effect relevant to the assessment under Article 6(3) of the Habitats Directive, which are:

- physical presence of the survey vessel,
- underwater noise including from the vessel and USBL positioning,

and these sources of effect are also those considered to be relevant under Article 12, in keeping with the definitions of, for example, deliberate actions and disturbance as clarified in European Commission (2021b) guidance. These sources of effect have, therefore, been considered against relevant Annex IV species which may be present over the survey area, and an assessment is provided in the sections which follow. This assessment builds on that already provided in Section 4 to cover those additional relevant Annex IV features.

6.2.1 Physical presence of the survey vessel

Marine mammals

The physical presence of the vessel may influence the distribution and movements of sensitive species in the water column, namely marine mammals. As hearing specialists, any displacement of marine mammals is most likely associated with acoustic disturbance, which is discussed in Section 6.2.2. There may also be responses from marine mammals and fish to the general physical presence of infrastructure and vessels (Sparling *et al.* 2015), along with the risk of collisions from vessels in transit.

The survey will result in a small increase in vessel traffic within the wider Kinsale and Celtic Sea (one vessel), being present for up to three days in total (see Section 2). The survey area is known to be frequented by several marine mammal species, however, the physical presence of the vessel around areas of existing activity, and its temporary presence are anticipated to cause no more than temporary and localised low-level behavioural responses similar to those from normal shipping, such that **the risk of impacts to Annex IV marine mammals from the planned survey activities is considered to be negligible, and significant effects are not considered to be likely.**

Marine turtles

The physical presence of vessel and equipment during the survey activities are anticipated to cause no more than temporary and localised low-level behavioural responses in Annex IV species, similar to those induced by wider shipping operations in the area. **The risk of impacts to Annex IV marine turtles from the planned survey activities is considered to be negligible, and significant effects are not considered to be likely.**

6.2.2 Underwater noise

Marine mammals

Marine mammals, for which sound is fundamental across a wide range of critical natural functions, show high sensitivity to underwater sound. Generally, the severity of effects tends to increase with increasing exposure to noise with both sound intensity and duration of exposure being important. A distinction can be drawn between effects associated with physical (including auditory) injury and effects associated with behavioural disturbance. With respect to injury, risk from an activity can be assessed using threshold criteria of sound levels, with the most recent criteria presented in Southall *et al.* (2019). Auditory capabilities, and in particular the range of frequencies over which sensitivity is greatest, varies between species and criteria are assigned to functional hearing groups with accompanying injury criteria. Table 6.5 expands upon that given in Table 4.2 of the AA screening, and provides details of the relevant marine mammals listed by functional hearing group, their estimated hearing range and recommended injury criteria, defined as the sound level at which a permanent threshold shift (PTS; permanent hearing damage) is estimated to occur (potential acoustic survey equipment and their indicative source characteristics are presented in Table 4.2).

Table 6.5: Marine mammal auditory injury criteria to pulsed sounds by functional hearing group

Functional hearing group (species relevant to the Kinsale area)	Estimated hearing range (region of greatest sensitivity) [frequency of peak sensitivity]	Proposed injury (PTS onset) threshold criteria to impulsive noise (dB re 1µPa, peak, unweighted)
Low frequency cetaceans Fin whale (<i>Balaenoptera physalus</i>) Minke whale (<i>Balaenoptera acutorostrata</i>) Humpback whale (<i>Megaptera novaeangliae</i>)	7Hz to 35kHz (200Hz to 19kHz) [5.6kHz]	219
High frequency cetaceans Common dolphin (<i>Delphinus delphis</i>) Bottlenose dolphin (<i>Tursiops truncatus</i>) Risso's dolphin (<i>Grampus griseus</i>) Killer whale (<i>Orcinus orca</i>)	150Hz to 160kHz (8.8kHz to 110kHz) [58kHz]	230
Very high frequency cetaceans Harbour porpoise (<i>Phocoena phocoena</i>)	275Hz to 160kHz (12kHz to 140kHz) [105kHz]	202
Phocid seals in water Grey seal (<i>Halichoerus grypus</i>) Harbour seal (<i>Phoca vitulina</i>)	50Hz to 86kHz (1.9kHz to 30kHz) [13kHz]	218

Source: Southall et al. (2019). Notes: The region of greatest sensitivity represents parameters f_1 and f_2 , which are the bounds of the flat, central portion of the frequency-weighting curve region; the frequency of peak sensitivity represents parameter f_0 .

Of the species likely to occur in the survey area, the harbour porpoise has the lowest threshold criteria for the onset of PTS at 202dB re 1µPa. Given the source characteristics and evidence of propagation presented above, the sources in the planned Kinsale survey (vessel and USBL positioning) will not generate sound levels exceeding this threshold. For all other species/functional hearing groups, the risk is lower still. Therefore, **the risk of injury to Annex IV marine mammals from the planned survey activities is considered to be negligible, and significant effects are not considered to be likely.**

With respect to behavioural disturbance of marine mammals, it has proved much more difficult to establish broadly applicable threshold criteria based on exposure alone (see Section 4.2.2 for more detail). The waters off the south coast of Ireland support a high diversity of cetaceans, and the wider Kinsale-Ballycotton-Seven Heads area may occasionally experience temporarily high localised densities of some species (primarily common dolphins) during the period April-December. However, considering the acoustic characteristics of the potential sources and their propagation, the relevant evidence of effects on marine mammals from noise sources including those from vessels and seismic survey, noting the significantly lower potential for effects of the USBL source, in addition to the small spatial footprint and short duration of the planned survey, **the risk of behavioural disturbance to any Annex IV species of marine mammal is considered to be extremely low, and significant effects are not considered to be likely.**

The risk of negative effects on marine mammals is considered to be sufficiently low that no mitigation measures are necessary. The planned survey does not include any seismic or other acoustic survey sources, and the location of the offshore survey area is such that it is not necessary to adhere to the DAHG Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (DAHG 2014). This is reflective of the low

risk to marine life posed by the survey, and the environment not being of high sensitivity to the survey activities.

Marine turtles

Available information on potential effects of underwater sound on marine turtles is very limited (Nelms *et al.* 2016). The hearing range of cheloniid species has been estimated at between 50-2,000Hz, with highest sensitivity below 400Hz (Popper *et al.* 2014). For leatherback turtles, measurements made on hatchlings suggested a similar low frequency sensitivity, with sound detection ranging between 50 and 1,200Hz when in water and between 50 and 1,600Hz in air (Dow Piniak *et al.* 2012).

