

OREDP II Appropriate Assessment – Natura Impact Statement



An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications















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Executive Summary

This report has been produced by NIRAS Group (UK) Ltd (NIRAS) for ClearLead Consulting Ltd and provides the Natura Impact Statement (NIS) with respect to the Strategic Environmental Assessment (SEA), Offshore Renewable Energy Development Plan II: Strategic Environmental Assessment Report (February 2023) as prepared by ClearLead Consulting Ltd. on behalf of the Department of the Environment, Climate and Communications (DECC). The NIS follows the approach set out in the Screening and Principles Reports (NIRAS, 2022a and NIRAS, 2022b) that were issued for consultation in May 2022. The NIS provides the information required by the Competent Authority (DECC) to undertake an Appropriate Assessment of the OREDP II.

The OREDP II provides the framework for the deployment of Offshore Renewable Energy (ORE) in Ireland as part of the enduring plan-led regime for ORE. The ORE technologies included in the OREDP II are fixed wind, floating wind, wave and tidal stream. As the OREDP II may affect sites designated as being of European importance (collectively termed Natura 2000 or N2K sites), an Appropriate Assessment (AA) is required to establish whether or not there will be significant effect(s) on such sites under the European Communities (Birds and Natural Habitats) Regulations 2011 –21, (S.I. 477 of 2011, as amended) (“Birds and Natural Habitats Regulations”) as a result of the OREDP II.

The draft Screening Report (NIRAS, 2022a) issued for consultation in May 2022 identified a list of protected sites and Qualifying Interests (QIs) where the potential for a Likely Significant Effect (LSE) cannot be excluded. The draft Screening Report also identified a series of pressures associated with ORE. Following consultation, that list of sites and QIs has been updated here within the NIS to include some additional QIs.

The geographic extent of the OREDP II and the flexibility in the OREDP II parameters (driven by an awareness of evolving technologies and a desire not to limit where projects could be located at this point) means that discrete areas for development are not defined and therefore is it not feasible to quantify potential effects on a spatial or temporal basis at this stage of the OREDP II. To enable a reasonable and meaningful assessment for the purposes of this NIS, a risk based approach has been adopted, combined with a mitigation hierarchy, to determine whether the OREDP II can be delivered with no adverse effect on integrity (AEOI) resulting and no requirement to consider alternatives or derogate from the requirements of the aforementioned regulations. The results have enabled a determination to be made on risk of AEOI for each of the individual protected sites and QIs screened in, together with the type of mitigation that may be required at project level to avoid an AEOI. For clarity, the NIS has concluded no AEOI in all cases and there is therefore no need to progress through the derogations.

The assessment takes into account the spatial extent of the OREDP II, the sensitivity of QIs to the pressures associated with the relevant ORE technology, the risk of an interaction between the OREDP II and the QIs and available information on the condition of the QIs at site and national level. The overall risk of an AEOL is scored 1 (Low), 2 (Low-Medium and Medium) and 3 (High), with maps provided to highlight how the different protected sites screened in have scored.

It is expected that the detail available at project level (in terms of project description, environmental conditions and protected site connectivity) will be greater than is currently available for the OREDP II assessment. Project level assessment is therefore expected to be required to confirm the relevant LSEs and it is expected that there will remain sufficient flexibility at project level to avoid AEOL. It should further be noted that the absence of a defined AEOL risk at a strategic level does not automatically follow that a conclusion of no LSE will be drawn at project level, and full assessment will be required.

A fundamental principle embedded in the NIS is the commitment to undertake a reasonable and meaningful assessment where possible. It is considered that at a strategic level, as a result of the scale and extent of the OREDP II and the uncertainty in terms of potential projects that may come forward under the OREDP II (including uncertainty around location, type of ORE, scale and timing) there is sufficient information to undertake a reasonable and meaningful strategic level Appropriate Assessment in the form of a risk based approach. In effect, this NIS has sought to identify the risks associated with the OREDP II for the screened in QIs. The results of the NIS should, therefore, be viewed as indicative, as they allow for forecasts to be made on the outcomes of future project level Appropriate Assessments. These indicative forecasts can also be used to identify where interventions are likely to be required at the project level.

Based on the NIS results, it is recommended that project level interventions should be made to ensure Projects in locations where risk of AEOL is greater are required to undertake specific consultation at key steps during planning. In addition, it is recommended that developers implement specific mitigation measures, if necessary, to avoid the risk of AEOLs.

It is considered that the inclusion of project level mitigation to the appropriate level as defined by AEOL risk (where required) will ensure that no AEOL results from the OREDP II alone and there is therefore no requirement to progress past the Stage 2 Assessment at Plan Level for the OREDP II alone.

The assessment for potential effects of the OREDP II in-combination with other plans and projects has concluded that none of the individual plans and projects have to date reported an AEOL (subject to appropriate mitigation measures) and that the requirement for mitigation measures to be adopted by relevant plans and projects yet to be assessed (as included here for the OREDP II) provides for the development of the OREDP II while avoiding an AEOL in-combination. There is therefore no requirement to progress past the Stage 2 Assessment for the OREDP II in-combination.

1 Introduction

The Department of the Environment, Climate and Communications (DECC) is in the process of developing the Offshore Renewable Energy Development Plan II (ORED II), which provides the framework for Offshore Renewable Energy (ORE) as part of the enduring plan-led regime. As required by the Planning and Development (Strategic Environmental Assessment) Regulations 2004¹, the ORED II is subject to a Strategic Environmental Assessment (SEA) which has been undertaken by ClearLead (Offshore Renewable Energy Development Plan II: Strategic Environmental Assessment Report (February 2023)). Further, as the ORED II may affect sites designated as being of European importance (collectively termed Natura 2000 or N2k sites), an Appropriate Assessment is required to establish whether or not there will be significant effect(s) on such sites under the European Communities (Birds and Natural Habitats) Regulations 2011 – 21, (S.I. 477 of 2011, as amended) (“Birds and Natural Habitats Regulations”).

In order for an Appropriate Assessment to be made, an appraisal of the ORED II has been carried out in relation to the potential effect on the qualifying interests (QIs) of N2k sites. This Natura Impact Statement (NIS) has been prepared by NIRAS Group (UK) Ltd (NIRAS) on behalf of ClearLead, to present the findings of that appraisal and inform the Appropriate Assessment that has been made by DECC in relation to the ORED II. The NIS is informed by the Screening Report (NIRAS, 2022a) and Screening Principles Report (NIRAS, 2022b) which collectively identify the pressures relevant to ORE and the sites and QIs that require assessment (noting subsequent updates in Section 1.6).

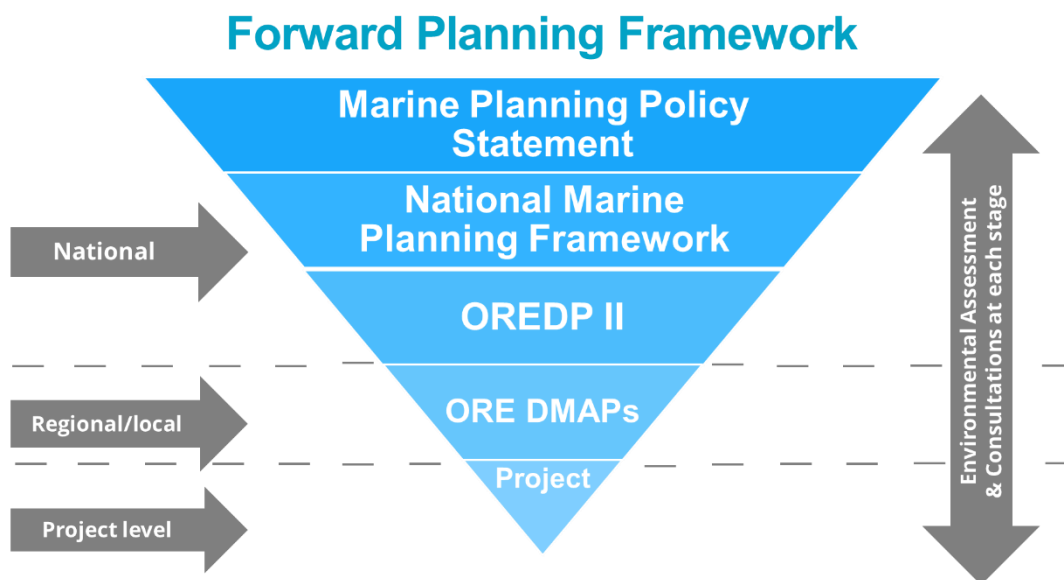
1.1 The ORED II

Ireland is aiming to transition to a low-carbon, climate-resilient and environmentally sustainable economy within EU and global frameworks. The development of Ireland’s offshore renewable energy resources is crucial to delivering on this ambition. The second Offshore Renewable Energy Plan (ORED II) has been produced by DECC and will lay the foundation for a new system

¹ The European SEA Directive (Directive 2001/42/EC: Assessment of the Effects of Certain Plans and Programmes on the Environment) is transposed into Irish law through the Environmental Assessment of Plans and Programmes Regulations S.I. No. 435 of 2004 (the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004), as amended by S.I. No. 200 of 2011 (the European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011 (‘the SEA Regulations’)).

for the management of Ireland’s marine space and the sustainable deployment of ORE in Ireland as part of the enduring plan-led regime. This is a dynamic strategy which will be updated by DECC cyclically to manage the development of ORE in a proactive and holistic way. OREDP II does not identify specific areas for ORE development but is instead the first step in the sectoral marine planning process for ORE, and essentially provides a broad, national level strategy for ORE development. OREDP II states that its geographic extent should be viewed as an indication of areas which are technically suitable for ORE, with consideration of individual spatial constraints to be taken into account at subsequent stages of the marine planning framework. The Forward Planning Framework is depicted below in

Figure 1: Forward Planning Framework for Ireland



The stated objectives of the OREDP II include to develop an understanding of the overall resource potential within Ireland’s waters and to provide an evidence base to facilitate the future identification of areas most suitable for the sustainable development of fixed and floating wind, wave, and tidal stream technologies (areas for ORE development) in Ireland’s Exclusive Economic Zone (EEZ). It is expected that Designated Maritime Area Plans (DMAPs) will be created under the statutory process in the Maritime Area Planning Act 2021 for sub-areas within the OREDP II area to provide statutory management plans for specific areas and to promote use of specific activities including ORE development; and/or for the purposes of the sustainable use and protection of particular marine environments.

In addition to the statutory requirement for Appropriate Assessment with respect to the OREDP II, it is expected that the conclusions of this NIS will feed into the subsequent DMAP process and it is acknowledged that additional Appropriate Assessment may be required for subsequent updates or within the DMAP areas as they are identified and brought forward.

The spatial extent of the OREDP II is driven by renewable energy resource and bathymetry, with the extent of technical resource identified for the types of ORE on which the OREDP II is based presented in the following figures: the OREDP II extents together are depicted in Figure 2, with floating wind in Figure 3; fixed wind in Figure 4; wave in Figure 5; and tidal stream in Figure 6. It is noted that the location of some hard constraints are expected to be identified within the OREDP II but have not been formally excluded within the NIS.

