Partners in UK offshore wind

MONA OFFSHORE WIND PROJECT

HRA Stage 2 Information to Support an Appropriate Assessment

Part Two: Special Areas of Conservation (SACs) Assessments

Document Number: MOCNS-J3303-RPS-10023

Document Reference: E1.2

APFP Regulations: 5(2)(g)

February 2024

F01

Image of an offshore wind farm

www.morganandmona.com/en

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
F01	Application	RPS	Mona Offshore Wind Ltd	Mona Offshore Wind Ltd	Feb 2024

Prepared by:

RPS

Prepared for:

Mona Offshore Wind Limited.

Contents

Tables

Figures

Supporting Documents

HRA Stage 2 ISAA Part 1 – Introduction (Document reference E1.1)

HRA Stage 2 ISAA Part 3 - SPA Assessments (Document Reference E1.3)

HRA Stage 1 Screening Report (Document Reference E1.4)

HRA Integrity matrices (Document Reference E1.5)

Glossary

Term	Meaning
Annex I habitat	A natural habitat type of community interest, defined in Annex I of the Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (Habitats Directive), whose conservation requires the designation of Special Areas of Conservation (SAC).
Annex II species	Animal or plant species of community interest, defined in Annex II of the Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (Habitats Directive), whose conservation requires the designation of Special Areas of Conservation (SAC).
Applicant	Mona Offshore Wind Limited.
Appropriate assessment	A step-wise procedure undertaken in accordance with Article 6(3) of the Habitats Directive, to determine the implications of a plan or project on a European site in view of the site's conservation objectives, where the plan or project is not directly connected with or necessary to the management of a European site but likely to have a significant effect thereon, either individually or in-combination with other plans or projects.
Benthic ecology	Benthic ecology encompasses the study of the organisms living in and on the sea floor, the interactions between them and impacts on the surrounding environment.
Biotope	The combination of physical environment (habitat) and its distinctive assemblage of conspicuous species.
Competent Authority	The term derives from the Habitats Regulations and relates to the duties which the Habitats Regulations impose on public bodies and individuals. Regulation 6(1) defines competent authorities as "any Minister, government department, public or statutory undertaker, public body of any description or person holding a public office".
Conservation objectives	In its most general sense, a conservation objective is the specification of the overall target for the species and/or habitat types for which a site is designated in order for it to contribute to maintaining or reaching favourable conservation status of the habitats and species concerned, at the national, the biogeographical or the European level.
Cumulative effects	Changes to the environment caused by a combination of present and future projects, plans or activities.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for one or more Nationally Significant Infrastructure Project (NSIP).
Echinoderm	A marine invertebrate of the phylum Echinodermata, such as a starfish, sea urchin, or sea cucumber.
Ensonified	Filled with sound.
Environmental Statement	The document presenting the results of the Environmental Impact Assessment (EIA) process for the Mona Offshore Wind Project.
Epifauna	Organisms living on the surface of the seabed.
European Commission	The executive body of the European Union responsible for proposing legislation, enforcing European law, setting objectives and priorities for action, negotiating trade agreements and managing implementing European Union policies and the budget.
European site	A Special Area of Conservation (SAC), possible SAC (pSAC), or candidate SAC, (cSAC), a Special Protection Area (SPA) or potential SPA (pSPA), a site listed as a site of community importance (SCI).

Term	Meaning
Evidence plan	The Evidence Plan is a mechanism to agree upfront what information the Applicant needs to supply to the Planning Inspectorate as part of the Development Consent Order (DCO) application for the Mona Offshore Wind Project.
Evidence Plan Expert Working Group (EWG)	Expert working groups set up with relevant stakeholders as part of the Evidence Plan process.
Filter feeder	A sub-group of suspension feeding animals that feed by straining suspended matter and food particles from water, typically by passing the water over a specialized filtering structure.
Habitat	The environment that a plant or animal lives in.
Habitats Directive	The Habitats Directive is the short name for European Union Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora. The Directive led to the establishing of European sites and setting out how they should be protected, it also extends to other topics such as European protected species.
Habitats Regulations	The Conservation (Natural Habitats, &c.) Regulations 1994, the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species 2017.
Habitats Regulations Assessment	A process required by the Habitats Regulations of identifying LSEs of a plan or project on a European site and (where LSEs are predicted or cannot be discounted) carrying out an appropriate assessment to ascertain whether the plan or project will adversely affect the integrity of the European site. If adverse effects on integrity cannot be ruled out, the latter stages of the process require consideration of the derogation provisions in the Habitats Regulations.
In-combination effects	The combined effect of the Mona Offshore Wind Project in-combination with the effects from a number of different projects on the same feature/receptor.
Infauna	The animals living in the sediments of the seabed.
Inter-Array Cables	Cables which connect the wind turbines to each other and to the offshore substation platforms. Inter-array cables will carry the electrical current produced by the wind turbines to the offshore substation platforms.
Interconnector Cables	Cables that may be required to interconnect the Offshore Substation Platforms in order to provide redundancy in the case of cable failure elsewhere.
Intertidal area	The area between Mean High Water Springs (MHWS) and Mean Low Water Springs (MLWS).
Landfall	The area in which the offshore export cables make contact with land and the transitional area where the offshore cabling connects to the onshore cabling.
Likely Significant Effect (LSE)	Any effect that may reasonably be predicted as a consequence of a plan or project that may affect the conservation objectives of the features for which the European site was designated, but excluding trivial or inconsequential effects. A likely effect is one that cannot be ruled out on the basis of objective information. A 'significant' effect is a test of whether a plan or project could undermine the site's conservation objectives.
Littoral	Residing within the littoral zone which extends from the high water mark, which is rarely inundated, to shoreline areas that are permanently submerged.

Term	Meaning
Marine licence	The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities. Section 149A of the Planning Act 2008 allows an applicant for a DCO to apply for 'deemed marine licences' as part of the DCO process. In addition, licensable activities within 12nm of the Welsh coast require a separate marine licence from NRW. A separate marine licence is required for the offshore export cables and related works located within and between the Mona Array Area and the landfall at MHWS.
Masking	Masking occurs when sound emissions interfere with a marine animal's ability to hear a sound of interest.
Maximum Design Scenario (MDS)	The scenario within the design envelope with the potential to result in the greatest impact on a particular topic receptor, and therefore the one that should be assessed for that topic receptor.
Mona 440 kV Cable Corridor	The corridor from the Mona onshore substation to the National Grid substation.
Mona Array Area	The area within which the wind turbines, foundations, inter-array cables, interconnector cables, offshore export cables and offshore substation platforms (OSPs) forming part of the Mona Offshore Wind Project will be located.
Mona Offshore Cable Corridor and Access Areas	The corridor located between the Mona Array Area and the landfall up to Mean High Water Springs (MHWS), in which the offshore export cables and the offshore booster substation will be located.
Mona Offshore Wind Project	The Mona Offshore Wind Project is comprised of both the generation assets and offshore and onshore transmission assets and associated activities.
Mona Onshore Cable Corridor	The corridor located between Mean High Water Springs (MHWS) at the landfall and the Mona onshore substation, in which the onshore cable route will be located.
Mona Proposed Onshore Development Area	The area in which the landfall, onshore cable corridor, onshore substation, mitigation areas, temporary construction facilities (such as access roads and construction compounds), and the connection to National Grid infrastructure will be located.
Mona scoping report	The Mona Scoping Report that was submitted to The Planning Inspectorate (on behalf of the Secretary of State) and Natural Resource Wales (NRW) for the Mona Offshore Wind Project.
Offshore Substation Platform (OSP)	The offshore substation platforms located within the Mona Array Area will transform the electricity generated by the wind turbines to a higher voltage allowing the power to be efficiently transmitted to shore.
Oligotrophic	A deficiency of plant nutrients that is usually accompanied by an abundance of dissolved oxygen.
Polychaete	A class of segmented worms often known as bristleworms.
Relevant Local Planning Authority	The Relevant Local Planning Authority is the Local Authority in respect of an area within which a project is situated, as set out in Section 173 of the Planning Act 2008. Relevant Local Planning Authorities may have responsibility for discharging requirements and some functions pursuant to the Development Consent Order, once made.

Term	Meaning
Special Area of Conservation (SAC)	Special Areas of Conservation (SACs) are areas designated under the European Union (EU) Habitat's Directive to help conserve certain plant and animals species listed in the Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended). The listed habitat types and species are those considered to be most in need of conservation at a European level (excluding birds).
Species	A group of living organisms consisting of similar individuals capable of exchanging genes or interbreeding.
Statutory consultee	Organisations that are required to be consulted by an applicant pursuant to the Planning Act 2008 in relation to an application for development consent. Not all consultees will be statutory consultees (see non-statutory consultee definition).
Sublittoral	Area extending seaward of low tide to the edge of the continental shelf.
Subtidal	Area extending from below low tide to the edge of the continental shelf.
Suspended sediment concentration	Suspended sediment concentration (SSC), which is defined as the total value of both mineral and organic material carried in suspension by a volume of water.
The Planning Inspectorate	The agency responsible for operating the planning process for Nationally Significant Infrastructure Projects (NSIPs).
The Secretary of State for Energy Security and Net Zero	The decision maker with regards to the application for development consent for the Mona Offshore Wind Project.
Tidal excursion	The horizontal distance over which a water particle may move during one cycle of flood and ebb.
Wind turbines	The wind turbine generators, including the tower, nacelle and rotor.

Acronyms

Acronym	Description
AC	Alternating Current
ADD	Acoustic Deterrent Devices
AfL	Agreement for Lease
CCW	Countryside Council Wales
CEA	Cumulative Effects Assessment
CMS	Construction Method Statement
CPT	Cone Penetration Test
cSAC	Candidate Special Area of Conservation
CSIP	Cable Specification and Installation Plan
CTV	Crew Transfer Vessel
DAERA	Department for Environment, Food and Rural Affairs

Acronym	Description
DCO	Development Consent Order
DDV	Drop Down Video
EDR	Effective Deterrence Range
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EMP	Environmental Management Plan
EMU	Ecological Marine Unit
EPS	European Protected Species
EWG	Expert Working Group
FCS	Favourable Conservation Status
GSRP	Grey Seal Reference Population
HF	High Frequency
HRA	Habitats Regulations Assessment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IEF	Important Ecological Feature
IMO	International Maritime Organisation
INNS	Invasive Non-Native Species
iPCoD	Interim Population Consequences of Disturbance Model
ISAA	Information to Support an Appropriate Assessment
IWC	International Whaling Commission
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect
MarESA	Marine Evidence Based Sensitivity Assessment
MBES	Multi-beam Echo-sounder
MDS	Maximum Design Scenario
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMMP	Marine Mammal Mitigation Plan
MMO	Marine Management Organisation
MMOs	Marine Mammal Observers
MPCP	Marine Pollution Contingency Plan
MU	Management Unit
NAS	Noise Abatement System
NEQ	Net Explosive Quantity

Acronym	Description
NIEA	Northern Ireland Environment Agency
NRW	National Resources Wales
OSP	Offshore Substation Platform
OSPAR	Oslo-Paris
PAM	Passive Acoustic Monitoring
PCW	Phocid Carnivore in Water
PEIR	Preliminary Environmental Information Report
pSAC	Possible Special Area of Conservation
pSPA	Potential Special Protection Area
PTS	Permanent Threshold Shift
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation
SBES	Single Beam Echosounder
SBP	Sub-Bottom Profilers
SCANS	Small Cetacean Abundance in the North Sea
SCI	Site of Community Importance
SCOS	Special Committee on Seals
SEL	Sound Exposure Level
SEL_{cum}	Cumulative Sound Exposure Level
SMRU	Sea Mammal Research Unit
SNCB	Statutory Nature Conservation Bodies
SNH	Scottish Natural Heritage
SOV	Service Operation Vessel
SPL	Sound Pressure Level
SPL_{pk}	Peak Sound Pressure Level
SSC	Suspended Sediment Concentration
SSS	Sidescan Sonar
SSSI	Site of Special Scientific Interest
TCE	The Crown Estate
TTS	Temporary Threshold Shift
TWT	The Wildlife Trust
UHRS	Ultra High Resolution Seismic
UXO	Unexploded Ordnance
WFD	Water Framework Directive
ZoI	Zone Of Influence

Units

Unit	Description
%	Percentage
cm	Centimetres
dB	Decibel
GWh	Gigawatt hour
Hz	Hertz
kg	kilogram
km	Kilometres
km^2	Square kilometres
kJ	Kilojoule
kV	Kilovolts
m	Metre
m/s	Metres per second
m^2	Square metres
m^3	Cubed metres
mG	Milligauss
Mg/l	Milligrams per litre
Ml/d	Megalitres per day
mm	Millimetres
MW	Megawatt
rms	Route mean square
^oC	Degrees centigrade
µPa	Micro Pascal

1 Habitats Regulations Assessment Stage 2 Information to Support an Appropriate Assessment – Part 2: SAC assessments

1.1 Introduction

1.1.1 Purpose of the Information to Support an Appropriate Assessment

1.1.1.1 This Information to Support an Appropriate Assessment (ISAA) has been prepared by RPS, on behalf of the Applicant, to support the Habitats Regulations Assessment (HRA) under Section 63 of the Conservation of Habitats and Species Regulations 2017 as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 and Section 28 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 for the Mona Offshore Wind Project.

1.1.1.2 The HRA Stage 2 ISAA builds upon the HRA Stage 1 Screening Report (Document Reference E1.4) and considers whether the Mona Offshore Wind Project could have adverse effects, either alone or in-combination with other plans or projects, on the integrity of any European site. This report will provide the Competent Authority with the information required to undertake an HRA Stage 2 Appropriate Assessment, see HRA Stage 2 ISAA Part 1 – Introduction (Document Reference E1.1) for more detail on the HRA process.

1.1.1.3 The scope of this HRA Stage 2 ISAA covers all relevant European sites and designated features where a Likely Significant Effect (LSE) has been identified due to the potential impacts arising from the Mona Offshore Wind Project. This includes both 'offshore' European sites and features (seaward of Mean High Water Springs (MHWS)), and potential impacts of offshore and intertidal infrastructure seaward of MHWS and onshore infrastructure on 'onshore' European sites (landward of Mean Low Water Springs (MLWS)).

1.1.2 Structure of the ISAA

1.1.2.1 As detailed in section 1.2.6 of the HRA Stage 2 ISAA Part 1 – Introduction (Document Reference E1.1), for clarity and ease of navigation, the ISAA is structured and reported in several 'Parts', as follows:

- HRA Stage 2 ISAA Part 1 – Introduction (Document Reference E1.1)
- HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2) (this document)
- HRA Stage 2 ISAA Part 3 – SPA assessments (Document Reference E1.3).

1.1.2.2 Each 'Part' of the ISAA is supported by a series of topic specific appendices and relevant documentation including European site summaries.

1.1.3 Structure of this document

1.1.3.1 This document constitutes the HRA Stage 2 ISAA Part 2 - SAC assessments and provides consideration of the implications of the Mona Offshore Wind Project on Special Area of Conservation (SACs).

1.1.3.2 This document is structured as follows:

- Section 1.1 : Introduction – this section details the purpose and structure of the ISAA
- Section 1.2: Consultation – this section provides a summary of the consultation undertaken with regards to the qualifying features of SACs, the responses provided, and how these have been addressed within this Part of the ISAA
- Section 1.3: Summary of HRA Stage 1 Screening – this section presents the SPAs potentially at risk of LSE and the features and pathways for which HRA Stage 2 ISAA is required, both alone and in combination.

1.1.3.3 Information for the HRA Stage 2 Appropriate Assessment is then provided in:

- Section 1.4: Information to inform the Appropriate Assessments, including maximum design scenarios, measures adopted as part of the Mona Offshore Wind Project, an outline of the approach taken to baseline data, conservation objectives, and the in-combination assessment
- Section 1.5: Assessment of potential adverse effect on integrity on European sites designated for Annex I habitats, alone and in-combination
- Section 1.5.4.41: Assessment of potential adverse effect on integrity on European sites designated for Annex II diadromous fish, alone and in-combination
- Section 1.7: Assessment of potential adverse effect on integrity on European sites designated for Annex II marine mammals, alone and in-combination
- Section 1.8: Summary – the conclusions of section 1.5 are summarised for clarity and the overall finding of this Part of the ISAA is provided.

1.1.3.4 The scope of this Part of the ISAA covers all relevant SACs and relevant qualifying interest features where LSEs have been identified due to impacts arising from the Mona Offshore Wind Project. This report will provide the Competent Authority with the information required to undertake an HRA Stage 2 Appropriate Assessment (see HRA Stage 2 ISAA Part 1 – Introduction (Document reference E1.1) for more detail on the HRA process).

1.2 Consultation

1.2.1.1 Consultation has been undertaken with statutory stakeholders during key stages of the Mona Offshore Wind Project with regards to the relevant Annex I habitat and Annex II fish and marine mammal features of SACs/Sites of Community Importance (SCIs).

1.2.1.2 A summary of the details of key consultation undertaken to date which is relevant to the HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2), the Mona Offshore Wind Project and the HRA process in general, is presented in Table 1.1.

Table 1.1: Summary of key consultation relevant to the HRA Stage 2 ISAA Part 2 – SAC assessments for the Mona Offshore Wind Project.