A variety of potential functions of hearing have been proposed for marine turtles, although the issue is poorly understood; they do not appear to vocalize or use sound for communication, but may use sound for navigation, locating prey, avoiding predators, and general environmental awareness (see Dow Piniak *et al.* 2012, Nelms *et al.* 2016 and references therein). While some authors have raised concerns over the potential for physical injury (including hearing damage) to marine turtles from anthropogenic noise generally (Samuel *et al.* 2005), such potential impacts remain to be investigated, as do any subsequent ecological effects (Nelms *et al.* 2016).

Underwater noise generated by the survey vessel may be detectable by leatherback turtles, although their low density and limited seasonal presence in the area dictates that very few individuals are likely to be exposed to noise levels beyond that of the background for the region. The frequency range of the USBL is beyond the hearing range of turtles.

Considering this low likelihood of exposure, the perceived limited sensitivity of the receptor, and the moderate intensity nature of the noise source, **the risk of disturbance or injury to Annex IV marine turtles is considered extremely remote.**

6.3 Conclusion

The assessment considered relevant Annex IV species (Table 6.1) likely to be present in the survey area, and concluded that the risk of disturbance or injury is very low and significant effects are not likely for relevant species of marine turtle and cetaceans.

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APPENDIX 1: NATURA 2000 SITE INFORMATION

The tabulations in this Appendix contain lists of the qualifying interests for each Natura 2000 site for which a potential interaction has been identified (Table 4.1) and those features of relevance to the survey programme. Additional information on site conservation objectives is also provided, which along with the qualifying interests inform a consideration of the nature of the interaction with the potential sources of likely significant effect.

Special Areas of Conservation (SAC)

Site Name: Roaringwater Bay and Islands SAC

Site Code: 000101

Site information

Relevant qualifying interests: Large shallow inlets and bays, reefs, vegetated sea cliffs of the Atlantic and Baltic coasts, harbour porpoise *Phocoena phocoena*, otter *Lutra lutra*, grey seal *Halichoerus grypus*, European dry heaths, submerged or partly submerged sea caves

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: harbour porpoise *Phocoena phocoena*, grey seal *Halichoerus grypus*

Summary Conservation objectives:

- To maintain the favourable conservation condition of large shallow inlets and bays
- To maintain the favourable conservation condition of reefs
- To maintain the favourable conservation condition of vegetated sea cliffs of the Atlantic and Baltic coasts
- To maintain the favourable conservation condition of harbour porpoise
- To restore the favourable conservation condition of otter
- To maintain the favourable conservation condition of grey seal
- To maintain the favourable conservation condition of European dry heaths
- To maintain the favourable conservation condition of submerged or partly submerged sea caves

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000101.pdf

Closest distance to the survey: 74km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (e.g. harbour porpoise and grey seal) these are expected to cause no more than temporary and localised low-level behavioural responses similar to those from normal shipping activity in the Kinsale and wider Celtic Sea areas. However, given the potential presence of these qualifying species the survey area there is the potential for interaction which is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. Given the potential presence of noise-sensitive qualifying species (e.g. harbour porpoise and grey seal) in the survey area, there is the potential for interaction which is considered further in Section 4.2.2.

Site Name: Blasket Islands SAC

Site Code: 0002172

Site information

Relevant qualifying interests: reefs, vegetated sea cliffs of the Atlantic and Baltic coasts, harbour

Site Name: Blasket Islands SAC
Site Code: 0002172

porpoise *Phocoena phocoena*, otter *Lutra lutra*, grey seal *Halichoerus grypus*, European dry heaths, submerged or partly submerged sea caves

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: harbour porpoise *Phocoena phocoena*

Summary Conservation objectives:

- To maintain the favourable conservation condition of reefs
- To restore the favourable conservation condition of vegetated sea cliffs of the Atlantic and Baltic coasts
- To maintain the favourable conservation condition of harbour porpoise
- To restore the favourable conservation condition of otter
- To maintain the favourable conservation condition of grey seal
- To maintain the favourable conservation condition of European dry heaths
- To maintain the favourable conservation condition of submerged or partly submerged sea caves

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002172.pdf **Further supporting information on the site conservation objectives:**

[https://www.npws.ie/sites/default/files/publications/pdf/Blasket%20Islands%20SAC%20\(002172\)%20Conservation%20objectives%20supporting%20document%20-%20Marine%20habitats%20\[Version%201\]_1.pdf](https://www.npws.ie/sites/default/files/publications/pdf/Blasket%20Islands%20SAC%20(002172)%20Conservation%20objectives%20supporting%20document%20-%20Marine%20habitats%20[Version%201]_1.pdf)

Closest distance to the survey: 188km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (e.g. harbour porpoise) these are expected to cause no more than temporary and localised low-level behavioural responses similar to those from normal shipping activity in the Kinsale and wider Celtic Sea areas. However, given the potential presence of these qualifying species the survey area there is the potential for interaction which is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. Given the potential presence of noise-sensitive qualifying species (e.g. harbour porpoise) in the survey area, there is the potential for interaction which is considered further in Section 4.2.2.

Site Name: Rockabill to Dalkey Island SAC
Site Code: 0003000

Site information

Relevant qualifying interests: reefs, harbour porpoise *Phocoena phocoena*

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: harbour porpoise *Phocoena phocoena*

Summary Conservation objectives:

- To maintain the favourable conservation condition of reefs
- To maintain the favourable conservation condition of harbour porpoise

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO003000.pdf **Further supporting information on the site conservation objectives:**

https://www.npws.ie/sites/default/files/publications/pdf/003000_Rockabill%20to%20Dalkey%20Island

Site Name: Rockabill to Dalkey Island SAC
Site Code: 0003000

[%20SAC%20Marine%20Supporting%20Doc_V1.pdf](#)

Closest distance to the survey: 260km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (e.g. harbour porpoise) these are expected to cause no more than temporary and localised low-level behavioural responses similar to those from normal shipping activity in the Kinsale and wider Celtic Sea areas. However, given the potential presence of these qualifying species the survey area there is the potential for interaction which is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. Given the potential presence of noise-sensitive qualifying species (e.g. harbour porpoise) in the survey area, there is the potential for interaction which is considered further in Section 4.2.2.