Figure 2 OREDP II Area

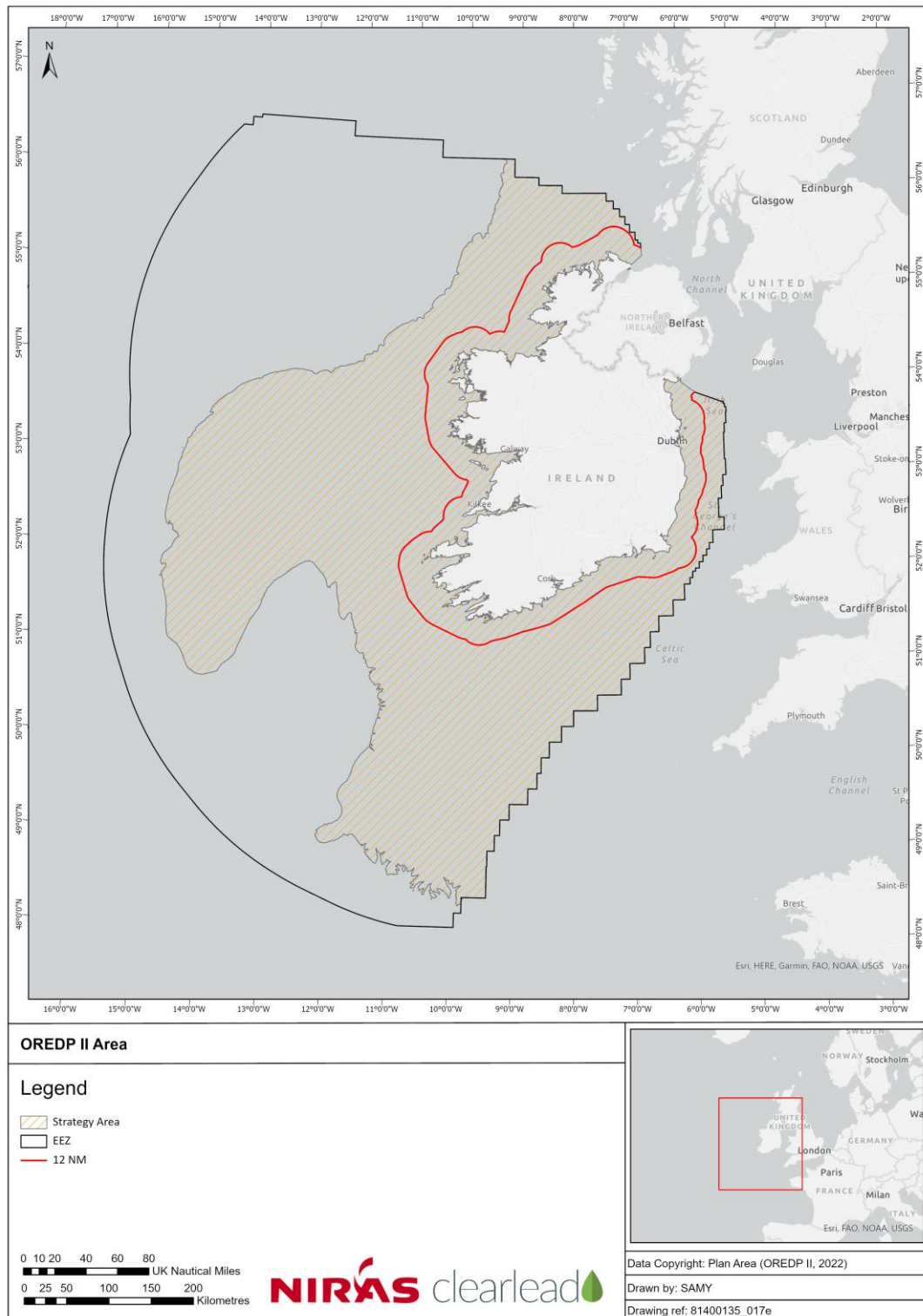


Figure 3 OREDP II Technical Resource Area for Floating Wind

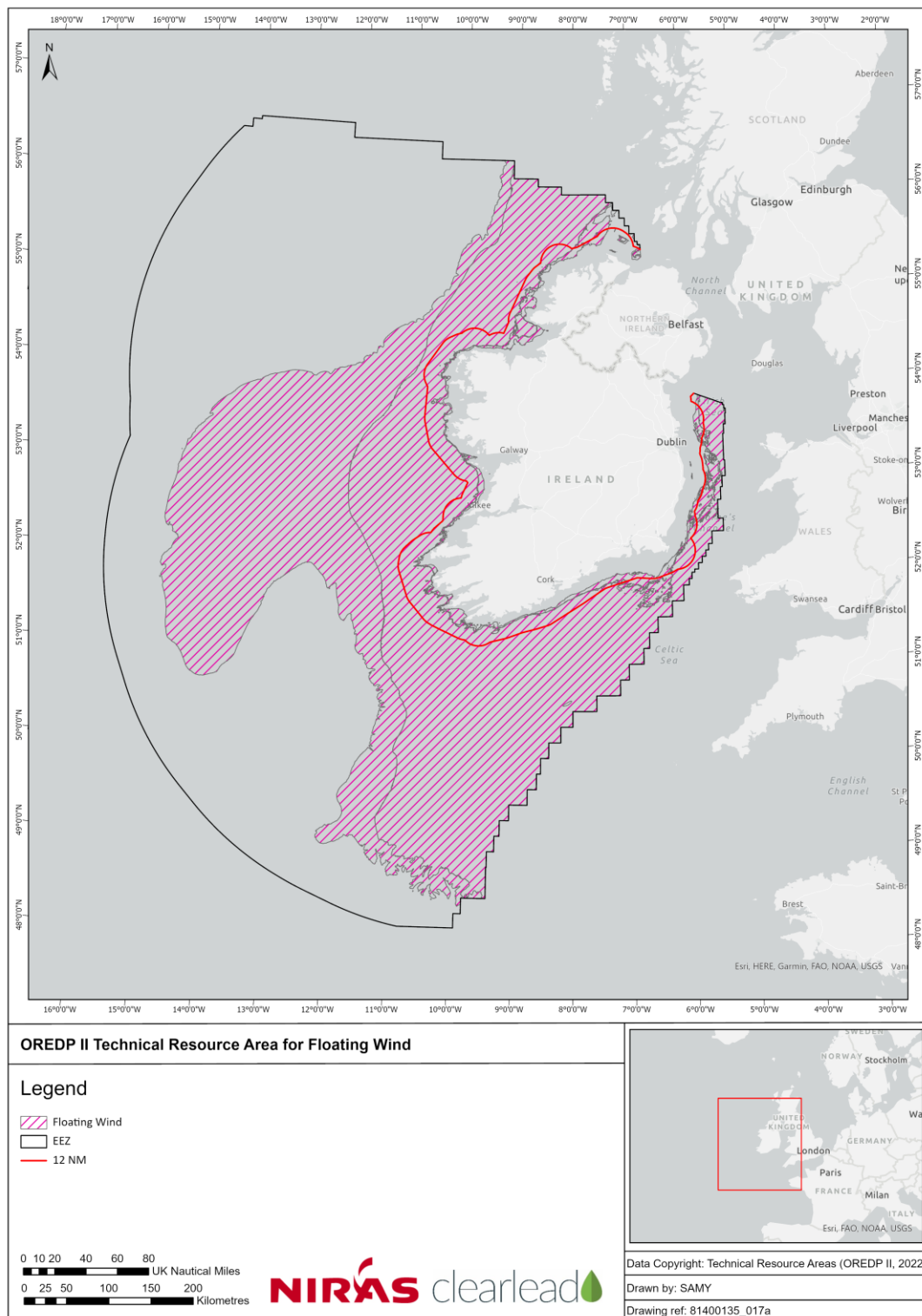


Figure 4 OREDP II Technical Resource Area for Fixed Wind

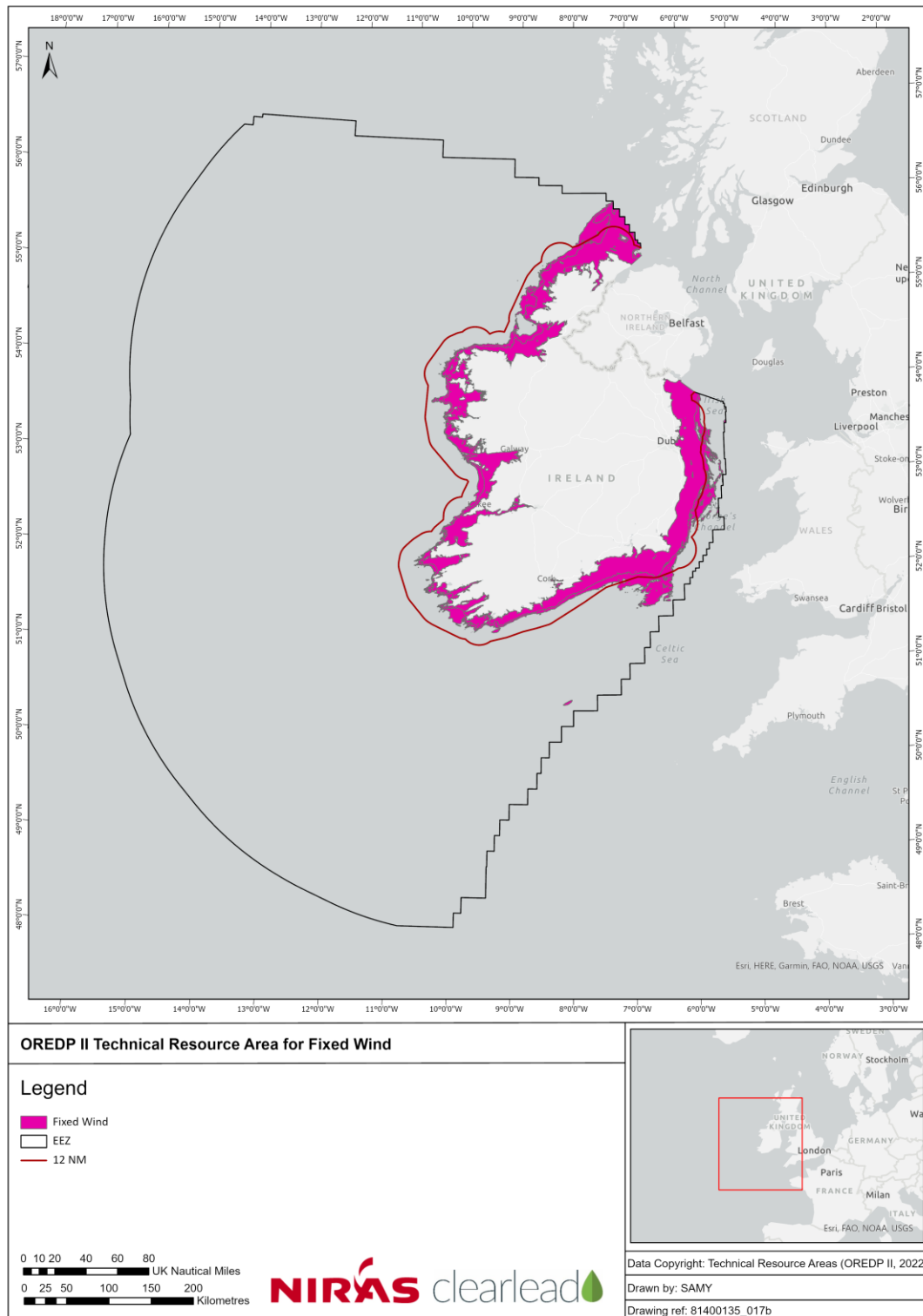


Figure 5 OREDP II Technical Resource Area for Wave

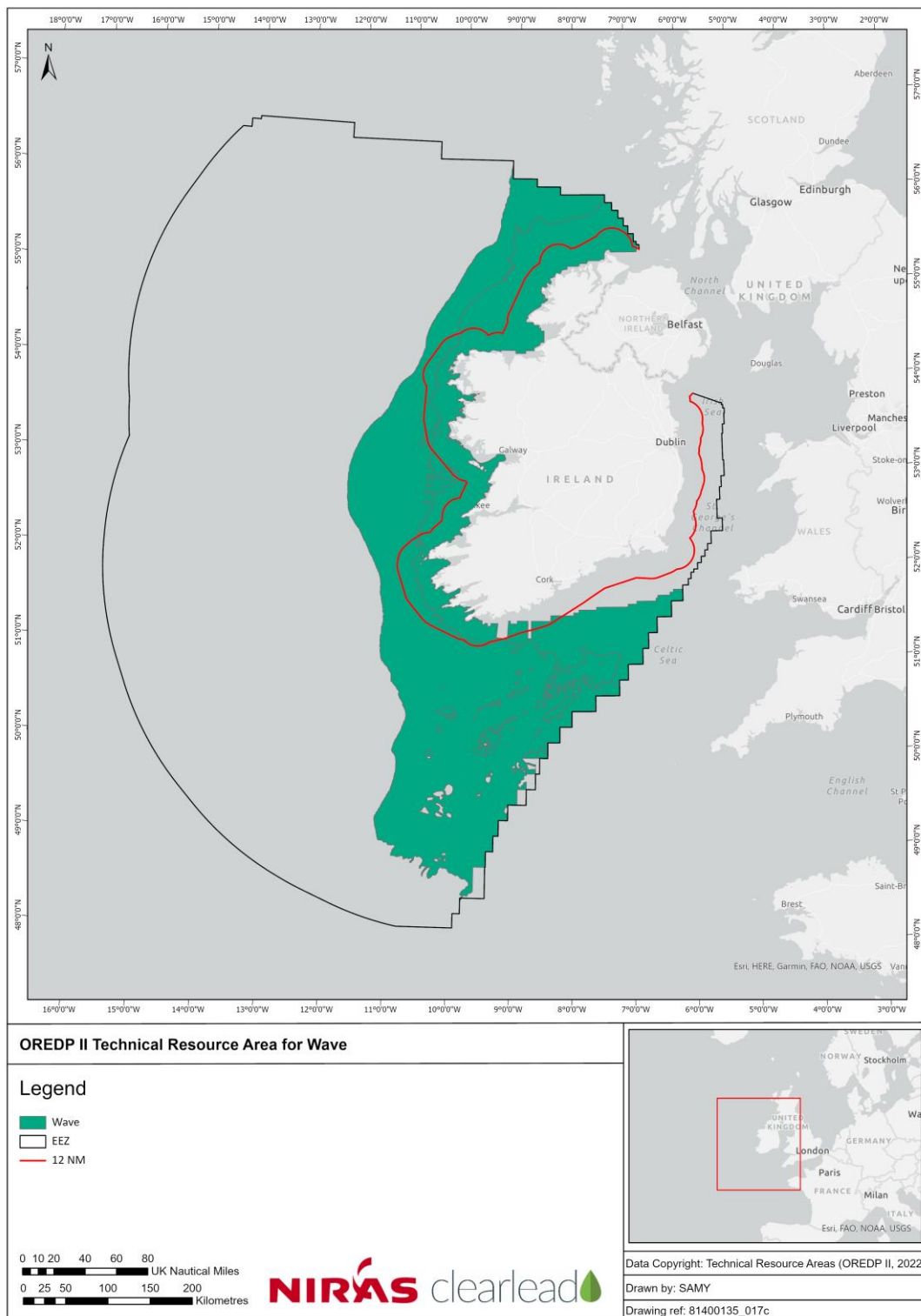
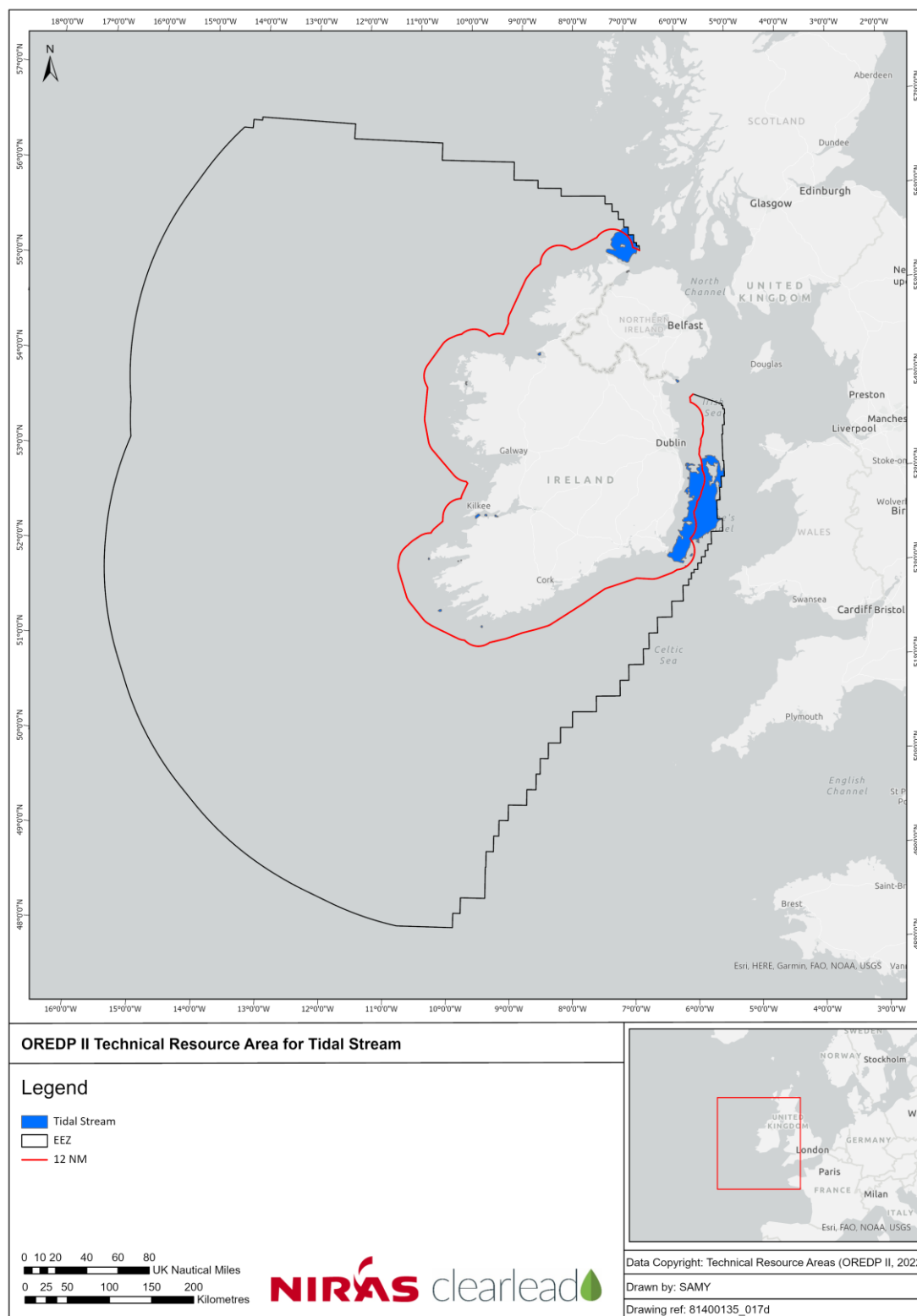


Figure 6 OREDP II Technical Resource Area for Tidal Stream



1.2 The Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) is a method of ensuring environmental considerations are broadly evaluated and integrated into a public plan, programme or modification thereof. The SEA Regulations aim at a high level of protection of the environment, and to integrate the consideration of the environment into the preparation and adoption of plans and programmes and with a view to promoting sustainable development.

The European SEA Directive¹ is transposed into Irish law through the Environmental Assessment of Plans and Programmes Regulations S.I. No. 435 of 2004 (the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004), as amended by S.I. No. 200 of 2011 (the European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011 ('the SEA Regulations')). The SEA Directive aims to achieve environmental protection at a strategic level, and to integrate the consideration of the environment into the preparation and adoption of applicable plans and programmes.

The SEA for OREDP II has been prepared by ClearLead (Offshore Renewable Energy Development Plan II: Strategic Environmental Assessment Report (February 2023)).

1.3 Legislative Background for AA

1.3.1 Birds and Natural Habitats Regulations

Appropriate assessment is a requirement of part 5 of the European Communities (Birds and Natural Habitats) Regulations 2011 S.I. No. 477 of 2011 which regulations give effect to the Habitats Directive 92/43/EEC and the Birds Directive 2009/147/EC (the 'Birds and Habitats Directives').

The 'Habitats and Birds Directives' seek to maintain and, where necessary, restore the favourable conservation status of certain natural habitats and species (qualifying interests or "QIs") throughout the European Union. The most important ecological sites for these QIs are protected as European sites, and comprise Special Areas of Conservation (SAC), candidate Special Areas of Conservation (cSAC), Special Protection Areas (SPA), and proposed Special Protection Areas (pSPA). Collectively these sites are known as European Sites, and together, they form part of the Natura 2000 (N2k) network of comparable sites throughout Member States.

1.3.2 The Appropriate Assessment Process

Under regulation 42(6) of S.I. No. 477 of 2011 (the 'Birds and Natural Habitats Regulations'), the public authority shall determine that an Appropriate Assessment of a plan or project is required where a plan or project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information

following screening under this Regulation that the plan or project, individually or in combination with other plans or projects, will have significant effect on a European site'. In light of any such assessment, the public authority may agree to the plan or project only if it has ascertained that the proposal will not, either on its own or in combination with other plans and projects, adversely affect the integrity of a European Site, unless there is no alternative solution and the plan or project must be carried out for imperative reasons of overriding public interest.

The above requirement promotes a four stage process, as outlined in Figure 7.

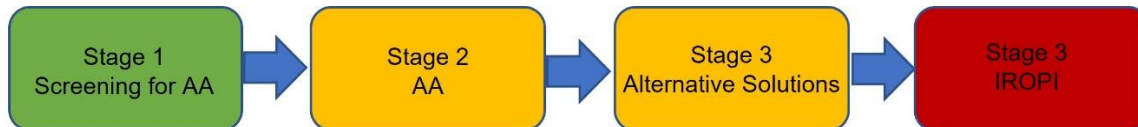


Figure 7: AA four stage process (from Environment, Heritage and Local Government, 2010)

The relevant Public Authority in this case is the Minister for the Environment, Climate and Communications. NIRAS has been contracted to undertake this assessment by the Sustainable Energy Authority of Ireland (SEAI), on behalf of DECC. Plan level guidance on the AA process in Ireland is provided in Environment, Heritage and Local Government (2010)².

1.3.3 Appropriate Assessment Stage 1 Screening

AA Stage 1 was undertaken and reported in NIRAS, 2022a. The draft report was issued for consultation on 31 May 2022, with responses received by close of the consultation period on 1 July 2022 summarised in Section 1.6 (including any updates or amendments to the screening conclusion made following consultation).

1.3.4 Appropriate Assessment Stage 2

This stage considers whether the plan or project, alone or in combination with other projects or plans, will have an adverse effect on the integrity of a N2K site, and includes any mitigation measures necessary to avoid, reduce or offset negative effects. The current report provides the information necessary to complete Stage 2 AA, including confirmation on the sites and QIs assessed (Appendix 1), the parameters for the assessment (Section 2), the approach to the assessment (Section 3), the determination of overall risk of AEOI from the OREDP II alone (Section 4), project level mitigation (if required) to ensure no AEOI results from the OREDP II alone (Section 5), consideration of the OREDP II in-combination with other plans and Projects (Section 6) and conclusions (Section 9).

² https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf

1.3.5 Appropriate Assessment Stage 3

Should the conclusions of the Stage 2 Assessment be negative, i.e. an adverse effect on the integrity of a site(s) cannot be excluded, then the process must progress to Stage 3 or the plan or project should be abandoned. Stage 3 (Figure 7) refers to consideration of all alternatives to avoid impact on the European site(s).

1.4 Climate Change

It is acknowledged that all energy projects result in emissions linked to climate change during construction, operation & maintenance and decommissioning. However, at this stage there is considerable uncertainty associated with the location and extent of potential future projects within the OREDP II which may go on to generate emissions linked to climate change. At a strategic level, it is not possible to undertake a reasonable and meaningful assessment, with this pressure better assessed at the project level. At project level, the assumption is that projects would only progress if they made a significant net positive effect to climate change.

The SEA is clear on climate change, and includes the following commitments:

- **At OREDP II level** - The OREDP II should incorporate and endorse existing regulatory and policy comments to offshore/vessel management air pollution protocols as set out with MARPOL and Ireland's enacting legislation. The OREDP II should set out the mechanism to address the data gap relating to baseline air quality (AQ) conditions in the marine environment; and
- **ORED II commitment for DMAP level** - Update understanding of for possible future gas/carbon storage sites within Irish waters through consultation. Consideration needs to be given to ensuring minimal disturbance to areas which have potential for high carbon sequestration. DMAPs should further consider Ecosystem mapping of sediment potential for carbon sequestration, known areas of carbon management habitats e.g. seagrass. Further consideration should be given to addressing the data gap relating to baseline AQ conditions in the marine environment.

1.5 Engagement and Consultation

Stage 1 Screening (Figure 7) for the OREDP II was undertaken in May 2022, with the approach presented in the Screening Principles Report (NIRAS, 2022b) and the results in the Screening Report (NIRAS, 2022a). These reports were issued for consultation by the SEAI on 31 May 2022 to the following consultees in Ireland:

- Department of the Environment, Climate and Communications;

- Department of Housing, Local Government and Heritage;
- Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media;
- Department of the Housing, Local Government and Heritage;
- Department of Agriculture, Food and the Marine; and
- Environmental Protection Agency.

The following transboundary consultees:

- Historic Environment Scotland;
- Scottish Environment Protection Agency;
- NatureScot;
- SEA Gateway (Scotland);
- Marine Scotland;
- Department of Agriculture, Environment and Rural Affairs (Northern Ireland);
- Cadw (Wales);
- Natural Resources Wales;
- Historic England;
- Natural England;
- Environment Agency (England);
- Marine Management Organisation (England);
- The Crown Estate;
- L'Energie et du Climat (France);
- General Secretariat for European Affairs (France); and
- Ministeres Ecologie Energie Territoires (France).

Irish and transboundary consultees were issued with a reminder on 24 June 2022, with the deadline for all comments being 1 July 2022.

In addition, the consultation was advertised on the SEAI website with a deadline of 1 July 2022 with the following developers responding to that:

- Wind Energy Ireland;
- Simply Blue;
- Codling Wind Park;
- National Offshore Wind Association;
- Mainstream Renewable Power;
- DP Energy Iberdrola; and
- FSTEO/Corio Generation.

A summary of all comments received is provided in Table 1 below, including how the comment has been addressed.

Table 1: Summary of Consultee Responses Received and Amendments made to Screening

Consultee	Date	Comment	Response
Environmental Co-ordination Unit, Climate Change & Bioenergy Policy Division, Department of Agriculture, Food and the Marine	01/07/22	Need to consider commercial sea fishing as a long-standing, pre-existing and traditional activity.	ORED P II in-combination is addressed in Section 6.
		Herring stocks around Ireland are in a poor state of decline.	Noted (herring are not a QI but are potentially a food source for species that are).
		Reference to the “EU Guidance document on Wind Energy developments and EU nature legislation” which references the following impacts on fish and shellfish: Electromagnetic fields, Underwater noise disturbance, Reef effects (European Commission, 2021 ³).	The Principles Report included the following pressures for migratory fish (among others) and therefore covered the points raised: P1 Habitat loss/gain P8 Underwater noise P11 EMF And pressures linked to ‘reef effects’: P15 invasive non-native species P16 entanglement
Historic England	28/06/22	Historic England has a statutory remit with regards archaeology and cultural heritage as found within English planning areas, either terrestrial or marine; as such matters are not included within an Appropriate Assessment we must therefore direct you to our colleagues in the UK Statutory Nature Conservation Bodies, as the primary parties to advise you	Noted. Transboundary consultees contacted noted under Section 1.5.

³<https://op.europa.eu/en/publication-detail/-/publication/2b08de80-5ad4-11eb-b59f-01aa75ed71a1/language-en>

		regarding this consultation exercise.	
Wind Energy Ireland	30/06/22	Conflation of assessment scoping and screening	<p>The term scoping had been included in the screening report on request of NPWS.</p> <p>Please note that the Screening Report itself presents the conclusions of screening, to inform the sites and QIs to take forward to NIS. The approach taken to screening is described in the Principles Report.</p>
		Comments on OREDP II and policy, actions and development areas	<p>Screening was undertaken on the OREDP II as provided and defined by DECC.</p> <p>An overview on the requirement for a NIS for the OREDP II, and potential AA requirements for subsequent updates to the Plan, is provided in Section 1.1.</p>
		Source-pathway-receptor model	<p>The pressures identified in the Principles Report draw on known pressures linked to the construction, operation & maintenance of ORE including consideration of the zone of influence associated with such pressures. The approach to assessment is defined here in Section 3 and includes the criteria 'interaction' to take account of the risk of an interaction to occur between the QI and the pressure.</p> <p>To the extent feasible, consideration has therefore been given to the source-pathway-receptor model.</p>
		In-combination	The approach to in-combination screening is outlined in Section 8.1 of

			the Principles report and concluded here in Section 6.
		Connectivity and pre-cautionary screening	<p>The precautionary nature of screening is noted.</p> <p>Please note that screening is run on the basis of potential connectivity but is also linked to relevant pressure and is screening for likely significant effect, not determination of effect.</p>
		Lesser-horse shoe bat	<p>It is noted and agreed that the species is not considered migratory. The 2.5km range referenced is a foraging range and not a screening range which, has been taken into account here within the NIS.</p> <p>Screening has been conducted on the OREDP II area and not the location of ORE within the timeframe of OREDP II as this is not known at this stage.</p> <p>It is unclear which sites/species the consultee considered to be missed as these are not referenced. Clarity was sought by SEAI by email on 04.08.22 but no response received.</p> <p>As a precaution, sites screened in were re-visited. Updates to screening are summarised in Section 1.6.</p>
		Potential development across most of Irelands EEZ	The scale of the resource potential areas is noted however screening has to be conducted across the entire OREDP II area(s), with further information on the document and future iterations in Section 1.1.
		Revision to national spatial strategy level AA	This Strategic level AA is intended to present at national spatial strategy level for OREDP II, with the need for

			project level AA to be determined by individual projects. Potential for future OREDP II iterations is noted in Section 1.1.
Northern Ireland Environment Agency	27/06/22	DAERA agrees with the responsible authority and the conclusions of the Appropriate Assessment Screening Report that the OREDP II is likely to have significant environmental effects on the qualifying features of European Sites and therefore an Appropriate Assessment and Natura Impact Statement will be carried out.	Noted.
Natural Resources Wales	26/05/22 (received with screening report comment 06/07/22)	NRW's position is that marine mammal sites that are within the same marine mammal management unit (MMMU) as the location of any activity should be scoped into assessment.	Noted. The approach to screening of marine mammal sites is defined in Section 7.3 of the Principles Report. The approach has screened in the SACs wholly within Welsh waters where a marine mammal is a feature.
		For birds we would expect scoping to be based on foraging distance set out in Woodward et al. (2019) for the summer months and the BDMPS approach set out by Natural England for seabirds outside the breeding season. The commercially available MigroPath and BTO's SOSSMAT tools are useful for examining migratory populations from estuaries and Special Protection Areas.	The approach taken for screening of birds is defined in Section 7.6 of the Principles Report. This includes the application of foraging ranges as defined by Woodward et al. (2019) in the breeding season. For non-breeding screening, this typically references such as Furness (2015) but this information is not available in Irish waters and therefore a qualitative approach was applied using available broad scale density information. For non-breeding seabirds and waterbirds in the non-breeding season, screening was based on potential connectivity and for migratory birds consideration of

			<p>migratory paths. The approach taken in the NIS is presented in Section 3.</p> <p>It is to be expected that at project level the approach taken will relate to that project at that time. In particular the level of detail (in relation to the project location, nature, scale and extent).</p>
		Inclusion of twaite shad	Screening for twaite shad follows the approach defined in Section 7.5 of the Principles Report and includes a number of sites in Welsh waters.
Natural Resources Wales	06/07/22	Atlantic salmon should be recorded as a feature of Afon Eden – Cors Goch Trawsfynydd SAC.	Noted and screening updated to include Atlantic salmon.
		Allis shad should be recorded as a feature of Pembrokeshire Marine SAC	Noted and screening updated to include allis shad.
		It is assumed that other sites in Wales (e.g. Dee Estuary SAC, Carmarthen Bay and Estuaries SAC etc) have been screened out because they are beyond the 100km range.	That is correct.
		Screening for harbour porpoise for wave energy	The approach to screening harbour porpoise sites is defined in the Principles Report, Section 7.3. The OREDP II area for wave ORE is depicted within Figure 5 of the current report. Screening did not identify any harbour porpoise sites in Welsh waters in relation to the designated wave energy area (noting that North Anglesey Marine SAC and West Wales Marine SAC are screened in for other ORE).

		The screening approach should be based on the methods highlighted in our comments on the SEA scoping report, including the use of the MigroPath or BTO's SOSSMAT tools.	The approach to screening is defined in the Principles Report and the approach to assessment presented here in Section 3.
		The application of foraging distances in Woodward et al., 2019, should use mean maximum distance + 1 SD to ensure the appropriate approach to screening for sea and migratory birds.	Table 7 identifies the criteria applied for QI interaction, with both mean and mean-maximum foraging ranges applied (with a varying level of potential interaction applied in each case).
		For breeding birds in the non-breeding season, Furness et al., 2015 is applicable to the Irish Sea and can be applied to the screening in this assessment. The principles report indicates that features and sites subject to negligibly low risk will be screened out (Section 7.6.2). This might require significant analysis, including reference to the conservation objectives and feature condition and this might be better undertaken as part of the appropriate assessment.	Breeding birds in the non-breeding season are included in the national strategy level assessment as defined in the Principles Report (Section 7.6.2) and here in Section 3.
		Estuarine sites for waders and wildfowl should be assessed for LSE, including the Dee Estuary, Severn Estuary, Burry Inlet, Treath Lafan Sands and the Dyfi SPAs, as should the assemblage feature of Skomer and Skokholm SPA.	The approach to screening is laid out in the Principles Report, with waders and wildfowl included here for assessment in line with that approach.
Department of Housing, Local Government and Heritage	01/07/22	The Department of Housing, Local Government and Heritage concurs with the conclusion of the Stage 1	Noted.

		assessment or Natura Impact Statement Screening.	
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1.6 Update to Screening Post Consultation

This NIS draws on the screening conclusions as presented in the Screening Report, with a number of updates. Specifically, the following has resulted in additions to the list of sites and QIs identified in NIRAS (2022a):

Comments on the draft screening report (see

- Table 1);
- Additional QIs identified during the assessment process (noting that screening used the excel spreadsheets downloaded from the NPWS website⁴) specifically during the review of QI condition per designated site⁵ where additional QIs were included for some sites (and therefore included here for completeness); and
- Migratory birds included at screening (to confirm inclusion of those associated Special Protection Areas (SPAs)) have now been expanded to show individual sites and species.

The principles applied to the inclusion of additional QIs followed that defined in the Principles Report (NIRAS, 2022b), with the updated conclusions of AA Stage 1 provided here in Appendix 1 as a final list of protected sites and QIs where potential for Likely Significant Effect (LSE) has been identified (or cannot be excluded). This includes QIs protected within over 200 Special Areas of Conservation (SACs) and over 200 SPAs. As a result, OREDP II has progressed to AA Stage 2, with the current report (the NIS) providing the information required for the Stage 2 Appropriate Assessment.

⁴<http://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba>,
https://www.npws.ie/sites/default/files/general/SPA_Datasheets_March_2022.zip and
https://www.npws.ie/sites/default/files/general/SAC_Datasheets_March_2022.zip

⁵ <https://www.npws.ie/protected-sites>

2 Parameters for the Assessment

The OREDP II includes the following types of ORE:

- Fixed bottom wind;
- Floating wind;
- Wave; and
- Tidal stream.

There are separate technical resource area(s) for each (Figure 3 to Figure 6), which collectively make up OREDP II (Figure 2). The assessment is made based on deployment of the technology itself (termed 'array') and not on cable corridors to shore (or the associated landfall and onward onshore works) with the latter excluded from the Plan. The assumption is that an array could be located anywhere within OREDP II (limited only by resource and water depth, noting the potential for future iterations in Section 1.1). An overview of the parameters to inform the assessment is provided below.

- OREDP II is limited landwards by the 10m depth contour (i.e. water depths shallower than 10m landwards are excluded from the Plan);
- Foundations – any foundation feasible for the ORE;
- Fixed and floating wind - three bladed horizontal axis turbines; and
- Covers the period post Phase 1 and Phase 2 (with these included within OREDP I).

It is clear from the geographic extent of OREDP II (Figure 2) and the flexibility in the parameters above that defining discrete areas for development or the quantification of potential effects is not feasible. To enable a reasonable and meaningful assessment, a risk based approach has been adopted, combined with a mitigation hierarchy, to demonstrate that OREDP II can be delivered with no adverse effect resulting and therefore no requirement to progress beyond Stage 2 AA. This approach is defined in Section 3. The results have enabled a determination to be made on risk of AEOI for each of the individual sites and QIs screened in. The results have also enabled additional outputs to be generated, that indicate relative adverse effect risk across OREDP II's extents (Section 8), with the purpose of informing the subsequent DMAP process.

3 NIS Methodology

The assessment of the OREDP II alone (before consideration of possible in-combination effects, see below and Section 6) has been undertaken for OREDP II as a whole (Figure 2), ensuring that the worst case is considered throughout. The assessment takes into account the spatial extent of OREDP II, the sensitivity of QIs to the pressures associated with the relevant ORE, the risk of

interactions between OREDP II and the QIs, and available information on the condition of the QIs at site and National level.

The methodologies and approach in all cases follow the key assessment principles laid out in the Principles Report (NIRAS, 2022b), fundamental to which is the commitment to undertake a reasonable and meaningful assessment where possible. This is an important consideration as it allows DECC to determine where the assessments can be concluded at OREDP II national strategy level, or where a meaningful assessment could only be undertaken at the project level. The latter can only occur in circumstances where it is considered that a LSE on a protected site is sensitive to information on the nature, scale, location or other parameter of a project that is not yet known or cannot reasonably be assumed. In such cases, a determination on whether a project level Appropriate Assessment would be required by law is needed, whereby sufficient project level detail would be required with sufficient flexibility to avoid an adverse effect.

The judgement on whether a reasonable and meaningful assessment can be made has also been used to determine the requirement for, and nature of, any mitigation. Mitigation solutions are explored further in Section 5.

In addition to the assessment for the OREDP II alone, there is also a requirement to consider the strategic document in-combination with relevant plans and projects, as presented in Section 6.

The final conclusions on the risk of an adverse effect on integrity on any of the sites and QIs screened in, alone and in-combination, are presented in Section 9. The conclusions have been reached based on a comprehensive review of the assessment, the mitigation solutions proposed and expert judgment made by the experienced assessment team.

It should be noted that the detail available for subsequent projects under OREDP II (in terms of project description, environmental conditions and protected site connectivity) will be greater than is currently available for OREDP II assessment. Project level assessment is expected to be required to confirm the relevant LSEs and it is expected that there will remain sufficient flexibility at project level to avoid AEOL. It should further be noted that where AEOL risk at Plan level is deemed to be less than 1 it does not automatically follow that a conclusion of no LSE will be drawn at project level, and full assessment will be required.

3.1 Assessment Approach Applied to the OREDP II Alone

The Phase 1 projects, which are primarily located off the east coast of Ireland, and Phase 2 projects, both predate OREDP II and fall within the remit of the original OREDP (Department of Communications, Energy and Natural Resources, 2014). The location, scale and extent of potential projects that may be as part of the enduring plan-led regime, and therefore under OREDP II, have not yet been defined in terms of scale, location, extent and technology beyond OREDP II's extents (Figure 2). Therefore, the assessment made here has assumed that a project

could be installed anywhere within the Plan, which itself includes the majority of the Irish marine area.