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
Steering Group				
July 2022	NRW, Natural England, MMO, JNCC and Planning Inspectorate	Steering Group meeting	• LSE Methodology circulated to members of the Steering Group to gain feedback and agreement on the methodology to be used • Methodology approach presented included the process for identifying European sites and species where there is the potential for a LSE. The process and associated buffers used to screen in sites was presented for Annex I habitats (offshore and coastal), Annex II diadromous fish, Annex II marine mammals, Annex I habitats (onshore), Annex II species (onshore) and ornithology (onshore and offshore) National Resources Wales (NRW) responses: • NRW agreed with the LSE Screening Methodology criteria that have been provided with respect to Marine and Coastal Physical Processes and benthic ecology • NRW noted that with reference to The Crown Estate Round 4 HRA principles, specifically section 3.6.17 – 3.6.23 migratory fish and freshwater pearl mussel, and Figure 3.1 Proposed regional boundaries for Atlantic salmon *Salmo salar* (from ABPmer (2014), cited in ABPmer (2018)), that a 100 km buffer is used for most diadromous fish except Atlantic salmon and freshwater pearl mussel, which use a 'Regional Areas Approach' • NRW advised that The Crown Estate Round 4 HRA principles are adopted in their original form, or that further justification is provided if they are not Joint Nature Conservation Committee (JNCC) responses: • JNCC were content with the LSE Screening Methodology with respect to Annex I habitats offshore and Annex II marine mammals.	Feedback received on the methodology has been considered and incorporated into the HRA Stage 1 Screening Report (Document Reference E1.4) in section 1.3. The Crown Estate Round 4 HRA principles have been adopted in their original form within the HRA Stage 1 Screening Report (Document Reference E1.4), for example for Annex I habitats a spatial overlap has been used to screen for direct effects whilst a 15 km buffer has been used to screen for indirect effects. For Annex II diadromous fish a 100 km buffer has been used for all features, other than Atlantic salmon where a 'regional areas approach' has been used, see Figure 1.11. For Annex II marine mammals the Crown Estate Round 4 HRA principles have not been adopted in their original form, following advice from NRW requesting the use of marine mammal management units (MU) and the OSPAR (Oslo-Paris) Region III Interim MU (for grey seal) to identify European sites with Annex I marine mammal management units with the potential for connectivity to the Mona Offshore Wind Project. For more information see section 1.3 of the HRA Stage 1 Screening Report (Document Reference E1.4).

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
February 2023	NRW, Natural England, MMO, JNCC and Planning Inspectorate	Steering Group meeting	• Overview of the Maximum Design Scenario (MDS) for overlap of the Mona Offshore Cable Corridor and Access Areas with the Menai Strait and Conwy Bay/Y Fenai a Bae SAC, and cable installation methods, sandwave clearance and cable protection measures associated with the Mona Offshore Cable Corridor and Access Areas • NRW's response to this meeting stated the following: – Regarding the proposed cable route through the Menai Strait and Conwy Bay/Y Fenai a Bae SAC, it appears from the feature layers that the cable route may potentially overlap and/or be in very close proximity to Annex I Reef, a feature designated for the Menai Strait and Conwy Bay SAC. NRW (A) advise that the cable route is micro-sited to avoid impacts to any potentially sensitive features within the SAC. Ideally, NRW (A) would advise avoidance of the Menai Strait and Conwy Bay SAC if there remains scope to do so. NRW (A) also advise that no cable rock protection is placed within the SAC.	As outlined in section 1.5.4.41, the Mona Offshore Cable Corridor and Access Areas does not overlap with any Annex I features of the Menai Strait and Conwy Bay/Y Fenai a Bae SAC. The Mona Offshore Wind Project has implemented various measures which will reduce the potential for impacts to Annex I reef features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC which are located at least 2.4 km from the Mona Offshore Cable Corridor and Access Areas. These measures adopted as part of the Mona Offshore Wind Project include minimising cable protection within the Menai Strait and Conwy Bay/Y Fenai a Bae SAC and ensuring that no sandwave clearance will be carried out within the Menai Strait and Conwy Bay/Y Fenai a Bae SAC. These measures adopted as part of the Mona Offshore Wind Project are listed in full within Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (Document reference F2.2) and also included in Table 1.5, Table 1.9, Table 1.13, Table 1.16 and Table 1.18 of this HRA Stage 2 ISAA.
October 2023	NRW, Natural England, MMO and JNCC	Steering Group meeting	• In response to concerns from stakeholders resulting from underwater sound associate with piling for bottlenose dolphin SACs the Applicants suggest a Piling Strategy (as per Beatrice, Seagreen Alpha and Bravo, Moray East and Neart na Gaoithe offshore wind farms) to be secured through the Development Consent Order (DCO) • The Piling Strategy will set out the detailed project design prior to construction compared to the application for consent, considering: – Number of foundations requiring piling – Refinement of hammer energies and durations – Further information on environmental receptors.	Project refinements and potential mitigation options will be considered within the Underwater sound management strategy that includes consideration of Noise Abatement Systems (NAS) as part of mitigation options, which will be developed in accordance with the Outline underwater sound management strategy (Document Reference J16), will be made as part of a stepped strategy post consent and following the mitigation hierarchy - avoid, reduce, mitigate. The Underwater sound management strategy (Document Reference J16) will be secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence and will be developed post-application through discussion and consultation with the licensing authority and Statutory Nature Conservation Bodies (SNCBs).

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			– Further information on what cumulative projects are piling • Based on the detailed project design and updated environmental sensitivities, the risk of effects would be reconsidered post consent to agree with Licensing Authority what mitigation and/or management measures would be required. The options may include: – Measures to minimise injury, e.g. soft starts, pre piling searches, ADDs etc. – Spatial restrictions – Noise abatement – Other measures as may be required.	The Applicant will continue to explore options for mitigating underwater sound post consent, at a time when more detailed information is available (i.e. geotechnical data) and where further refinements to the Mona Offshore Wind Project, through detailed design, have been made on this basis. Use of sound reduction or NAS will be considered as an option post consent and following the mitigation hierarchy - avoid, reduce, mitigate. Consequently, if NAS is required a detailed exploration of available technologies will be undertaken and information presented to demonstrate how such technology would contribute to the reduction in underwater sound from piling.
Expert Working Groups				
Marine mammals				
December 2021	NRW, Natural England, MMO, JNCC, Cefas and The Wildlife Trusts (TWT).	Expert Working Group 01 (EWG01) meeting	• Position on the use of marine mammal Management Units (MUs) for impact assessment or screening, and advice on applying these marine mammal MUs during Appropriate Assessment was provided in NRW's position statement.	Marine mammal MUs, including the OSPAR III Region (for grey seals) have been used when screening for LSE in the HRA Stage 1 Screening Report (Document Reference E1.4).
July 2022	NRW, Natural England, MMO, JNCC, Cefas and TWT.	EWG02 meeting	• LSE Methodology presented and discussed to the EWG for agreement on the methodology to be used.	Feedback on the LSE Methodology has been incorporated into HRA Stage 1 Screening Report (Document Reference E1.4). and this HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2). Marine mammal MUs, including the OSPAR III Region (for grey seals) have been used when screening for LSE in the HRA Stage 1 Screening Report (Document Reference E1.4).
November 2022	NRW, Natural England, MMO, JNCC,	EWG03 meeting	• Approach to HRA Screening with regard to the process and foraging ranges/MUs used to identify relevant sites and species.	The use of marine mammal MUs were used to identify sites with the potential for connectivity with the Mona Offshore Wind Project in section 1.3.4 of the HRA Stage 1 Screening and European sites within the relevant MUs where a

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
	Cefas and TWT.			potential LSE was identified have been brought through to this HRA Stage 2 ISAA.
June 2023	NRW, Natural England, MMO, JNCC, Cefas and TWT.	EWG04 meeting	• Reference populations and densities • Outline of the approach to Interim Population Consequences of Disturbance (iPCoD) modelling for the Mona Offshore Wind Project alone and in-combination.	The agreed reference populations, densities and results of iPCoD modelling have been used when carrying out assessment of impacts for Annex II marine mammals section 1.7 of this HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2).
July 2023	NRW, Natural England, MMO, JNCC, Cefas and TWT.	EWG05 meeting	• Summary of the main section 42 consultation relevant to marine mammals and how this will be addressed moving from Preliminary Environmental Information Report (PEIR) to the application for consent • Discussion on use of the Effective Deterrent Range (EDR) approach and including the unweighted threshold 143 dB re 1µPa^{2}s SEL_{ss} to represent the minimum fixed noise threshold at which significant disturbance could occur for Environmental Statement and HRA • Removal of the use of dose response for HRA.	Discussion outputs have been incorporated into section 1.7 of HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2), the unweighted threshold 143 dB re 1µPa^{2}s SEL_{ss} threshold has been presented to represent the minimum fixed sound threshold at which significant disturbance could occur. The dose response approach was removed for bottlenose dolphin, grey seal and harbour seal considered in this HRA Stage 2 ISAA. The National Marine Fisheries Service (NMFS) level-B harassment threshold of 160 dB re 1 µPa (root mean square (rms)) has been applied for piling for the area-based assessment in section 1.7 for bottlenose dolphin, grey seal and harbour seal features.
September 2023	NRW, Natural England, MMO, JNCC,	Technical note issued to NRW, Natural England, MMO, JNCC, Cefas and TWT after EWG05	RPS produced a technical note to seek feedback on the following topics of relevance to the HRA: • Consideration of OSPAR Region III or maximum foraging range for Grey Seal Cumulative Effects Assessment (CEA)/ in-combination assessment. • Species-specific MUs and additional information provided by telemetry studies used for screening of European sites with Annex II marine mammals features for HRA Stage 1 Screening • The approach was accepted through the EWG process, and therefore the same approach has been carried forward for the final HRA, as follows:	For harbour porpoise, bottlenose dolphin, and harbour seal the MUs outlined (Celtic and Irish Seas MU, Irish Seas MU and Wales and North West England MU, respectively) have been used for the identification of European sites with Annex II marine mammals features, for grey seal the relevant European sites within the OSPAR III Region have been considered for potential LSE in section 1.3.4 of the HRA Stage 1 Screening Report (Document Reference E1.4). Additional information set out in Carter *et al*. (2022) and telemetry data presented in the PEIR (Wright and Sinclair, 2022) has then been used to screen out SACs with no potential connectivity with the Mona Offshore Wind Project. As outlined above, above the unweighted threshold 143 dB re 1µPa^{2}s SEL_{ss} threshold has been used to assess

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			– For harbour porpoise all sites within the Celtic and Irish Seas MU will be considered – For bottlenose dolphin all sites within the Irish Sea MU will be considered – For grey seal all SACs in the Wales MU, North West England MU, Southwest Scotland and Northern Ireland MU will be screened for LSE. Additional information set out in Carter *et al*. (2022) and telemetry data presented in the PEIR (Wright and Sinclair, 2022), indicates some potential connectivity with the Isles of Scilly Complex SAC, Lundy SAC, The Maidens SAC and Saltee Islands SAC and these sites are therefore included – For harbour seal, the Wales and North West England MU was used, alongside consideration of connectivity presented in Carter *et al.* (2022) and telemetry data in the PEIR which screened in Strangford Lough SAC and Murlough SAC – There are no SACs within Isle of Man waters • Use of EDRs for HRA and removal of dose response Environmental Impact Assessment (EIA). • Feedback was received from NRW, Natural England and JNCC and all stakeholders agreed with the approach outlined above.	disturbance resulting from piling for harbour porpoise features and the dose response approach has been removed from the HRA Stage 2 ISAA. The NMFS level-B harassment threshold of 160 dB re 1 µPa (rms) has been applied for piling for the area-based assessment in section 1.7 for bottlenose dolphin, grey seal and harbour seal features.
December 2023	NRW, Natural England, Cefas, JNCC, TWT	EWG06 meeting	Presented the Underwater sound management strategy which focuses on the impacts of underwater sound for marine mammals and fish. The Underwater sound management strategy will set out potential mitigation options which could be employed if there are residual concerns about the cumulative impacts of underwater sound following refined project design. Updates to HRA approach and screening areas were also presented:	The Outline underwater sound management strategy (Document Reference J16) includes potential further mitigation options, should the measures in the MMMP (Document Reference J21) not reduce impacts, such that there will be no residual significant effect from the Mona Offshore Wind Project. The Underwater sound management strategy is discussed in the Table 1.84 and discussed in the relevant sections throughout the assessment (piling and UXO).

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			• OSPAR Region III been considered to identify any additional sites with grey seal as a qualifying feature, which may have connectivity with the Mona Offshore Wind Project. Telemetry data has been used to screen out additional sites that did not show connectivity • Approach to the assessment of disturbance resulting from piling for harbour porpoise in the ISAA now presents both EDRs (15 km for pin piles) and area-based threshold approach (using 143 dB re 1µPa). For all other species, the NMFS level-B harassment threshold of 160 dB re 1 µPa SPL_{rms} will be applied for piling alongside the relevant EDR (NMFS, 2005). • JNCC asked whether the EDR approach was used alongside TTS ranges to assess impacts resulting from underwater sound associated with Unexploded Ordnance (UXO) detonation and that this should be included if it is not currently presented in the assessment.	Further HRA assessment of the potential effects on SACs is provided in section 1.7. The EDR approach has also been presented to assess impacts resulting from underwater sound associated with UXO detonation, for the Mona Offshore Wind Project alone (paragraph 1.7.3.134 to 1.7.3.136) and for the Mona Offshore Wind Project in-combination with other projects and plans (1.7.4.144 to 1.7.4.146).
Benthic, fish and shellfish and physical processes				
November 2022	Natural England, NRW, MMO, JNCC and TWT.	EWG02 meeting	• Meeting to discuss the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and the approach to LSE screening. NRW requested to be consulted on the export cable corridor. They wanted to know why the route has been chosen and what had been considered within the process to choose the route. • NRW asked if the physical processes modelling supported the decision to not include certain features of the Menai Strait and Conwy Bay SAC in the assessment.	The site selection process of the export cable corridor was presented and discussed with NRW via the Evidence Plan Steering Group. In addition, NRW was consulted later in the EWG process on the Mona Offshore Cable Corridor through the provision of the benthic survey scope of works which outlined the area which would be investigated for the Mona Offshore Cable Corridor. The scope of works also included detail regarding what information would be used to further refine the Mona Offshore Cable Corridor. The results of the modelling regarding increases in Suspended Sediment Concentration (SSC) and changes in physical processes including tidal, wave and sediment transport regimes were not found to extend to the coast (i.e. submerged and partially submerged sea caves will not be affected) and, therefore, only those designated features of the Menai Strait and Conwy Bay SAC with the potential to

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
				be affected have been assessed in this HRA Stage 2 ISAA in section 1.5.
July 2023	Natural England, NRW, MMO, JNCC and TWT	EWG04 meeting	• Benthic updated baseline characterisation for the Mona Offshore Cable Corridor and Access Areas with regard to the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. • NRW flagged that it would be good to see more information on the methodology for the open cut trenching option.	Discussion outputs on the baseline characterisation for the Mona Offshore Cable Corridor and Access Areas with regard to the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC have been incorporated into the HRA Stage 1 Screening Report (Document Reference E1.1) (section 1.3.2, 1.3.3) and this HRA Stage 2 ISAA Part 2 SAC assessments (Document Reference E1.2) in section 1.5. Since the submission of the PEIR, open cut trenching through the intertidal area has been removed from the project design (Volume 1, Chapter 3: Project description of the Environmental Statement) and all export cables at the landfall will be installed beneath the intertidal area using trenchless techniques. The assessments have been updated accordingly.
October 2023	Natural England, NRW, MMO, JNCC and TWT	EWG05 meeting	• Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC HRA - The Applicant was looking for agreement that there will be no LSE from long term habitat loss and temporary habitat disturbance and so these impact pathways can be screened out of the ISAA for the Menai Strait and Conwy Bay SAC (i.e. due to no overlap with any designated features and so no direct impacts).	Following agreement that there will be no LSE from long term habitat loss and temporary habitat disturbance these impact pathways have been screened out of the ISAA for the Menai Strait and Conwy Bay SAC and are therefore not assessed within section 1.5 of this HRA Stage 2 ISAA Part 2 SAC assessments (Document Reference E1.2).
November 2023	NRW	Written response following EWG05	• NRW(A) agree with the applicant that no Annex I features were identified within this section of the export cable corridor • NRW(A) agree there will be no LSE from long term habitat loss and temporary habitat disturbance so these impacts can be screened out of the ISAA • NRW(A) advise that indirect impacts to benthic habitats from changes in physical processes should be screened into the ISAA as these changes can also lead to potential indirect impacts on Annex I features	Long-term habitat loss, temporary habitat disturbance and resuspension of contaminated sediments have been screened out for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC in the HRA Stage 1 Screening Report (Document Reference E1.1). Indirect impacts to Annex I reef and Annex I sandbanks features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC are screened in and assessed in section 1.5.