Site Name: Bandon River SAC
Site Code: 0002171

Site information

Relevant qualifying interests: Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation, alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*), freshwater pearl mussel *Margaritifera margaritifera*, brook lamprey *Lampetra planeri*

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: freshwater pearl mussel *Margaritifera margaritifera*

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected.

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002171.pdf

Closest distance to the survey: 69km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

While supporting a population of Atlantic salmon, this is not a qualifying interest of the site. As Atlantic salmon forms a critical part of the lifecycle of the freshwater pearl mussel interest feature, it is considered here as if it were an interest feature. With respect to this potentially sensitive species, survey activities would be expected to cause no more than temporary and localised low-level behavioural responses similar to those from normal shipping activity in the Kinsale and Celtic Sea areas, and the potential for significant effects on the site has therefore not been identified.

Underwater noise from vessel and survey activities

As above, in view of the freshwater pearl mussel interest feature, the potential for interaction with Atlantic salmon is considered here. The primary contributor to underwater noise from the survey will be vessel activity USBL positioning. In view of the qualifying interest dependency on a potentially noise sensitive feature (Atlantic salmon), the potential for likely significant effect is considered further in Section 4.2.2.

Site Name: Blackwater River (Cork/Waterford) SAC
Site Code: 0002170

Site information

Relevant qualifying interests: Freshwater pearl mussel *Margaritifera margaritifera*, white-clawed crayfish *Austropotamobius pallipes*, sea lamprey *Petromyzon marinus*, brook Lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, twaite shad *Alosa fallax*, Atlantic salmon *Salmo salar* (only in fresh water), estuaries, mudflats and sandflats not covered by seawater at low tide, perennial vegetation of stony banks, *Salicornia* and other annuals colonizing mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), otter, Mediterranean salt meadows (*Juncetalia maritimi*), Killarney fern *Trichomanes speciosum*, water courses of plain to montane levels with the *Ranunculon fluitantis* and *Callitricho-Batrachion* vegetation, old sessile oak woods with *Ilex* and *Blechnum* in the British Isles, alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*), *Taxus baccata* woods of the British Isles.

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, twaite shad *Alosa fallax*, Atlantic salmon *Salmo salar*, freshwater pearl mussel *Margaritifera margaritifera*

Summary Conservation objectives:

- To restore the favourable conservation condition of the freshwater pearl mussel
- To maintain the favourable conservation condition of white-clawed crayfish
- To restore the favourable conservation condition of sea lamprey
- To maintain the favourable conservation condition of brook lamprey
- To maintain the favourable conservation condition of river lamprey
- To restore the favourable conservation condition of twaite shad
- To maintain the favourable conservation condition of Atlantic salmon
- To maintain the favourable conservation condition of estuaries
- To maintain the favourable conservation condition of mudflats and sandflats not covered by seawater at low tide
- To maintain the favourable conservation condition of perennial vegetation of stony banks
- To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand
- To restore the favourable conservation condition of Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- To restore the favourable conservation condition of otter
- To maintain the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*)
- To maintain the favourable conservation condition of Killarney fern
- To maintain the favourable conservation condition of water courses of plain to montane levels with the *Ranunculon fluitantis* and *Callitricho-Batrachion* vegetation
- To restore the favourable conservation condition of old sessile oak woods with *Ilex* and *Blechnum*
- To restore the favourable conservation condition of alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)
- The status of *Taxus baccata* woods of the British Isles as a qualifying Annex I habitat for the Blackwater River (Cork/Waterford) SAC is currently under review.

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002170.pdf

Closest distance to the survey: 56km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (e.g. sea lamprey, river lamprey, twaite shad, Atlantic salmon and by association the freshwater pearl mussel) these are

**Site Name: Blackwater River (Cork/Waterford) SAC
Site Code: 0002170**

expected to cause no more than temporary and localised low-level behavioural responses similar to those from normal shipping activity in the Kinsale and wider Celtic Sea areas. However, given the potential presence of these qualifying species the survey area there is the potential for interaction which is considered further in Section 4.2.1

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. In view of the potential noise sensitivity of qualifying interests which have the potential to occur in or near the survey area (e.g. Atlantic salmon, sea lamprey), the potential for likely significant effect is considered further in Section 4.2.2.

**Site Name: River Barrow and River Nore SAC
Site Code: 0002162**

Site information

Relevant qualifying interests: Desmoulin's whorl snail *Vertigo moulinsiana*, freshwater pearl mussel *Margaritifera margaritifera*, white-clawed crayfish *Austropotamobius pallipes*, sea lamprey *Petromyzon marinus*, brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, twaite shad *Alosa fallax*, Atlantic salmon *Salmo salar* (only in fresh water), estuaries, mudflats and sandflats not covered by seawater at low tide, *Salicornia* and other annuals colonizing mud and sand, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), otter *Lutra lutra*, Mediterranean salt meadows (*Juncetalia maritimi*), Killarney fern *Trichomanes speciosum*, Nore freshwater pearl mussel *Margaritifera durrovensis*, water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, European dry heaths, hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, petrifying springs with tufa formation (*Cratoneurion*), old sessile oak woods with *Ilex* and *Blechnum* in the British Isles alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, twaite shad *Alosa fallax*, Atlantic salmon *Salmo salar*, freshwater pearl mussel *Margaritifera margaritifera*

Summary Conservation objectives:

- The status of the freshwater pearl mussel (*Margaritifera margaritifera*) as a qualifying Annex II species for the River Barrow and River Nore SAC is currently under review.
- To maintain the favourable conservation condition of white-clawed crayfish
- To restore the favourable conservation condition of sea lamprey
- To restore the favourable conservation condition of brook lamprey
- To restore the favourable conservation condition of river lamprey
- To restore the favourable conservation condition of twaite shad
- To restore the favourable conservation condition of salmon
- To maintain the favourable conservation condition of estuaries
- To maintain the favourable conservation condition of the mudflats and sandflats not covered by seawater at low tide
- To maintain the favourable conservation condition of *Salicornia* and other annuals colonizing mud and sand
- To restore the favourable conservation condition of Atlantic salt meadows
- To restore the favourable conservation condition of otter
- To restore the favourable conservation condition of Mediterranean salt meadows
- To maintain the favourable conservation condition of Killarney fern
- To restore the favourable conservation condition of the Nore freshwater pearl mussel
- To maintain the favourable conservation condition of water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
- To maintain the favourable conservation condition of European dry heaths