As a result of the large area for potential development and the lack of parameters to enable a quantified assessment to be carried out, this assessment has adopted a risk based approach. This is based on a method developed by NIRAS for The Crown Estate (England & Wales) and their Round 4 Offshore Wind Habitats Regulations Assessment (HRA) 'Export Cable Region Assessment' or 'ECRA') (NIRAS, 2022) and as revised for the Celtic Sea Floating Wind spatial planning. The approach is based on identifying the overall risk of an AEOI across broad areas where there is limited knowledge of the likely location and timing of future development activities under the Plan.

This risk-based approach is conservative (precautionary) and takes into consideration both the vulnerability of Qualifying Interests (QI) ("QI Vulnerability") and the vulnerability of the Protected Sites ("Protected Site Vulnerability") to the potential impacts arising from the installation, operation and future decommissioning of ORE. In this way an understanding of the risk of an AEOI resulting is developed. This is useful at the national strategy level, as indicative forecasts of risk can be used to identify where interventions are likely to be required at the project level. However, the assessment steps described below do not replace the information requirements of project level NIS (and AA) and also do not attempt to pre-empt their conclusions. This is particularly important to bear in mind where this national strategy level assessment makes use of broad data sets as a substitute for the more detailed information requirements ordinarily required for project level assessment.

The OREDP II national strategy level risk based approach to assessment has been adopted here with slight changes to that applied by NIRAS (2022c) to reflect both the inherent differences between an array based assessment (as required for the current document) and a cable corridor (including landfall) based assessment (as undertaken on Round 4 for the ECRA), but in particular to take account of the specific characteristics of protected site and QIs in Ireland.

The approach taken in the assessment of potential for adverse effects for OREDP II alone can be summarised by the following steps:

- Confirmation on the protected site(s) and QIs screened in for potential LSE ((Appendix 1), noting that the relevant pressures per receptor group are as provided in the Principles Report (NIRAS, 2022b);
- QI vulnerability determined on the basis of sensitivity risk (Section 3.2) to the ORE and the potential (likelihood) of interaction with the document (Section 3.3);
- Site vulnerability (Section 3.4) determined on the basis of QI condition at site level and national level;
- Combined QI and Site vulnerability score to determine risk of an AEOI from OREDP II alone (Section 4); and

- The appropriate level of mitigation relative to overall risk score (Section 5).

The consideration of in-combination is made separately in Section 6.

3.2 How QI Sensitivity Risk has been determined

For all QIs, a sensitivity risk score has been assigned for each QI relative to each pressure screened into the assessment (pressures relevant to each receptor are identified in The Principles Report (NIRAS, 2022b)). The sensitivity risk score is a professional judgment supported as far as possible by scientific evidence. The score takes account of known QI sensitivity to each pressure, in the context of risk represented by renewable energy developments. For example, with respect to Pressure 1 (habitat loss/gain) the sensitivity risk would be clear, because habitat loss/gain is a clear and direct change known to potentially result from ORE developments, whereas Pressure 10 (toxic contaminants) is more nuanced and is low risk with respect to ORE developments; although a QI may be highly sensitive to certain toxic contaminants, in the context of renewable energy developments the risk sensitivity overall would be lower (because the potential for toxic contamination resulting from a renewable energy development is low) and it would be disproportionate to apply a high sensitivity risk as a blanket approach. Where sensitivity risk is assigned, clarity is provided on such judgments. For the sensitivity risk score, a value of low, medium or high has been applied.

The approach taken for specific QI groups is detailed in the following sections.

3.2.1 Sensitivity Risk for Birds

For the bird QIs of SPAs, the sensitivity risk score draws on sensitivity scores assigned in published literature (specifically in King et al. (2009), Webb et al. (2016), Furness et al. (2012), Wright et al. (2012), Wade et al. (2016), Williams et al. (1995) and Cutts et al. (2014)). The values have allowed a sensitivity risk to be assigned to the named species, based on published information and with respect to the defined pressure in the context of renewable energy development. That information is summarised for SPA birds in Table 2 below. It should be noted that screening for bird QIs has divided birds into four separate groups, with not all screened in for all pressures (the sensitivity risk score applied per species in Appendix 1 is the maximum score to any of the relevant pressures to ensure the assessment remains precautionary):

- Breeding birds in the breeding season;
- Breeding birds in the non breeding season;
- Non breeding birds (non breeding season); and
- Migratory seabirds and migratory waterbirds.

The relevant sensitivity risk is then applied to the individual bird species screened in as a high, medium or low value, as presented in Appendix 1.

Table 2: Pressure and Risk for SPA QIs

Pressure	Fixed wind?	Floating wind?	Wave ?	Tidal stream?	Bird groups screened in	Reference Used	Description	Sensitivity Risk Allocation
P1 Habitat loss/gain	Yes	Yes	Yes	Yes	Excluding migratory seabirds and migratory waterbirds	Wade et al. (2016)	Provides vulnerability scores for seabird species to marine renewable energy developments on a score from 1 (high habitat flexibility) to 4 (low habitat flexibility)	High flexibility (1) = LOW Moderate flexibility (2-3) = MEDIUM Low flexibility (4) = HIGH
P2 Direct physical damage	Yes	Yes	Yes	Yes	Excluding migratory seabirds and migratory waterbirds	Wade et al. (2016)	Provides vulnerability scores for seabird species to marine renewable energy developments on a score from 1 (high habitat flexibility) to 4 (low habitat flexibility)	High flexibility (1) = LOW Moderate flexibility (2-3) = MEDIUM Low flexibility (4) = HIGH
P3 Indirect physical damage	Yes	Yes	Yes	Yes	Excluding migratory seabirds and migratory waterbirds	Wade et al. (2016)	Provides vulnerability scores for seabird species to marine renewable energy developments on a score from 1 (high habitat flexibility) to 4 (low habitat flexibility)	High flexibility (1) = LOW Moderate flexibility (2-3) = MEDIUM Low flexibility (4) = HIGH

Pressure	Fixed wind?	Floating wind?	Wave ?	Tidal stream?	Bird groups screened in	Reference Used	Description	Sensitivity Risk Allocation
P4 Collision (in water)	No	No	Yes	Yes	Excluding migratory seabirds and migratory waterbirds	Wade et al. (2016)	Provides vulnerability scores for seabird species to marine renewable energy developments. Benthic foraging scores used ranging from 1 (limited benthic foraging) to 5 (all benthic foraging)	1 = LOW 2-4 = MEDIUM 5 = HIGH
P5 Collision (in air)	Yes	Yes	No	No	All birds	Wade et al. (2016)	Provides vulnerability scores for Scottish seabird species to marine renewable energy developments. Vulnerability to collision used	0 = LOW 1 – 249 = MEDIUM ≥ 250 = HIGH
						Wright et al. (2012)	Potential Collision Height (PCH) values where <10% is low, 10-49% is medium and ≥50% is high	<10% = LOW 10-49% = MEDIUM ≥50% = HIGH
P7 Physical presence	Yes	Yes	Yes	Yes	Excluding migratory seabirds and migratory waterbirds	Wade et al. (2016)	Provides vulnerability scores for Scottish seabird species to marine renewable energy developments. “Displacement: structures” scores of 1 (Low	Low vulnerability (1) = LOW Moderate vulnerability (2-4) = MEDIUM Very high vulnerability = HIGH

Pressure	Fixed wind?	Floating wind?	Wave ?	Tidal stream?	Bird groups screened in	Reference Used	Description	Sensitivity Risk Allocation
							vulnerability) to 5 (High vulnerability) used	
						Cutts et al. (2014)	The Waterbird Disturbance Toolkit has been designed to provide a process whereby the level of potential disturbance to waterbirds from a range of construction activities on or adjacent to wetland systems can be assessed (as high, medium and low)	Low Medium High
P8 Underwater noise	Yes	Yes	Yes	Yes	Excluding migratory seabirds and migratory waterbirds	Wade et al. (2016)	Provides vulnerability scores for Scottish seabird species to marine renewable energy developments on a score from 1 (low vulnerability to displacement from vessels and helicopters) to 5 (high vulnerability to displacement from vessels and helicopters)	Low vulnerability (1) = LOW Moderate vulnerability (2-4) = MEDIUM High vulnerability (5) = HIGH
P9 Above water noise	Yes	Yes	Yes	Yes	Excluding migratory	Wade et al. (2016)	Provides vulnerability scores for Scottish seabird species	Low vulnerability (1) = LOW

Pressure	Fixed wind?	Floating wind?	Wave ?	Tidal stream?	Bird groups screened in	Reference Used	Description	Sensitivity Risk Allocation
					seabirds and migratory waterbirds		to marine renewable energy developments on a score from 1 (low vulnerability to displacement from vessels and helicopters) to 5 (high vulnerability to displacement from vessels and helicopters)	Moderate vulnerability (2-4) = MEDIUM High vulnerability (5) = HIGH
						Cutts et al. (2014)	The Waterbird Disturbance Toolkit has been designed to provide a process whereby the level of potential disturbance to waterbirds from a range of construction activities on or adjacent to wetland systems can be assessed (as high, medium and low)	LOW MEDIUM HIGH
P10 Toxic contaminants	Yes	Yes	Yes	Yes	Excluding migratory seabirds and migratory waterbirds	Webb et al., (2016)	Provides a method for assessing seabird vulnerability to oil pollution, with species ranked according to overall vulnerability	≤ 0.249 = LOW $0.250 - 0.749$ = MEDIUM ≥ 0.750 = HIGH

Pressure	Fixed wind?	Floating wind?	Wave ?	Tidal stream?	Bird groups screened in	Reference Used	Description	Sensitivity Risk Allocation
P11 Electromagnetic fields	Yes	Yes	Yes	Yes	Not screened in for birds due to no impact pathway			
P12 Light	Yes	Yes	Yes	Yes	Excluding migratory seabirds and migratory waterbirds	Wade et al. (2016)	Flight at night 1 = hardly any flight at night 5 = much flight activity at night	1 = LOW 2-4 = MEDIUM 5 = HIGH
						King et al. (2009)	Nocturnal flight activity 1 = hardly any flight at night 5 = much flight activity at night	1 = LOW 2-4 = MEDIUM 5 = HIGH
P13 Temperature	Yes	Yes	Yes	Yes	Not screened in for birds due to no impact pathway			
P14 Suspended sediments	Yes	Yes	Yes	Yes	Excluding migratory seabirds and migratory waterbirds	Wade et al. (2016)	Provides vulnerability scores for Scottish seabird species to marine renewable energy developments on a score from 1 (high habitat flexibility) to 4 (low habitat flexibility)	High flexibility (1) = LOW Moderate flexibility (2-3) = MEDIUM Low flexibility (4) = HIGH

Pressure	Fixed wind?	Floating wind?	Wave ?	Tidal stream?	Bird groups screened in	Reference Used	Description	Sensitivity Risk Allocation
P15 Invasive non-native species	Yes	Yes	Yes	Yes	Not screened in for birds due to no impact pathway			
P16 Entanglement	No	No	Yes	Yes	Excluding migratory seabirds and migratory waterbirds	Furness et al. (2012)	Provides sensitivity scores for various impacts associated with tidal and wave energy devices. Scores for drowning risk used (1 = extremely low risk, 4 = moderate risk)	1-2 = LOW 3-4 = MODERATE

3.2.2 Annex I Habitat Sensitivity Risk

Annex I habitats screened in include both intertidal and subtidal habitats, with sensitivity risk considered separately in each case. All the Annex I habitats screened in are summarised in Table 3. N/A is assigned to the sensitivity risk where the pressure is not relevant to the QI as a result of a clear lack of pathway for the pressure and habitat including where screened out (noting NIRAS 2022a considered habitats as a group and not individual Annex I habitats; when considered as individual habitats it is inevitable that differences in sensitivity will be apparent). The determination of sensitivity risk has considered a number of points, specifically:

- Is the habitat restricted to intertidal or above high water areas? If yes, the habitat will not have a high risk sensitivity to the pressures associated with ORE arrays, especially for transitional habitats found above high water (noting that OREDP II excludes consideration of cable corridors to shore including landfall);
- Is the habitat at protected site and national strategy scale sensitive to the pressure (as opposed to small scale and localised change);
- How sensitive is the specific Annex I habitat to the type of pressure associated with ORE arrays (noting that cable corridors including landfall pressures are excluded from assessment); and
- A value of 'N/A' where the pressure would not be expected to manifest at national strategy level with respect to the QI (for example because the QI occurs above high water and the pressure applies solely below low water).

Sensitivity risk for each of the pressures is defined as Low (L), Medium (M) or High (H) (or 'N/A'). The maximum sensitivity risk for each QI was taken forward for inclusion in the assessment process.

Table 3: Annex I Habitats Screened In and the Sensitivity Risk Assigned

Habitat	All ORE?	P1 Physical loss/ gain	P2 Direct physical damage	P3 Indirect physical damage/ habitat	P10 Toxic contamination	P11 Electromagnetic field	P13 Temperature	P14 Suspended sediment	P15 Invasive non-native species	Maximum Sensitivity for Assessment
Sandbanks which are slightly covered by sea water all the time (1110)	Yes	H	M	M	L	L	L	L	M	H
	QI has no resistance or resilience to direct habitat loss (P1), although recovery from direct habitat damage (P2) would be expected (rapidly for mobile banks, more slowly where hydrodynamic processes are less active). Potential for some damage/habitat change from indirect effects (P3). Experience elsewhere indicates relatively lower sensitivity of QI to ORE for other pressures (e.g. BEIS, 2020) but some uncertainty around P15 (invasive non-native species) results in a precautionary assessment of M for this pressure.									
Estuaries (1130)	Yes	M	M	L	L	N/A	N/A	L	L	M
	Conservatively, as a large scale QI, estuaries are assumed to have moderate sensitivity to direct impacts (P1 and P2) should there be co-location with ORE projects (noting that tidal range is not included here). Other pressures are considered to represent relatively low sensitivity risk for the QI at this scale.									
Mudflats and sandflats not covered by seawater at low tide (1140)	Yes	N/A	N/A	L	L	N/A	N/A	L	L	L
	No potential for direct effects to occur given the wholly intertidal location of the QI and wholly subtidal location of the OREDP II (as noted in Section 2, OREDP II is defined at its landward extent by the 10m contour). Low indirect risk only and excluding pressures that are limited to a few m range.									
Coastal lagoons (1150)	Yes	N/A	N/A	L	L	N/A	N/A	L	L	L

Habitat	All ORE?	P1 Physical loss/gain	P2 Direct physical damage	P3 Indirect physical damage/habitat	P10 Toxic contamination	P11 Electromagnetic field	P13 Temperature	P14 Suspended sediment	P15 Invasive non-native species	Maximum Sensitivity for Assessment
	No potential for direct effects to occur given the wholly intertidal/ transitional location of the QI and wholly subtidal location of OREDP II (as noted in Section 2, OREDP II is defined at its landward extent by the 10m contour). Low indirect risk only and excluding pressures that are limited to a few m range.									
Large shallow inlets and bays (1160)	Yes	M	M	L	L	N/A	N/A	L	L	M
	Conservatively, as a large scale QI, large shallow inlets and bays are assumed to have moderate sensitivity to direct impacts (P1 and P2) should there be co-location with ORE projects. Other pressures are considered to represent relatively low sensitivity risk for the QI at this scale.									
Reefs (1170)	Yes	H	H	M	M	L	L	M	M	H
	QI has no resistance or resilience to direct habitat loss (P1) and this is limited for direct damage (P2). Potential for some damage/habitat change from indirect effects (P3). Experience elsewhere indicates potential moderate sensitivity risk for suspended sediments (P13) and toxic contaminants (P10) and relatively lower sensitivity of QI to ORE for other pressures (e.g. BEIS, 2020). Uncertainty around P15 (invasive non-native species) results in a precautionary assessment of M for this pressure.									
Submarine structures made by leaking gases (1180)	Yes	H	H	M	L	L	L	L	L	H
	Potential for co-location of ORE and QI. QI has no resistance or resilience to direct habitat loss (P1), and potentially very limited ability to recover from direct habitat damage (P2).									
Annual vegetation of drift lines (1210)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L

Habitat	All ORE?	P1 Physical loss/ gain	P2 Direct physical damage	P3 Indirect physical damage/ habitat	P10 Toxic contamination	P11 Electromagnetic field	P13 Temperature	P14 Suspended sediment	P15 Invasive non-native species	Maximum Sensitivity for Assessment
	QI present above or around high water so only remote/indirect effects possible.									
Perennial vegetation of stony banks (1220)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L
	QI present above or around high water so only remote/indirect effects possible.									
Vegetated sea cliffs of the Atlantic and Baltic coasts (1230)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L
	QI present above or around high water so only remote/indirect effects possible.									
<i>Salicornia</i> and other annuals colonizing mud and sand (1310)	Yes	N/A	N/A	L	L	N/A	N/A	L	L	L
	No potential for direct effects to occur given the wholly intertidal/ transitional location of the QI and wholly subtidal location of OREDP II (as noted in Section 2, OREDP II is defined at its landward extent by the 10m contour). Low indirect risk only and excluding pressures that are limited to a few m range.									
Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) (1330)	Yes	N/A	N/A	L	L	N/A	N/A	L	L	L
	No potential for direct effects to occur given the wholly intertidal/ transitional location of the QI and wholly subtidal location of OREDP II (as noted in Section 2 OREDP II is defined at its landward extent by the 10m contour). Low indirect risk only and excluding pressures that are limited to a few m range.									
	Yes	N/A	N/A	L	L	N/A	N/A	L	L	L

Habitat	All ORE?	P1 Physical loss/gain	P2 Direct physical damage	P3 Indirect physical damage/ habitat	P10 Toxic contamination	P11 Electromagnetic field	P13 Temperature	P14 Suspended sediment	P15 Invasive non-native species	Maximum Sensitivity for Assessment
Mediterranean salt meadows (<i>Juncetalia maritimi</i>) (1410)	No potential for direct effects to occur given the wholly intertidal/ transitional location of the QI and wholly subtidal location of OREDP II (as noted in Section 2 OREDP II is defined at its landward extent by the 10m contour). Low indirect risk only and excluding pressures that are limited to a few m range.									
Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>) (1420)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L
	No potential for direct effects to occur given the wholly intertidal/ transitional location of the QI and wholly subtidal location of OREDP II (as noted in Section 2 OREDP II is defined at its landward extent by the 10m contour). Low indirect risk only and excluding pressures that are limited to a few m range.									
Embryonic shifting dunes (2110)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L
	QI present above or around high water so only remote/indirect effects possible.									
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ("white dunes") (2120)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L
	QI present above or around high water so only remote/indirect effects possible.									
Fixed coastal dunes with herbaceous vegetation ("grey dunes") (2130)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L
	QI present above or around high water so only remote/indirect effects possible.									
	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L

Habitat	All ORE?	P1 Physical loss/gain	P2 Direct physical damage	P3 Indirect physical damage/habitat	P10 Toxic contamination	P11 Electromagnetic field	P13 Temperature	P14 Suspended sediment	P15 Invasive non-native species	Maximum Sensitivity for Assessment
Decalcified fixed dunes with <i>Empetrum nigrum</i> (2140)	QI present above or around high water so only remote/indirect effects possible.									
Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>) (2150)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L
	QI present above or around high water so only remote/indirect effects possible.									
Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) (2170)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L
	QI present above or around high water so only remote/indirect effects possible.									
Humid dune slacks (2190)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L
	QI present above or around high water so only remote/indirect effects possible.									
Submerged or partially submerged sea caves (8330)	Yes	N/A	N/A	L	L	N/A	N/A	L	L	L
	No potential for direct overlap given the locations and nature of the QI. Low indirect risk only.									
Machairs (21A0)	Yes	N/A	N/A	L	L	N/A	N/A	N/A	N/A	L
	QI present above or around high water so only remote/indirect effects possible.									

3.2.3 Annex II Marine Mammal Sensitivity Risk

Marine mammals screened in are harbour seal (*Phoca vitulina*), grey seal (*Halichoerus grypus*), harbour porpoise (*Phocoena phocoena*) and bottlenose dolphin (*Tursiops truncatus*). The risk sensitivity assigned to each species for each of the pressures identified is given as a High (H), Medium (M) or Low (L) value in Table 4, with N/A where the pressure is not relevant to the QI as a result of a clear lack of pathway for the pressure and species (noting NIRAS 2022a considered marine mammals as a group and not individual species). The maximum value of sensitivity risk per QI is taken forward for inclusion in the assessment process. The risk sensitivity scores applied draw on the extensive experience held within the UK offshore wind industry (e.g. recent projects such as Awel y Mor in Wales⁶, Neart na Gaoithe in Scotland⁷ and Hornsea Four in England⁸), workshop outputs e.g.⁹ projects at EMEC¹⁰ and scientific research e.g. that undertaken by SMRU¹¹.

⁶ <https://infrastructure.planninginspectorate.gov.uk/projects/wales/awel-y-mor-offshore-wind-farm/>

⁷ <https://nngoffshorewind.com/resources/>

⁸ <https://infrastructure.planninginspectorate.gov.uk/projects/yorkshire-and-the-humber/hornsea-project-four-offshore-wind-farm/>

⁹ <https://abdn.pure.elsevier.com/en/publications/assessing-the-risks-to-marine-mammal-populations-from-renewable-e>

¹⁰ <https://www.emec.org.uk/projects/>

¹¹ <http://www.smru.st-andrews.ac.uk/research-policy/>

Table 4: Marine Mammal Annex II Species Screened In and the Sensitivity Risk Assigned

Species	P1 Physical habitat loss/gain	P2 Direct physical habitat damage	P3 Indirect physical damage/habitat change	P4 Collision (marine mammals and fish)	P16 Entanglement ¹²	P7 Physical presence	P8 Underwater noise	P9 Above water noise	P10 Toxic contamination	P11 Electromagnetic field	P14 Suspended sediment	P15 Invasive non-native species	Maximum Maximum for Assessment
Harbour seal	L	L	L	Fixed/ floating wind – L Wave & tide - H	Fixed wind, wave & tide – N/A Floating wind - M	M	H	M	L	N/A	L	L	H
	Low direct sensitivity for habitat (with haulout locations being above low water and therefore beyond the extent of the plan, with direct risk therefore linked to seaward extent of supporting habitat which is typically extensive). Sensitivity risk attached to collision and entanglement strongly linked to the type of ORE, with seals known to respond to physical presence and above water noise. Key sensitivity risk considered to be underwater noise for most ORE, with typically low sensitivity risk for wider indirect pressures. Seals are not known to be sensitive to EMF.												
Grey Seal	L	L	L	Fixed and floating wind – L Wave and tide - H	Fixed wind, wave and tide – N/A Floating wind - M	M	H	M	L	N/A	L	L	H

¹² Pressure does not apply to fixed wind, noting that NIRAS, 2022b identified it for wave and tide only, with floating wind included for completeness

Species	P1 Physical habitat loss/gain	P2 Direct physical habitat damage	P3 Indirect physical damage/habitat change	P4 Collision (marine mammals and fish)	P16 Entanglement ¹²	P7 Physical presence	P8 Underwater noise	P9 Above water noise	P10 Toxic contamination	P11 Electromagnetic field	P14 Suspended sediment	P15 Invasive non-native species	Maximum Maximum for Assessment
	Low direct sensitivity for habitat (with haulout locations being above low water and therefore beyond the extent of the plan, with direct risk therefore linked to seaward extent of supporting habitat which is typically extensive). Sensitivity risk attached to collision and entanglement strongly linked to the type of ORE, with seals known to respond to physical presence and above water noise. Key sensitivity risk considered to be underwater noise for most ORE, with typically low sensitivity risk for wider indirect pressures. Seals are not known to be sensitive to EMF.												
Harbour porpoise	L	L	L	Fixed and floating wind – L Wave and tide - H	Fixed wind, wave and tide – N/A Floating wind - M	L	H	N/A	L	L	L	L	H
	Low direct sensitivity for habitat, which is typically extensive. Sensitivity risk attached to collision and entanglement strongly linked to the type of ORE, with harbour porpoise not typically considered for above water noise. Key sensitivity risk considered to be underwater noise for most ORE, with low sensitivity risk for wider indirect pressures.												
Bottlenose dolphin	L	L	L	Fixed and floating wind – L Wave and tide - H	Fixed wind, wave and tide – N/A Floating wind - M	L	H	N/A	L	L	L	L	H

Maximum Maximum for Assessment	
P15 Invasive non-native species	
P14 Suspended sediment	
P11 Electromagnetic field	
P10 Toxic contamination	
P9 Above water noise	
P8 Underwater noise	
P7 Physical presence	
P16 Entanglement¹²	
P4 Collision (marine mammals and fish)	
P3 Indirect physical damage/ habitat change	
P2 Direct physical habitat damage	
P1 Physical habitat loss/ gain	
Species	Low direct sensitivity for habitat, which is typically extensive. Sensitivity risk attached to collision and entanglement strongly linked to the type of ORE, with bottlenose dolphin not typically considered for above water noise. Key sensitivity risk considered to be underwater noise for most ORE, with low sensitivity risk for wider indirect pressures.

3.2.4 Annex II Terrestrial Mammal Sensitivity Risk

Terrestrial mammals screened in are otter (*Lutra lutra*) and the lesser horseshoe bat (*Rhinolophus hipposideros*). The risk sensitivity assigned to each species for each of the pressures identified is given as a high, medium or low value in Table 5, with N/A where the pressure is not relevant to the QI, as a result of a clear lack of pathway for the pressure and species. The determination of sensitivity risk draws on information available on NPWS website specific to these species in Ireland, including NPWS (undated) and NPWS (2018).