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			• NRW(A) agree that resuspension of contaminated sediments can be screened out of the ISAA for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC.	
December 2023	Natural England, MMO, JNCC, NRW, Cefas and TWT and Isle of Man Government	EWG06	• Meeting confirmed that, on the basis of NRW's response agreeing that temporary and long term habitat loss and contaminated sediments can be screened out for no LSE, the following impact pathways have been screened in for LSE and are assessed in the HRA Stage 2 ISAA Part 2 – SAC assessments for Annex I reefs and Annex I sandbanks for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC: – Increases in SSC and associated deposition – Changes in physical processes – Increased risk of introduction and spread of Invasive Non-Native Species (INNS) – Accidental pollution. • Summary of the assessment of increases in SSC and sediment deposition for the Annex I reefs and Annex I sandbanks features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC was presented. NRW queried if wind generated sediment transport, particularly in the nearshore area had been considered. • Summary of the assessment of changes in physical processes for the Annex I reefs and Annex I sandbanks features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC was presented. NRW queried the reversibility of the impact if cable protection may remain *in situ*.	Indirect impacts to Annex I reef and Annex I sandbanks features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC are screened in and assessed in section 1.5.The assessment of increases in SSC and sediment deposition for the Annex I reefs and Annex I sandbanks features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is presented in paragraph 1.5.3.8. The effects of wind in the nearshore is considered in paragraph 1.5.3.13. The assessment of changes in physical processes for the Annex I reefs and Annex I sandbanks features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is presented in paragraph 1.5.3.55. The MDS assumes that cable protection may remain *in situ* although this would be subject to discussions with the SNCBs at the time of decommissioning. The HRA Stage 1 Screening Report (Document Reference E1.1) screens in changes in physical processes during the decommissioning phase and this is assessed accordingly in paragraph 1.5.3.55.

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
S42 Consultation				
Annex I Habitats				
June 2023	NRW	S42 Consultation	• The Mares interconnector is shown as connecting to National Grid via the Dee estuary into Connahs Quay. Can you confirm that the connection point for Mares is subsea connection to Connahs Quay as shown.	Mares interconnect cable within Figure 1.9 has been updated and is now correct.
June 2023	NRW	S42 Consultation	• No survey data has been presented in the PEIR to understand whether there are any potential Annex I features present within the cable route. Information on the potential locations of cable protection along the export cable route has not been presented. Without the above information it is not possible to fully assess the potential impacts of the development on the Menai Strait and Conwy Bay SAC.	Site-specific survey data for the Mona Offshore Cable Corridor and Access Areas has now been incorporated into Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (Document Reference: F2.2) and the HRA Stage 1 Screening Report (Document Reference E1.1). On the basis of the site-specific survey results, no Annex I habitats were recorded within the area of overlap between the Mona Offshore Cable Corridor and Access Areas and the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The site-specific survey data correlates with the NRW (2016) mapped distribution of Annex I habitat features which also indicate no presence of Annex I features within the Mona Offshore Cable Corridor and Access Areas, therefore all direct impacts were screened out within the HRA Stage 1 Screening Report (Document Reference E1.1) and are therefore not assessed in section 1.5 of this HRA Stage 2 ISAA Part 2 SAC assessments (Document Reference E1.2).
June 2023	NRW	S42 Consultation	• NRW (A) seek clarification on why the Dee Estuary SAC features have been screened into the ISAA and not into the PEIR. If a potential impact pathway is identified here, it is also applicable in the PEIR.	On the basis of the physical processes modelling for the Mona Offshore Wind Project (see HRA Stage 1 Screening Report (Document Reference E1.1) section 1.3.2), Volume 6, Annex 6.1: Physical processes technical report of the Environmental Statement (Document reference F6.1.1) and Volume 2, Chapter 6: Physical processes of the Environmental Statement (Document reference F2.1) there is no potential impact pathway for the Dee Estuary SAC and it has been screened out and therefore not assessed in this

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
				HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2) in line with the Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (Document Reference F2.2) (see section 1.3.2).
June 2023	NRW	S42 Consultation	• NRW(A) advise that the potential introduction of invasive non-native species (INNS) should also be screened in for the relevant qualifying features of the Menai Strait and Conwy Bay SAC. The impact should then be taken through to the stage 2 appropriate assessment stage where the relevant mitigation measures (i.e. the production and adherence to a Biosecurity Risk Assessment) can then be implemented.	The potential introduction of invasive non-native species has now been screened in, within the HRA Stage 1 Screening Report (Document Reference E1.1) and is assessed in section 1.5.3 and 1.5.4 of this HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2).
June 2023	NRW	S42 Consultation	• NRW (A) note that only the Annex I Reef and Annex I Sandbanks which are slightly covered by seawater all the time features have been screened in for the Menai Strait and Conwy Bay SAC. Clarification is sought on whether the potential for increases in Suspended Sediment Concentration (SSC) and sediment deposition could extend to other features of the SAC (i.e. Submerged or partially submerged sea caves)? It would be useful to see a map with the extent of the plume against the features of the Menai Strait and Conwy Bay SAC and also against the Dee Estuary SAC features to understand any potential overlap.	Modelling has been undertaken to understand the impact of cable installation in the Mona Offshore Cable (Volume 2, Chapter 1: Physical processes of the Environmental Statement). The outputs of this modelling have been considered in the relevant assessments in section 2.9 of Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (Document Reference F2.2) including in regards to the extent of impacts on the Menai Strait and Conwy Bay SAC. Additional information has been included to justify screening out the other features (mudflats, shallow inlets and bays and submerged or partially submerged sea caves of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC on the basis of the physical processes modelling, see Volume 6, Annex 6.1: Physical processes technical report of the Environmental Statement (Document reference F.6.1.1) and Volume 2, Chapter 6: Physical processes of the Environmental Statement (Document reference F2.1) and section 1.4.3 of the HRA Stage 1 Screening Report (Document Reference E1.1).
June 2023	NRW	S42 Consultation	• NRW (A) advise that the conservation objectives for the Dee Estuary SAC should be taken from the Regulation 33 advice package as these are the	As outlined above, in relation to Annex I habitats the Dee Estuary SAC has now been screened out in the HRA Stage 1 Screening Report (Document Reference E1.1) and is

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			agreed conservation objectives for cross-border sites: Dee Estuary-Reg33-Volume 1-English-091209_1.pdf (NRW)	therefore not assessed in this HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2). The Regulation 33 advice package, has however been used for Annex II diadromous fish features of the site in section 1.5.4.41 of this HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2).
June 2023	NRW	S42 Consultation	• NRW (A) advise that a full Biosecurity Risk Assessment and Invasive Non-Native Species (INNS) Management Plan is completed in relation to all marine operation activities associated with the current proposal. The risk assessment and management plan should include consideration of all activities, vehicles and equipment used as well as how the risk will be minimised through appropriate mitigation and adherence to best practice guidance and management measures. The risk assessment should include a review of all the available data in relation to the presence of marine INNS where applicable to the current proposal, and the potential risks associated with each species identified.	Measures regarding minimising the risk of introduction and spread of INNS will be included in the Offshore Environmental Management Plan (EMP) including a separate Biosecurity Risk Assessment and INNS Management Plan.
June 2023	NRW	S42 Consultation	• No spatial figures have been presented to understand the extent of the sediment plume and potential interactions with Annex I features of the Menai Strait and Conwy Bay SAC. Furthermore, until the results of the export cable route survey are presented, NRW (A) are unable to assess whether there are any potentially sensitive habitats that could be impacted by the plume, we are therefore unable to agree with the conclusions at this point.	Site-specific survey data has now been included in section 1.5 to justify the conclusions of no adverse effect on integrity.
June 2023	NRW	S42 Consultation	• Should the results of the ECR survey data show that the cable route interacts with Annex I features of the Menai Strait and Conwy Bay SAC, the Applicant will need to assess and carefully consider any potential long-term habitat loss to these features against the conservation objectives for the SAC. At this point and without the survey data, NRW (A) are unable to agree with the conclusions presented here for the	On the basis of the site-specific survey results (see section 1.5.2), no Annex I habitats were recorded within the area of overlap between the Mona Offshore Cable Corridor and Access Areas and the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The site-specific survey data correlates with the NRW (2016) mapped distribution of Annex I habitat features which also indicate no presence of Annex I features within the Mona Offshore Cable Corridor and

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			potential long-term habitat loss of Annex I Reef and Annex I Sandbanks which are slightly covered by seawater all the time. We note there is a commitment to investigate opportunities to limit the extent of cable protection within the Menai Strait and Conwy Bay SAC. NRW (A) welcome this commitment and as per our advice during pre-application consultation, encourage the applicant to not place any cable protection within the SAC and in particular within Annex I features.	Access Areas, all direct impacts were screened out within the HRA Stage 1 Screening and are therefore not assessed in section 1.5 of this HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2).
June 2023	NRW	S42 Consultation	• Further information on the potential locations of the cable protection inside and outside the SAC is required in order to understand any potential impacts to changes in physical processes which may have indirect impacts on Annex I benthic features of the SAC. Furthermore no assessment on secondary scour has been carried out.	Aside from cable crossings (of which there are none in the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC), cable protection will be remedial (e.g. where cables become exposed due to mobile seabed). The Mona Offshore Wind Project will not use cable protection where burial can be successful as burial is the most effective means of protecting the cable. It is difficult to predict where cable burial may not be successful, and so difficult to predict where cable protection may be required. The engineers have looked at the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC in detail to refine the parameters, but exact locations are not currently known. Measures adopted as part of the Mona Offshore Wind Project in relation to minimising cable protection within the SAC are outlined in Table 1.13. An assessment of secondary scour is provided in the assessment of changes in physical processes in paragraph 1.5.3.55 to 0. There is, however, a commitment to provide scour protection and the effectiveness in limiting residual or secondary scour is subject to site specific detailed design.
Annex II diadromous fish – no S42 consultation received of relevance to the HRA Stage 2 ISAA				
Annex II marine mammals				
June 2023	NRW	S42 Consultation	• NRW (A) does not agree with the approach taken to assess the area disturbed for harbour porpoise. Only the EDR approach has been used for the assessment of disturbance associated with pile driving during the	In addition to EDRs, an unweighted threshold 143 dB re 1µPa^{2}s SEL_{ss} has been presented to represent the minimum fixed sound threshold at which significant disturbance would occur from impulsive sound sources for

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			construction phase to assess impacts on harbour porpoise features in the North Anglesey Marine SAC. Based on the modelled contours provided in the PEIR, it is difficult to rule out absence of an adverse effect on the North Anglesey Marine SAC for the MDS of two simultaneous monopile drives. NRW (A) strongly advise that further information based on noise thresholds is provided, as we are currently unable to rule out an adverse effect on integrity for harbour porpoise • NRW (A) recommends that in addition / in parallel to EDRs, an unweighted threshold 143 dB re 1µPa^{2}s SEL_{ss} (Brandt *et al.*, 2018; Heinis *et al.*, 2019) should be used to represent the minimum fixed noise threshold at which significant disturbance would occur from impulsive noise sources.	impacts harbour porpoise resulting from underwater sound associated with piling (alone and in combination) in section 1.7.3 and 1.7.4 of this HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2).
June 2023	NRW	S42 Consultation	• The use of noise mitigation strategies/attenuation technology such as bubble curtains, timing of piling (given North Anglesey Marine SAC is a summer site), or piling methods have not been proposed as potential mitigation methods. Given the impact ranges calculated in Volume 5, Annex 3.1: Underwater sound technical report, NRW (A) strongly recommend that these are considered and included in any future mitigation plan. Whilst there is the potential that mitigation might not be formally required for the purposes of removing adverse effect on integrity in the HRA or reducing significant effects in the EIA, it should be incorporated in accordance with industry best practice, to reduce effects in relation to European Protected Species (EPS).	Measures adopted as part of the Mona Offshore Wind Project are presented in Table 1.84. A commitment to considering NAS as an option as part of the Underwater sound management strategy (Document Reference J16) has been made as part of a stepped strategy post consent and following the mitigation hierarchy - avoid, reduce, mitigate. The project has prepared an Outline underwater sound management strategy (Document Reference J16) which is secured in the deemed marine licence in Schedule 14 of the draft DCO. This establishes a process of investigating options (such as NAS) to manage underwater sound levels in consultation with the licensing authority and SNCBs and agreeing, prior to construction, which mitigation measures will be implemented to reduce impacts such that there will be no residual significant effect.
June 2023	NRW	S42 Consultation	• In section 1.5.3.7 Summary of LSE screening conclusions, with regard to the grey seal MU, reference should be made to the OSPAR Region III	Reference has been made to the OSPAR Region III interim MU in paragraph 1.3.3.6, however, the use of telemetry data from Wright and Sinclair (2022) in addition to the Seal Management Units (SMU) is deemed sufficient to capture

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			interim MU and the relevant NRW position statement (NRW, 2023).	any SACs with potential connectivity to the Mona Offshore Wind Project.
June 2023	NRW	S42 Consultation	• NRW (A) recommend that section 1.9.1.6 Assessment of potential Adverse Effect on Integrity: Annex II marine mammals, is amended for clarification. For grey seal, NRW (A) previously advised the use of the OSPAR Region III MU as per NRW's Position Statement on the use of marine mammal MUs for screening and assessment in HRA for SACs with marine mammal features. We agreed with the proposal to use the combined Wales MU, North West England MU, SW Scotland and Northern Ireland MU for grey seal in parallel with the OSPAR Region III MU. We recommend that any similar statements within the document be amended. NRW (A) also agreed that the foraging ranges from Carter *et al.* (2022) would be a suitable alternative as these also capture the movement ranges of grey seal.	The HRA Stage 1 Screening report Document Reference E1.4) now considers European sites within the OSPAR Region III Interim MU designated for grey seal, however telemetry data from Wright and Sinclair (2022) has then been used to capture any SACs with potential connectivity to the Mona Offshore Wind Project.
June 2023	NRW	S42 Consultation	• With reference to Table 1.101 Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for Annex II marine mammal features from underwater sound during the construction phase, please refer to Paragraphs 151 and 164 of the current document advising the use of noise mitigation strategies/attenuation technology.	Project refinements and potential mitigation options will be considered within the Underwater sound management strategy, an outline of which has been submitted with the application for consent with a more detailed marine mammal mitigation protocol. The Underwater Sound Management Strategy (Document Reference J16) will be secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence and will be developed post-application through discussion and agreement with stakeholders. The Applicant will continue to explore options for mitigating piling sound post consent, at a time when more detailed information is available (i.e. geotechnical data) and where further refinements to the Mona Offshore Wind Project detailed design have been made on this basis. A commitment to NAS will be considered as part of a stepped strategy post consent and following the mitigation hierarchy - avoid, reduce, mitigate. Consequently, if NAS is required a

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
				detailed exploration of available technologies will be undertaken and information presented to demonstrate how such technology would contribute to the reduction in underwater sound from piling.
June 2023	NRW	S42 Consultation	• NRW (A) disagree that the extent of disturbance (from piling) is likely to be an overestimate due to impulsive noise losing its characteristics with range, particularly for harbour porpoise. We also recommend including reference to the Level B Harassment threshold for continuous noise of 120 dB Sound Pressure Level (SPL)rms.	Point noted and the Applicant agrees that the dose response is based on observed probability of a behavioural response during piling. Distance from an impulsive sound source is a strong predictor of a behavioural response. Sound propagation can result in changes in waveform, whereby waveform elongates with distance (which reflects the current understanding of the transition from impulsive to continuous sound). Higher frequencies of the sound are attenuated more due to molecular absorption, whilst very low frequencies cannot propagate in shallow water. Therefore characteristics of the sound far from the source are very different to the characteristics of the sound at source, and therefore likely to affect how a marine mammal perceives and reacts to sound (rather than just using sound level alone).The dose response curve from measurements taken at the Beatrice offshore wind farm was based on piling at much smaller maximum hammer energies and over distances not exceeding 60 km. As a comparison, the distance at which a 50% response was measured for the Beatrice OWF was 7.4 km at the first location piled (Graham *et al.,* 2019) compared to an approximate range of 27 to 42 km for the Mona Offshore Wind Project, depending on the transect. Therefore, whilst the assessment applies the dose response as the best available estimate of proportional responses, it is considered to be highly conservative due to the propagation distances predicted for the Mona Offshore Wind Project which for a given sound level will not be equivalent in characteristics to those found at the Beatrice offshore wind farm. The assessment refers to the 143 dB re 1µPa^{2}s SEL_{ss} unweighted threshold (from Tougaard, 2021) recommended by NRW which is based on a collation of field studies of harbour porpoise response to elevated subsea sound from piling. The unweighted threshold 143 dB re 1µPa^{2}s SEL_{ss} represents the minimum

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
				fixed generalised response threshold at which significant disturbance could occur. At ranges beyond the received level of unweighted threshold 143 dB re 1µPa^{2}s SEL_{ss} the disturbance is likely to be 'mild' with less likelihood of active avoidance.
June 2023	NRW	S42 Consultation	• In section 1.9.3.19 Assessment of adverse effects alone, please refer to our comments in Paragraphs 146 and 157, regarding the use of a more up to date peak seasonal density for harbour porpoise from the latest edition of the Marine Mammal Atlas (Evans and Waggitt, 2023). NRW (A) advise that any assessments of magnitude and significance, population modelling, and conclusions for harbour porpoise in the PEIR documents are revised with an updated density.	The final densities used in the assessment for harbour porpoise has been based on the latest edition of the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) as agreed with NRW and other stakeholders via the marine mammals EWG and therefore some values are higher than previously assessed for PEIR. Densities have been presented in Table 4.12 of Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference: F2.4) (as agreed via the EWG) and the assessment updated within the HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2).
June 2023	NRW	S42 Consultation	• NRW (A) note in section 1.9.3.20 Assessment of adverse effects alone, that for bottlenose dolphin, dual densities have been used for the assessment; the outer Cardigan Bay density (0.035/ km^2) within a 6 km region from the coastline, and the Small Cetaceans in the European Atlantic and North Sea (SCANS) III block E densities elsewhere (0.0082 /km^2). As per our comments in Paragraph 158, to avoid the use of dual densities and overly precautionary conclusions, we have previously advised (and provided) the use of densities taken from the newest version of the Marine Mammal Atlas (Evans and Waggitt, 2023). Density values provided for the Mona array area and Mona study area were 0.0011/ km^2 and 0.0018 / km^2 respectively.	The final densities used in the assessment for bottlenose dolphin has been based on the latest edition of the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) as agreed with NRW and other stakeholders via the marine mammals EWG and therefore some values are higher than previously assessed for PEIR. Densities have been presented in Table 4.12 of Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference: F2.4) (as agreed via the EWG) and the assessment updated within the HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2).
June 2023	NRW	S42 Consultation	• With reference to sections 1.9.4.10 –15 Assessment of adverse effects in-combination, the use of MUs as the appropriate screening distance has not always been followed when screening in projects for the assessment of potential cumulative effects. No justification has been provided for only considering	The approach to the in-combination assessment was revised for the final application and presented to the EWG in a technical note included in the Technical Engagement Plan Appendices Part 1 (A to E) (Document reference