**Site Name: River Barrow and River Nore SAC
Site Code: 0002162**

- To maintain the favourable conservation condition of hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
- To maintain the favourable conservation condition of petrifying springs with tufa formation (*Cratoneurion*)
- To restore the favourable conservation condition of old oak woodland with *Ilex* and *Blechnum*
- To restore the favourable conservation condition of alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002162.pdf

Closest distance to the survey: 113km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (e.g. sea lamprey, river lamprey, twaite shad, Atlantic salmon and by association the freshwater pearl mussel) these are expected to cause no more than temporary and localised low-level behavioural responses similar to those from current normal shipping activity in the Kinsale and Celtic Sea areas. However, given the migratory nature of some of the qualifying species, there is the potential for interaction with site qualifying interests, which are considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. In view of the potential noise sensitivity of qualifying interests which have the potential to occur in or near the survey area (e.g. Atlantic salmon, sea lamprey), the potential for likely significant effect is considered further in Section 4.2.2.

**Site Name: Lower River Suir SAC
Site Code: 0002137**

Site information

Relevant qualifying interests: Freshwater pearl mussel *Margaritifera margaritifera*, white-clawed crayfish *Austropotamobius pallipes*, sea lamprey *Petromyzon marinus*, brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, twaite shad *Alosa fallax*, Atlantic salmon *Salmo salar*, Atlantic salt meadows (*Glauco-Puccinellietalia maritima*), otter *Lutra lutra*, Mediterranean salt meadows (*Juncetalia maritimi*), water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, hydrophilous tall herb fringe communities of plains and of the montane to alpine levels, old sessile oak woods with *Ilex* and *Blechnum* in the British Isles, alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*), *Taxus baccata* woods of the British Isles.

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, twaite shad *Alosa fallax*, Atlantic salmon *Salmo salar*, freshwater pearl mussel *Margaritifera margaritifera*

Summary Conservation objectives:

- To restore the favourable conservation condition of Atlantic salt meadows
- To restore the favourable conservation condition of Mediterranean salt meadows (*Juncetalia maritimi*)
- To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
- To maintain the favourable conservation condition of Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
- To restore the favourable conservation condition of Old sessile oak woods with *Ilex* and

Site Name: Lower River Suir SAC
Site Code: 0002137

Blechnum in the British Isles

- To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, *Alnion incanae*, *Salicion albae*)
- To restore the favourable conservation condition of *Taxus baccata* woods of the British Isles
- To restore the favourable conservation condition of Freshwater Pearl Mussel
- To maintain the favourable conservation condition of White-clawed Crayfish
- To restore the favourable conservation condition of Sea Lamprey
- To restore the favourable conservation condition of Brook Lamprey
- To restore the favourable conservation condition of River Lamprey
- To restore the favourable conservation condition of Twaite Shad
- To restore the favourable conservation condition of Atlantic Salmon
- To maintain the favourable conservation condition of Otter

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002137.pdf

Closest distance to the survey: 113km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (e.g. sea lamprey, river lamprey, twaite shad, Atlantic salmon and by association the freshwater pearl mussel) these are expected to cause no more than temporary and localised low-level behavioural responses similar to those from current normal shipping activity in the Kinsale and Celtic Sea areas. However, given the migratory nature of some of the qualifying species, there is the potential for interaction with site qualifying interests, which are considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. In view of the potential noise sensitivity of qualifying interests which have the potential to occur in or near the survey area (e.g. Atlantic salmon, sea lamprey), the potential for likely significant effect is considered further in Section 4.2.2.

Site Name: Slaney River Valley SAC
Site Code: 000781

Site information

Relevant qualifying interests: Estuaries, freshwater pearl mussel *Margaritifera margaritifera*, Mudflats and sandflats not covered by seawater at low tide, sea lamprey *Petromyzon marinus*, brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilis*, twaite shad *Alosa fallax*, Atlantic salmon *Salmo salar*, otter *Lutra lutra*, *Phoca vitulina* (harbour seal), Atlantic salt meadows (*Glaucopuccinellietalia maritimae*), Mediterranean salt meadows (*Juncetalia maritimi*), water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, old sessile oak woods with *Ilex* and *Blechnum* in the British Isles, alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, *Alnion incanae*, *Salicion albae*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: sea lamprey *Petromyzon marinus*, river lamprey *Lampetra fluviatilis*, twaite shad *Alosa fallax*, Atlantic salmon *Salmo salar*, freshwater pearl mussel *Margaritifera margaritifera*

Summary Conservation objectives:

- The status of the freshwater pearl mussel (*Margaritifera margaritifera*) as a qualifying Annex II species for the Slaney River Valley SAC is currently under review

Site Name: Slaney River Valley SAC
Site Code: 0000781

- To restore the favourable conservation condition of Sea lamprey
- To restore the favourable conservation condition of Brook lamprey
- To restore the favourable conservation condition of River lamprey
- To restore the favourable conservation condition of Twaite shad
- To restore the favourable conservation condition of Salmon
- To maintain the favourable conservation condition of Estuaries
- To maintain the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide
- To restore the favourable conservation condition of Otter
- To maintain the favourable conservation condition of Harbour Seal
- To maintain the favourable conservation condition of Water courses of plain to montane levels with the *Ranunculus fluitantis* and Callitricho-Batrachion vegetation
- To restore the favourable conservation condition of old sessile oakwoods with Ilex and Blechnum
- To restore the favourable conservation condition of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion)

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO000781.pdf

Closest distance to the survey: 156km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (e.g. sea lamprey, river lamprey, twaite shad, Atlantic salmon and by association the freshwater pearl mussel) these are expected to cause no more than temporary and localised low-level behavioural responses similar to those from current normal shipping activity in the Kinsale and Celtic Sea areas. However, given the migratory nature of some of the qualifying species, there is the potential for interaction with site qualifying interests, which are considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. In view of the potential noise sensitivity of qualifying interests which have the potential to occur in or near the survey area (e.g. Atlantic salmon, sea lamprey), the potential for likely significant effect is considered further in Section 4.2.2.

Site Name: Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC
Site Code: UK0030396

Site information

Relevant qualifying interests: *Phocoena phocoena*

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: harbour porpoise *Phocoena phocoena*

Summary Conservation objectives:

To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters

In the context of natural change, this will be achieved by ensuring that:

1. The species is a viable component of the site.
2. There is no significant disturbance of the species.
3. The condition of supporting habitats and processes and prey availability are maintained.