Table 5: Terrestrial Mammal Annex II Species Screened In and the Sensitivity Risk Assigned

Species	P1 Physical habitat loss/ gain	P2 Direct physical habitat damage	P3 Indirect physical damage/ habitat change	P4 Collision (marine mammals and fish)	P5 Collision (birds and bats)	P16 Entanglement ¹³	P7 Physical presence	P8 Underwater noise	P9 Above water noise	P10 Toxic contamination	P11 Electromagnetic field	P14 Suspended sediment	P15 Invasive non-native species	Maximum Sensitivity for Assessment
Otter	L	L	L	L	N/A	L	L	L	L	L	L	L	L	L
	Otter occur coastally but are not known to forage further than 80m from the coast (NPWS, undated). Low sensitivity risk attached to direct pressure (noting that OREDP II is limited by the 10m depth contour, with potential foraging habitat for otter both within and outwith that contour being extensive). Potential indirect sensitivity considered to be low as a consequence of the sensitivity of otter and the potential for impact associated with ORE within habitat occupied by otter.													
Lesser horseshoe bat	N/A	N/A	N/A	N/A	L	N/A	L	N/A	L	N/A	N/A	N/A	N/A	L
	Not known to be migratory in Ireland, foraging within 2.5km of roosts (NPWS, 2018). No potential for direct consequences to occur to lesser horseshoe bat as a consequence of ORE (other than a low sensitivity risk to collision (P5) due to the known behaviour of the species, with a low sensitivity risk to indirect pressures.													

¹³ Pressure does not apply to fixed wind, noting that NIRAS, 2022b identified it for wave and tide only, with floating wind included for completeness

3.2.5 Migratory Fish and Pearl Mussel Sensitivity Risk

Migratory fish and pearl mussel screened in are:

- Sea lamprey (*Petromyzon marinus*);
- River lamprey (*Lampetra fluviatilis*);
- Twait shad (*Alosa fallax*);
- Atlantic salmon (*Salmo salar*);
- Freshwater pearl mussel (FWPM) (*Margaritifera margaritifera*); and
- Nore Pearl Mussel (NPM) (*Margaritifera durrovensis*),

The pearl mussel species are wholly freshwater and would not have a direct connectivity to the Plan. However, the species are linked in their life cycle to salmon and are therefore included. For migratory fish species, the potential sensitivity risk primarily relates to indirect risk for a protected site (noting that the extent of OREDP II does include some direct overlap with relevant protected sites) and direct risk to individuals as mobile species that may be found both inside and outside protected site boundaries. The risk sensitivity assigned to each species for each of the pressures identified is given as a high, medium or low value in Table 5, with N/A where the pressure is not relevant to the QI as a result of a clear lack of pathway for the pressure and species (noting NIRAS 2022a considered migratory fish as a group and not individual species).

Protected sites for migratory fish are focused on estuaries and rivers, with the key concern for ORE arrays typically associated with access to and from the estuarine mouth (and potential to impede that). These are associated with wider concern for individuals as mobile species beyond protected site boundary (where understanding of fish movement patterns is considerably less).

The key pressures of concern for migratory fish are considered to be underwater noise and EMF. The shad species are related to herring which are recognised to be hearing specialists. It is assumed that shad may have relatively high sensitivity to underwater noise. Noise sensitivity in salmonids is understood to be intermediate since the swim bladder is not connected to the inner ear. Salmon are therefore able to detect only the particle motion component of noise (Mueller-Blenkle et al., 2010). However, along with shad, salmon are potentially sensitive to injury from very high levels of noise, although disturbance is much more likely to be a concern given the greater range of impact. Lamprey, which lack a swim bladder, are assumed to be relatively less sensitive to underwater noise (Popper et al., 2014).

Species which are understood to be sensitive to magnetic fields (i.e. lamprey and salmon/freshwater pearl mussel) whether natural or anthropogenic, are assumed to have Moderate sensitivity to EMF. The principal concern is that migration behaviour could be affected by operational power cables; this is not demonstrated for the species in question but because uncertainty remains, on a precautionary basis a Moderate sensitivity risk has been determined.

Further references drawn on include experience from the UK offshore wind industry, together with Irish specific references (e.g. Kurz & Costello (1999) and Anon (2009)) and Annex II species references (e.g. Maitland & Hatton-Ellis (2003) and Harding et al. (2016)).

Table 6: Migratory Fish and Pearl Mussel Annex II Species Screened In and the Sensitivity Risk Assigned

Species	P1 Physical habitat loss/ gain	P2 Direct physical habitat damage	P3 Indirect physical damage/ habitat change	P4 Collision (marine mammals and fish)	P16 Entanglement	P7 Physical presence	P8 Underwater noise	P10 Toxic contamination	P11 Electromagnetic field	P14 Suspended sediment	P15 Invasive non-native species	Maximum Sensitivity for Assessment
Sea lamprey	L	L	L	L	L	L	L	L	M	L	L	M
	Low indirect sensitivity risk through supporting habitat afforded by protected site, potential sensitivity risk as a mobile species is typically low except for EMF; as a species able to detect EMF, sea lamprey are considered to have a Medium sensitivity risk for the type of EMF associated with ORE (noting that the OREDP II includes arrays only and not cable corridors).											
River lamprey	L	L	L	L	L	L	L	L	M	L	L	M
	Low indirect sensitivity risk through supporting habitat afforded by protected site, potential sensitivity risk as a mobile species is typically low except for EMF; as a species able to detect EMF, river lamprey are considered to have a Medium sensitivity risk for the type of EMF associated with ORE (noting that OREDP II includes arrays only and not cable corridors).											
Twaite shad	L	L	L	L	L	L	H	L	N/A	L	L	H
	Low indirect sensitivity risk through supporting habitat afforded by protected site, potential sensitivity risk as a mobile species is typically low except for underwater noise; as a species assumed to be sensitive to underwater noise, twaite shad are considered to have a High sensitivity risk for underwater noise associated with ORE (noting that OREDP II includes arrays only and not cable corridors) but not sensitive to EMF.											

Allis shad	L	L	L	L	L	L	H	L	N/A	L	L	H
	Low indirect sensitivity risk through supporting habitat afforded by protected site, potential sensitivity risk as a mobile species is typically low except for underwater noise; as a species assumed to be sensitive to underwater noise, allis shad are considered to have a High sensitivity risk for underwater noise associated with ORE (noting that OREDP II includes arrays only and not cable corridors) but not sensitive to EMF.											
Atlantic salmon	L	L	L	L	L	L	M	L	M	L	L	M
	Low indirect sensitivity risk through supporting habitat afforded by protected site, potential sensitivity risk as a mobile species is typically low except for underwater noise and EMF; as a species considered to be sensitive to underwater noise and EMF, salmon are considered to have a Moderate sensitivity risk to both associated with ORE (noting that OREDP II includes arrays only and not cable corridors).											
Freshwater pearl mussel	L	L	L	L	L	L	M	L	M	L	L	M
	Indirect risk through Atlantic salmon											
Nore pearl mussel	L	L	L	L	L	L	M	L	M	L	L	M
	Indirect risk through Atlantic salmon											

3.3 How QI Interaction has been determined

The potential for a QI to interact with the OREDP II has been scored as Low, Medium and High based on the receptor specific criteria set out in Table 7. To be clear, the potential for interaction is a broad, strategic level judgment to enable key risk to be identified and highlighted. It does not preclude the need to assess in full at project level and, given the OREDP II extent, is necessarily undertaken at a broad, strategic and high level. Irish specific guidance is applied where available, drawing on UK guidance and evidence base where necessary (e.g. see DCCAE & SEAI, 2017 for a review of these).

Of note here is the term ‘continuous’ or ‘near continuous’ applied specifically in Table 7 to the consideration of habitats. Effectively, the term has been used to differentiate between habitats that are typically patchy or of limited extent and habitats that are typically extensive and widespread. For habitats, the differentiation between high and medium risk applies in both cases where there is direct overlap between the Plan and the relevant SAC. The risk of an adverse effect for habitats is strongly linked to the degree of direct interaction between a ORE and the QI (for example direct habitat loss of part of a QI has been found to be adverse in England¹⁴). For a QI that is extensive and widespread, such interaction is a greater risk, whereas for a QI that is patchy such interaction is a lower risk (noting that interaction does not consider sensitivity or effect and is purely a ‘pathway’ type criteria). The differentiation enables a distinction to be drawn between a high or medium risk of interaction for habitats. Key drivers when the criteria is applied are:

- Intertidal and transitional habitats such as dunes, saltmarsh, machair and intertidal mud – typically extensive distribution (and therefore deemed potentially continuous or near continuous);
- Subtidal habitats such as sandbanks, estuaries and bays – typically extensive distribution (and therefore deemed potentially continuous or near continuous);
- Intertidal and transitional habitats such as sea caves, drift line, stony banks, vegetated cliffs and lagoons typically have a patchy and/or isolated distribution (and are therefore deemed not to be continuous); and
- Subtidal habitats such as sea caves, reefs and leaking gas typically have a patchy and/or isolated distribution (and are therefore deemed not to be continuous).

¹⁴E.g. <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010080/EN010080-003267-EN010080%20Hornsea%20Three%20-%20Habitats%20Regulations%20Assessment.pdf>

Table 7: Criteria used to assign QI interaction scores

Receptor Group	Low	Medium	High	Justification
Birds – breeding season	Direct overlap between the OREDP II area and mean-maximum foraging range of QIs associated with Protected Site	Direct overlap between the OREDP II area and mean foraging range of QIs associated with Protected Site	Direct overlap between the OREDP II area and Protected Site.	Seabirds are highly mobile birds and are able to utilise large sea areas for foraging, roosting and other maintenance behaviours during the breeding season whilst being constrained by the necessity to provision young and therefore exhibiting central place foraging. The use of foraging ranges allows for a precautionary approach incorporating areas beyond a breeding colony that may potentially be utilised by birds
Birds – non-breeding season	None	Direct overlap between the OREDP II area and a 10 km buffer associated with the Protected Site	Direct overlap between the OREDP II area and Protected Site.	A 10 km buffer is the maximum buffer used in comparable assessments associated with Qualifying Interests of SPAs in the non-breeding season and takes account of the range of potential impacts
Migratory waterbirds	None	None	Does the OREDP II intersect the 1km buffer from the coast (Yes=High)	Expert judgement – 1 km is considered to represent an area through which the majority of movements of waterbirds will occur

Migratory seabirds	None	OREDP II located within migratory corridor of relevant feature	Direct overlap between the OREDP II area and Protected Site.	
Annex I habitats	OREDP II within 15km buffer of the Protected Site	Direct overlap between the OREDP II area and Protected Site. Within the Protected Site, QI distribution not continuous	Direct overlap between the OREDP II area and Protected Site. Within the Protected Site, QI near continuous distribution	<p>Benthic habitats (intertidal and subtidal) are not mobile in the short term and the potential for interaction is limited to direct interaction (requiring overlap) or a zone of influence indirect interaction (typically low risk for benthic habitats due to the nature of such impacts associated with renewable energy in terms of extent and magnitude, accounted for by applying a 15km range to encompass indirect impacts e.g. sediment plume and in line with screening).</p> <p>The consideration of QI distribution takes account of the likely reduced interaction risk for a QI that is patchily distributed compared to one that is semi-continuous or continuously distributed. Where there is uncertainty the presumption is for a more continuous distribution.</p>
Annex II marine mammals	Protected Site more than 26km from the OREDP II	Protected Site up to 26km from the OREDP II (but not overlapping). This range is frequently	Direct overlap between the OREDP II area and Protected Site	<p>Marine mammals are highly mobile, with numerous studies investigating potential for interaction with marine renewables or to inform screening¹⁵. Guidance from DAHG (2014) advocates a risk based approach to consider injury or disturbance to marine mammals from underwater noise, noting potential for significant behavioural disturbance to result from piling driving noise over several km (10 km is considered, with a 10km buffer minimum recommended for survey in DCCAE, 2018) and is very focused on managing that risk.</p>

¹⁵ <https://jncc.gov.uk/our-work/marine-mammals-and-offshore-industries/>

		used to assess disturbance on harbour porpoise in the UK, and it is derived from a literature review used to inform statutory nature conservation body (SNCB) guidance.		<p>To determine interaction risk here, the criteria applied is not linked to density data, but is instead linked to protected sites as the assessment is site based, together with the OREDP II areas and the most significant potential Zone of Influence (Zol).</p> <p>To enable consideration to be made at OREDP II level (as opposed to project level), the range for potential interaction has been linked to the pressure with the likely largest Zol for the QI (P8 underwater noise). In the literature, the evidence for the largest interaction range is strongest for piling noise (with limited published data for unexploded ordnance (UXO) at present¹⁶). At the strategic level of OREDP II, in the absence of noise modelling to predict impact ranges (which would not be feasible based on the available OREDP II parameters), the application of a fixed disturbance response range as the interaction criteria is more appropriate and is more precautionary than applying an injury range. The fixed ranges in literature are for disturbance and are limited to Germany (8km¹⁷ but that requires noise mitigation at source) and the UK (which is up to 26km¹⁸) for harbour porpoise (no such range is available for other species), the latter substantially exceeding the 10km noted by DAHG (2014) in the context of significant disturbance. The 26km is applied here as a proxy to all four species, based on evidence such as the limited bottlenose dolphin exclusion during piling observed by Graham et al. (2017) who also noted very similar results in impact to harbour porpoise and bottlenose, together with seal tag data which showed a reduction in seal</p>
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¹⁶<https://www.gov.uk/government/publications/marine-environment-unexploded-ordnance-clearance-joint-interim-position-statement/marine-environment-unexploded-ordnance-clearance-joint-interim-position-statement>

¹⁷https://www.ascobans.org/sites/default/files/document/AC21_Inf_3.2.2.a_German_Sound_Protection_Concept.pdf

¹⁸<https://hub.jncc.gov.uk/assets/2e60a9a0-4366-4971-9327-2bc409e09784>

				density within 25km of pile driving (Russell et al., 2016). It is acknowledged that disturbance can occur beyond that range, however evidence also shows that not all animals within that range will be disturbed, with the value reflective of the overall temporary loss of habitat ¹⁹ .
Annex II terrestrial mammals	None	Otter: OREDP II within 1km of Protected Site Bat: OREDP II within 2.5km of Protected Site	Direct overlap between the OREDP II and Protected Site.	Both otter and lesser horseshoe bat (the terrestrial mammal QIs screened in) are terrestrial in nature. However, otter does forage into the marine environment (up to approximately 80m from shore, NPWS undated), and bats could fly locally, with a foraging range up to 2.5km (NPWS, 2018) (noting that the species is not known for being migratory). The OREDP II is limited to consideration of arrays only and not cable corridors, and therefore will not have direct interaction in the intertidal or immediate coastal zone. By ensuring a buffer is placed on the interaction range, the potential for individual animals to venture outside protected site boundary is taken into account (noting that it is considered unlikely for either species to venture far seawards from the intertidal).
Annex II migratory fish and pearl mussel	QI >100km distance	QI within 100km of the OREDP II.	Direct overlap between OREDP II area and Protected Site	A range of 100km is typically applied to the assessment of marine fish in HRA assessment in the UK with respect to marine renewables (for example in the Plan level assessment for Round 4 in the UK where 100km was applied), as it allows for the ZoI of the key pressure (P8 underwater noise) with respect to access to estuary mouths and allows for uncertainty as regards where migratory fish occur at sea. No similar range has been identified in Ireland. For example, the range agreed on the Awel y Mor offshore wind farm was deemed an appropriate migratory fish screening range by Natural Resources Wales (in RWE Renewables UK, 2022) and noting for example that for salmon, the Neart na Gaoithe assessment considered the range of significant

¹⁹ <https://data.jncc.gov.uk/data/2e60a9a0-4366-4971-9327-2bc409e09784/JNCC-Report-654-FINAL-WEB.pdf>

				avoidance to extend only as far as 14 km (in Mainstream Renewable Power, 2012).
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3.4 Protected Site Vulnerability

For SACs and SPAs, protected site vulnerability has been determined on the basis of the condition of the sites ('Protected site condition', as recorded in the documents available on a site by site basis) and at national level ('QI National Condition') from Article 17 Reporting for SACs and Article 12 Reporting for SPAs.

3.4.1 Individual QI Condition

Information on QI condition within individual protected sites is available publicly, from the following sources:

- For Ireland – on a site by site basis within the site specific conservation objectives documentation (noting that for some sites this is contained within a 'Conservation Objectives Supporting Document' but where such a document was not available the information has been sourced from the 'Conservation Objectives' document, which in some instances states the conservation status but in others is termed 'generic' with information on the condition of individual QIs not provided);²⁰
- For the UK – on a site by site basis within the publicly available datasets;²¹ and
- For France – for some sites only within publicly available datasets²².

It should be noted that existing pressures would have been a factor in the overall QI condition.

To ensure consistent scores for QI condition, the following criteria have been applied:

- Low – protected site QI categorised as being in favourable condition (e.g. 'to maintain');
- Medium – information unknown or unavailable; and
- High – protected site QI categorised as being in unfavourable condition (e.g. 'to restore')

Within Appendix 1, for each habitat and species screened in, QI site condition (where available) has been taken into account and the relevant score applied. The inclusion of QI condition in this manner ensures the site-specific information is incorporated into the consideration of AEOI risk, as a QI in unfavourable condition will typically be less tolerant to an impact than a QI in favourable condition, with the requirement that the QI attain favourable condition and not purely maintain it.

²⁰ <https://www.npws.ie/protected-sites/conservation-management-planning/conservation-objectives> and through searching individual sites on <https://www.npws.ie/protected-sites>

²¹ <https://jncc.gov.uk/our-work/uk-protected-area-datasets-for-download/>

²² <https://inpn.mnhn.fr/site/natura2000/>

The condition of a QI is also relevant to the conservation objectives, with these typically aimed at maintaining or attaining favourable condition.

3.4.2 QI National Condition

For all SAC QIs, Article 17 of the Habitats Directive requires each member state to report to the European Commission every six years on the conservation status of the natural habitats and species in the Annexes and on the implementation of the measures taken under the Directive. The most recent submissions made were in 2019 including for Ireland²³, the UK²⁴ and France²⁵. The relevant information drawn on per QI is the 'overall assessment of conservation status', with that applied here to determine if the QI would score Low, Medium or High according to the criteria defined below. It should be noted that the Article 17 reporting also takes into account the main pressures and threats with respect to that QI.

Article 12 of the Birds Directive similarly requires reporting on a six-year cycle, on the implementation of national provisions under the Directive. The most recent submissions were also made in 2019 including for Ireland²⁶, the UK²⁷ and France²⁸ with the central reporting drawn on for all countries for consistency²⁹. That information on the EU central source is provided per species and in a number of ways, including short term and long term population trends for breeding, passage and wintering birds (where applicable); these are the trends applied here and given there are more than one value (short and long, with variable combinations of breeding, passage and wintering), on a precautionary basis, the most negative of these values has been used to the selection of the relevant criteria (as Low, Medium or High) as defined below.

The following criteria are applied to QI National Condition:

- Low – conservation or population status marked as positive (e.g. favourable, stable etc.);
- Medium – conservation or population status marked as unknown or not graded; and

²³ <https://www.npws.ie/publications/article-17-reports>

²⁴ <https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019/>

²⁵ <https://inpn.mnhn.fr/programme/rapportage-directives-nature/presentation?lg=en>

²⁶ <https://www.npws.ie/sites/default/files/publications/pdf/IWM114.pdf>

²⁷ <https://jncc.gov.uk/our-work/article-12-report-2019/>

²⁸ <https://inpn.mnhn.fr/programme/rapportage-directives-nature/presentation?lg=en>

²⁹ <https://circabc.europa.eu/ui/group/173a90fc-40bf-492d-a3a9-df99c4aa8807/library/1480caf0-b524-447a-9bd9-3d8ebd736dd>

- High – conservation or population status marked as negative (e.g. unfavourable, inadequate, declining etc.).

4 Determining Overall Risk of Adverse Effect on Integrity

To determine the overall risk of an adverse effect on integrity of each protected site and QI, and therefore inform where interventions are required, the assessment scores outlined in Section 3 were combined in three steps, with these outlined below.

4.1 Step 1 – Establish QI Vulnerability

QI vulnerability was established by combining the QI sensitivity risk score with the QI interaction score, as shown in Figure 8. All scores were taken forward for further assessment unless a value of not applicable (N/A) was assigned (due to the threshold for a QI interaction score not being met) or a value of L-L was assigned (because the sensitivity and interaction scores are both low, resulting in an extremely low risk). This was done in order to avoid unnecessary consideration of QIs where no potential for interaction with the OREDP II was determined or the interaction and sensitivity are both low.

Figure 8 Determination of QI Vulnerability

		QI Sensitivity Risk		
		Low	Medium	High
QI Interaction	Low	L-L	Low	Low
	Medium	Low	Low-Medium	Medium
	High	Low	Medium	High

4.2 Step 2 – Establish Protected Site Vulnerability

A Protected Site Vulnerability score was established by combining the site level QI Condition score (as defined per QI on a site by site basis) with the national level QI Condition score (as defined for the receptor on a national basis), as shown in Figure 9. Sites that are in unfavourable condition (i.e. high Protected Site Condition) are already considered to be under pressure and, therefore, more sensitive to any additional effects from the OREDP II than a site that is in favourable condition (i.e. low Protected Site Condition). The vulnerability of a site is not only due

to its current site condition, consideration is also be given to the condition of these QIs at a national level and therefore the overall contribution to Natura 2000.

The resultant score from combining the different condition measures has been weighted more highly than the QI vulnerability score, because these scores relate to the published condition at individual sites and for the QI across the National contribution to the N2k network.

Figure 9 Determination of Protected Site Vulnerability

		Site level QI Condition		
		Low	Medium	High
National level QI Condition	Low	Low	Low	Medium
	Medium	Low	Medium	High
	High	Medium	High	High

4.3 Step 3 – Establish Overall Risk of AEOI

The overall score to establish the risk of an AEOI (and therefore the level of strategic level mitigation that may be required) was established by combining the QI vulnerability with the protected site vulnerability, as shown in Figure 10. The risk of an AEOI from the OREDP II alone applies to any protected site that includes a QI(s) with an overall score of 2 or above.

Figure 10 Determination of Overall Score Representing the Risk of an AEOI

		QI Vulnerability			
		Low	Low-Medium	Medium	High
Protected Site Vulnerability	Low	1	2	2	3
	Medium	1	2	2	3
	High	1	2	3	3

4.4 Step 4 - Results

The scores for all four parameters (QI sensitivity risk, QI interaction, QI site level condition and QI national level condition) are presented in Appendix 1, alongside the overall combined AEOI risk

score for each QI and each protected site screened in. This provides a comprehensive list of the protected sites associated with those QIs for which the NIS has identified a risk of an AEOI as a result of the OREDP II alone, and specifically the degree of that risk. That information is also presented in Figure 11 to Figure 15 below, to clearly show visually where designated sites are located with a combined AEOI risk score of 1, 2 and 3 respectively.