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			the cumulative impacts of piling from Awel y Môr. Marine mammal populations are wide ranging, and MUs appropriately capture the range of such populations. The purpose of the cumulative assessment is to assess the impact of all projects whose construction phases overlap temporally with the construction phase for the Mona Offshore Wind Project and could potentially impact a population within a given MU. Thus all projects that fall within that MU should be screened in.	E4.1). All projects within the relevant MU have now been considered in section 1.7.4.
June 2023	NRW	S42 Consultation	• In section 1.9.4 Assessment of adverse effects in-combination, it is unclear whether all Tier 1 and Tier 2 projects have been considered for the assessment of in-combination injury and disturbance from underwater sound generated during piling, and whether the contribution to disturbance from all projects was considered in the IPCoD modelling. NRW (A) recommend consideration of any Tier 1 and Tier 2 projects which overlap temporally, and if required the results should be updated.	The approach to the in-combination assessment in section 1.7.4 has been checked and aligned with this advice. With respect to the tier 2 projects, the EIA Scoping Reports for these projects do not provide detailed information about potential impacts of underwater sound as a result of piling and therefore it is not possible to undertake a full, quantitative assessment for these projects and they have not been included in the population modelling. As such, a qualitative assessment of the tier 2 projects is undertaken in the in-combination assessment in section 1.7.4.
June 2023	NRW	S42 Consultation	• Assessment of adverse effects in-combination, NRW (A) recommend using the results from IPCoD modelling when assessing impacts of disturbance on a population against conservation objectives related to the population maintaining itself on a long-term basis. These results could also inform and strengthen conclusions made for harbour porpoise. NRW (A) recommend that the ratio of the impacted versus unimpacted population over a set period of time (for example the first six years, based on the former Favourable Conservation Status (FCS) reporting period), and the full 25 year modelled period are provided. If, as a result of Permanent Threshold Shift (PTS) or disturbance, a population shows a continued decline of >1% per year (versus a modelled unimpacted reference population over, for example, the first six years since the start of piling)	The results from IPCoD modelling have now been used when assessing impacts of disturbance on a population against conservation objectives related to the population maintaining itself on a long-term basis in section 1.7.3 and 1.7.4.

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
			then there is a high likelihood that a significant effect and AEOSI cannot be ruled out (NRW 2023a).	
June 2023	NRW	S42 Consultation	• With reference to section 1.9.4 Assessment of adverse effects in-combination, please see Paragraphs 171 and 242 of the current document regarding assessment of injury and disturbance from vessel use and use of the term 'habituation'. Conclusions drawn may also need to be updated for the ISAA.	Updates to Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4) for the 'injury and disturbance from vessel use' impact and use of the term habituation have been carried across to this HRA Stage 2 ISAA Part 2 - SAC assessments (Document Reference E1.2).
June 2023	NRW	S42 Consultation	• Assessment of adverse effects in-combination, based on the assumption that the absence of prey will not impact marine mammals since they would also be displaced to potentially greater distances. However, this conclusion is dependent on recovery time of both receptors and no evidence regarding the length of time for fish species to return to the displaced area has been provided. This also differs from the conclusions made when assessing impacts on marine mammal disturbance from piling. If recovery in marine mammals occurs within hours/days (and literature suggests it does for example Brandt *et al.* (2018)), there may be an in-combination impact from loss of prey, and/or energetic costs of foraging in a different (potentially less preferred) area.	The approach to the impact 'changes in fish and shellfish communities affecting prey availability' in paragraph 1.7.3.468 to 1.7.3.483 has been updated in line with the changes to Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference: F2.4)
June 2023	JNCC	S42 Consultation	• JNCC do not believe there is sufficient information available at this stage to conclude no adverse effect on the North Anglesey Marine SAC from UXO clearance.	Additional information has been added to the assessment of underwater sound generated with UXO detonation. The EDR approach has now been presented to specifically assess the levels of disturbance in relation to the disturbance thresholds within the North Anglesey Marine SAC, see section 1.7.3 and 1.7.4.

1.3 Summary of HRA stage 1 screening conclusions

1.3.1 Overview

1.3.1.1 This section summarises all pathways identified for potential LSE (arising alone and/or in-combination) and defines the scope of the Stage 2 assessments within this HRA Stage 2 ISAA Part 2 – SAC assessments.

1.3.2 Screening outcomes for the Mona Offshore Wind Project alone

1.3.2.1 The potential for LSE as a result of the Mona Offshore Wind Project alone has been identified following HRA Stage 1 Screening Report (Document Reference E1.4) with respect to 43 SACs.

Annex I habitats (offshore and coastal)

1.3.2.2 The following European site designated for Annex I habitats (offshore and coastal) was advanced to the HRA Stage 2 ISAA:

- Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC.

Annex II otter

1.3.2.3 No European sites designated for Annex II otter features (River Dee and Bala Lake SAC) were advanced to the HRA Stage 2 ISAA.

Annex II diadromous fish

1.3.2.4 The following nine European sites designated for Annex II diadromous fish were advanced to the HRA Stage 2 ISAA:

- Dee Estuary/Aber Dyfrdwy SAC
- River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC
- River Ehen SAC
- River Eden SAC
- River Derwent and Bassenthwaite Lake SAC
- Solway Firth SAC
- River Kent SAC
- River Bladnoch SAC
- Afon Gwyrfai a Llyn Cwellyn SAC.

Annex II marine mammals

1.3.2.5 A total of 33 European sites were advanced to the HRA Stage 2 ISAA for Annex II marine mammals. These sites are listed below, broken down by country:

- Twelve sites in the United Kingdom:
  - North Anglesey Marine/Gogledd Môn Forol SAC
  - North Channel SAC

  - Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC
  - West Wales Marine/Gorllewin Cymru Forol SAC
  - Cardigan Bay/Bae Ceredigion SAC
  - Pembrokeshire Marine/Sir Benfro Forol SAC
  - Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC
  - Isles of Scilly Complex SAC
  - Lundy SAC
  - The Maidens SAC
  - Strangford Lough
  - Murlough SAC
- Four sites in Ireland:
  - Rockabill to Dalkey Island SAC
  - Roaringwater Bay and Islands SAC
  - Blasket Islands SAC
  - Saltee Islands SAC
- Seventeen sites in France:
  - Mers Celtiques - Talus du golfe de Gascogne SCI
  - Abers - Côte des legends SCI
  - Ouessant-Molène SCI
  - Côte de Granit rose-Sept-Iles SCI
  - Anse de Goulven, dunes de Keremma SCI
  - Tregor Goëlo SCI
  - Côtes de Crozon SCI
  - Chaussée de Sein SCI
  - Cap Sizun SCI
  - Récifs du talus du golfe de Gascogne SCI
  - Anse de Vauville SCI
  - Cap d'Erquy-Cap Fréhel SCI
  - Baie de Saint-Brieuc – Est SCI
  - Banc et récifs de Surtainville SCI
  - Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI
  - Estuaire de la Rance SCI
  - Baie du Mont Saint-Michel SCI.

1.3.3 LSE in-combination

LSE in-combination for Annex I habitats (offshore and coastal)

1.3.3.1 For Annex I habitats, the potential for LSE alone was identified for one site: Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, therefore effects in-combination have been considered at Stage 2 Appropriate Assessment.

1.3.3.2 For potential impacts discounted for LSE alone, there is either no pathway to effect, or the Mona Offshore Wind Project would result in only negligible or inconsequential effects that would not contribute (even collectively with other projects or plans) in a material way to in-combination effects. Therefore, where an impact has been screened out for LSE alone, it has also been screened out for in-combination effects.

LSE in-combination for Annex II diadromous fish species

1.3.3.3 A precautionary approach to the selection of relevant sites for Annex II diadromous fish was adopted in the LSE screening in order to capture all sites with the potential for connectivity with the Mona Offshore Wind Project, and in particular to consider the potential for disruption to migration (i.e. barriers to migration) of diadromous fish (including but not limited to Atlantic salmon *Salmo salar*) to/from natal rivers (river of origin). For the purposes of LSE screening, a precautionary approach was adopted using a preliminary buffer of 100 km from the Mona Offshore Array Area and Mona Offshore Cable Corridor and Access Areas for all Annex II diadromous fish species except Atlantic salmon and freshwater pearl mussel *Margaritifera margaritifera* where the regional area has been considered. These screening buffers take into account the likely migratory routes and distances for diadromous fish as outlined in ABPmer (2014), and follow the methodology outlined in the Plan Level HRA (TCE, 2022), in line with feedback from stakeholders.

1.3.3.4 No potential impact pathways were identified between the Mona Offshore Wind Project and any additional sites designated for Annex II diadromous fish, therefore there is no potential for in-combination effects at any sites apart from those which are screened in for Stage 2 Appropriate Assessment (Dee Estuary/Aber Dyfrdwy SAC, River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC, River Ehen SAC, River Eden SAC, Derwent and Bassenthwaite Lake SAC, Solway Firth SAC, River Kent SAC, River Bladnoch SAC and Afon Gwyrfai a Llyn Cwellyn SAC).

LSE in-combination for Annex II marine mammals

1.3.3.5 As marine mammals are highly mobile animals with the potential to forage over wide areas, all European sites for marine mammal features with a range that overlaps with the Mona Offshore Wind Project were considered.

1.3.3.6 For Annex II cetaceans (harbour porpoise *Phocoena phocoena* and bottlenose dolphin *Tursiops truncatus*) the search area extended to the relevant MU for each species, as defined by the Inter Agency Marine Mammal Working Group (IAMMWG, 2015). For harbour seal *Phoca vitulina* and grey seal *Halichoerus grypus*, SACs located within the same seal MU (Special Committee on Seals (SCOS), 2022 in parallel with the OSPAR Region III MU, as well as recent sources on seal foraging ranges (Carter *et al.*, 2022) and telemetry data presented in Appendix 2 of Volume 6, Annex 4.1: Marine mammals technical report of the Environmental Statement (Document reference F6.4.1), (Wright and Sinclair, 2022) were considered. These were in line with feedback from stakeholders via the marine mammals EWG (see Table 1.1).

1.3.3.7 Potential for LSE alone has been identified for all UK sites within species' range, therefore in-combination effects for these sites have been assessed at Stage 2 Appropriate Assessment.

1.3.3.8 For potential impacts discounted for LSE alone, there is either no pathway to effect, or the Mona Offshore Wind Project would result in only negligible or inconsequential effects that would not contribute (even collectively with other projects or plans) in a material way to in-combination effects. Therefore, where an impact has been screened out for LSE alone, it has also been screened out for in-combination effects.

1.3.4 Summary table of LSE screening outcomes

1.3.4.1 Table 1.2 presents a summary of the European sites and relevant qualifying features for which LSE could not be ruled out and therefore an Appropriate Assessment is required to be undertaken.

Table 1.2: A summary of all European sites for which the potential for LSE could not be discounted at the Stage 1 screening stage, and for which Appropriate Assessment is required.

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC	26.8	0.0	Reefs	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor and Access Areas only) • Increased risk of introduction and spread of INNS (Mona Offshore Cable Corridor and Access Areas only) • Changes in physical processes (Mona Offshore Cable Corridor only and decommissioning phase only) • Removal of hard substrates (decommissioning only for Mona Offshore Cable Corridor and Access Areas and for Annex I reef only) • Accidental pollution (Mona Offshore Cable Corridor and Access Areas only) • In-combination effects.
				Operations and maintenance	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor and Access Areas only) • Increased risk of introduction and spread of INNS (Mona Offshore Cable Corridor and Access Areas only) • Changes in physical processes (Mona Offshore Cable Corridor and Access Areas only) • Accidental pollution (Mona Offshore Cable Corridor and Access Areas only) • In-combination effects.
			Sandbanks which are	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor and Access Areas only)

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
			slightly covered by seawater all the time.		• Increased risk of introduction and spread of INNS (Mona Offshore Cable Corridor and Access Areas only) • Changes in physical processes (Mona Offshore Cable Corridor only and decommissioning phase only) • Accidental pollution (Mona Offshore Cable Corridor and Access Areas only) • In-combination effects.
				Operations and maintenance	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor and Access Areas only) • Increased risk of introduction and spread of INNS (Mona Offshore Cable Corridor and Access Areas only) • Changes in physical processes (Mona Offshore Cable Corridor and Access Areas only) • Accidental pollution (Mona Offshore Cable Corridor and Access Areas only) • In-combination effects.
Dee Estuary/Aber Dyfrdwy SAC	39.3	13.2	Sea lamprey *Petromyzon marinus*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• Electromagnetic Fields (EMF) from subsea electric cables • In-combination effects.
			River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
River Dee and Bala Lake/Afon Dyfrydwy a Llyn Tegid SAC	64.4	40.7	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
			Sea lamprey *Petromyzon marinus*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
			River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
River Ehen SAC	83.01	106.4	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
			Freshwater pearl mussel *Margaritifera margaritifera*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
River Eden SAC	86.5	104.8	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
			Sea lamprey *Petromyzon marinus*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
			River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
Afon Gywrfai a Llyn Cwellyn SAC	92.3	91.2	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
					• In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
River Kent SAC	96.7	105.1	Freshwater pearl mussel *Margaritifera margaritifera*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
River Derwent and Bassenthwaite SAC	99.7	119.7	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
			Sea lamprey *Petromyzon marinus*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
			River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
Solway Firth SAC	114.5	134.8	Sea lamprey *Petromyzon marinus*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
			River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
River Bladnoch SAC	121.5	141.4	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.
				Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
North Anglesey Marine/Gogledd Môn Forol SAC	22.58	17.5	Harbour porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site investigation surveys • Underwater sound from vessels and other vessel activities

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
					• Changes in fish and shellfish communities affecting prey availability (construction only) • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
North Channel SAC	81.5	94.5	Harbour porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC	94.1	93.0	Bottlenose dolphin *Tursiops truncatus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
				Construction/decommissioning	• Underwater sound from piling

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
			Grey seal *Halichoerus grypus*		• Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
West Wales Marine/Gorllewin Cymru Forol SAC	95.4	94.4	Harbour porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
Strangford Lough SAC	112.2	125.1	Harbour seal *Phoca vitulina*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
					• In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
Murlough SAC	115.9	127.1	Harbour seal *Phoca vitulina*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
Cardigan Bay/Bae Ceredigion SAC	162.5	161.5	Bottlenose dolphin *Tursiops truncatus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
			Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
					• Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
The Maidens SAC	166.8	179.8	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
Pembrokeshire Marine/Sir Benfro Forol SAC	211.7	210.7	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
	274.8	273.8		Construction/decommissioning	• Underwater sound from piling

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
Bristol Channel Approaches SAC			Harbour porpoise *Phocoena phocoena*		• Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
Lundy SAC	309.5	308.5	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
Isles of Scilly Complex SAC	439.3	438.3	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
					• In-combination effects.
Rockabill to Dalkey Island SAC	126.1	129.3	Harbour porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
Saltee Islands SAC	235.4	234.4	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
Roaringwater Bay and Islands SAC	448.8	447.8	Harbour porpoise	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
			Phocoena phocoena		• Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
Blasket Islands SAC	565.5	564.5	Harbour Porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
• 17 French SCIs (as listed in paragraph 1.3.2.5) • Mers Celtiques - Talus du golfe de Gascogne SCI • Abers - Côte des legends SCI • Ouessant-Molène SCI	See HRA Stage 1 Screening Report (Document Reference: E1.4)	See HRA Stage 1 Screening Report (Document Reference: E1.4)	Harbour porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.
				Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
• Côte de Granit rose-Sept-Iles SCI • Anse de Goulven, dunes de Keremma SCI • Tregor Goëlo SCI • Côtes de Crozon SCI • Chaussée de Sein SCI • Cap Sizun SCI • Récifs du talus du golfe de Gascogne SCI • Anse de Vauville SCI • Cap d'Erquy-Cap Fréhel SCI • Baie de Saint-Brieuc – Est SC • Banc et récifs de Surtainville SCI • Baie de Lancieux, Baie de l'Arguenon, Archipel de					

European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor and Access Areas (km)	Relevant qualifying features	Project phase	Impact
Saint Malo et Dinard SCI • Estuaire de la Rance SCI • Baie du Mont Saint-Michel SCI					

1.4 Information to Support the Appropriate Assessment

1.4.1 Maximum design scenarios

1.4.1.1 For all European sites considered in this Part of the HRA Stage 2 ISAA, the assessments have been based on a realistic MDS. Each MDS has been derived from the design envelope for the Mona Offshore Wind Project and is presented within the relevant receptor chapters. Volume 1, Chapter 3: Project description of the Environmental Statement (Document reference F1.3) describes the Mona Offshore Wind Project design and identifies the range of potential parameters for all relevant components.