Further supporting information on the site conservation objectives:

Site Name: Bristol Channel Approaches / Dynesfeydd Môr Hafren SAC
Site Code: UK0030396

http://archive.jncc.gov.uk/pdf/BristolChApproaches_ConsAdvice.pdf

Closest distance to the survey: 185km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (harbour porpoise) these are expected to cause no more than temporary and localised low-level behavioural responses similar to those from normal shipping activity in the Kinsale and wider Celtic Sea areas. However, given the potential presence of these qualifying species the survey area there is the potential for interaction which is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. Given the potential presence of noise-sensitive qualifying species (harbour porpoise) in the survey area, the potential for likely significant effect is considered further in Section 4.2.2.

Site Name: North Anglesey Marine / Gogledd Môn Forol SAC
Site Code: UK0030398

Site information

Relevant qualifying interests: *Phocoena phocoena*

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: harbour porpoise *Phocoena phocoena*

Summary Conservation objectives:

To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters

In the context of natural change, this will be achieved by ensuring that:

- 1. The species is a viable component of the site.
- 2. There is no significant disturbance of the species.
- 3. The condition of supporting habitats and processes and prey availability are maintained.

Further supporting information on the site conservation objectives:

http://archive.jncc.gov.uk/pdf/NAnglesey_ConsAdvice.pdf

Closest distance to the survey: 294km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (harbour porpoise) these are expected to cause no more than temporary and localised low-level behavioural responses similar to those from normal shipping activity in the Kinsale and wider Celtic Sea areas. However, given the potential presence of these qualifying species the survey area there is the potential for interaction which is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. Given the potential presence of noise-sensitive qualifying species (harbour porpoise) in the survey area, the potential for likely significant effect is considered further in Section 4.2.2.

Site Name: West Wales Marine / Gorllewin Cymru Forol SAC
Site Code: UK0030397

Site information

Relevant qualifying interests: *Phocoena phocoena*

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: harbour porpoise *Phocoena phocoena*

Summary Conservation objectives:

To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters

In the context of natural change, this will be achieved by ensuring that:

- 1. The species is a viable component of the site.
- 2. There is no significant disturbance of the species.
- 3. The condition of supporting habitats and processes and prey availability are maintained.

Further supporting information on the site conservation objectives:

<https://cdn.naturalresources.wales/media/681439/w-wales-marine-objectives-advice.pdf?mode=pad&rnd=13162576075000000>

Closest distance to the survey: 166km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (harbour porpoise) these are expected to cause no more than temporary and localised low-level behavioural responses similar to those from normal shipping activity in the Kinsale and wider Celtic Sea areas. However, given the potential presence of these qualifying species the survey area there is the potential for interaction which is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. Given the potential presence of noise-sensitive qualifying species (harbour porpoise) in the survey area, the potential for likely significant effect is considered further in Section 4.2.2.

Site Name: North Channel SAC
Site Code: UK0030398

Site information

Relevant qualifying interests: *Phocoena phocoena*

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: harbour porpoise *Phocoena phocoena*

Summary Conservation objectives:

To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters

In the context of natural change, this will be achieved by ensuring that:

- 1. The species is a viable component of the site.
- 2. There is no significant disturbance of the species.
- 3. The condition of supporting habitats and processes and prey availability are maintained.

Further supporting information on the site conservation objectives:

http://archive.jncc.gov.uk/pdf/NorthChannel_ConsAdvice.pdf

Site Name: North Channel SAC
Site Code: UK0030398

Closest distance to the survey: 370km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

The survey will result in a small increase in vessel traffic in the Kinsale Area (one vessel present for approximately 3 days). With respect to potentially sensitive qualifying species (harbour porpoise) these are expected to cause no more than temporary and localised low-level behavioural responses similar to those from normal shipping activity in the Kinsale and wider Celtic Sea areas. However, given the potential presence of these qualifying species the survey area there is the potential for interaction which is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

The primary contributor to underwater noise is from the vessel and USBL positioning. Given the potential presence of noise-sensitive qualifying species (harbour porpoise) in the survey area, the potential for likely significant effect is considered further in Section 4.2.2.

Special Protection Areas (SPAs)

Site Name: Ballymacoda Bay SPA
Site Code: 0004023

Site information

Relevant qualifying interests: Wigeon (*Anas penelope*), teal (*Anas crecca*), ringed plover (*Charadrius hiaticula*), golden plover (*Pluvialis apricaria*), grey plover (*Pluvialis squatarola*), lapwing (*Vanellus vanellus*), sanderling (*Calidris alba*), dunlin (*Calidris alpina*), black-tailed godwit (*Limosa limosa*), bar-tailed godwit (*Limosa lapponica*), curlew (*Numenius arquata*), redshank (*Tringa totanus*), turnstone (*Arenaria interpres*), black-headed gull (*Chroicocephalus ridibundus*), common gull (*Larus canus*), lesser black-backed gull (*Larus fuscus*), Wetland & Waterbirds

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: lesser black-backed gull (*Larus fuscus*)

Summary Conservation objectives:

- To maintain the favourable conservation condition of those qualifying interests listed above in Ballymacoda Bay SPA, including the wetland habitat as a resource for the regularly occurring migratory birds that utilise it.

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004023.pdf

Closest distance to the survey: 49km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

As noted in Section 3.4, physical disturbance of seaduck and other waterbird flocks by vessel traffic is unlikely, but the distance from a vessel at which flushing of birds could take place is significantly less than the minimum distance of the proposed survey (49km) such that there is no foreseeable interaction. Gull species, while having the potential to forage within range of the survey area (see Woodward *et al.* 2019), are regarded to have a low sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et al.* 2019). There is either no potential for interaction in the case of waterbirds, or the qualifying interest which could interact is not sensitive to the proposed activities. However, in view of the potential for interaction, the latter is considered in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Ballycotton Bay SPA
Site Code: 004022

Site information

Relevant qualifying interests: Teal (*Anas crecca*); ringed plover (*Charadrius hiaticula*); golden plover (*Pluvialis apricaria*); grey plover (*Pluvialis squatarola*); lapwing (*Vanellus vanellus*); black-tailed godwit (*Limosa limosa*); bar-tailed godwit (*Limosa lapponica*); curlew (*Numenius arquata*); turnstone (*Arenaria interpres*); common gull (*Larus canus*); lesser black-backed gull (*Larus fuscus*); Wetland & Waterbirds

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: lesser black-backed gull (*Larus fuscus*) – note this is a wintering feature of the site

Summary Conservation objectives:

- To maintain the favourable conservation condition of those qualifying interests listed above in Ballycotton Bay SPA, including the wetland habitat as a resource for the regularly occurring migratory birds that utilise it.