Figure 11: Combined AEIO Risk Score for Birds Screened in within associated SPAs

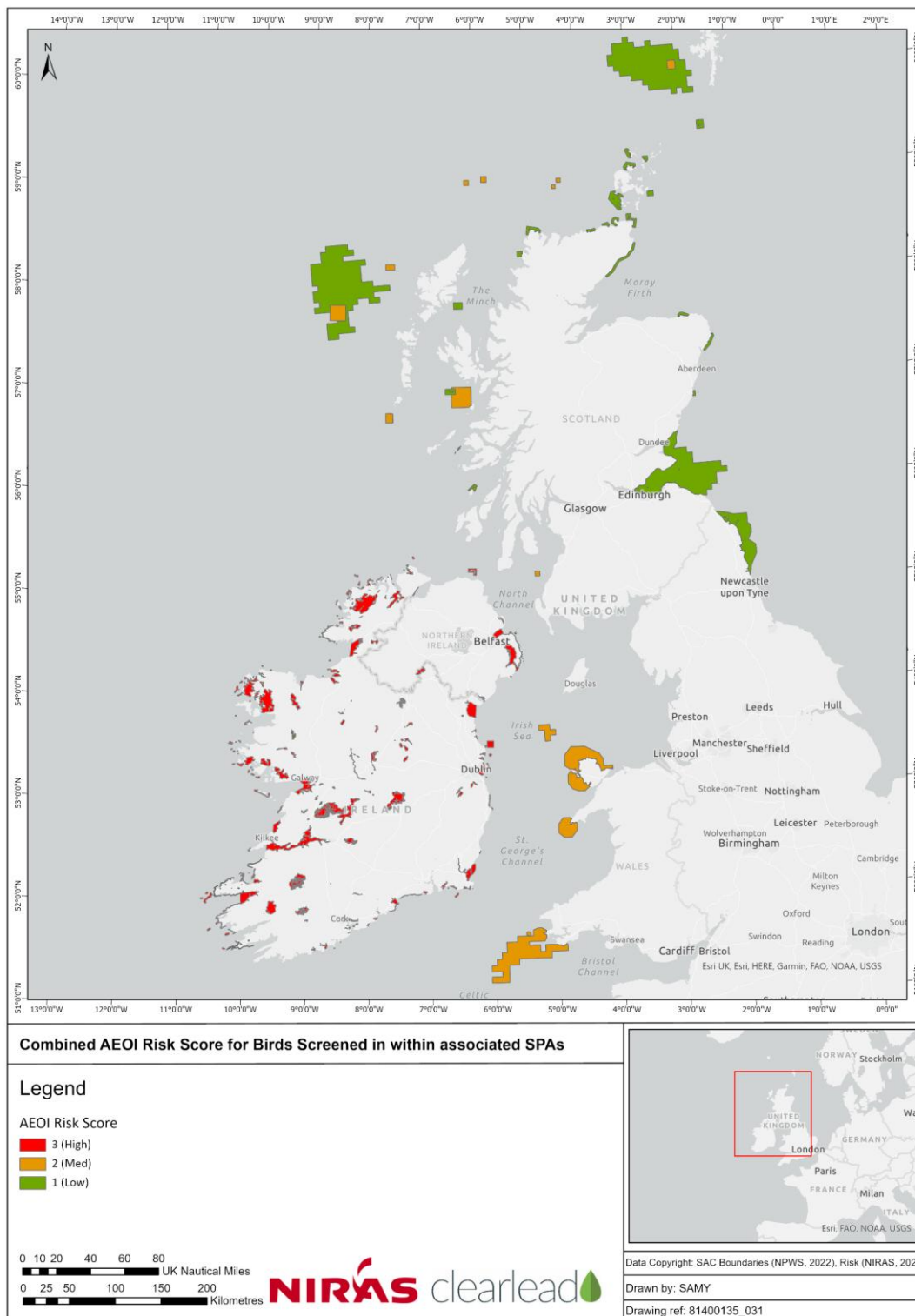


Figure 12: Combined AEIO Risk Score for Annex I Habitats Screened in within associated SACs

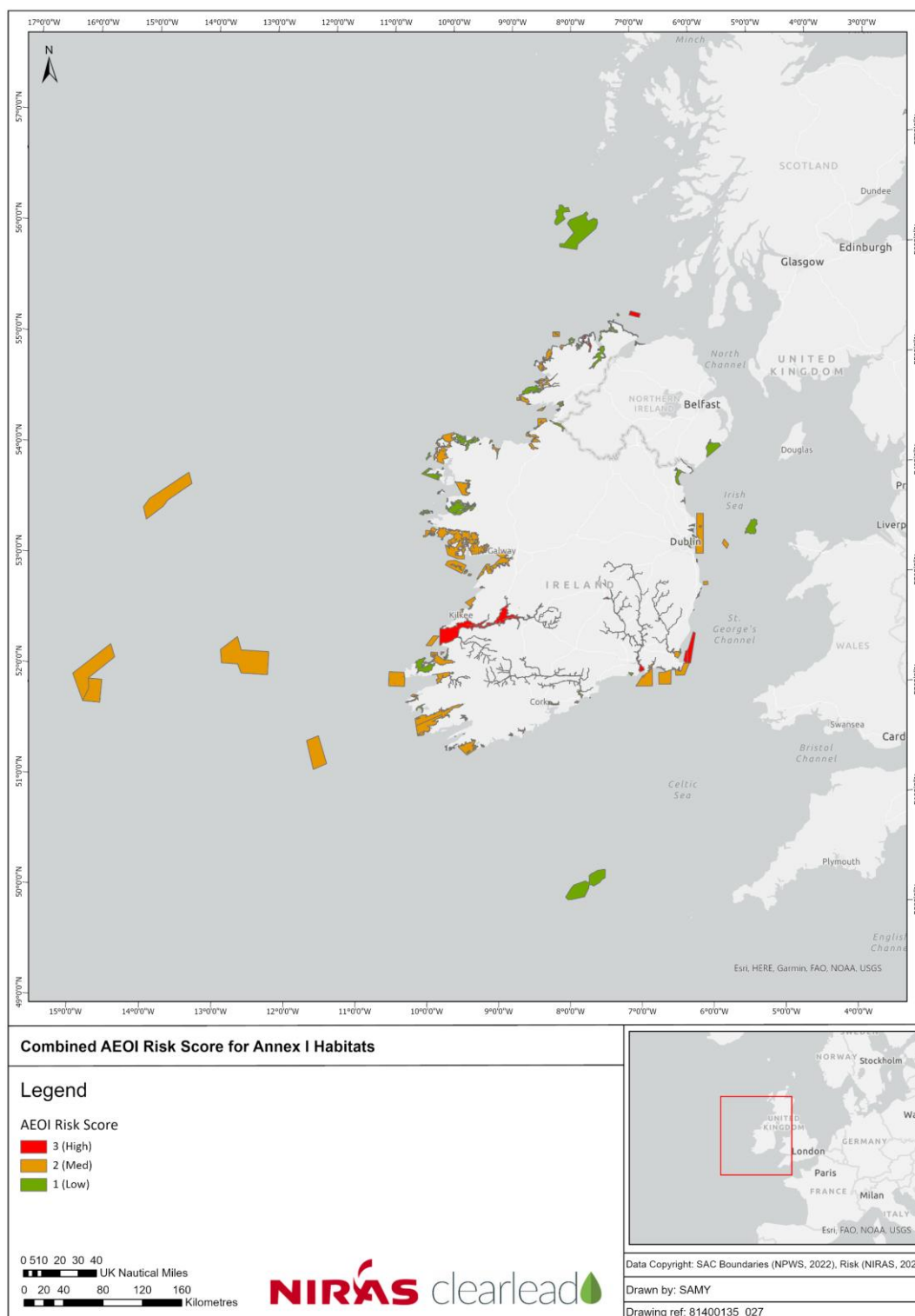


Figure 13: Combined AEOI Risk Score for Annex II Marine Mammals Screened in within associated SACs

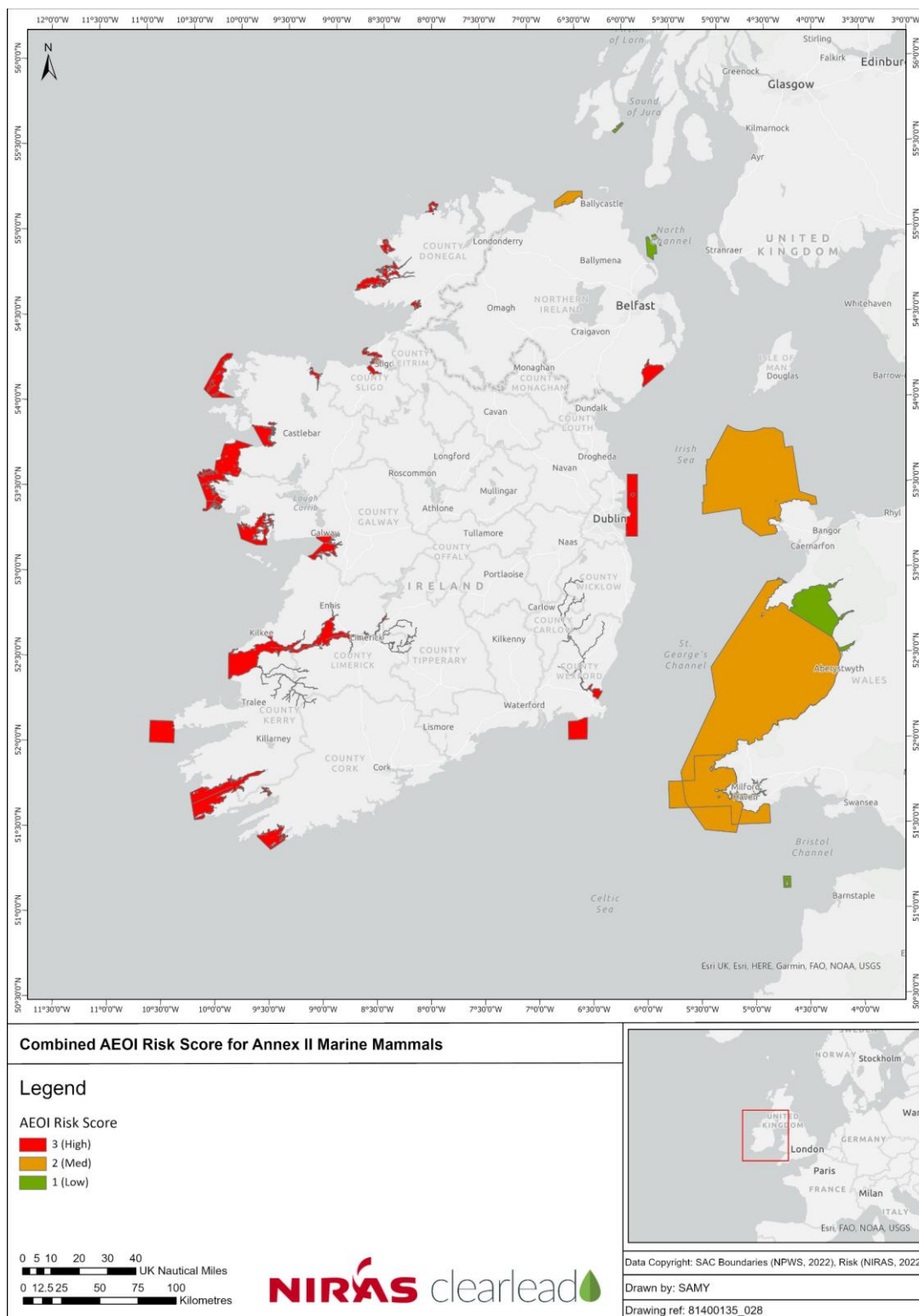


Figure 14: Combined AEIO Risk Score for Annex II Terrestrial Mammals Screened in within associated SACs

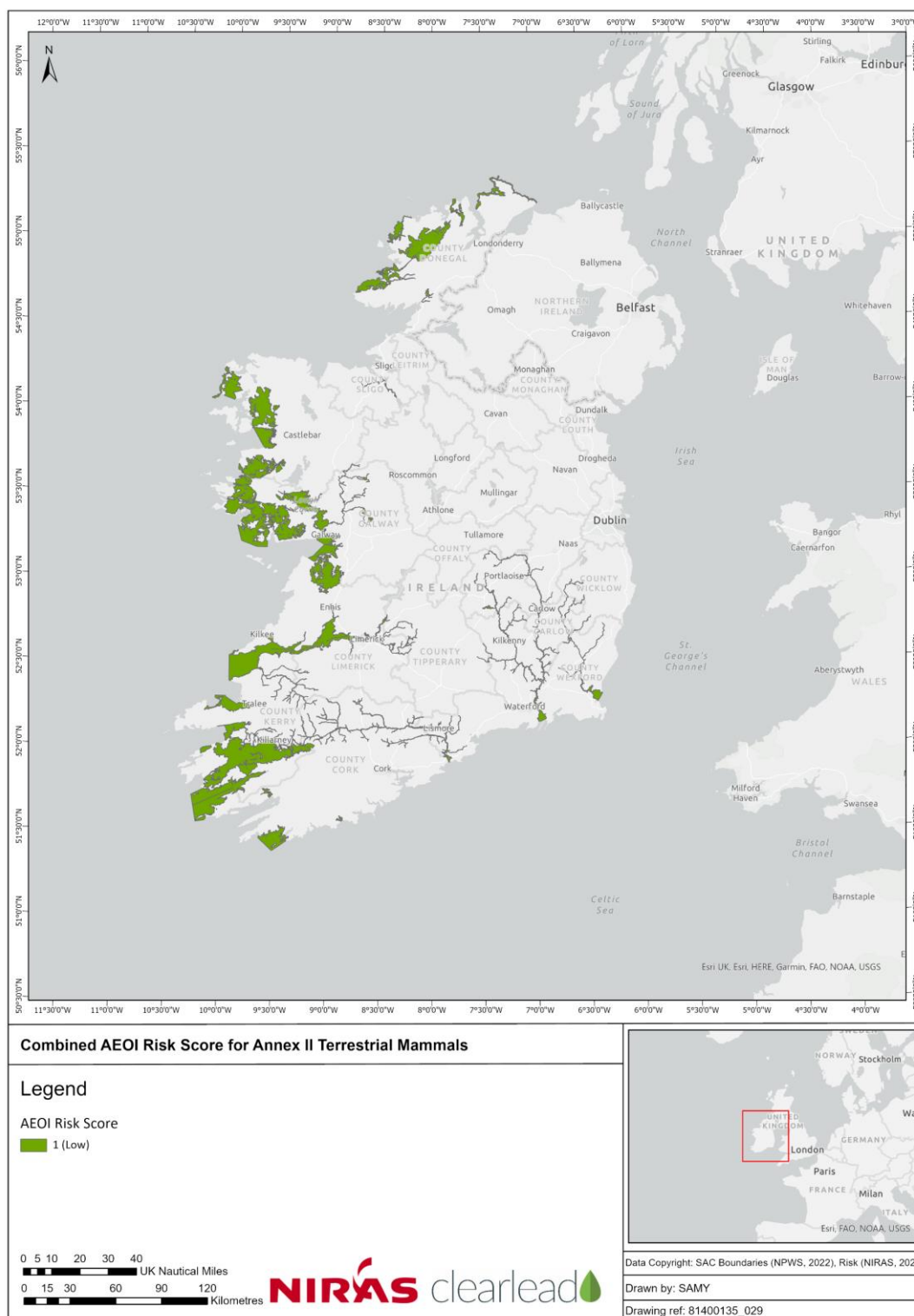
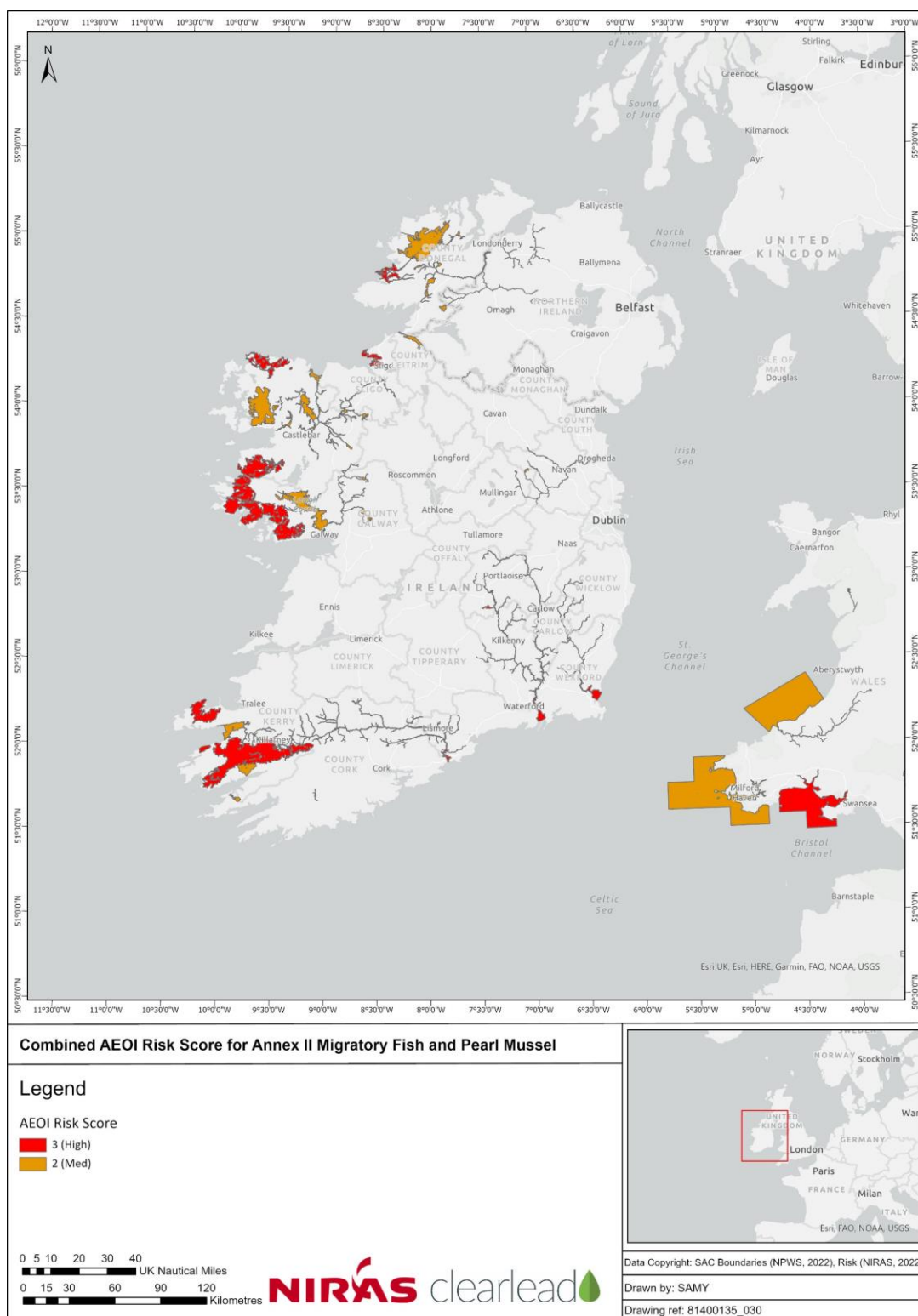


Figure 15: Combined AEOI Risk Score for Annex II Migratory Fish and Pearl Mussel Screened in within associated SACs



A fundamental principle embedded in the NIS is the commitment to undertake a reasonable and meaningful assessment where possible. It is considered that at this national, strategic level, as a result of the scale and extent of the OREDP II and the uncertainty in terms of potential projects that may come forward under the OREDP II (including uncertainty around location, type of ORE, scale and timing) defining discrete areas for development or otherwise quantifying potential effects on a spatial or temporal basis is not feasible at this stage of the OREDP II. In the absence of such information, this NIS has identified the AEOI risks associated with the OREDP II for QIs that have been screened in. The results of the NIS should, therefore, be viewed as indicative, as they allow for forecasts to be made on the outcomes of future project level Appropriate Assessments. These indicative forecasts can also be used to identify where interventions are likely to be required at the project level.

Based on the NIS results, it is recommended that project level interventions should be made to ensure Projects that are likely to have a significant effect on a protected site(s) are required to undertake specific consultation at key steps during planning. In addition, it is recommended that developers implement specific mitigation measures, if necessary, to avoid risk of AEOI. The categories of mitigation are considered in Section 5. Should AA be required for subsequent DMAP stages, it is expected that appropriate mitigation would be identified at that time (if required).

It is considered that the inclusion of project level mitigation to the appropriate level as defined by AEOI risk (where required) will ensure that no AEOI results from the OREDP II alone and there is therefore no requirement to progress past the Stage 2 Assessment at this strategic level for the OREDP II alone (Figure 7).

5 Project Level Mitigation

All Projects that progress through OREDP II should be required to provide evidence of site selection, including:

- Consideration of alternatives;
- Detail on existing constraints that may have influenced the chosen location (e.g. to avoid existing infrastructure);
- A justification of the interaction with QIs (direct or indirect); and
- Detailed information on the location and extent of relevant QIs, supported by survey data if required.

Additional project level mitigation is recommended, according to the overall risk score assigned to the QIs under consideration. Each risk category is considered in turn below and it is the inclusion of this mitigation (where required at project Level) that allows the overall OREDP II level conclusion of no AEOI.

5.1 Combined Risk Category 1

QIs in this category are not expected to require specific mitigation measures. However, as standard it is presumed that developers undertake their activities in line with industry best practice and relevant government guidance, and at project level that this will be secured through condition(s) within future consent(s). For example, application of a Marine Mammal Monitoring Plan, an Environmental Management Plan, a Pollution Control Plan etc. In a similar manner, it is expected that developers will adhere to international conventions such as MARPOL³⁰ and COLREGS³¹. These measures are included as examples only, are not intended to be an exhaustive list, but are indicative of the type of measure expected to be implemented at project level to avoid an AEOL for the QIs in this category.

5.2 Combined Risk Category 2

For QIs that fall within this category, it is recommended that affected Projects must provide additional information within their project Level NIS. The information within the NIS will then determine the need for and type of any mitigation measures required. The information is considered under receptor groups below and are in addition to the measures under Risk Category 1 (Section 5.1).

5.2.1 Measure for Habitats under Risk Category 2

Potential interaction (direct or indirect) with habitat QIs should be identified by affected Projects using the following information:

- Can direct interaction be avoided or minimised? In particular, for QIs that are non continuous. For example by micro-siting; and
- Can indirect interaction be managed? For example through use of construction methods, through foundation design, through cable burial vs protection.

5.2.2 Measures for Migratory Fish and Pearl Mussel under Risk Category 2

Potential interaction (direct or indirect) with migratory fish and pearl mussel QIs should be identified by affected Projects using the following information:

³⁰[https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-\(MARPOL\).aspx](https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx)

³¹<https://www.imo.org/en/About/Conventions/Pages/COLREG.aspx>

- Understanding seasonality of fish migrations/movements;
- Seasonal programming of works if required, e.g. to avoid work that would lead to relevant pressure(s) at sensitive periods;
- Apply mitigation measures to works for example use of quieter construction methods or noise abatement; and
- Establish the feasibility of cable burial including burial depth.

5.2.3 Measures for Marine Mammals under Risk Category 2

Potential interaction (direct or indirect) with marine mammal QIs should be identified by affected Projects using the following information (noting that all four marine mammal QIs under Category 2 are features of UK SACs):

- Understanding seasonality of site use including species present;
- Seasonal programming of works if required, e.g. to avoid work that would lead to relevant pressure(s) at sensitive periods; and
- Identify need for mitigation measures to works or operation for example use of quieter construction methods, noise abatement or clearance of debris.

5.2.4 Measures for Terrestrial Mammals under Risk Category 2

No terrestrial mammal QIs were identified under risk category 2.

5.2.5 Measures for Birds under Risk Category 2

Potential interaction (direct or indirect) with ornithological QIs should be identified by affected Projects using the following information:

- Understanding species presence throughout the year: density, distribution and where relevant information on flight and diving. Application of appropriate survey techniques; and
- Identification of sensitive areas or seasons

5.3 Combined Risk Category 3

For QIs that fall within this category, affected developers must avoid irreparable damage to these high risk QIs if an AEOI is to be avoided. This may include one or more of the following measures:

- Spatial avoidance; and/or
- Temporal avoidance; and/or
- Use of alternative technology; and/or
- Project modification; and/or
- Use of alternative installation methods.

The appropriate measure(s) to apply will depend on the QI affected and the type, location, scale, extent and timing of Project(s).

No terrestrial mammal QIs were identified under risk category 3.

6 In-combination Assessment

The SEA (ClearLead Consulting Ltd, 2022) has identified a number of Plans and Policies for the cumulative assessment, a number of which will run alongside OREDP II. Of these Plans, those given consideration (qualitative only) within the SEA are included below in Table 8 (noting that those considered here include the Plans considered only and not Policies).

Table 8: Plans identified for Cumulative Assessment in the SEA (ClearLead Consulting Ltd, 2022)

Plan	Date	Justification for Cumulative Assessment in the SEA	Relevance In-combination in NIS
National Marine Planning Framework	2021	Establishes a national plan for Ireland's seas and for the future development of the marine planning system in Ireland towards 2040. The NMPF sits at the top of a hierarchy of plans and sectoral policies for the marine area, of which OREDP II is one, and provides a coherent framework in which sectoral policies and objectives can be realised. Implements the Maritime Spatial Planning (MSP) Directive 2014/89/EU for Ireland.	Covers the period to 2040. The NIS included a number of mitigation measures (to include measures on individual projects under the Plan) to ensure no AEOL would result. The accompanying Appropriate Assessment to the NMPF ³² concluded no AEOL in all cases. The requirement on the NMPF and the OREDP II with respect to project level mitigation (where relevant) provides measures to avoid AEOL in-combination.
National Energy and Climate Plan (NECP) 2021 – 2030	2020	Integrates and incorporates all planned policies and measures in relation to Climate Change and Energy provision in Ireland into a single coherent Plan. Of particular relevance to offshore renewables NECP includes objectives and	Draft consulted on, currently no NIS or AA found. Will end before OREDP II commences. No AEOL risk identified to consider in-combination with the OREDP II.

³² <https://www.gov.ie/en/publication/60e57-national-marine-planning-framework/>

		policies for 'Decarbonisation - Renewable Energy'.	
EirGrid – Shaping Our Electricity Future Roadmap	2021	Provides an outline of the key developments from a networks, engagement, operations and market perspective needed to support a secure transition to at least 70% renewables on the electricity grid by 2030. Covers both Ireland and Northern Ireland. Roadmap makes a commitment to further review and updates, to take account of emerging energy policy. The future evolution of the power system beyond 2030 is also implicitly considered in delivering the broader EU ambition of net zero carbon emissions in the economy by 2050.	Includes mitigation measures supported by monitoring for adaptive management, to mitigate potential for significant long term negative impacts (together with project level environmental assessments). Currently no NIS or AA found. Will end before OREDP II commences. No AEOI risk identified to consider in-combination with the OREDP II.
ORED P I	2014	Defined a series of enablers which provide specific precursor to OREDP I and sets out the framework under which a number of offshore wind farm projects in Ireland's maritime area are being brought forward.	Will end as OREDP II commences. Concluded no AEOI accompanied by Plan and project level mitigation measures. It is expected that the mitigation requirements will provide for the no AEOI conclusion for the duration of the Plan and until OREDP II commences. No AEOI risk in-combination has been identified.

The projects currently in the public domain (Phase 1) all predate the OREDP II. The list of Phase 1 projects has been provided by DECC, with no additional projects identified, as follows:

- Oriel Wind Park (EIS dated 2007³³, and several subsequent Foreshore Applications³⁴;

³³ <https://www.gov.ie/en/foreshore-notice/5229c-oriel-windfarm-ltd/>

³⁴ <https://www.gov.ie/en/foreshore-notice/0f8ec-oriel-windfarm-ltd/?referrer=http://www.gov.ie/en/publication/3f608-oriel-windfarm-ltd/#determination>

and

- Dublin Array (formerly Bray and Kish Banks) (a site investigations application dated 2019³⁵ and 2021³⁶);
- Codling Wind Park (I and II) (Foreshore Licence Application³⁷);
- Fuinneamh Scheirde Teoranta (Foreshore Licence Application³⁸);
- North Irish Sea Array (Site Investigations³⁹); and
- Arklow Bank (Site Investigations⁴⁰).