1.4.1.2 The MDS for each of the potential impacts for each receptor group are tabulated separately in each of the receptor sections of this Part of the HRA Stage 2 ISAA according to the effect-pathway under consideration. The assessment scenarios are consistent with those used for assessment in relevant chapters of the Environmental Statement.

1.4.1.3 The MDSs identified in this Part of the HRA Stage 2 ISAA have been selected as those having the potential to result in the greatest effect on an identified receptor or receptor group. These scenarios have been selected from the project design provided in Volume 1, Chapter 3: Project description of the Environmental Statement (Document Reference F1.3). Effects of greater adverse significance are not predicted to arise should any other development scenario, based on details within the project design (e.g. different infrastructure layout), to that assessed here be taken forward in the final design scheme.

1.4.2 Measures adopted as part of the Mona Offshore Wind Project

1.4.2.1 An iterative approach to the Mona Offshore Wind Project EIA and HRA process has been utilised to inform the Mona Offshore Wind Project design (through the identification of LSEs and development of measures to address these), this is explained in more detail in Volume 1, Chapter 5: Environmental Impact Assessment methodology of the Environmental Statement (Document Reference F1.5). The incorporation of such measures within the design of the Mona Offshore Wind Project demonstrates commitment to implementing the identified measures.

1.4.2.2 The term 'measures adopted as part of the Mona Offshore Wind Project' is used in this Part of the HRA Stage 2 ISAA to include the following measures (adapted from IEMA, 2016):

- Measures included as part of the project design. These include modifications to the location or design envelope of the Mona Offshore Wind Project which are integrated into the application for consent. These measures are secured through the consent itself through the description of the development and the parameters secured in the DCO and/or marine licences (referred to as primary mitigation in IEMA, 2016)
- Measures required to meet legislative requirements, or actions that are generally standard practice used to manage commonly occurring environmental

effects and are secured through the DCO requirements and/or the conditions of the marine licences (referred to as tertiary mitigation in IEMA, 2016).

1.4.3 Baseline information

1.4.3.1 Baseline information on the European sites identified for further assessment within this Part of the HRA Stage 2 ISAA has been gathered through a comprehensive desktop study of existing studies and datasets. The key data sources are summarised in each of the receptor group sections below and presented in detail within topic chapters in the Environmental Statement. Any additional sources of information used in this Part of the HRA Stage 2 ISAA are also summarised. The key baseline data sources, for each receptor, are outlined below:

- Annex I habitats – informed by data from site-specific surveys presented in Volume 2, Annex 2.1: Benthic subtidal and intertidal ecology technical report of the Environmental Statement (Document Reference: F6.2.1) and Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (Document Reference: F2.2).
- Annex II diadromous fish – informed by Volume 2, Annex 3.1: Fish and shellfish ecology technical report of the Environmental Statement (Document Reference: F.6.3.1) and Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)
- Annex II marine mammals – informed by the 24 month site-specific aerial survey data and baseline characterisation presented in Volume 6, Annex 4.1: Marine mammal technical report of the Environmental Statement (Document Reference: F.6.4.1) and Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference: F2.4).

1.4.3.2 For brevity, information on the European sites is summarised within the main body of this Part of the HRA Stage 2 ISAA.

1.4.4 Conservation objectives and advice

1.4.4.1 The SNCBs have produced conservation advice for European sites under their statutory remit. This conservation advice provides supplementary information on sites and features, and although the content provided is similar, the format of the advice provided varies between the different SNCBs.

1.4.4.2 Conservation objectives set the framework for establishing appropriate conservation measures for each feature of the site and provide a benchmark against which plans or projects can be assessed. The conservation objectives set out the essential elements needed to ensure that a qualifying habitat or species is maintained or restored at a site. If all the conservation objectives are met, then the integrity of the site will be maintained, and deterioration or significant disturbance of the qualifying features avoided.

1.4.4.3 In this Part of the HRA Stage 2 ISAA, the Applicant has referenced the most up-to-date conservation objectives and conservation advice available. It is recognised that in the conservation advice documents, if any feature of the SAC is in unfavourable condition, the integrity of the site is deemed to be compromised and the overarching objective is therefore to restore site integrity.

1.4.4.4 Due to the location and scale of the Mona Offshore Wind Project, European sites with the potential to be impacted fall variously under the remit of NRW, Natural England,

NatureScot, National Parks and Wildlife Service (NPWS), the JNCC and Office Français de la Biodiversité.

1.4.4.5 Natural England has published a 'European Site conservation objectives: Supplementary advice on conserving and restoring features' document. The document presents attributes which are ecological characteristics of the designated species and habitats within a site. Each attribute has a target which is either quantified or qualitative depending on the available evidence. Targets are also listed for the desired state to be achieved for the attribute.

1.4.4.6 For Welsh sites including the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, Lleyn Peninsula and the Sarnau/Pen Llŷn a'r Sarnau SAC, Cardigan Bay/Bae Ceredigion SAC and the Pembrokeshire Marine/Sir Benfro Forol SAC, conservation advice has been developed by NRW in the form of a 'Regulation 37 Document'.

1.4.4.7 For some European sites under the statutory remit of NatureScot, NRW and/or Natural England a Conservation Advice Package (CAP) document has been produced. Of the European sites screened into this Part of the HRA Stage 2 ISAA, a CAP document has only been produced for the River Bladnoch SAC; CAP documents for other European sites have not yet been produced. This document contains revised and updated conservation objectives for the features of each site, site-specific clarifications and advice in order for the conservation objectives to be achieved, and advice on management required to achieve the conservation objectives. The Solway Firth SAC CAP is currently being jointly developed by Natural England and NatureScot but has not yet been published.

1.4.4.8 For European sites located within the Republic of Ireland there are currently no CAP documents. However, conservation objectives have been published for all sites and these have been considered within this Part of the HRA Stage 2 ISAA.

1.4.4.9 For European sites which fall within both Welsh and English or English and Scottish territorial waters the two relevant governing SNCBs can publish separate conservation objectives for the same European site. For example, both Natural England and NRW have published conservation objectives for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. Where this is the case for European sites assessed within this Part of the HRA Stage 2 ISAA, the most recently published conservation objectives have been used. Following S42 consultation responses from NRW on the agreed conservation objectives for the Dee Estuary/Aber Dyfrdwy SAC, the Natural England and Countryside Council Wales (CCW) (2010) conservation objectives have been used within this Part of the HRA Stage 2 ISAA, see Table 1.1.

1.4.5 Approach to the in-combination assessments

1.4.5.1 The Habitats Regulations require the consideration of the potential effects of a project on European sites both alone and in-combination with other plans or projects.

1.4.5.2 When undertaking an in-combination assessment projects, plans or activities with which the Mona Offshore Wind Project may interact to produce an in-combination effect must be identified. These interactions may arise within the construction, operations and maintenance, or decommissioning phases. The process of identifying those projects, plans or activities for which there is the potential for an interaction to occur is referred to as 'screening'.

1.4.5.3 A specialised process has been developed in order to methodically and transparently screen the large number of projects, plans and activities that may be considered cumulatively alongside the Mona Offshore Wind Project. This involves a staged

process that considers the level of detail available for projects, plans and activities, as well as the potential for interactions on a conceptual, physical and temporal basis.

1.4.5.4 The projects, plans and activities screened into the in-combination assessment have been consulted upon with the SNCBs through this HRA Stage 2 ISAA, in order to seek agreement on the projects, plans and activities to be considered in the cumulative assessment.

1.4.5.5 For the Mona Offshore Wind Project in-combination assessment a tiered approach has been adopted. This approach provides a framework for placing relative weight on the potential for each project/plan to be included in the in-combination assessment to ultimately be realised, based upon the project/plan's current stage of maturity and certainty in the project's parameters. The allocation of each project, plan and activity into tiers is not affected by the screening process but is merely a categorisation applied to all projects, plans and activities that have been screened in for assessment.

1.4.5.6 The tiered approach uses the following categorisations:

- Tier 1
  - Under construction
  - Permitted application
  - Submitted application
  - Those currently operational that were not operational when baseline data were collected, and/or those that are operational but have an ongoing impact
- Tier 2
  - Scoping report has been submitted and is in the public domain
- Tier 3
  - Scoping report has not been submitted or is not in the public domain
  - Identified in a relevant development plan
  - Identified in other plans and programmes.

1.4.5.7 An overview of the projects or activities considered for each receptor group are tabulated separately in each of the receptor chapters according to the effect-pathway under consideration.

1.5 Assessment of potential adverse effect on integrity: Annex I habitats (offshore and coastal)

1.5.1 Overview

1.5.1.1 The HRA Stage 1 Screening Report (Document Reference E1.4) identified the potential for LSEs on the following European site designated for Annex I habitat features (section 1.3.2) as shown in Figure 1.1:

- Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

1.5.1.2 LSEs on this European site were identified for the following potential impacts:

- During the construction and decommissioning phase:
  - Increases in SSC and sediment deposition (Mona Offshore Cable Corridor and Access Areas only)

  - Increased risk of introduction and spread of INNS (Mona Offshore Cable Corridor and Access Areas only)
  - Changes in physical processes (Mona Offshore Cable Corridor only and decommissioning phase only)
  - Removal of hard substrates (Mona Offshore Cable Corridor and Access Areas only and Annex I reef only during the decommissioning phase)
  - Accidental pollution (Mona Offshore Cable Corridor and Access Areas only)
  - In-combination impacts
- During the operations and maintenance phase:
  - Increases in SSC and sediment deposition (Mona Offshore Cable Corridor and Access Areas only)
  - Increased risk of introduction and spread of INNS (Mona Offshore Cable Corridor and Access Areas only)
  - Changes in physical processes (Mona Offshore Cable Corridor and Access Areas only)
  - Accidental pollution (Mona Offshore Cable Corridor and Access Areas only)
  - In-combination impacts.

1.5.1.3 This section presents the Stage 2 assessments (considering effects both alone and in-combination) for these sites. A summary of all Appropriate Assessments undertaken within this report is provided in the concluding section of this report (section 1.8).

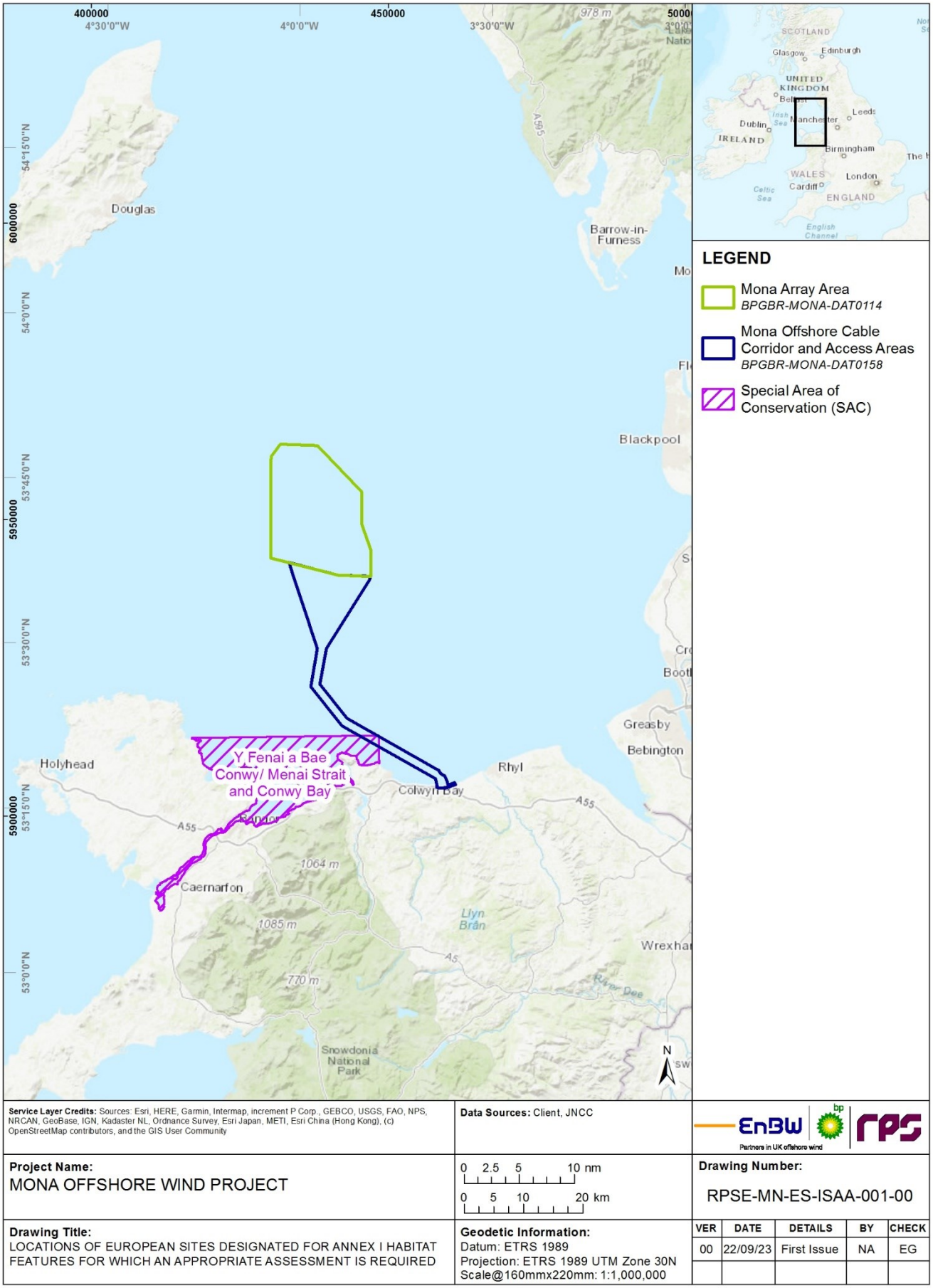

Figure 1.1: Locations of European sites with Annex I habitat features for which an Appropriate Assessment is required.

1.5.2 Baseline information

1.5.2.1 Baseline information on the Annex I habitat features of the European sites identified for further assessment within the HRA process has been gathered through a comprehensive desktop study of existing studies and datasets, full details of which are presented within Volume 2 Chapter 7: Benthic subtidal and intertidal ecology of the Environmental Statement (Document reference F2.2) and Volume 6, Annex 2.1: Benthic subtidal and intertidal ecology technical report of the Environmental Statement (Document reference F6.2.1).

1.5.2.2 A benthic subtidal survey of the Mona Offshore Cable Corridor and Access Areas, including the area of overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, was undertaken in summer 2022. Full details of these surveys are outlined in Volume 6, Annex 2.1: Benthic subtidal and intertidal ecology technical report of the Environmental Statement (Document Reference F6.2.1) and a summary is presented below.

1.5.2.3 The subtidal site-specific surveys within the Mona Offshore Cable Corridor and Access Areas consisted of infaunal grab samples and Drop Down Video (DDV) surveys. Five stations were sampled in the area of the Mona Offshore Cable Corridor and Access Areas which overlaps with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. Where the Mona Offshore Cable Corridor and Access Areas overlaps with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC the sediments were classified as either sandy gravel or gravelly sand.

1.5.2.4 In the area of overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, and also the part of the Mona Offshore Cable Corridor and Access Areas to the south of the SAC, the benthic communities were characterised by the *Kurtiella bidentata* and *Thyasira spp.* in circalittoral muddy mixed sediment (SS.SMx.CMx.KurThyMx), *Nephtys cirrosa* and *Bathyporeia spp.* in infralittoral sand (SS.SSa.IFiSa.NcirBat) and circalittoral coarse sediment (SS.SCS.CCS) biotopes (Figure 1.2). Full details on the communities and biotopes present are provided in Volume 6, Annex 2.1: Benthic subtidal and intertidal ecology technical report of the Environmental Statement (Document Reference F6.2.1).

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

Site description

1.5.2.5 The Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is located in northwest Wales and is located 26.8 km from the Mona Array Area and overlaps the Mona Offshore Cable Corridor and Access Areas. The physical and environmental conditions including characteristics such as sediment type, aspect, water clarity and exposure to tidal currents vary extensively throughout the site and give rise to a diverse range of habitats and associated marine species and communities (NRW, 2018a). The varying physical geography of areas such as the narrows of the Menai Strait to the more open waters of Conwy Bay, and the moderately wave-exposed Great and Little Ormes, results in the establishment of contrasting and in many cases rare marine communities (NRW, 2018a).

Feature accounts

1.5.2.6 The qualifying features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC are outlined below.

1.5.2.7 Annex I habitats that are the primary reason for selection of the site include:

- Sandbanks which are slightly covered by seawater all the time
- Mudflats and sandflats not covered by seawater at low tide
- Reefs.

1.5.2.8 Annex I habitats present as a qualifying feature, but not a primary reason for selection of the site;

- Large shallow inlets and bays
- Submerged or partially submerged sea caves.

1.5.2.9 The sections below provide information on the range, extent and associated species of the relevant Annex I habitat features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC which have been screened in and taken forward to Appropriate Assessment (i.e. Annex I reefs and Annex I sandbanks which are slightly covered by seawater all the time). As detailed in section 1.3, the mudflats and sandflats not covered by seawater at low tide, large shallow inlets and bays and submerged or partially submerged sea caves features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC have been screened out and are therefore not discussed further.

1.5.2.10 The distribution of the features within the SAC are shown in Figure 1.2. The assessments presented in this section consider both the intertidal and subtidal elements of the Annex I reef feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. This is to reflect the potentially differing sensitivities of the associated communities and biotopes. It should however be noted that the conclusions are made against the Annex I reef feature as a whole.