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004022.pdf

Closest distance to the survey: 42km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

As noted in Section 3.4, physical disturbance of seaduck and other waterbird flocks by vessel traffic is unlikely, but the distance from a vessel at which flushing of birds could take place is significantly less than the minimum distance of the proposed survey (42km) such that there is no foreseeable interaction. Gull species, while having the potential to forage within range of the survey area (see Woodward *et al.* 2019), are regarded to have a low sensitivity to shipping traffic (Garthe & Hüppop 2004, Fiessbach *et al.* 2019). There is either no potential for interaction in the case of waterbirds, or the qualifying interest which could interact is not sensitive to the proposed activities. However, in view of the potential for interaction, the latter is considered in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Courtmacsherry Bay SPA
Site Code: 0004219

Site information

Relevant qualifying interests: great northern diver (*Gavia immer*), shelduck (*Tadorna tadorna*), wigeon (*Anas penelope*), red-breasted merganser (*Mergus serrator*), golden plover (*Pluvialis apricaria*), lapwing (*Vanellus vanellus*), dunlin (*Calidris alpina*), black-tailed godwit (*Limosa limosa*), bar-tailed godwit (*Limosa lapponica*), curlew (*Numenius arquata*), black-headed gull (*Chroicocephalus ridibundus*), common gull (*Larus canus*), wetland and waterbirds.

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: common gull (*Larus canus*)

Summary Conservation objectives:

- To maintain the favourable conservation condition of those qualifying interests listed above in Ballymacoda Bay SPA, including the wetland habitat as a resource for the regularly occurring migratory birds that utilise it.

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004023.pdf

Site Name: Courtmacsherry Bay SPA
Site Code: 0004219

Closest distance to the survey: 42km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

While common gull has the potential to forage within range of the survey area (see Woodward *et al.* 2019), they are not regarded to have a high sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et al.* 2019). However, in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Cork Harbour SPA
Site Code: 004030

Site information

Relevant qualifying interests: Little grebe (*Tachybaptus ruficollis*), great crested grebe (*Podiceps cristatus*), cormorant (*Phalacrocorax carbo*), grey heron (*Ardea cinerea*), shelduck (*Tadorna tadorna*), wigeon (*Anas penelope*), teal (*Anas crecca*), pintail (*Anas acuta*), shoveler (*Anas clypeata*), red-breasted merganser (*Mergus serrator*), oystercatcher (*Haematopus ostralegus*), golden plover (*Pluvialis apricaria*), grey plover (*Pluvialis squatarola*), lapwing (*Vanellus vanellus*), dunlin (*Calidris alpina*), black-tailed Godwit (*Limosa limosa*), bar-tailed godwit (*Limosa lapponica*), curlew (*Numenius arquata*), redshank (*Tringa totanus*), black-headed gull (*Chroicocephalus ridibundus*), common gull (*Larus canus*), lesser black-backed gull (*Larus fuscus*), common tern (*Sterna hirundo*), Wetland & Waterbirds

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: common gull (*Larus canus*), lesser black-backed gull (*Larus fuscus*)

Summary Conservation objectives:

- To maintain the favourable conservation condition of those qualifying interests listed above in Cork Harbour SPA, including the wetland habitat as a resource for the regularly occurring migratory birds that utilise it.

Feature attributes and targets defining favourable conservation status:

https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004030.pdf

Closest distance to the survey: 37km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

As noted in Section 3.4, physical disturbance of seaduck and other waterbird flocks by vessel traffic is unlikely, but the distance from a vessel at which flushing of birds could take place is significantly less than the minimum distance of the proposed survey (37km) such that there is no foreseeable interaction. Gull species, while having the potential to forage within range of the survey area (see Woodward *et al.* 2019), are regarded to have a low sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et al.* 2019). There is either limited potential for interaction in the case of waterbirds, or the qualifying interest which could interact is not sensitive to the proposed activities. In view of the potential for interaction with sensitive qualifying interests of the site, the latter is considered in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Helvick Head to Ballyquin SPA

Site Code: 004192

Site information

Relevant qualifying interests: Cormorant (*Phalacrocorax carbo*), peregrine (*Falco peregrinus*), herring gull (*Larus argentatus*), kittiwake (*Rissa tridactyla*), chough (*Pyrrhocorax pyrrhocorax*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: kittiwake (*Rissa tridactyla*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004192.pdf

Closest distance to the survey: 62km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

While kittiwake and herring gull have the potential to forage within range of the survey area (see Woodward *et al.* 2019), they are not regarded to have a high sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et al.* 2019). However, in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Old Head of Kinsale SPA

Site Code: 004021

Site information

Relevant qualifying interests: Kittiwake (*Rissa tridactyla*), guillemot (*Uria aalge*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: kittiwake (*Rissa tridactyla*), guillemot (*Uria aalge*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004021.pdf

Closest distance to the survey: 33km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Kittiwake and common guillemot have the potential to forage within range of the survey area (see Woodward *et al.* 2019), and are of low sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et al.* 2019). In view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (guillemot) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: Saltee Islands SPA

Site Code: 004002

Site information

Relevant qualifying interests: Razorbill (*Alca torda*), Atlantic puffin (*Fratercula arctica*), northern fulmar (*Fulmarus glacialis*), lesser black-backed gull (*Larus fuscus*), cormorant (*Phalacrocorax carbo*), black-legged kittiwake (*Rissa tridactyla*), northern gannet (*Morus bassanus*), guillemot (*Uria aalge*), shag (*Phalacrocorax aristotelis*), herring gull (*Larus argentatus*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*), lesser black-backed gull (*Larus fuscus*), northern gannet (*Morus bassanus*), black-legged kittiwake (*Rissa tridactyla*), Atlantic puffin (*Fratercula arctica*),