The publicly available information on the above projects with respect to NIS and AA concludes no AEIOI in all cases. No list of Phase 2 projects was available, with DECC reviewing consultation submissions on these during 2022. Therefore, no information on these Phase 2 projects is available to consider in-combination with the OREDP II.

All Plans and Projects reviewed for inclusion in-combination with the OREDP II, where an assessment has been made, have concluded no AEIOI (with mitigation at plan and/or project level where appropriate). Therefore, there is currently no known AEIOI risk relevant to the OREDP II and to which the OREDP II could contribute in-combination.

<https://www.gov.ie/en/consultation/b183e-fs007383-oriel-windfarm-limited-site-investigations-for-the-proposed-offshore-oriel-wind-farm/> and <https://www.gov.ie/en/consultation/552d0-fs007383-oriel-windfarm-limited-site-investigations-for-the-proposed-offshore-oriel-wind-farm/>

³⁵<https://www.gov.ie/en/foreshore-notice/ebe99-innogy-site-investigation-dublin-array-at-kish-and-bray-banks/?referrer=http://www.gov.ie/en/publication/0eac3-innogy-site-investigation-dublin-array-at-kish-and-bray-banks/#determination>

³⁶ <https://www.gov.ie/en/foreshore-notice/96643-fs007188-rwe-renewables-ireland-site-investigations-for-the-proposed-dublin-array-ore-development/#application-documents>

³⁷<https://www.gov.ie/en/foreshore-notice/31ca6-fs007045-codling-wind-park-ltd/?referrer=http://www.gov.ie/en/publication/4a6b4-fs007045-codling-wind-park-ltd/>

³⁸ <https://www.gov.ie/en/foreshore-notice/7a077-fuinneamh-sceirde-teoranta-site-investigations-for-the-proposed-sceirde-rocks-offshore-wind-farm/>

³⁹<https://www.gov.ie/en/consultation/b0d5a-fs007358-statkraft-north-irish-sea-array-nisa-site-investigations-for-export-cable-route/> and <https://www.gov.ie/en/foreshore-notice/75eec-fs007031-statkraft-north-irish-sea-array-nisa-site-investigations/?referrer=http://www.gov.ie/en/publication/cf656-fs007031-statkraft-north-irish-sea-array-nisa-site-investigations/>

⁴⁰ <https://www.gov.ie/en/consultation/c623d-fs007339-sure-partners-arklow-bank-wind-park-phase-2-site-investigations-invitation-for-public-submissions-on-appropriate-assessment/> and <https://www.gov.ie/en/foreshore-notice/aa32d-sure-partners-site-investigations-at-arklow-bank/?referrer=http://www.gov.ie/en/publication/69368-sure-partnerssse-site-investigations-at-arklow-bank/#determination>

The assessment of the OREDP II alone has identified where there is a risk of an AEOI, together with a mitigation hierarchy to enable an AEOI to be avoided at Plan level.

A conclusion of no AEOI for the Plan in-combination has therefore been concluded for the following reasons:

- There is no existing risk of AEOI for the Plan to contribute to in-combination; AND
- Relevant Plans and Projects identified, where information is available, have to date all concluded no AEOI alone and in-combination (accompanied where relevant by plan and or project level mitigation); AND
- The mitigation hierarchy included for the OREDP II provides certainty that it can be delivered without an AEOI.

There is therefore no requirement to progress past the Stage 2 Assessment at Plan Level for the OREDP II in-combination (Figure 7).

7 Sites that may be brought forward for Subsequent Protection

It is understood that current work streams within NPWS are exploring the identification and designation of additional SACs and SPAs in Irish waters. However, the proposed sites were insufficiently advanced for inclusion within this NIS. It is expected that should additional sites be designated in the future, these would be taken into consideration during any future iterations of the document (Section 1.1).

8 AEOI Risk outside Protected Sites

This NIS is concerned with determining the risk for an AEOI to result as a consequence of the OREDP II in relation to protected sites and QIs, and the type of mitigation that may be required at project level to address that risk. The assessment is presented in the preceding sections and is necessarily site focused, and as such it does not provide information on geographic location of that risk for subsequent projects located across the OREDP II area and outside immediate protected site boundaries. To aid in the high-level consideration of risk across OREDP II, and assist in subsequent iterations or updates, a number of figures have been prepared to indicate how that site based risk may translate seawards. That information has been presented for information purposes only in Appendix 2 and applies the following assumptions:

- **Birds** – for key species and where the information is available, the mean foraging range (see Table 7) has been applied to each relevant SPA (colour coded to match the relevant risk criteria) to indicate how far seawards that foraging range extends. In addition, and as a ‘flat layer’ (because the information is not available in GIS format) the predicted summer density

distribution at sea from the ObSERVE data⁴¹ has been included where available for information within these figures (for common/herring gull, all auk species, all black-backed gulls, kittiwake, gannet, fulmar and Manx shearwater);

- **Habitats** – for all protected sites, a blanket 15km buffer (see Table 7) has been applied to each SAC where an Annex I habitat has been screened in, colour coded to match the relevant risk criteria;
- **Marine mammals** – for all protected sites, a blanket 26km buffer (see Table 7) has been applied to each SAC where an Annex II marine mammal species has been screened in, colour coded to match the relevant risk criteria. In addition, and as a ‘flat layer’ (because the information is not available in GIS format) the predicted density distribution at sea from the ObSERVE data⁴² has been included for cetacean species and the predicted at sea distribution for grey and harbour seal from Carter et al. (2020) for information purposes;
- **Terrestrial mammals** – for all protected sites, a blanket 2.5km buffer (see Table 7) has been applied to each SAC where an Annex II terrestrial mammal species has been screened in, colour coded to match the relevant risk criteria; and
- **Migratory fish and pearl mussel** – for all protected sites, a blanket 100km buffer (see Table 7) has been applied to each SAC where an Annex II migratory fish/pearl mussel species has been screened in, colour coded to match the relevant risk criteria.

It is acknowledged that the information presented will not take into account all potential AEOI risk outside protected site boundaries, however at this strategic level it provides a useful first look at where higher risk may be apparent.

9 Conclusions

The assessment made here provides for AEOI risk with respect to OREDP II to be determined and, where such a risk exists, to provide for mitigation to avoid an AEOI. Therefore, it is recommended that the Appropriate Assessment can conclude that the OREDP II alone and combination will not have an AEOI of all the protected sites considered in the NIS.

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⁴¹ https://secure.dccae.gov.ie/downloads/SDCU_DOWNLOAD/ObSERVE_Aerial_Report.pdf

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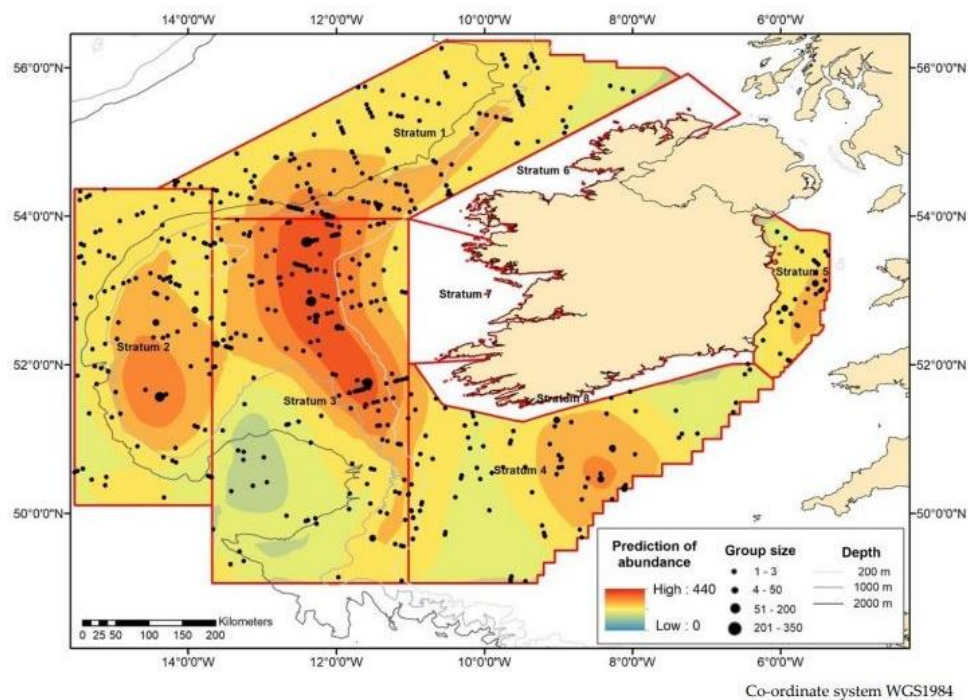
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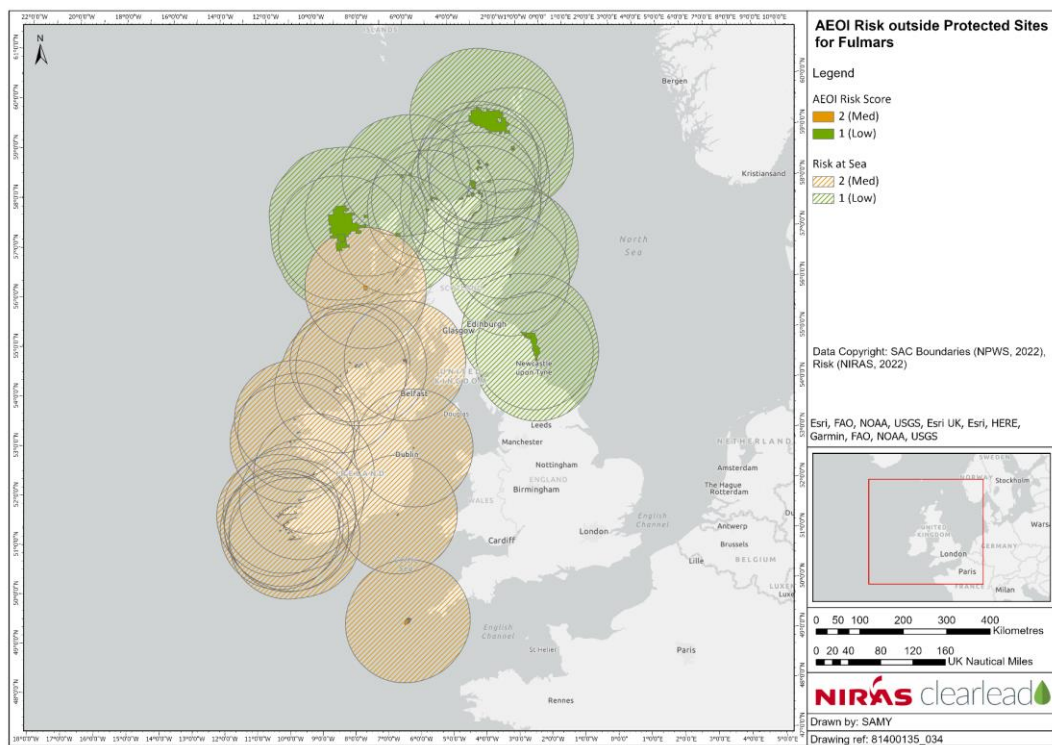
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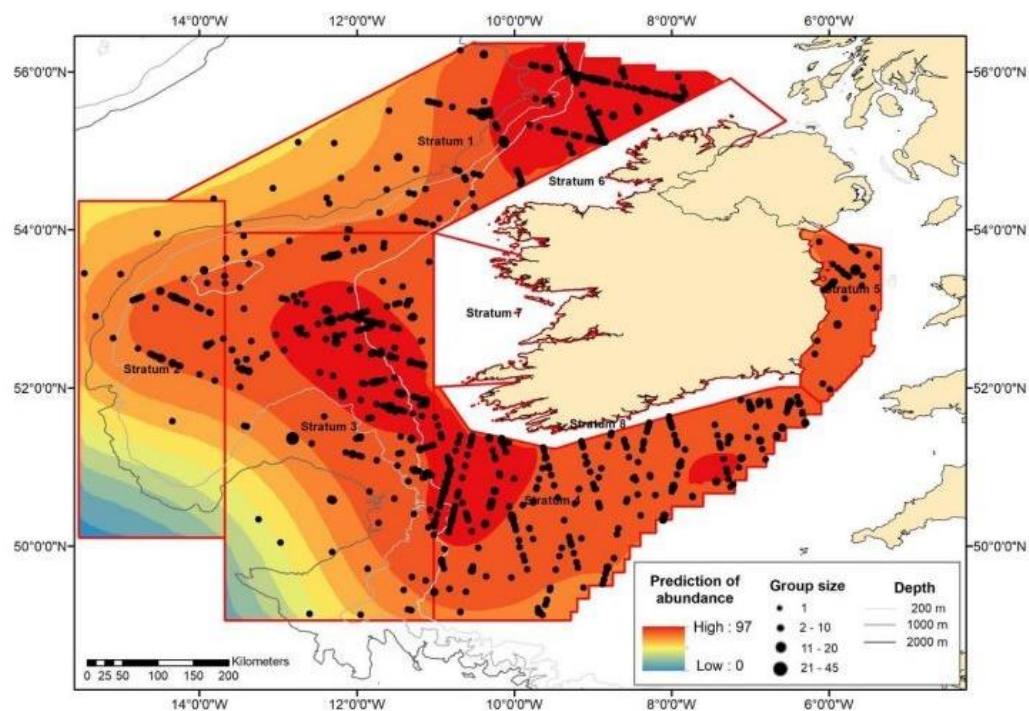
Appendix 1 – Sites and QIs for Assessment including the Relevant Scores Applied

Appendix 2 – AEOI Risk outside Protected Sites

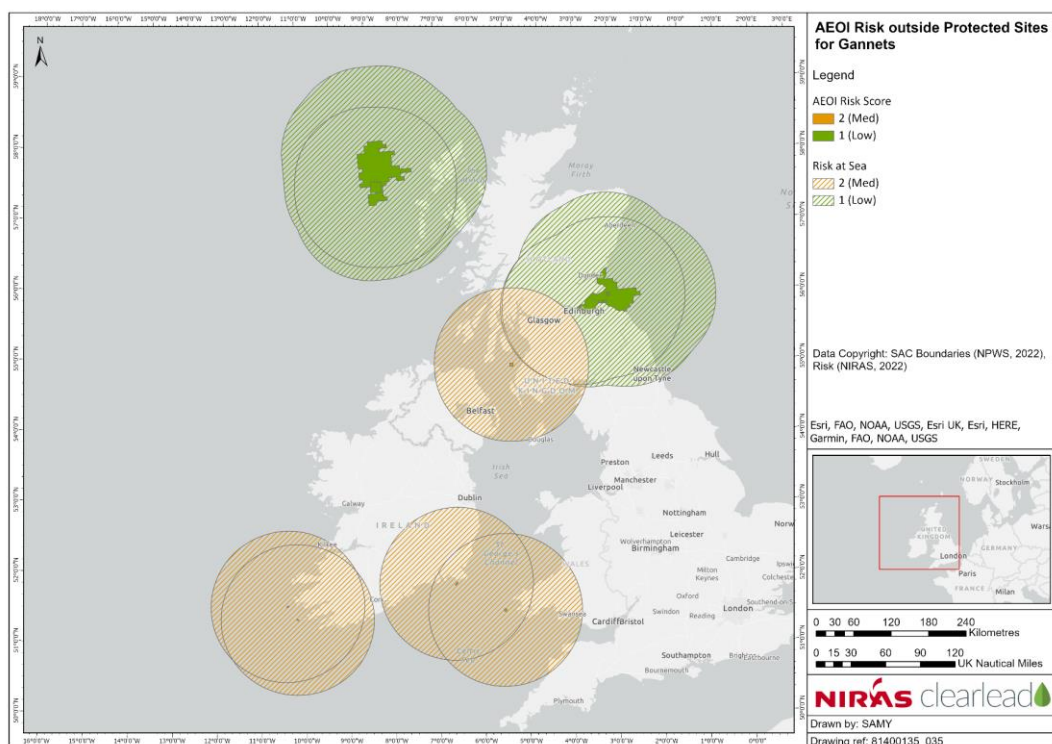


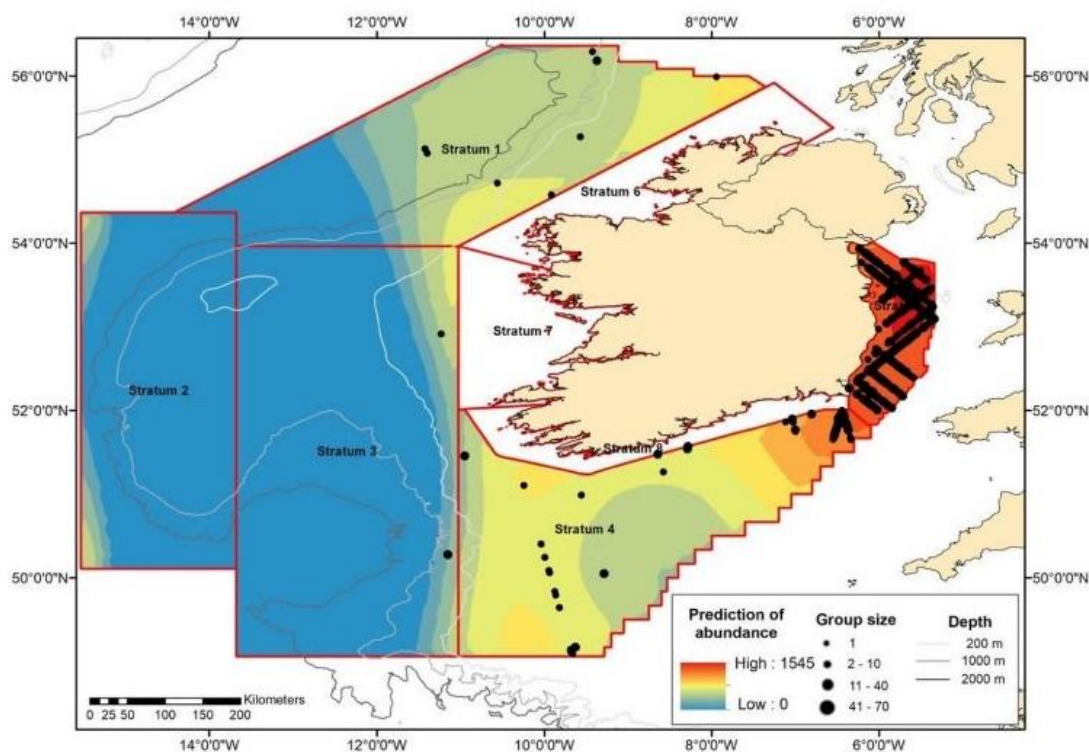
Predicted density distribution of northern fulmar in summer (2015 and 2016 combined) (Rogan et al., 2018).



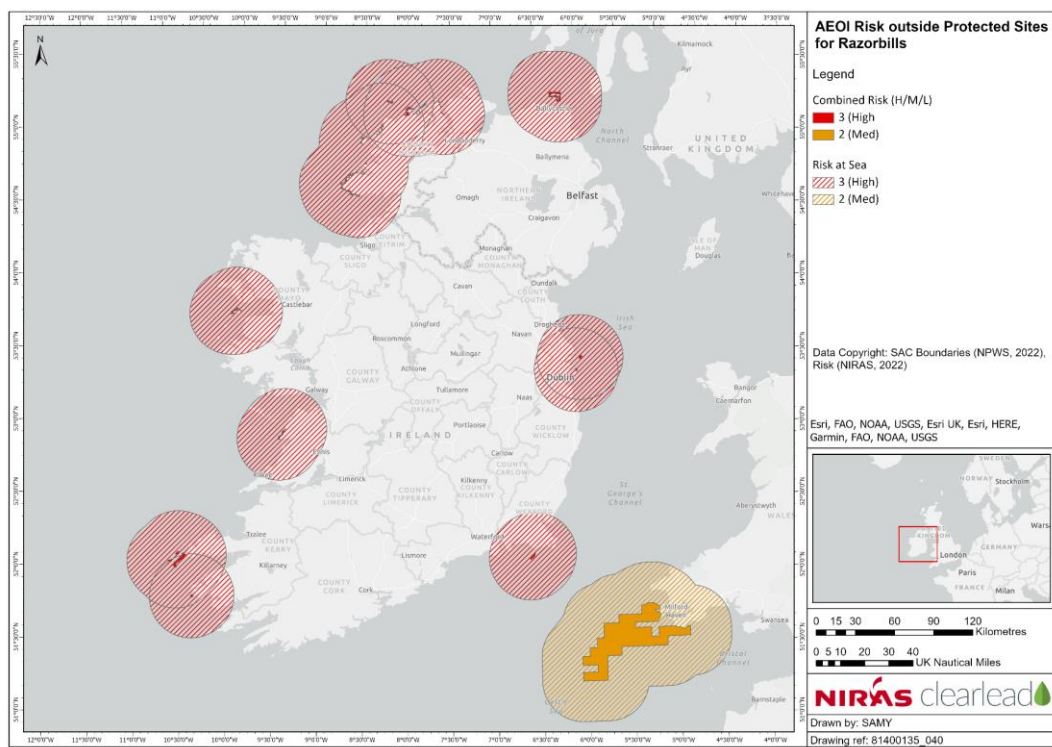


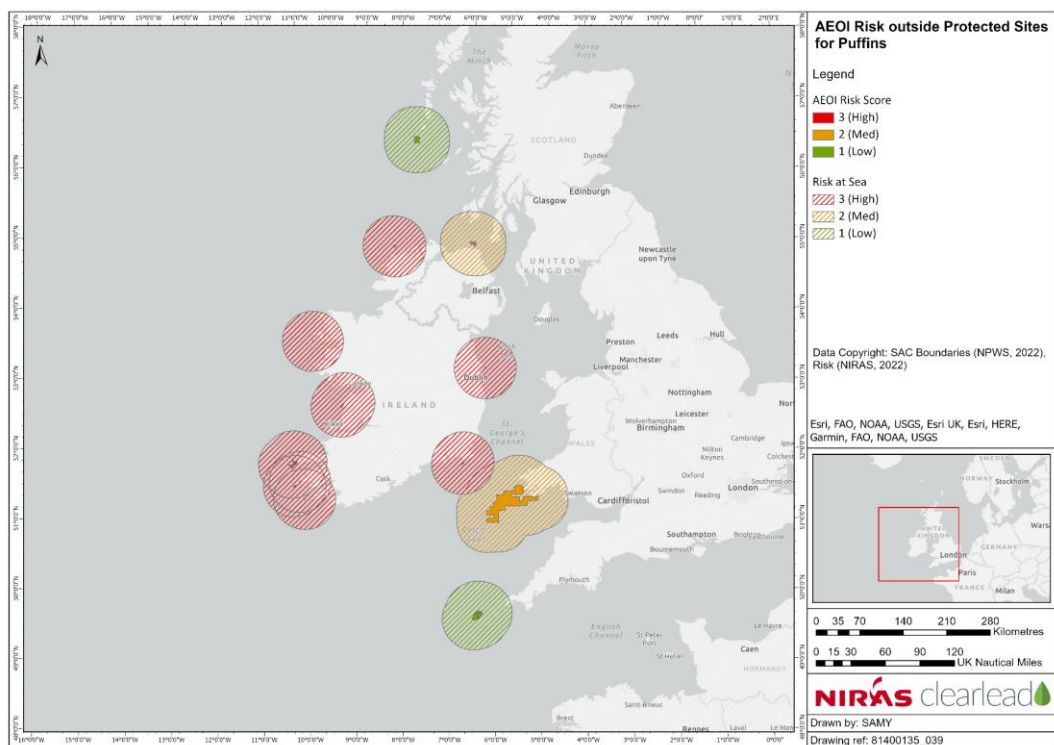
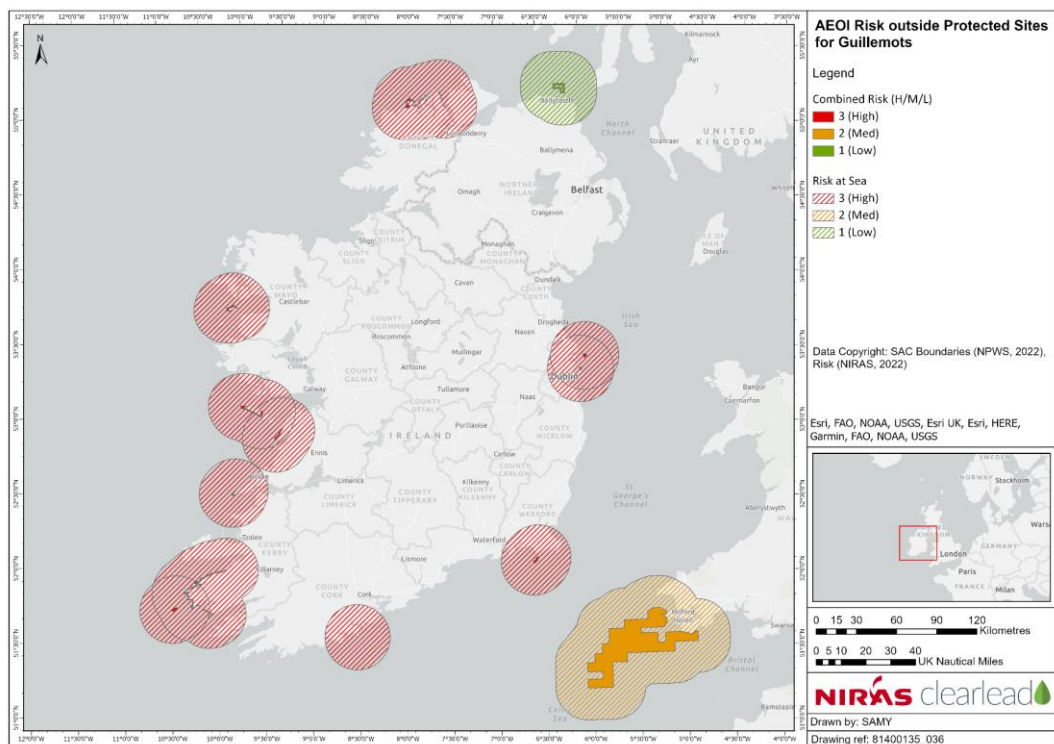
Predicted density distribution of northern gannet in summer (2015 and 2016 combined) (Rogan et al., 2018).