Reefs

1.5.2.11 Reefs are rocky marine habitats or biological concretions that rise from the seabed. They are generally subtidal but may extend as an unbroken transition into the intertidal zone, where they are exposed at low tide. There are two main types of reefs, geogenic reefs where animal and plant communities develop on rock or stable boulders and cobbles, and biogenic reefs where the reef structure is created by the animals themselves (JNCC, 2022e).

1.5.2.12 The Annex I reef feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC occurs throughout the entire SAC in intertidal and subtidal areas. The reef feature includes the tidal rapids of the Menai Strait, and limestone reefs along the southeast Anglesey coast and around Puffin Island and the Great and Little Ormes (JNCC, 2022e). The waters of the Menai Strait are relatively turbid and contain a relatively high level of suspended material, with strong tidal streams reaching up to 8 knots (4 m/s) in places during spring tides. As a result, the rocky reefs of the Menai Strait are dominated by diverse communities that feed mainly by filtering their food from the seawater. The intertidal and subtidal limestone reefs are home to several species that bore into rock, such as the rock-boring sponge *Cliona celata*, piddocks *Hiatella arctica*, polychaete worms *Polydora sp*., and acorn worms *Phoronis hippocrepia* (JNCC, 2022e). Subtidal clay outcrop reef communities are dominated by boring bivalves (piddocks) and are located at two known locations in the east Menai Strait, near Gallows Point just west of Beaumaris and between Beaumaris and Penmon (NRW, 2018a). The communities associated with intertidal under-boulder, overhang and crevice reef communities are dominated by either serrated wrack *Fucus serratus* or oar weed *Laminaria digitata*. The shaded sides of boulders are often colonised by

various foliose and filamentous red seaweed species, whilst animal communities depend on the type of underlying substrate. Where boulders and cobbles occur in the subtidal, animal communities of sea anemones, including the dahlia anemone *Urticina felina* and *Sagartia troglodytes*, as well as sea mats and turf forming sea firs are present (NRW, 2018a).

1.5.2.13 Strong tidal currents which occur in many of the reef areas prevent grazing animals, for example periwinkle from accessing the open rock surfaces. This results in the presence of dense foliose red seaweeds such as dulse *Palmaria palmata,* and false Irish moss *Mastocarpus stellatus* in intertidal and shallow subtidal areas where light levels allow (NRW, 2018a). In intertidal and shallow subtidal locations within the Menai Strait reefs are often overlain by dense coverings of brown algae including serrated wrack *Fucus serratus*, egg wrack *Ascophyllum nodosum* and oar weed *Laminaria digitata.* Red seaweeds such as *Phycodrys rubens*, *Plocamium cartilagineum* and sea beech *Delesseria sanguinea* also grow as epiphytes on the kelp and wrack plants (NRW, 2018a).

1.5.2.14 In areas of subtidal reef, seaweed cover is reduced and filter feeding animals dominate as a result of the turbid conditions (NRW, 2018a). In areas of moderate tidal stream reefs are dominated by unusually large sponge communities such as bread crumb sponges *Halichondria panicea* and *Halichondria bowerbanki* and the finger sponge *Haliclona oculate.* Although monitoring carried out by Irving and Stanwell Smith (2013) has suggested that the abundance of sponges within the Menai Strait may be decreasing. These sponge communities also provide habitat for marine invertebrates such as oaten pipes hydroid *Tubularia indivisa*, the sea fir *Sertularia argentea* and sea anemones including the fried egg anemone *Sagartia elegans*, the plumose anemone *Metridium dianthus* and the dahlia anemone *Urticina felina*. Mobile species associated with the subtidal reef areas, include the velvet swimming crab *Necora puber*, shore crab *Carcinus maenas*, edible crab *Cancer pagurus*, the long-clawed porcelain crab *Pisidia longicornis* and the butterfish *Pholis gunnellus*.

1.5.2.15 The reef feature occurs throughout the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, with the most significant areas of intertidal reef occurring at Menai Bridge between Beaumaris and Penmon and between Penmon and Red Wharf Bay. At Great and Little Orme the feature extends out into the subtidal. At the east area of Conwy Bay the reef feature occurs as cobble skears (areas of cobbles protruding just above sediment deposits) and mussel beds in the Morfa Conwy area for small areas of biogenic reef (NRW, 2016).

1.5.2.16 The indicative locations of the Annex I reef features, as mapped by NRW (2018), alongside the infaunal biotopes present within the Mona Offshore Cable Corridor and Access Areas as identified from the site-specific surveys (as outlined in paragraph 1.5.2.4) are presented in Figure 1.2. The purple dots correspond to point sample locations where biological records exist for reef habitats from subtidal survey work. The turquoise and green shaded areas correspond to polygons for definite and potential reef as identified from Countryside Council for Wales (CCW; now NRW) Phase 1 Intertidal Habitat Map (intertidal reef areas), admiralty charts and expert knowledge.

1.5.2.17 As outlined in paragraph 1.5.2.1 to 1.5.2.2, as part of site-specific surveys five sample stations were sampled within the area of overlap between the Mona Offshore Cable Corridor and Access Areas and the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. Of these five sample stations, two were subject to a stony reef assessment but neither were found to have any resemblance to Annex I stony reef. On the basis of the site-specific survey results, no Annex I reef was recorded within the area of overlap

between the Mona Offshore Cable Corridor and Access Areas and the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The site-specific survey data correlates with the NRW (2016) mapped distribution of Annex I habitat features which also indicate no presence of Annex I features within the Mona Offshore Cable Corridor and Access Areas

Sandbanks which are slightly covered by seawater all the time

1.5.2.18 This habitat feature consists of sandy sediments which are permanently covered by shallow sea water generally at depths less than 20 m below chart datum. The types of community associated with the habitat are influenced by location, exposure, topography, depth, turbidity and salinity of the surrounding water. The Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC includes the Four Fathom Banks complex, a relatively rare type of subtidal sandbank in Wales, owing to its comparatively large, and fairly sheltered location. The sediments associated with the sandbanks vary from muddy sands in areas where tidal streams are weak to clean well sorted and rippled sand in the outer areas where tidal streams are stronger. In the inner shore areas, communities are dominated by polychaetes such as *Spio filicornis*.

1.5.2.19 This feature occurs in three main locations within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC: the Menai Strait Sandbanks, Conwy Bay Bank and Red Wharf Bay Bank (NRW, 2016). The Menai Strait Sandbanks are located at the north and south entrances to the Menai Strait. The Conwy Bay Bank is situated to the west of Great Orme and extends approximately 6 km southwards into Conwy Bay. The Red Wharf Bay Bank is located north of the Red Wharf Bay and encompasses Ten Feet Bank near Puffin Island. The bank extends approximately 12 km in a northwest/southeast direction from the west side of Puffin Island (NRW, 2016).

1.5.2.20 The indicative locations of the sandbank features, as mapped by NRW (2018), are presented in Figure 1.2. The nearest mapped location of the feature is 3 km from the Mona Offshore Cable Corridor and Access Areas.

1.5.2.21 As outlined in paragraph 1.5.2.1 to 1.5.2.2, subtidal site-specific surveys within the Mona Offshore Cable Corridor and Access Areas consisting of infaunal grab samples and DDV surveys. During these surveys no Annex I sandbank were recorded in the area of overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The site-specific survey data correlates with the NRW (2016) mapped distribution of Annex I habitat features which also indicate no presence of the Annex I sandbank feature within the Mona Offshore Cable Corridor and Access Areas.

Condition assessment

1.5.2.22 Table 1.3 outlines the indicative condition assessments (which are taken from NRW, 2018b) of the relevant qualifying features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC which have been taken forward for detailed consideration in the Appropriate Assessment. Overall the condition assessment deemed that the reefs and sandbanks which are slightly covered by seawater all the time features are in favourable condition.

Table 1.3: Feature condition assessments and associated confidence levels for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC.

Component of habitat feature assessed	Indicative assessment of component	Overall indicative assessment of feature	Key evidence type used	Level of agreement between assessors	Confidence in evidence used to make the assessment	Component confidence level
Reefs						
Distribution and extent (within the site)	Favourable	Favourable	Monitoring data and expert judgement	High	Medium	Medium
Structure and function	Favourable		Some monitoring data, Water Framework Directive (WFD) data and expert judgement	High	Low	Low
Typical species	Unknown		Monitoring data and expert judgement	High	Not applicable	Not applicable
Sandbanks which are slightly covered by seawater all the time						
Distribution and extent (within the site)	Favourable	Favourable	NRW monitoring report (2007) and additional data (2010)	High	Low	Low
Structure and function	Favourable		NRW monitoring report (2007) and additional data (2010) and WFD assessments	Low	Low	Low
Typical species	Favourable		NRW monitoring report (2007) and additional data (2010) and WFD assessments	High	Low	Low

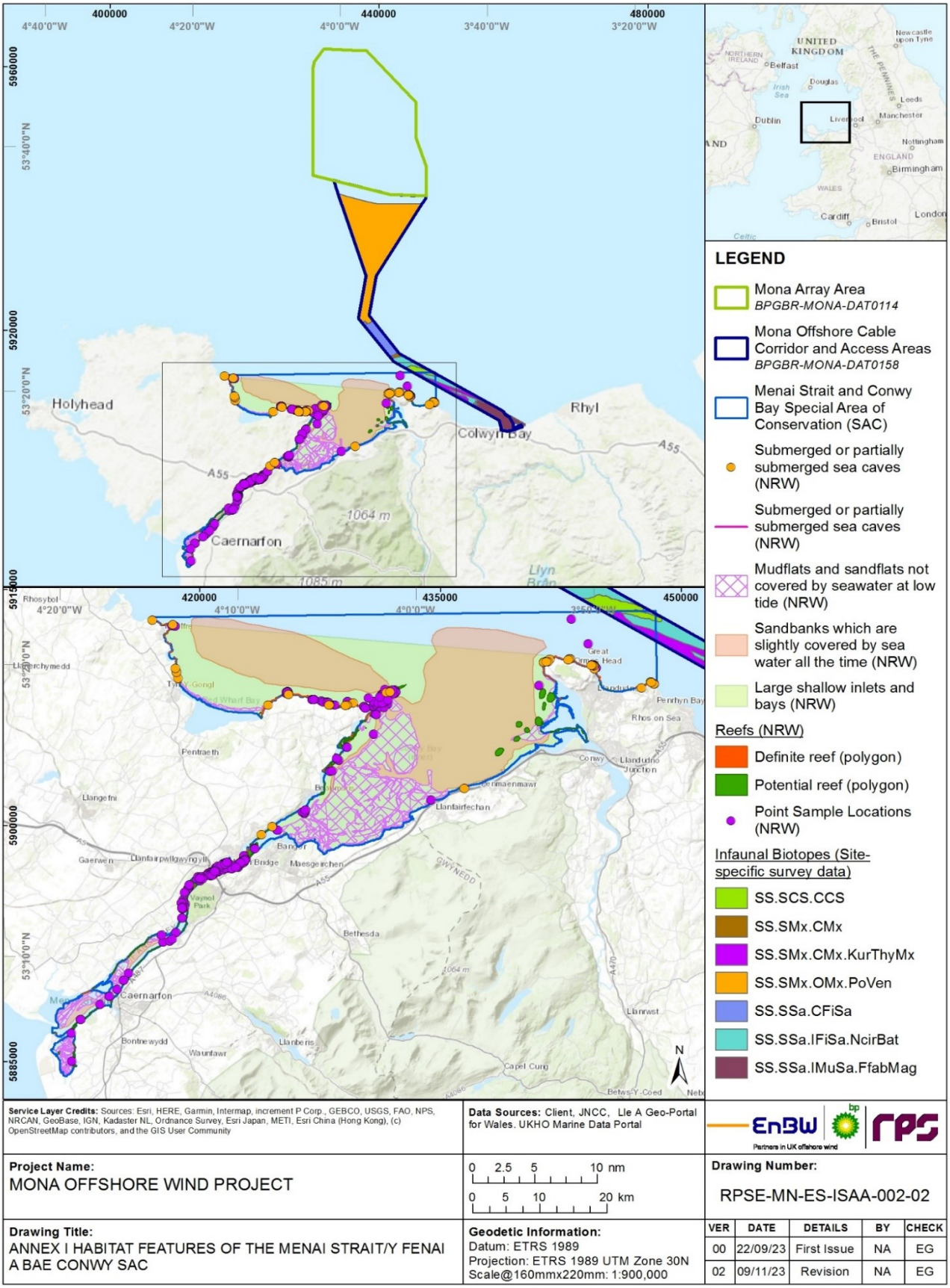

Figure 1.2: Annex I habitat distribution within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (NRW, 2016). Biotope codes defined in Appendix H of Volume 6, Annex 2.1: Benthic subtidal and intertidal ecology technical report of the Environmental Statement (Document Reference F6.2.1).

Conservation objectives

1.5.2.23 The conservation objectives for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, taken from NRW (2008)[1], are provided under the headings set out below (i.e. habitat features, range, structure and function etc.). Additional information on understanding and interpreting the conservation objectives are provided in NRW (2008).

1.5.2.24 To achieve favourable conservation status all the following, subject to natural processes, need to be fulfilled and maintained in the long term. If these objectives are not met, restoration measures will be needed to achieve favourable conservation status.

Habitat features

- Mudflats and sandflats not covered by seawater at low tide
- Reefs
- Sandbanks which are slightly covered by seawater all the time
- Large shallow inlets and bays
- Submerged or partially submerged sea caves.

Range

1.5.2.25 The overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing. For the intertidal mudflats and sandflats feature these include:

- Muddy gravel communities
- Dwarf eelgrass, *Zostera noltei* beds
- Sediment communities at Traeth Lafan.

1.5.2.26 For the reef feature these include:

- Reef communities in high energy wave-sheltered, tide-swept conditions
- Under-boulder, overhang and crevice communities
- Limestone reef communities
- Clay outcrop reef communities.

1.5.2.27 For the large shallow inlets and bays feature these include:

- Organically enriched muddy sediment areas.

Structure and function

1.5.2.28 The physical biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded. Important elements include:

[1] https://cdn.cyfoethnaturiol.cymru/media/687997/eng-menai-strait-reg-37-report-2018.pdf

- Geology
- Sedimentology
- Geomorphology
- Hydrography and meteorology
- Water and sediment chemistry
- Biological interactions.

1.5.2.29 The structure and function objective above, includes a need for nutrient levels in the water column and sediments to be:

- At or below existing statutory guideline concentrations
- Within ranges that are not potentially detrimental to the long term maintenance of the habitat features species populations, their abundance and range.

1.5.2.30 Contaminant levels in the water column and sediments derived from human activity to be:

- At or below existing statutory guideline concentrations
- Below levels that would potentially result in increase in contaminant concentrations within sediments or biota
- Below levels potentially detrimental to the long-term maintenance of the feature
- Species populations, their abundance or range taking into account bioaccumulation and biomagnification.

Restoration and recovery

1.5.2.31 This includes the need for restoration of some reef features such as underboulder, overhang and crevice communities, and of some mudflat and sandflat features such as the muddy gravel habitats and sheltered muddy habitats. All of these habitats are also part of the large inlets and bays feature.

Typical species

1.5.2.32 The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded. Important elements include:

- Species richness
- Population structure and dynamics
- Physiological heath
- Reproductive capacity
- Recruitment
- Mobility
- Range.

1.5.2.33 As part of this objective it should be noted that:

- Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum sustainable yield and secure in the long term
- The management and control of activities or operations likely to adversely affect the habitat feature is appropriate for maintaining it in favourable condition and is secure in the long term.

1.5.3 Assessment of adverse effects alone

1.5.3.1 The following assessments of the effects of the Mona Offshore Wind Project alone on Annex I habitats have been informed by the detailed project-specific physical processes modelling and technical assessments presented in Volume 6, Annex 6.1: Physical processes technical report of the Environmental Statement (Document reference F6.1.1) and Volume 2, Chapter 6: Physical processes of the Environmental Statement (Document Reference F2.1). The assessments have also drawn upon the sensitivity assessments of the relevant Annex I habitats, and their component biotopes, detailed in and Volume 2, Chapter 2 Benthic subtidal and intertidal ecology of the Environmental Statement (Document reference F2.2) which reference the best available literature and evidence with regards to sensitivity. In this regard, the Applicant is confident that the conclusions made on whether an adverse effect on integrity on a European site(s) and qualifying features can or cannot be ruled out have been identified in light of the best scientific knowledge in the field and all reasonable scientific doubt can be ruled out.

Increases in SSC and associated sediment deposition

1.5.3.2 Temporary increases in SSC and associated sediment deposition are predicted to occur during the construction and decommissioning phases as a result of seabed preparation (sandwave, boulder and debris clearance), and installation of offshore export cables. Temporary increases in SSC and associated sediment deposition are predicted to occur during the operations and maintenance phase as a result of activities within the Mona Array Area and Mona Offshore Cable Corridor and Access Areas (i.e. jack-ups associated with maintenance and cable repair/reburial events). These activities may result in temporary changes to water clarity, smothering and siltation rate changes.