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004002.pdf

Closest distance to the survey: 119km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Fulmar, lesser black-backed gull, northern gannet, puffin and kittiwake have the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low to moderate (puffin) for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (northern gannet, puffin) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: Puffin Island SPA

Site Code: 004003

Site information

Relevant qualifying interests: Razorbill (*Alca torda*), Atlantic puffin (*Fratercula arctica*), northern fulmar (*Fulmarus glacialis*), European storm-petrel (*Hydrobates pelagicus*), lesser black-backed gull (*Larus fuscus*), Manx shearwater (*Puffinus puffinus*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*), Manx shearwater (*Puffinus puffinus*), European storm-petrel (*Hydrobates pelagicus*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004003.pdf

Closest distance to the survey: 168km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Site Name: Puffin Island SPA
Site Code: 004003

Fulmar, Manx shearwater and European storm-petrel have the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (Manx shearwater) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: Cliffs of Moher SPA
Site Code: 004005

Site information

Relevant qualifying interests: razorbill (*Alca torda*), Atlantic puffin (*Fratercula arctica*), northern fulmar (*Fulmarus glacialis*), red-billed chough (*Pyrrhocorax pyrrhocorax*), black-legged kittiwake (*Rissa tridactyla*), common guillemot (*Uria aalge*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004005.pdf

Closest distance to the survey: 322km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Fulmar, while having the potential to forage within range of the survey area (see Woodward *et al.* 2019), are regarded to have a low sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et al.* 2019). However, in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Skelligs SPA
Site Code: 004007

Site information

Relevant qualifying interests: Atlantic puffin (*Fratercula arctica*), northern fulmar (*Fulmarus glacialis*), European storm-petrel (*Hydrobates pelagicus*), Manx shearwater (*Puffinus puffinus*), black-legged kittiwake (*Rissa tridactyla*), northern gannet (*Morus bassanus*), common guillemot (*Uria aalge*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*), northern gannet (*Morus bassanus*), Manx shearwater (*Puffinus puffinus*), European storm-petrel (*Hydrobates pelagicus*),

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Site Name: Skelligs SPA
Site Code: 004007

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004007.pdf

Closest distance to the survey: 162km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Fulmar, Manx shearwater, northern gannet and European storm-petrel have the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (Manx shearwater, northern gannet) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: Basket Islands SPA
Site Code: 004008

Site information

Relevant qualifying interests: razorbill (*Alca torda*), Atlantic puffin (*Fratercula arctica*), northern fulmar (*Fulmarus glacialis*), European storm-petrel (*Hydrobates pelagicus*), lesser black-backed gull (*Larus fuscus*), Manx shearwater (*Puffinus puffinus*), red-billed chough (*Pyrrhocorax pyrrhocorax*), black-legged kittiwake (*Rissa tridactyla*), Arctic tern (*Sterna paradisaea*), shag (*Phalacrocorax aristotelis*), herring gull (*Larus argentatus*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*), Manx shearwater (*Puffinus puffinus*), European storm-petrel (*Hydrobates pelagicus*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004008.pdf

Closest distance to the survey: 189km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Fulmar, European storm-petrel and Manx shearwater have the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (Manx shearwater) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: The Bull and The Cow Rocks SPA
Site Code: 004066

Site information

Relevant qualifying interests: Atlantic puffin (*Fratercula arctica*), European storm-petrel (*Hydrobates pelagicus*), northern gannet (*Morus bassanus*)

Site Name: The Bull and The Cow Rocks SPA
Site Code: 004066

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern gannet (*Morus bassanus*), European storm-petrel (*Hydrobates pelagicus*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004066.pdf

Closest distance to the survey: 136km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Northern gannet and European storm petrel have the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (northern gannet) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: Lambay Island SPA
Site Code: 004069

Site information

Relevant qualifying interests: razorbill (*Alca torda*), greylag goose (*Anser anser*), Atlantic puffin (*Fratercula arctica*), northern fulmar (*Fulmarus glacialis*), lesser black-backed gull (*Larus fuscus*), cormorant (*Phalacrocorax carbo carbo*), black-legged kittiwake (*Rissa tridactyla*), guillemot (*Uria aalge*), shag (*Phalacrocorax aristotelis*), herring gull (*Larus argentatus*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004069.pdf

Closest distance to the survey: 291km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Fulmar has the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Magharee Islands SPA
Site Code: 004125

Site information

Relevant qualifying interests: Barnacle goose (*Branta leucopsis*), common gull (*Larus canus*), little tern (*Sterna albifrons*), common tern (*Sterna hirundo*), Arctic tern (*Sterna paradisaea*), European storm-petrel (*Hydrobates pelagicus*), shag (*Phalacrocorax aristotelis*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: European storm-petrel (*Hydrobates pelagicus*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004125.pdf

Closest distance to the survey: 246km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

European storm-petrel, while having the potential to forage within range of the survey area (see Woodward *et al.* 2019), are regarded to have a low sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et al.* 2019). However, in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Dingle Peninsula SPA
Site Code: 004153

Site information

Relevant qualifying interests: Peregrine (*Falco peregrinus*), northern fulmar (*Fulmarus glacialis*), red-billed chough (*Pyrrhocorax pyrrhocorax*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004153.pdf

Closest distance to the survey: 194km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Fulmar, while having the potential to forage within range of the survey area (see Woodward *et al.* 2019), are regarded to have a low sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et al.* 2019). However, in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any

Site Name: Dingle Peninsula SPA
Site Code: 004153

underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Iveragh Peninsula SPA
Site Code: 004154

Site information

Relevant qualifying interests: peregrine falcon (*Falco peregrinus*), northern fulmar (*Fulmarus glacialis*), red-billed chough (*Pyrrhocorax pyrrhocorax*), black-legged kittiwake (*Rissa tridactyla*), common guillemot (*Uria aalge*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*), black-legged kittiwake (*Rissa tridactyla*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004154.pdf

Closest distance to the survey: 144km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Fulmar and black-legged kittiwake, while having the potential to forage within range of the survey area (see Woodward *et al.* 2019), are regarded to have a low sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et al.* 2019). However, in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Beara Peninsula SPA
Site Code: 004155

Site information

Relevant qualifying interests: northern fulmar (*Fulmarus glacialis*), red-billed chough (*Pyrrhocorax pyrrhocorax*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004155.pdf

Closest distance to the survey: 120km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Fulmar, while having the potential to forage within range of the survey area (see Woodward *et al.* 2019), are regarded to have a low sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et*