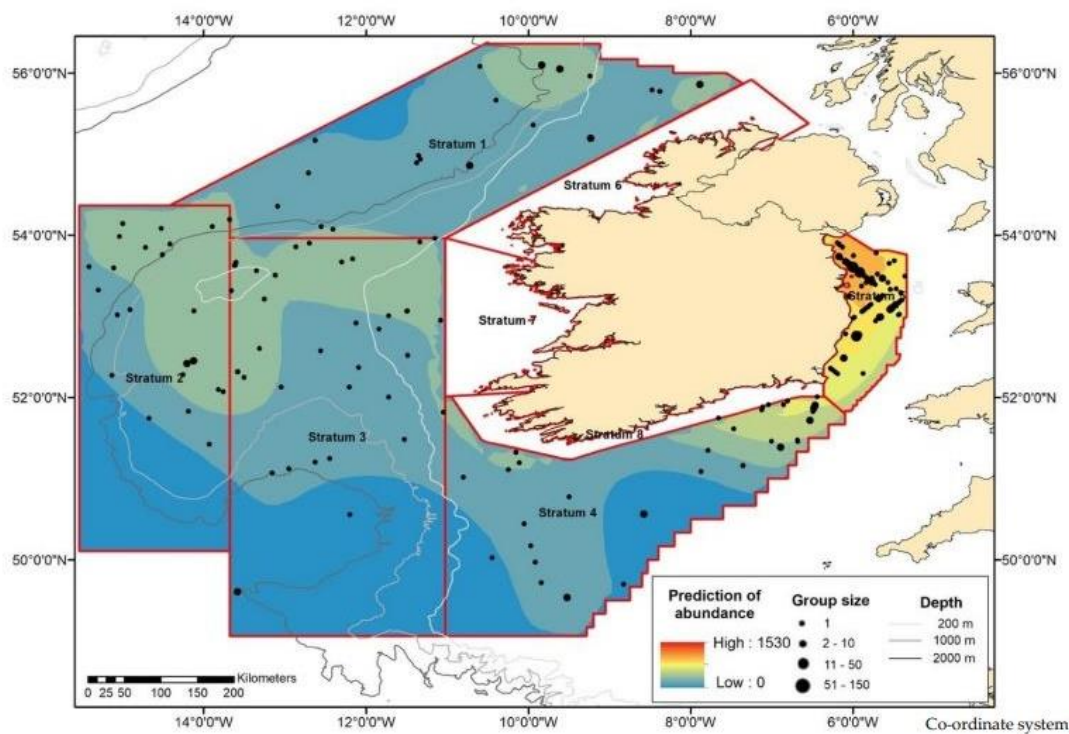




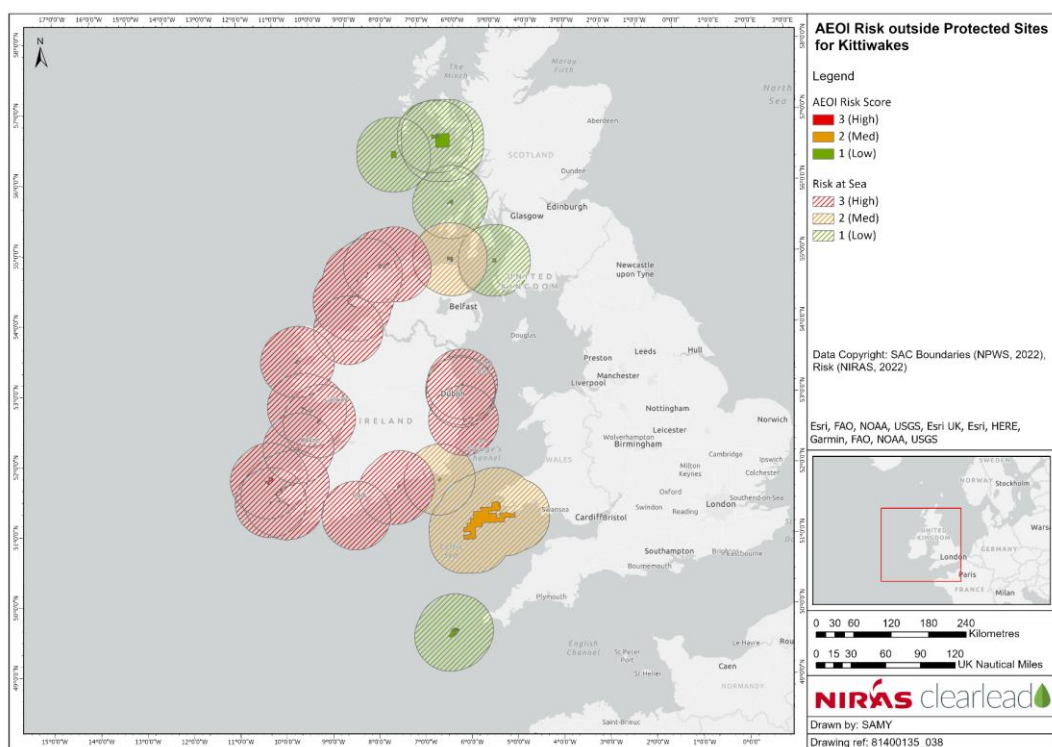
Predicted density distribution of auk species (Razorbills, Common Guillemots and Atlantic puffins) in summer (2015 and 2016 combined) (Rogan et al., 2018).

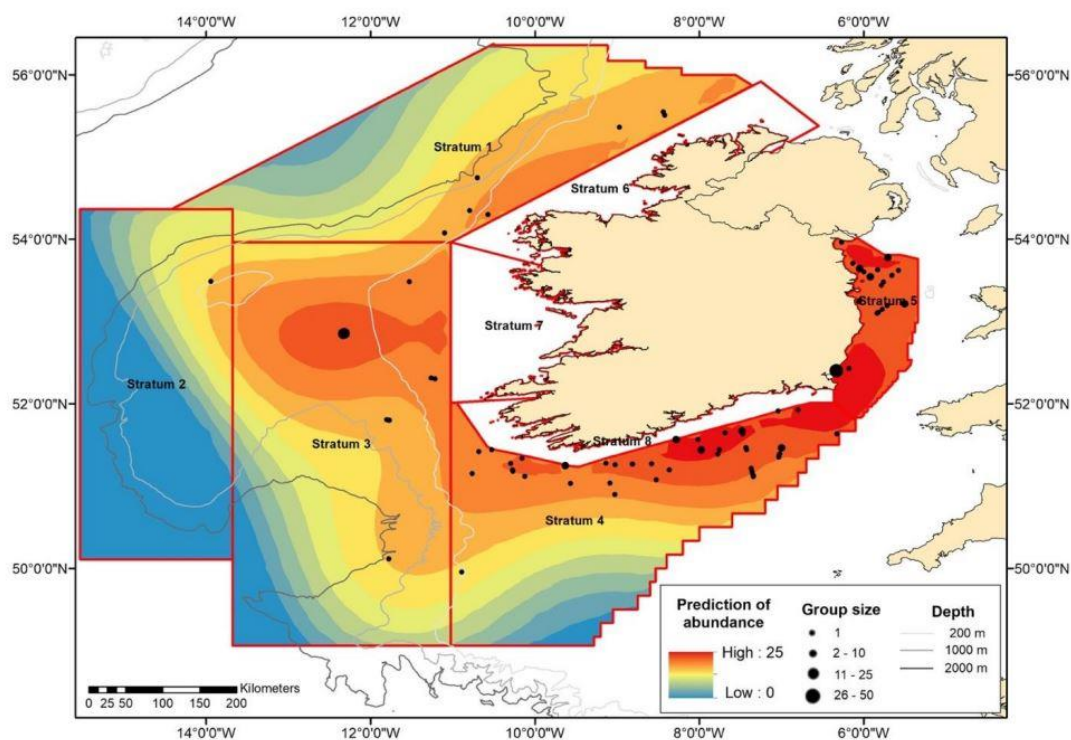




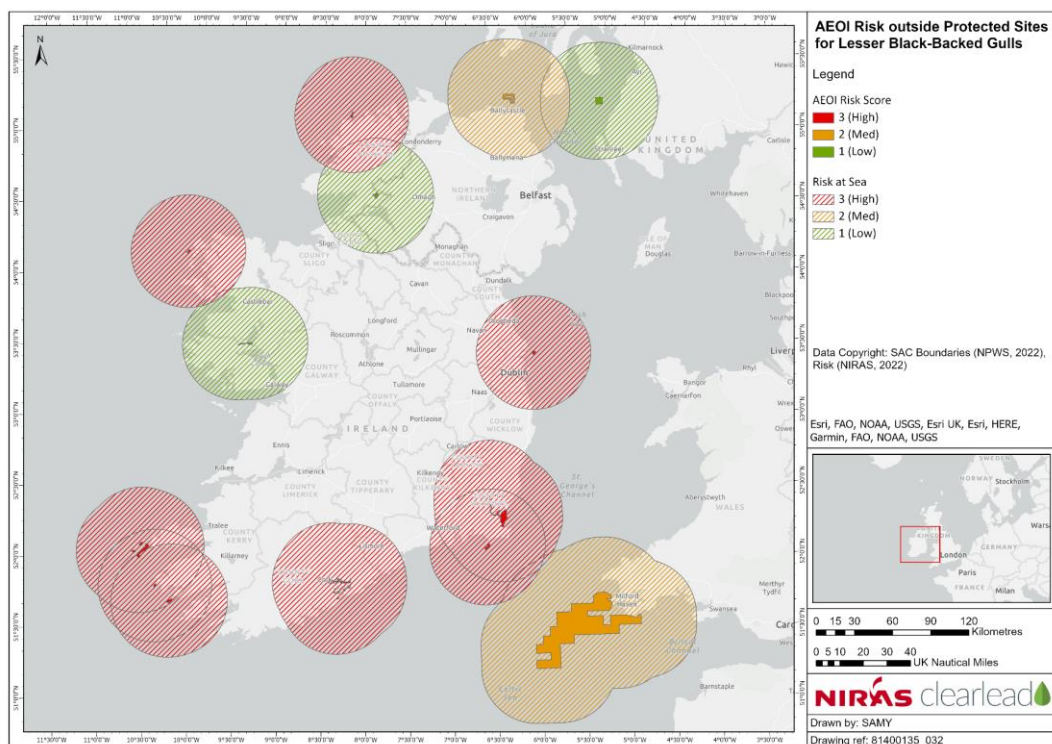


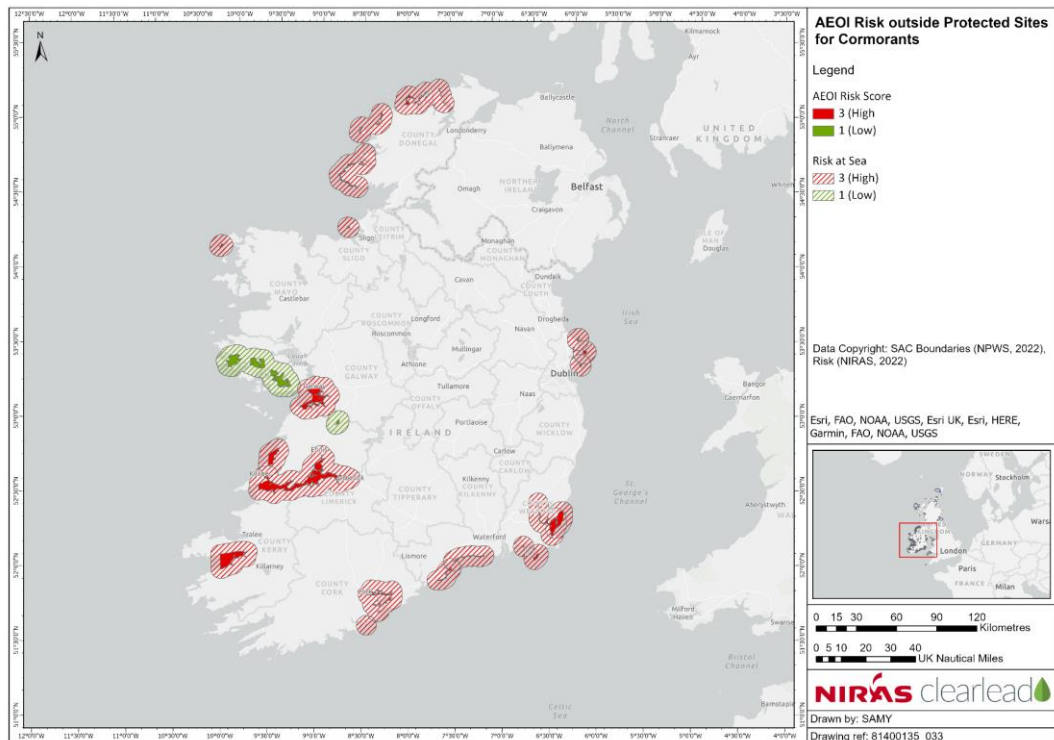
Predicted density distribution of black-legged kittiwake in summer (2015 and 2016 combined) (Rogan et al., 2018).

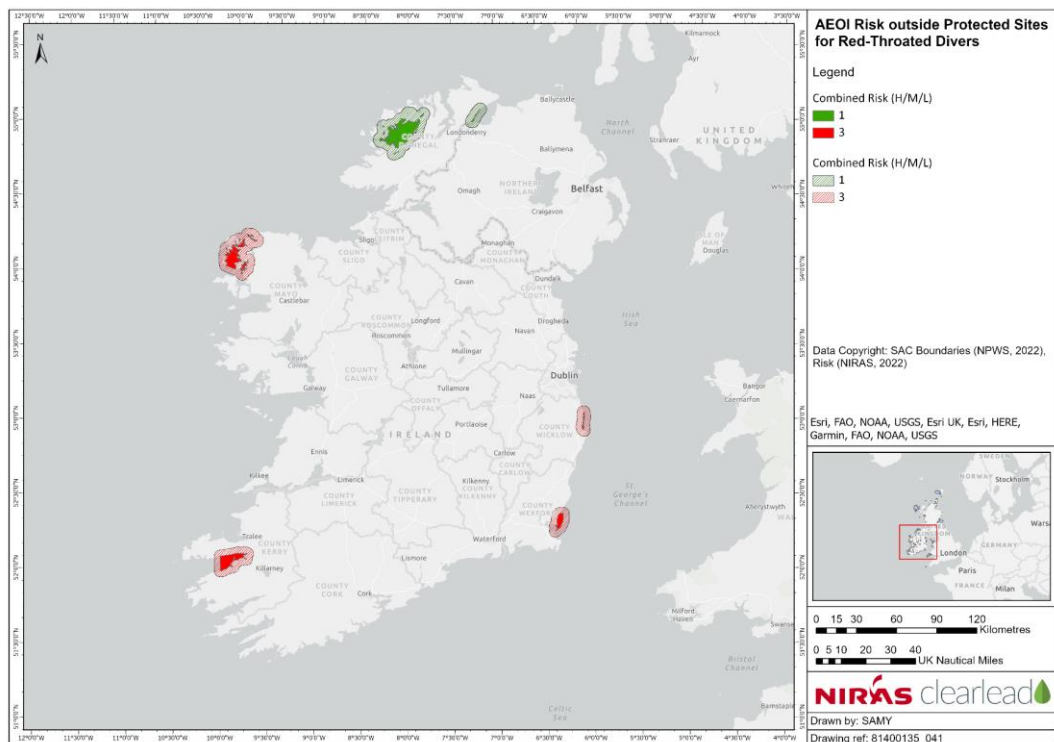


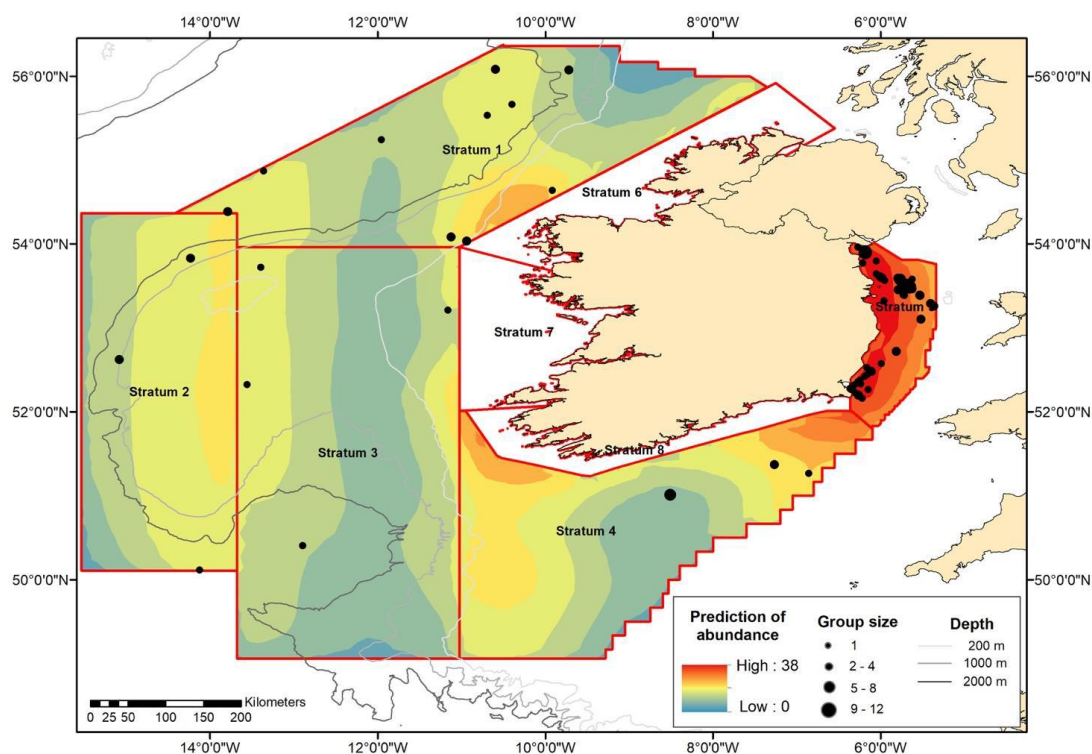


Predicted density distribution of black-backed gulls (all surveys combined) (Rogan et al., 2018).

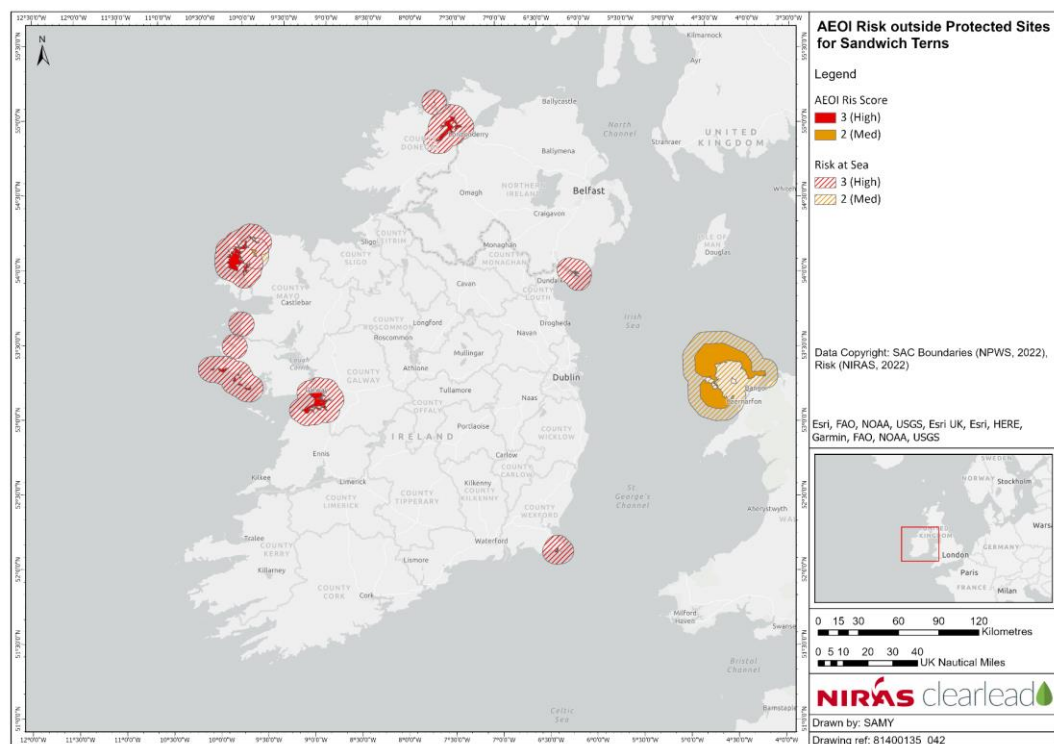


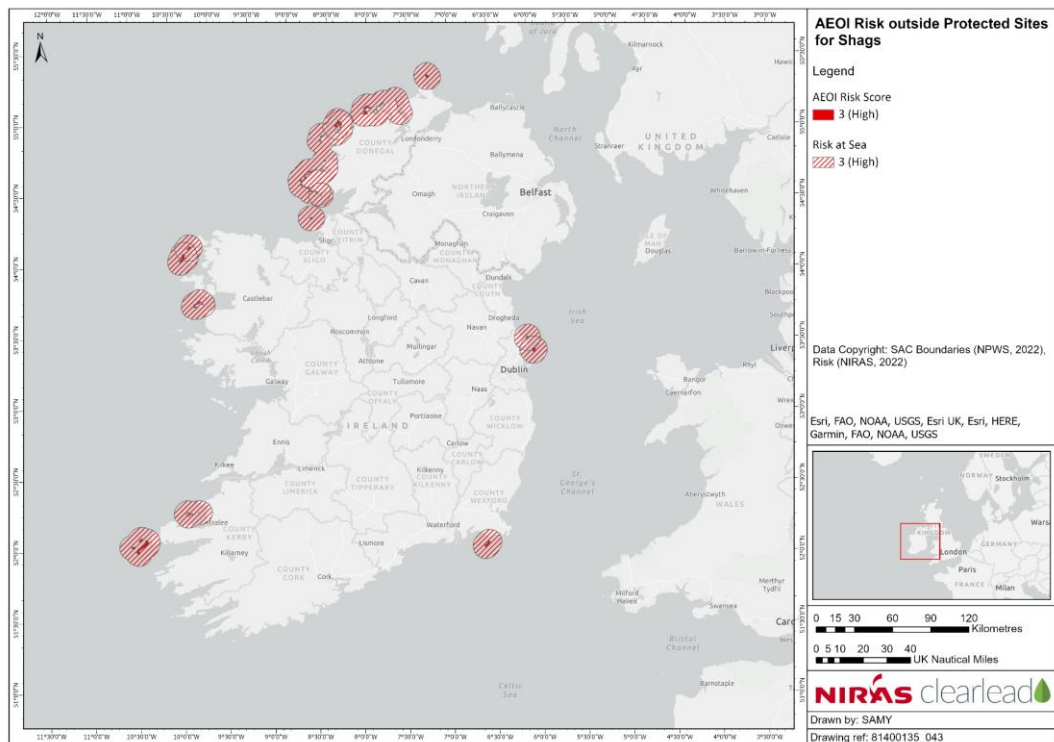




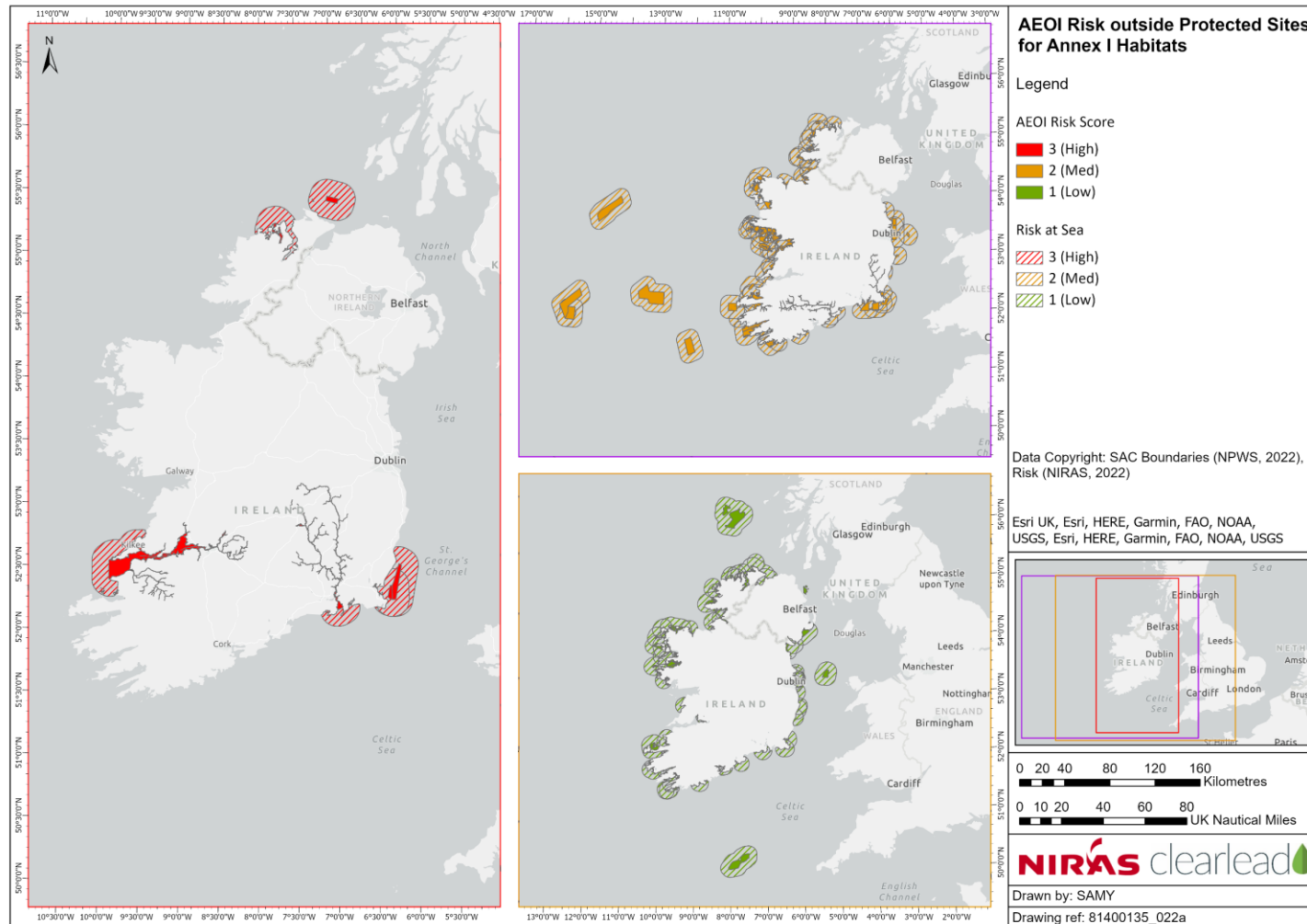


Predicted density distribution of tern species (all surveys combined) (Rogan et al., 2018).