1.5.3.3 The HRA Stage 1 Screening Report (Document Reference E1.4) determined that this potential impact pathway applies to the Mona Offshore Cable Corridor and Access Areas only. The Mona Array Area is at its closest point is located 26.8 km from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC which is beyond the Zone of Impact (ZoI) predicted for increased SSC and associated sediment deposition (as determined by the physical processes modelling, see Volume 6, Annex 6.1: Physical processes technical report of the Environmental Statement (Document reference F.6.1.1)). As the Mona Offshore Cable Corridor and Access Areas overlaps with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, only this element of the Mona Offshore Wind Project was screened in. It should be noted however that, whilst the MDS considers the proposed activities along the whole length of the Mona Offshore Cable Corridor and Access Areas, for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC the impact is largely only applicable to the 8.1 km of subtidal export cables (total for all four export cables) that overlap with the SAC and the ZoI associated with increases in SSC and sediment deposition.

1.5.3.4 The assessment of LSE during the HRA screening process identified that during construction and decommissioning, LSE could not be ruled out for the potential impact of increased SSC and associated sediment deposition associated with the Mona Offshore Cable Corridor and Access Areas for the Annex I reefs and Annex I sandbanks which are slightly covered by seawater all the time features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC.

1.5.3.5 The following sections explain how this potential impact on Annex I habitat features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC has been quantified and assessed.

1.5.3.6 The MDS considered for the assessment of potential impacts on Annex I habitat features from the increases in SSC and associated deposition is presented in Table 1.4.

Table 1.4: MDS considered for the assessment of potential impacts on Annex I habitats (offshore and coastal) from increases in SSC and sediment deposition during the construction, operations and maintenance and decommissioning phases.

Phase	MDS	Justification
Construction phase	Site preparation: • Sandwave clearance activities undertaken over an approximate 12 month duration within the wider four year construction programme • Offshore export cables: sandwave clearance along 72 km of offshore export cables (noting that only 8.1 km of export cables overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC), with a width of 20 m, to an average depth of 5.1 m. Total spoil volume for all offshore export cables of 1,504,000 m^3. Cable installation: • Offshore export cables: installation via trenching of up to 360 km of cable (noting that only 8.1 km of export cables overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC), with a trench width of up to 3 m and a depth of up to 3 m. Total spoil volume for all offshore export cables of 1,620,000 m^3. Installed over a period of 15 months.	Site preparation: The volume of material to be cleared from individual sandwaves will vary according to the local dimensions of the sandwave (height, length and shape) and the level to which the sandwave must be reduced. Based on the available data, it is anticipated that the sandwaves requiring clearance in the Mona Array Area are likely to be in the range 15 m in height. This will be confirmed pre-construction. In all cases the material cleared from the sandwave will be sidecast (i.e. placed in close proximity to the breach) in order that the sediment is readily available for supply for sandwave recovery. Site clearance activities may be undertaken using a range of techniques, the suction hopper dredger will result in the greatest increase in suspended sediment and largest plume extent as material is released near the water surface during the relocation of material. In reality plough dredging may be implemented however the volume of material brought into suspension would be reduced as material is ploughed along the bed. Boulder clearance activities will result in minimal increases in SSC and have therefore not been considered in the assessment. Cable installation: Cable routes inevitably include a variety of seabed material and in some areas 3 m depth may not be achieved or may be of a coarser nature which settles in the vicinity of the cable route. The assessment therefore considers the upper bound in terms of suspended sediment and dispersion potential. Cables may be buried by ploughing, trenching or jetting with jetting mobilising the greatest volume of material to increase SSC.
Operations and maintenance phase	Mona Offshore Wind Project lifetime of 35 years • 14 export cable repair events (two repairs every five years) for each	The greatest foreseeable number of cable reburial and repair events is considered to the MDS for sediment dispersion (noting that only 8.1 km of export cables overlap

Phase	MDS	Justification
	of the four export cables (i.e. 56 repair events in total) affecting up to 4 km per cable per repair event (i.e. 16 km for all four cables) for all offshore export cables, with a disturbance width of 20 m (noting that only 8.1 km of export cables overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and so the MDS assumes all four cables are repaired per repair event) • Seven reburial events (one event every five years) affecting up to 15 km of cable per reburial event Reburial of up to 15 km of subtidal export cables in one event every five years for all offshore export cables with a disturbance width of 20 m (noting that only 8.1 km of export cables overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and so the MDS assumes all four cables are reburied per reburial event).	with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC).
Decommissioning phase	Offshore export cables will be removed up to the HDD exit pits and disposed of onshore. Scour and cable protection will remain *in situ.*	The removal of cables may be undertaken using similar techniques to those employed during installation, therefore the potential increases in SSC and deposition would be no greater than those associated with the construction phase.

Measures adopted as part of the Mona Offshore Wind Project

1.5.3.7 Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of potential impacts on Annex I habitat features from increased SSC and sediment deposition are presented in Table 1.5.

Table 1.5: Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for Annex I habitat features from increases in SSC and sediment deposition.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
Development and adherence to an Offshore Construction method statement (CMS) which includes a Cable specification and installation plan (CSIP) that does not permit sandwave clearance within the Menai Strait and Conwy Bay SAC.	To minimise potential impacts on the Menai Strait and Conwy Bay SAC.	The Offshore CMS is secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Construction and decommissioning phases

Information to support assessment

1.5.3.8 As outlined in paragraph 1.5.2.17 and 1.5.2.21, no designated features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC were recorded during the site specific surveys in the area of overlap with the Mona Offshore Cable Corridor and Access Areas. Furthermore, as outlined in Table 1.5, a measure has been adopted as part of the Mona Offshore Wind Project to not undertake sandwave clearance within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. This will substantially reduce the potential for increases in SSC and sediment deposition within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as sediment disturbance will be limited to the 20 m width of disturbance from the cable installation tool. However as the sediment plumes associated with sandwave clearance can extend beyond the Mona Offshore Cable Corridor and Access Areas, and there will also be increases in SSC as a result of the cable installation itself, the Annex I reefs and Annex I sandbanks not covered by seawater at low tide features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC have been assessed in relation to this impact.

1.5.3.9 Site clearance activities, which will only occur outside of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, may be undertaken using a range of techniques. The use of a suction hopper dredger will result in the greatest increase in suspended sediment and largest plume extent as material is released near the water surface during the disposal of material. A plough dredger would mobilise a much smaller amount of sediment into suspension at the seabed and have reduced sediment plume concentrations and extents compared to other types of dredgers. The modelling simulated the use of a suction hopper dredger with a phasing representative of the scale of the sandwaves, dredging, and then depositing material within the Mona Offshore Cable Corridor and Access Areas as it progressed along the route, resulting in higher quantification of sedimentation compared to the plough dredging.

1.5.3.10 The dredging phase plumes (typically <50 mg/l) are predicted to be smaller than the plumes generated during the dumping phase (up to 1,000 mg/l at the release site; Figure 1.3). The plume however is expected to be most extensive when the deposited material is redistributed on the successive tides. However, the most extensive increases are seen as the deposited material is redistributed on the successive tides, where sedimentation occurs on the slack tide reducing the SSC completely and resuspension and transport occurs when the tidal currents increase. Under these circumstances, concentrations of 300 mg/l to 500 mg/l are predicted. The average suspended sediment concentration during the course of the operation is presented in Figure 1.4 with values <300 mg/l with a plume envelope width of circa 20 km which corresponds with the tidal excursion. These increases would be intermittent over the construction phase. Sedimentation of deposited material following sandwave clearance in the Mona Offshore Cable Corridor and Access Areas is focussed within 100 m of the site of release with a maximum depth of 0.5 to 1 m, whilst the finer sediment fractions are distributed in the vicinity at much smaller depths of 5 to 10 mm (see Figure 1.5). The dispersion of the released material is predicted to continue on successive tides. Sedimentation one day following the cessation of the clearance operation results in deposited material at the site of release with depth 1 m whilst in the locality lower depths, typically <30 mm, are present at 100 m distance from the release with the formation of sandwaves being visible.

1.5.3.11 Refinement of the project description has reduced both the length of export cable route requiring sandwave clearance, the height of sandwave clearance to 3 m and also

minimised the corridor width of sandwave clearance to 40 m for export cables. Therefore, the magnitude of impacts would be reduced from those presented in Volume 6, Annex 1.1: Physical processes technical report of the Environmental Statement (Document Reference: F6.1.1) and described above.

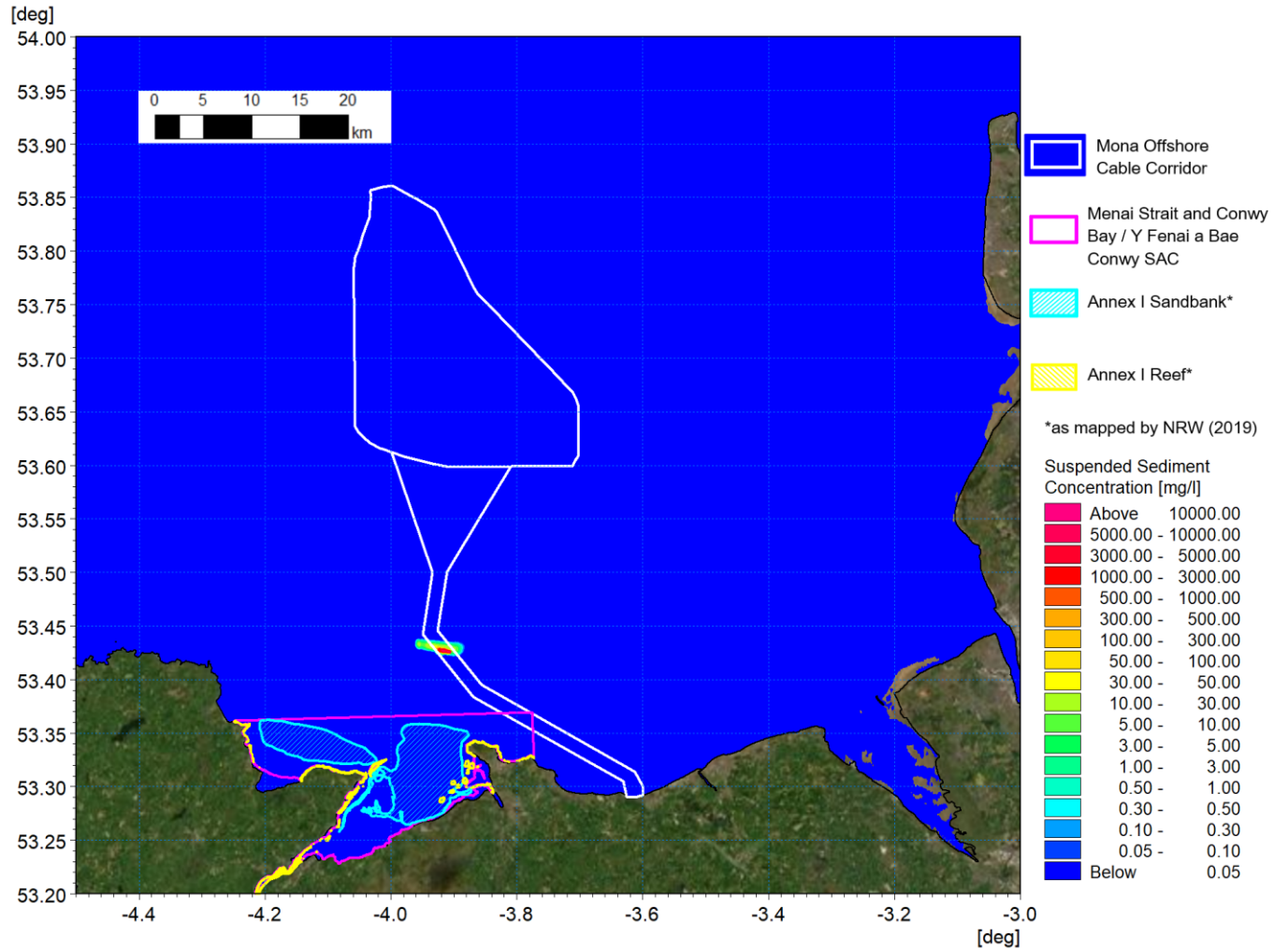

Figure 1.3: Average suspended sediment concentration during dumping phase (sandwave clearance) – offshore export cable.

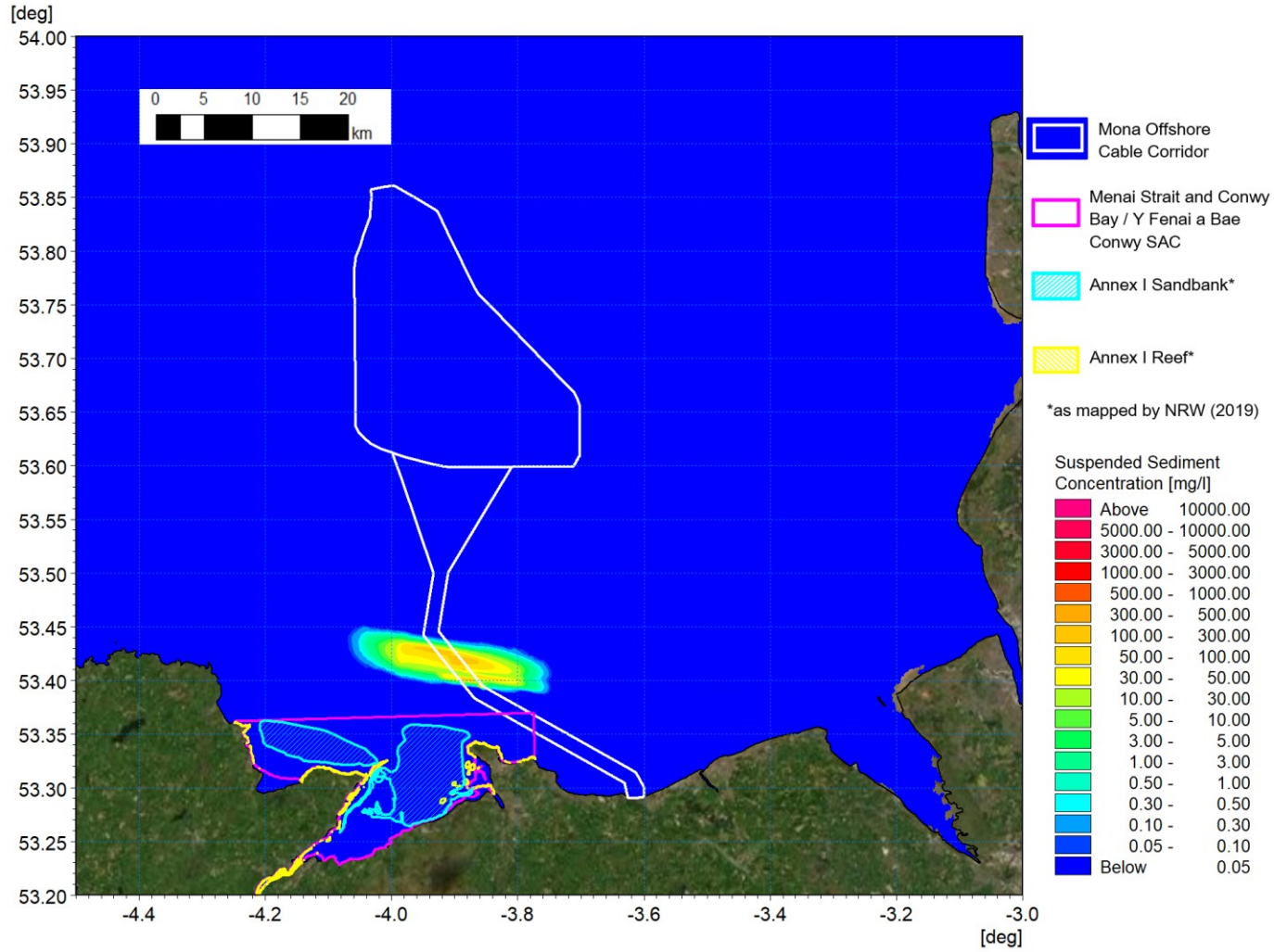

Figure 1.4: Average suspended sediment concentration during sandwave clearance operations – offshore export cable.