Site Name: Beara Peninsula SPA
Site Code: 004155

al. 2019). However, in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Deenish Island and Scariff Island SPA
Site Code: 004175

Site information

Relevant qualifying interests: Northern fulmar (*Fulmarus glacialis*), European storm-petrel (*Hydrobates pelagicus*), lesser black-backed gull (*Larus fuscus*), Manx shearwater (*Puffinus puffinus*), Arctic tern (*Sterna paradisaea*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*), Manx shearwater (*Puffinus puffinus*), European storm-petrel (*Hydrobates pelagicus*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004175.pdf

Closest distance to the survey: 145km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Fulmar, Manx shearwater and European storm petrel, have the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (Manx shearwater) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: Kerry Head SPA
Site Code: 004189

Site information

Relevant qualifying interests: northern fulmar (*Fulmarus glacialis*), red-billed cough (*Pyrhocorax pyrrhocorax*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: northern fulmar (*Fulmarus glacialis*)

Summary Conservation objectives:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA (above)

Feature attributes and targets defining favourable conservation status:

Not listed - https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO004189.pdf

Site Name: Kerry Head SPA
Site Code: 004189

Closest distance to the survey: 255km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Fulmar, while having the potential to forage within range of the survey area (see Woodward *et al.* 2019), are regarded to have a low sensitivity to shipping traffic (Garthe & Hüppop 2004, Fliessbach *et al.* 2019). However, in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

None of the qualifying interests are diving seabirds which are likely to be most at risk of any underwater noise effects, and therefore no interactions with the survey are considered to be possible.

Site Name: Skomer, Skokholm and the Seas off Pembrokeshire / Sgomer, Sgogwm a Moroedd Penfro SPA
Site Code: UK9014051

Site information

Relevant qualifying interests: Atlantic puffin (*Fratercula arctica*), Manx shearwater (*Puffinus puffinus*), European storm-petrel (*Hydrobates pelagicus*), lesser black-backed gull (*Larus fuscus*), red-billed chough (*Pyrrhocorax pyrrhocorax*), short-eared owl (*Asio flammeus*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: Manx shearwater (*Puffinus puffinus*) European storm-petrel (*Hydrobates pelagicus*)

Summary Conservation objectives:

Only draft conservation objectives are presently available for the site:

<https://cdn.naturalresources.wales/media/675733/skomer-skokholm-and-seas-off-pembs-pspa-draft-conservation-objectives-final.pdf?mode=pad&rnd=131625760740000000>

Closest distance to the survey: 130km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Manx shearwater and European storm-petrel have the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (Manx shearwater) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: Grassholm SPA
Site Code: UK9014041

Site information

Relevant qualifying interests: Northern gannet (*Morus bassanus*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: Northern gannet (*Morus bassanus*)

Summary Conservation objectives:

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- The population will not fall below 30,000 pairs in three consecutive years,
- It will not drop by more than 25% of the previous year's figures in any one year.

Site Name: Grassholm SPA
Site Code: UK9014041

- There will be no decline in this population significantly greater than any decline in the North Atlantic population as a whole.

[https://naturalresources.wales/media/674134/Grassholm%20SPA%20Management%20Plan%2021%5B1%5D.4.08%20\(English\).pdf](https://naturalresources.wales/media/674134/Grassholm%20SPA%20Management%20Plan%2021%5B1%5D.4.08%20(English).pdf)

Closest distance to the survey: 173km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Northern gannet has the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (northern gannet) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: Irish Sea Front SPA
Site Code: UK9020328

Site information

Relevant qualifying interests: Manx shearwater (*Puffinus puffinus*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: Manx shearwater (*Puffinus puffinus*),

Summary Conservation objectives:

To avoid significant deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long term and makes an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species. This contribution would be achieved through delivering the following objectives for each of the sites qualifying features:

- Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term;
- Maintain the habitats and food resources of the qualifying features in favourable condition.
- Ensure access to the site from linked breeding colonies

<https://hub.jncc.gov.uk/assets/0032da71-db02-44b5-b4e1-022d77ef7ee3#irish-sea-front-sas-conservation-objectives.pdf>

Closest distance to the survey: 323km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Manx shearwater has the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (Manx shearwater) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: Copeland Islands SPA
Site Code: UK9020291

Site information

Relevant qualifying interests: Manx shearwater (*Puffinus puffinus*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: Manx shearwater (*Puffinus puffinus*),

Summary Conservation objectives:

To maintain each feature in favourable condition. Component objectives for breeding Manx shearwater are, no significant decrease in population against national trends and, fledging success sufficient to maintain or enhance population

<https://www.daera-ni.gov.uk/publications/special-protection-area-copeland-islands>

Closest distance to the survey: 418km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Manx shearwater has the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (Manx shearwater) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.

Site Name: Aberdaron Coast and Bardsey Island SPA
Site Code: UK9013121

Site information

Relevant qualifying interests: Manx shearwater (*Puffinus puffinus*)

Qualifying interests identified for further consideration on the basis of a foreseeable interaction with the survey area: Manx shearwater (*Puffinus puffinus*),

Summary Conservation objectives:

The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:

- Breeding population of Manx shearwater (confined to Ynys Enlli) is stable or increasing.
- Reproductive rates remain stable.
- Deaths from the lighthouse attractions, fencing and other infrastructure are minimal.
- No ground predators are introduced.
- Nesting birds are not disturbed by restoration works on boundary walls or recreational activities.
- All factors affecting the achievement of these conditions are under control.

See the following document for performance indicators for the feature:

<https://naturalresources.wales/media/672092/Glannau%20Aberdaron%20Plan%20English.pdf>

Closest distance to the survey: 254km

Consideration of site interest features against potential sources of likely significant effect

The physical presence of survey vessel

Manx shearwater has the potential to forage within range of the survey area (see Woodward *et al.* 2019). Sensitivity to vessel movements is considered to be low for those species (see Garthe & Hüppop 2004, MMO 2018, Fliessbach *et al.* 2019), but in view of the potential for interaction, this is considered further in Section 4.2.1.

**Site Name: Aberdaron Coast and Bardsey Island SPA
Site Code: UK9013121**

Underwater noise from vessel and survey activities

There is the potential for interactions between diving seabird species (Manx shearwater) which are potentially sensitive to underwater noise, and the survey activities. This is considered further in Section 4.2.2.