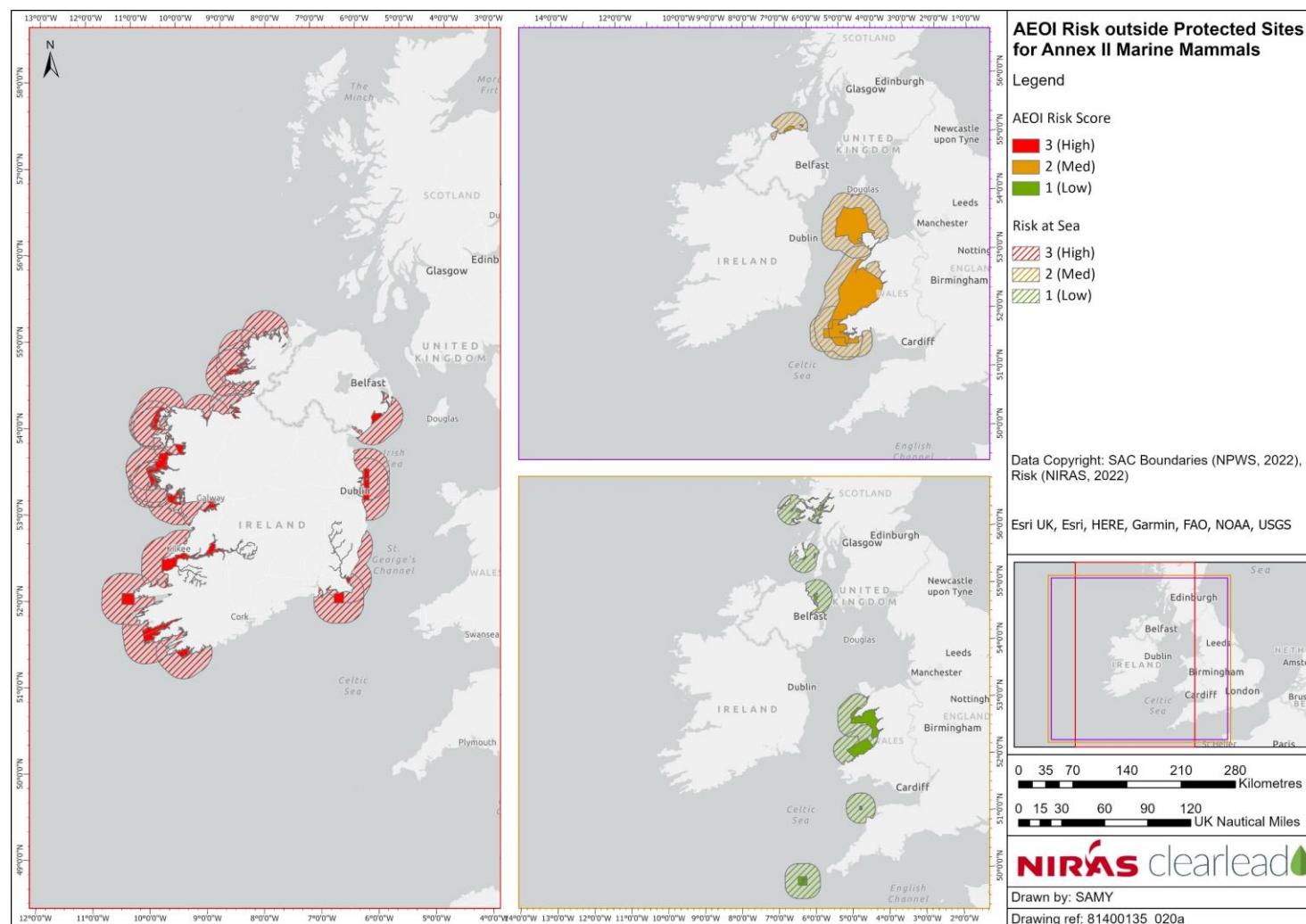




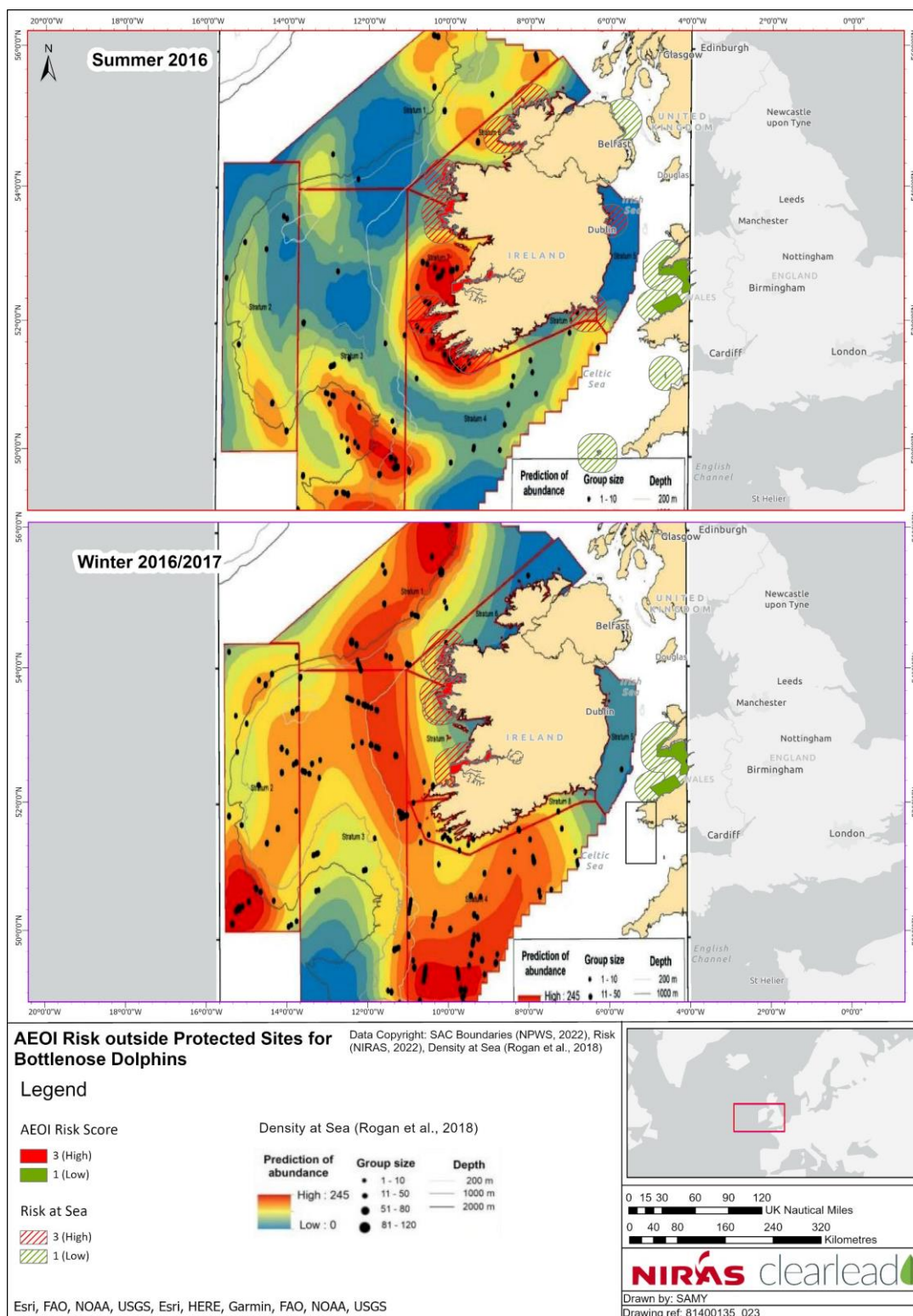
AEOI Risk outside Protected Sites for Annex I Habitats



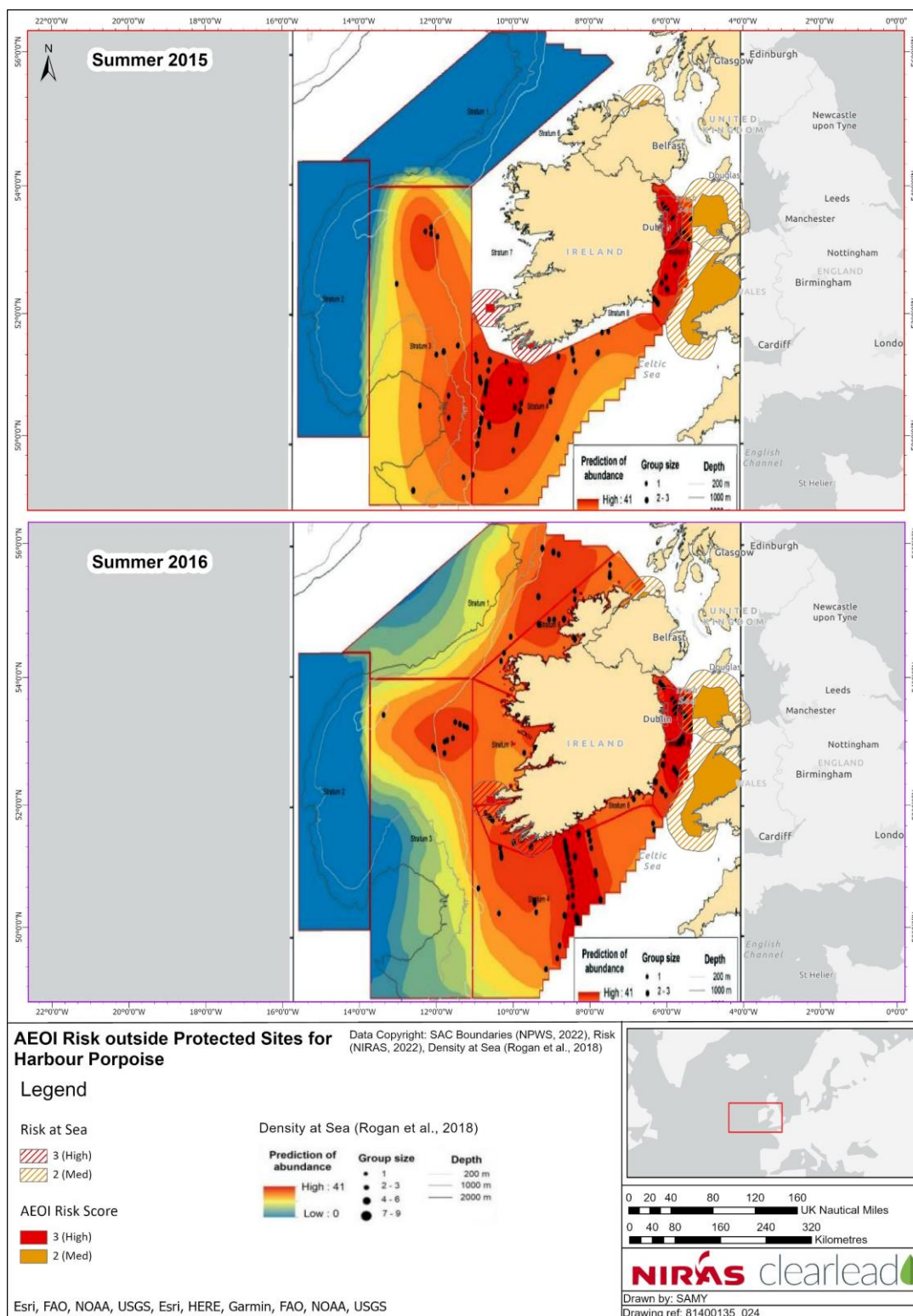
AEOI Risk outside Protected Sites for Annex II Marine Mammals



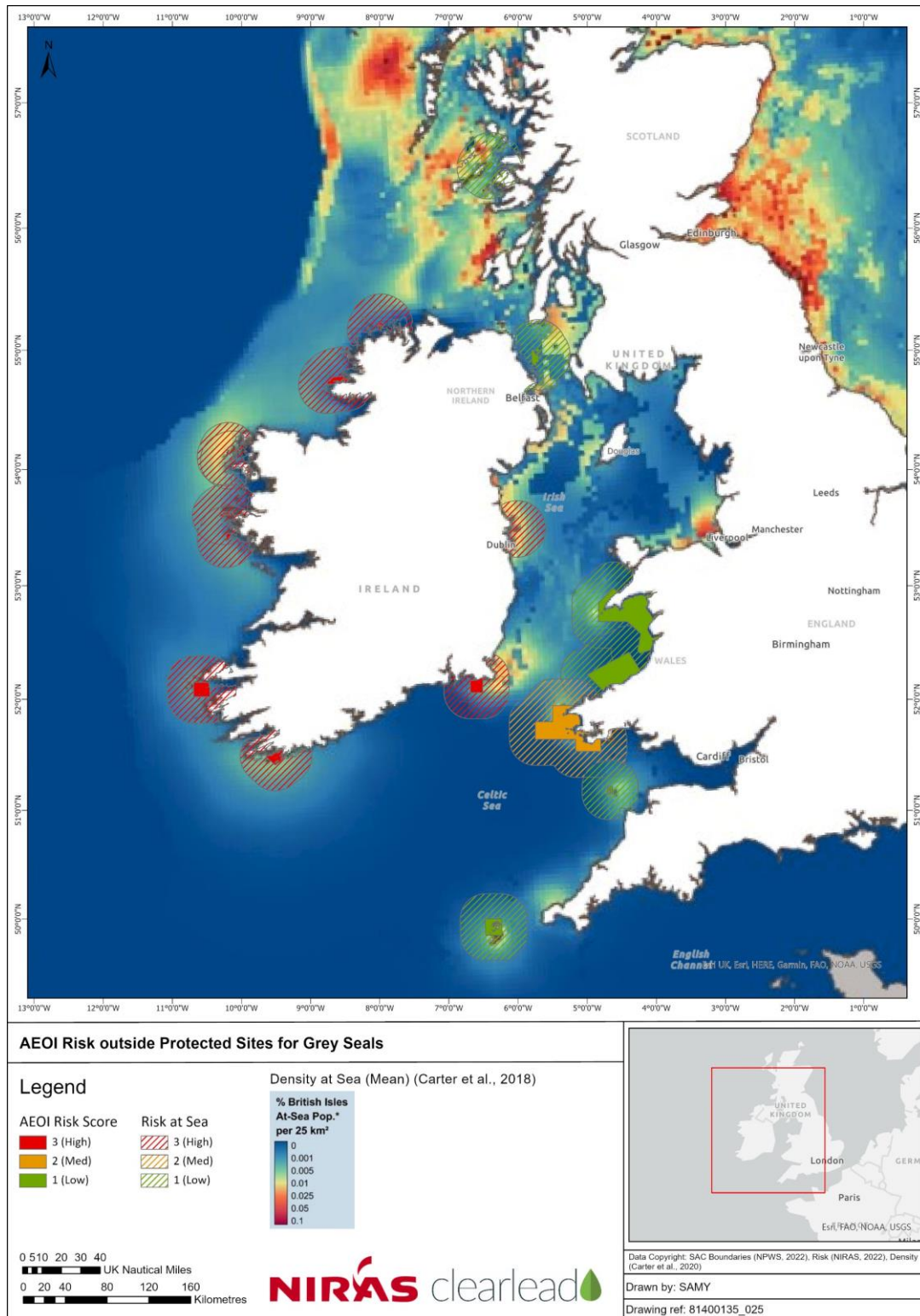
AEOI Risk outside Protected Sites for Bottlenose Dolphins



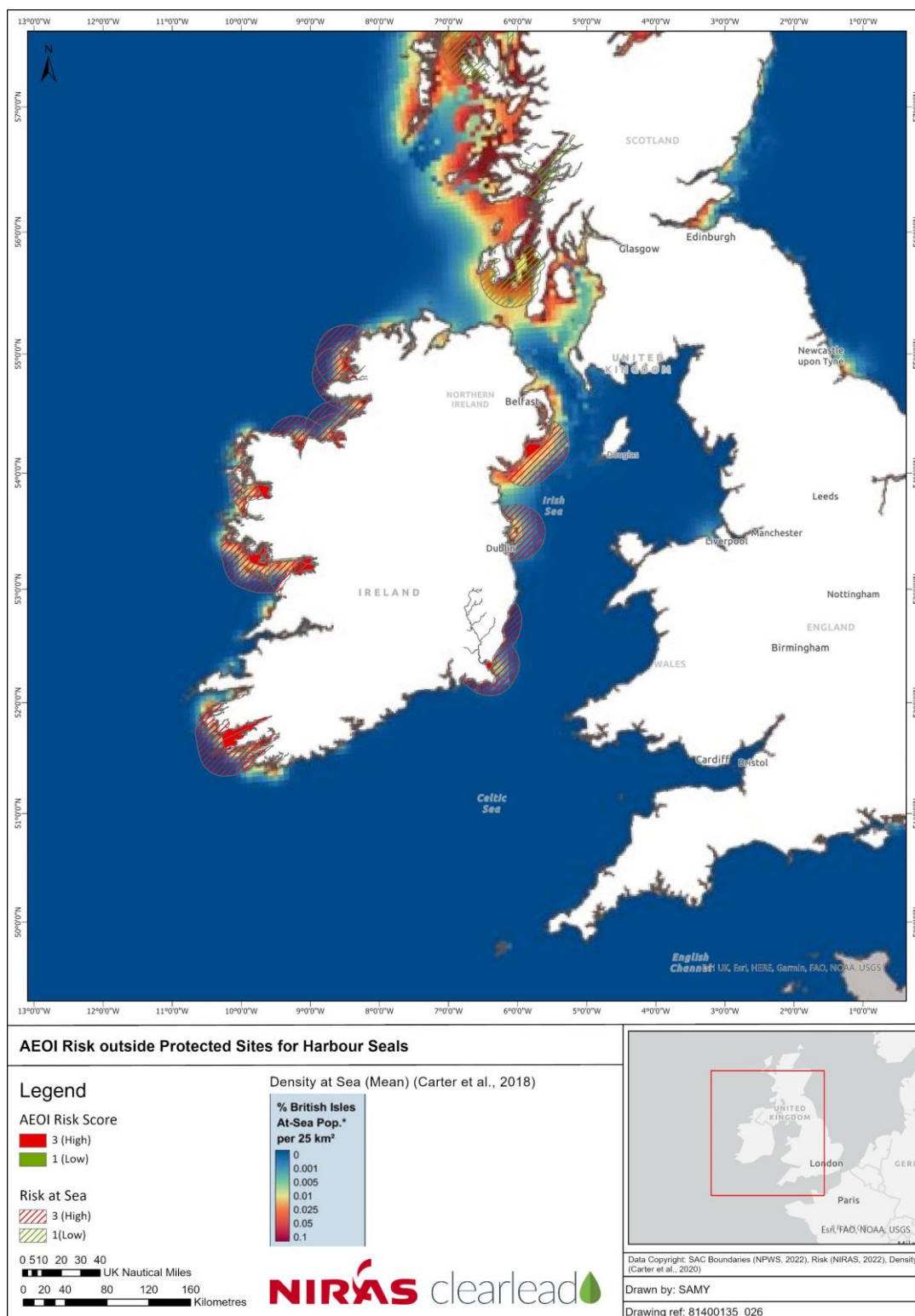
AEOI Risk outside Protected Sites for Harbour Porpoise



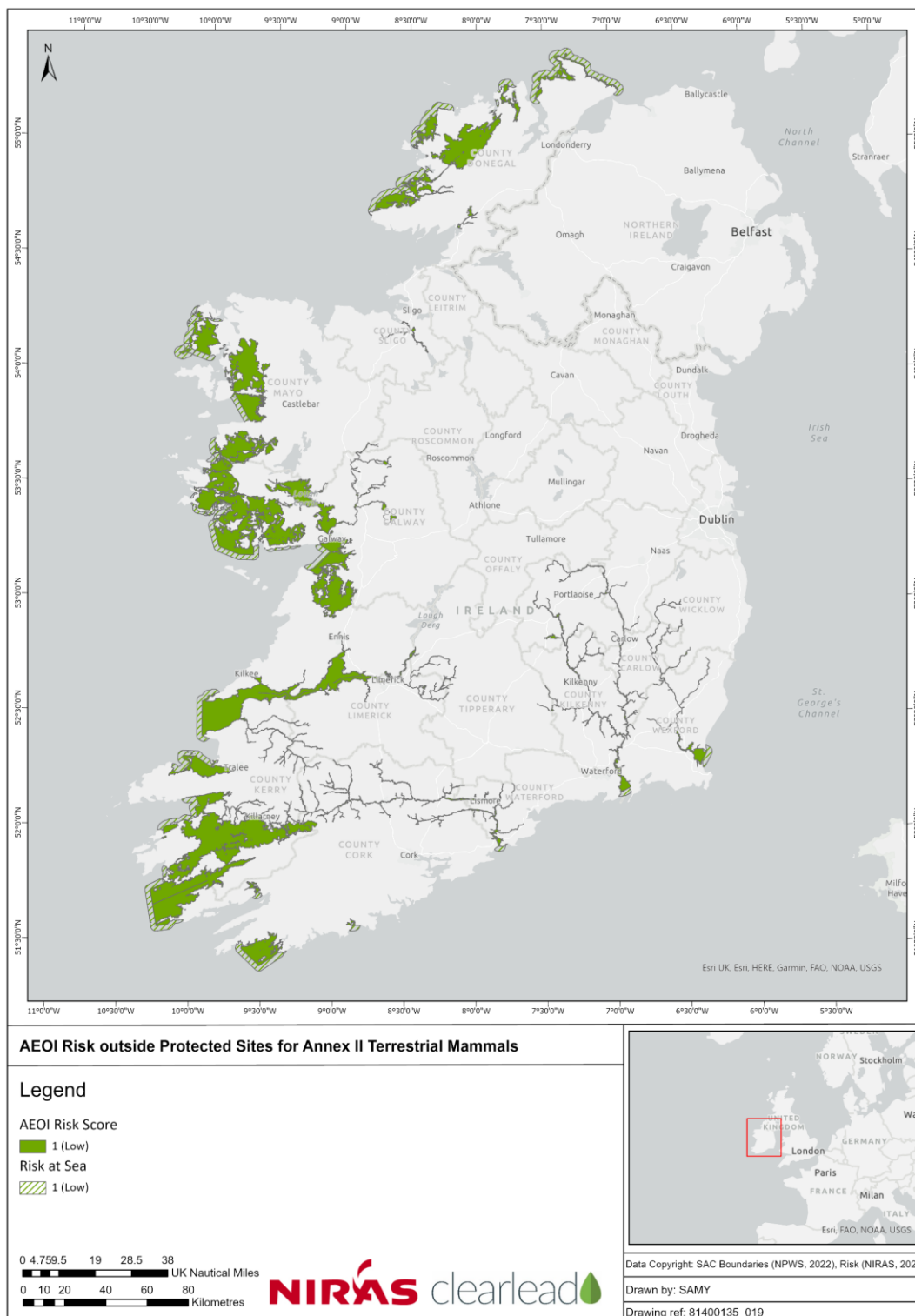
AEOI Risk outside Protected Sites for Grey Seals



AEOI Risk outside Protected Sites for Harbour Seals



AEOI Risk outside Protected Sites for Annex II Terrestrial Mammals



AEOI Risk outside Protected Sites for Annex II Migratory Fish and Pearl Mussel