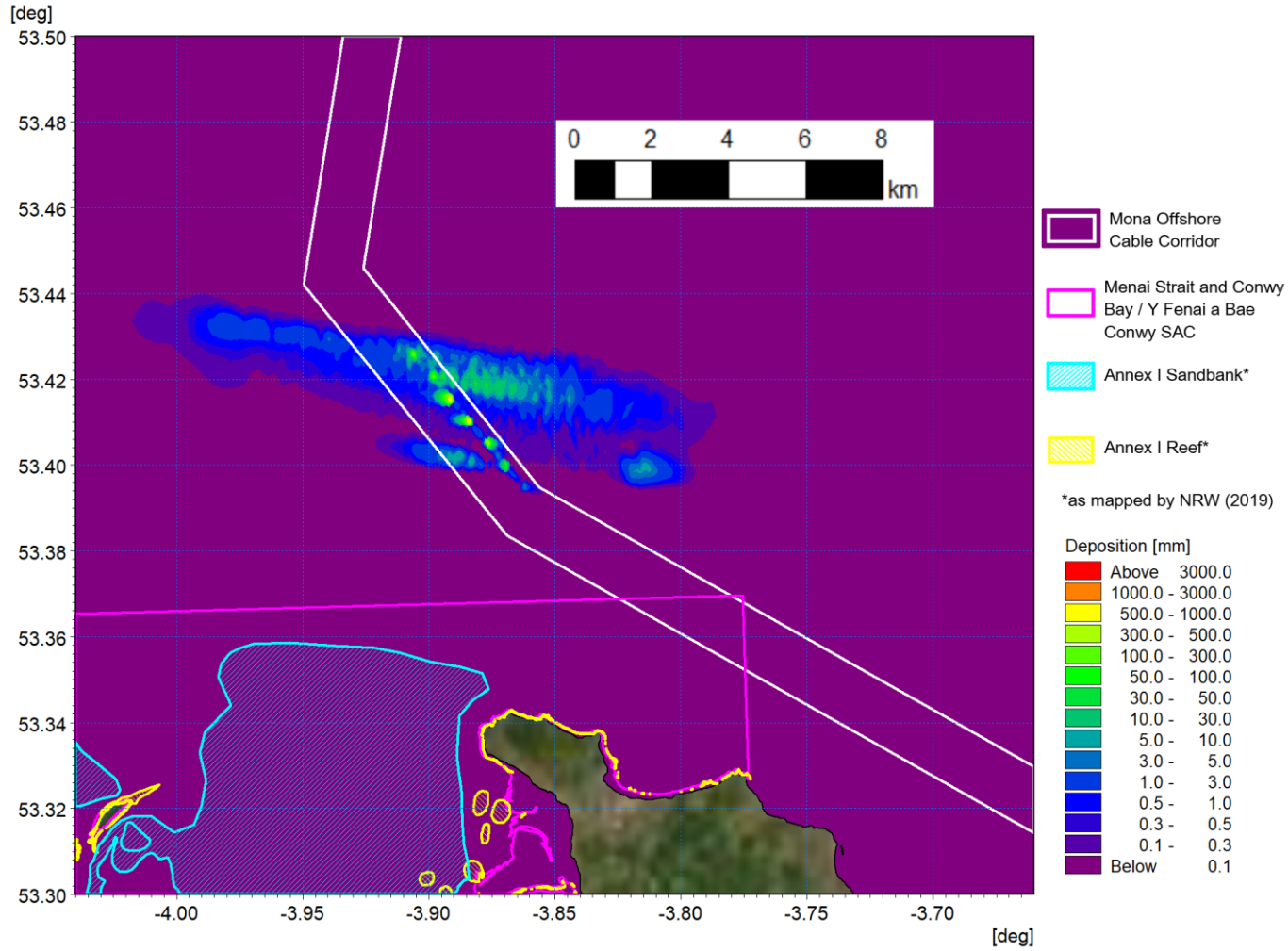

Figure 1.5: Average sedimentation during sandwave clearance operations – offshore export cable.

1.5.3.12 During the installation of offshore export cables, the SSCs along the Mona Offshore Cable Corridor and Access Areas are predicted to range between 50 and 1,000 mg/l where the greatest levels are located at the source of the sediment release in the shallowest water. The modelling outputs presented in Volume 6, Annex 1.1: Physical processes technical report of the Environmental Statement (Document Reference: F6.1.1) predicted average SSCs of <300 mg/l along the cable path, with the level dropping to background levels on the slack tide. The average SSC plume during the course of trenching along the export cable route is shown in Figure 1.6. It should, however, be noted, that increases in SSC would be intermittent during the construction phase as sections of the offshore export cables are installed. Tidal patterns indicate that although the released material migrates both east and west by settling and being re-suspended on successive tides, the sedimentation level is small, typically <0.5 mm, and the greatest levels of deposition occur along the trenching route as coarser material settles. The suspended sediment plume envelope for the offshore export cable installation has a width of approximately 20 km which corresponds with the tidal excursion (see Figure 1.7). Figure 1.8 illustrates the sedimentation levels one day following cessation of offshore export cable installation.

1.5.3.13 The modelling of export cable installation from the Mona Array Area to the nearshore region was undertaken with tidal forcing. In nearshore regions the tidal flows are oriented parallel to the coastline and the plume is not predicted to encroach on the shoreline and the Menai Strait and Conwy Bay SAC features (see Figure 1.6). This would therefore also be the case for any seabed preparation activities. Under the additional influence of wind and wave driven currents the plume may be driven towards the shoreline when installation is taking place both inshore of the Constable Bank and during ebb tides. However, it is noted that in the case of the Menai Strait and Conwy Bay SAC features the principal wind direction would need to be from the northeast. Winds from this sector typically have a 6% occurrence and waves are fetch limited. Additionally, the influence of wind and wave action perpendicular to tidal flow will also increase dispersion and reduce SSC and any related deposition to levels indiscernible from background levels.

1.5.3.14 The impact within the intertidal zone of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is likely to be reduced compared to the subtidal zone. Volume 2, Chapter 6: Physical processes of the Environmental Statement (Document reference F2.1) details that due to the nature of the tidal flow mobilised sediment is carried offshore and does not accumulate along the coastline.

1.5.3.15 The impact of cable removal as part of the decommissioning phase is not expected to be greater than the construction phase of the Mona Offshore Wind Project. In actuality the release of sediment in the decommissioning phase will be lower than the construction phase as the MDS assumes that activities such as seabed preparation within the Mona Offshore Cable Corridor and Access Areas will not be required.

1.5.3.16 Volume 2, Chapter 2 Benthic subtidal and intertidal ecology of the Environmental Statement (Document reference F2.2) concluded that the impact on the designated features of the SAC (i.e. Annex I sandbanks and Annex I reef) is predicted to be of local spatial extent, short to medium term duration (i.e. construction phase of up to four years, although at any one time only a small proportion of activities resulting in this impact will occur), intermittent and medium reversibility.

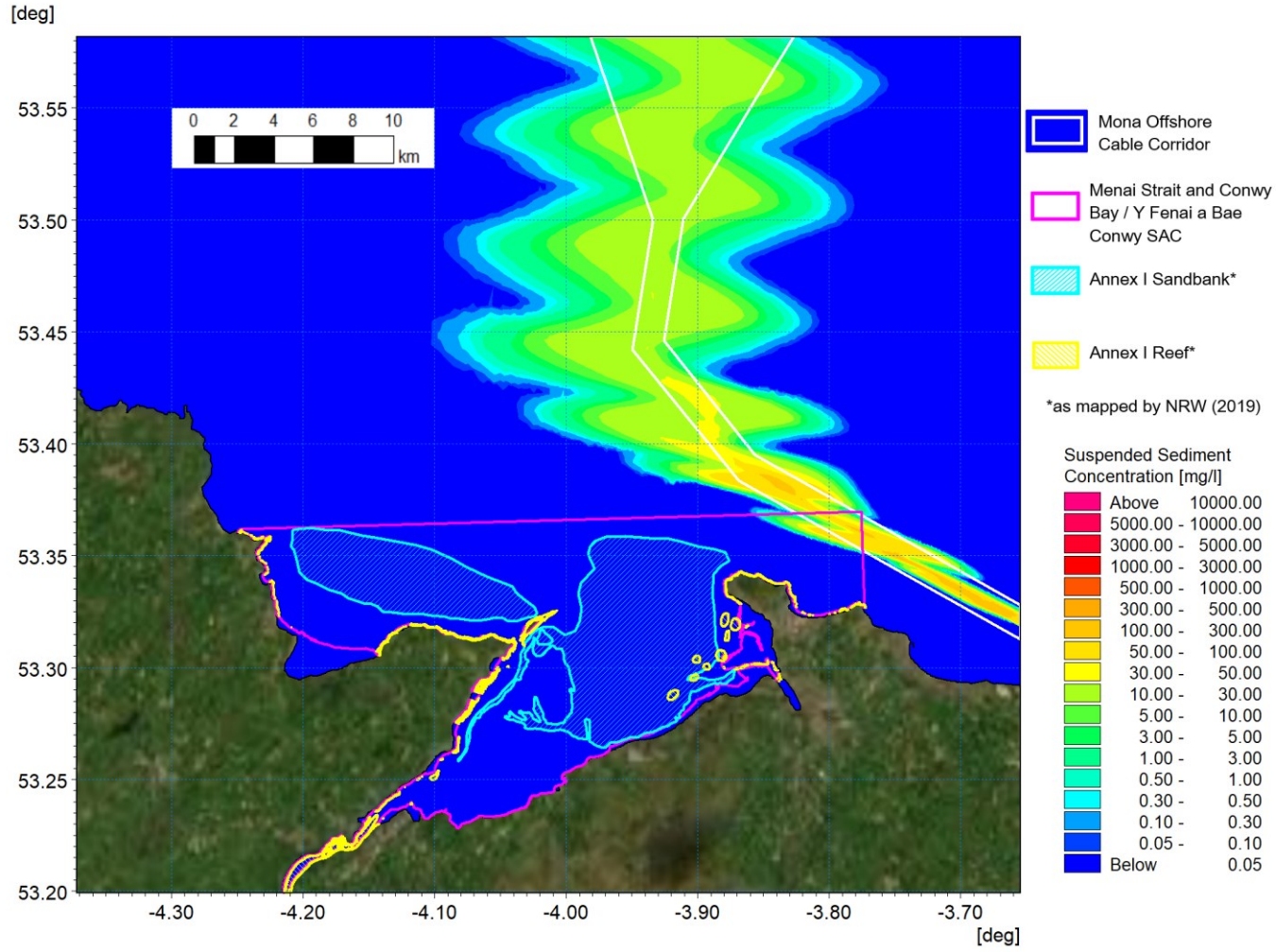

Figure 1.6: Average SSCs during offshore export cable trenching.

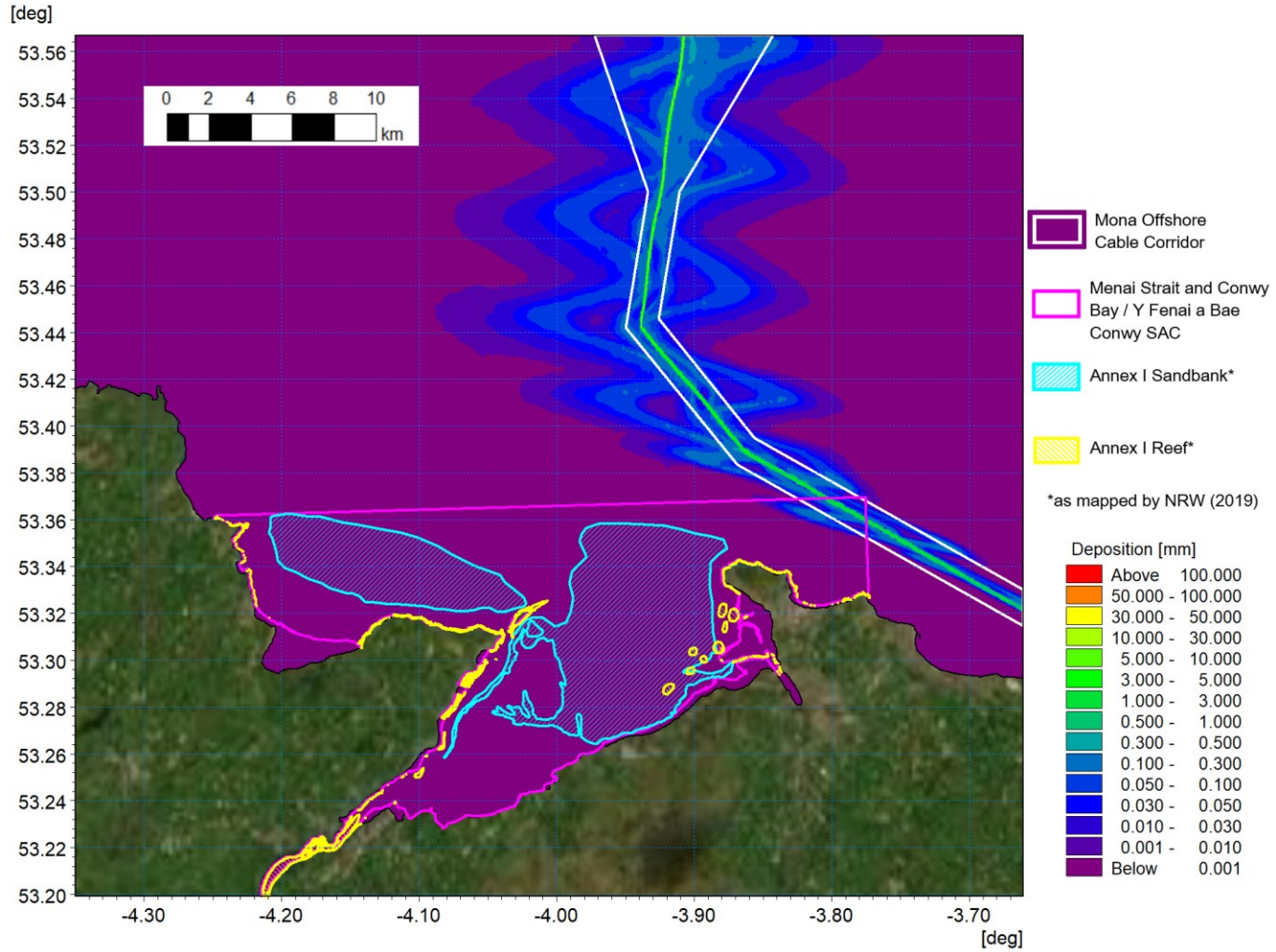

Figure 1.7: Average sedimentation during offshore export cable installation.

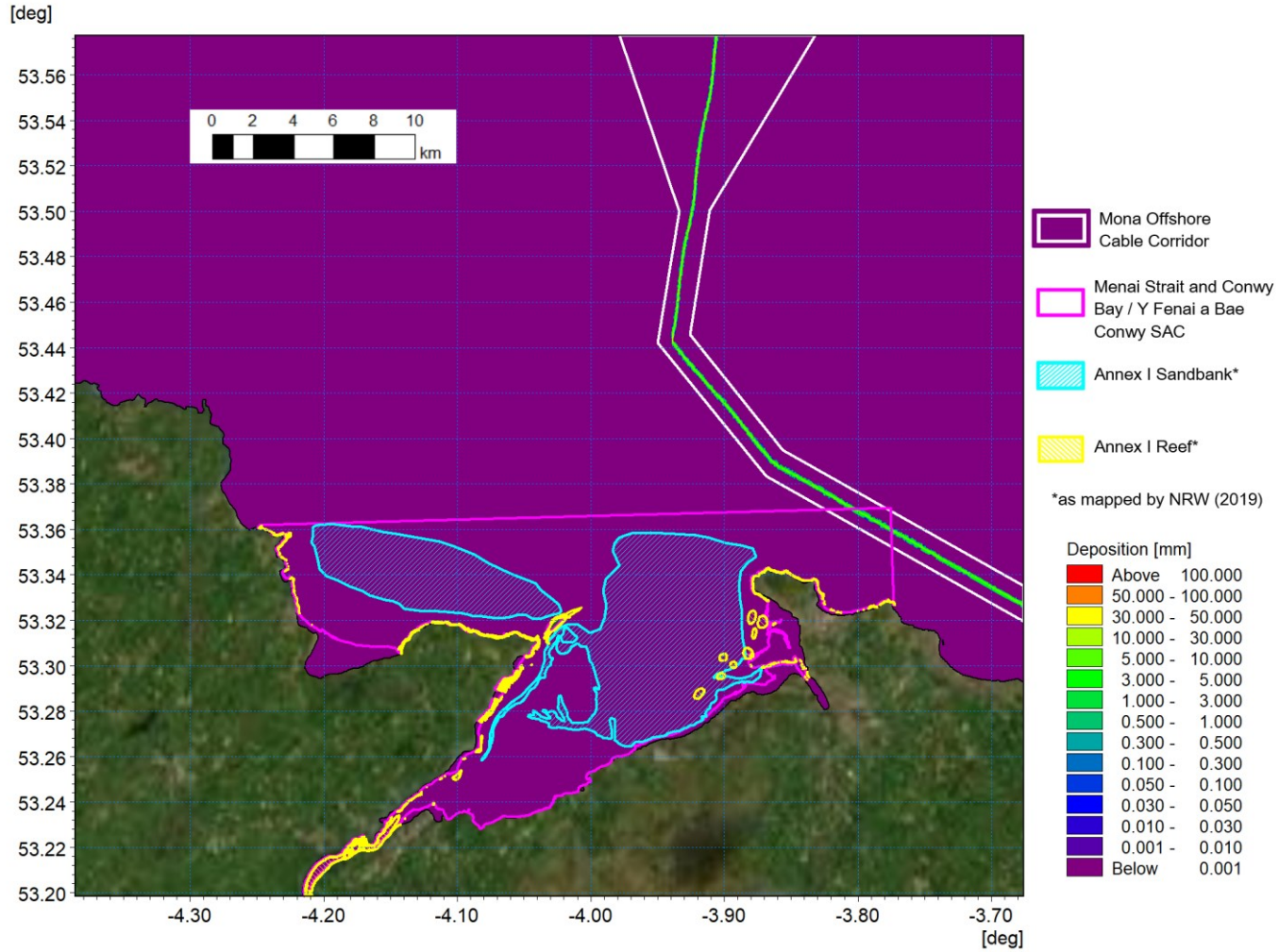

Figure 1.8: Sedimentation one day following cessation of offshore export cable installation.

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

1.5.3.17 Seabed preparation (sandwave, boulder and debris clearance) and installation of offshore export cables may lead to intermittent increases in SSC and associated sediment deposition during the construction phase as described in paragraph 1.5.3.12, which in turn may result in adverse effects on the Annex I designated features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC through reduced water clarity and smothering. Although as outlined in Table 1.5, a measure has been adopted as part of the Mona Offshore Wind Project to not undertake sandwave clearance within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC.

1.5.3.18 Potential impacts associated with increases in SSC and associated sediment deposition for the relevant designated features are discussed below.

Reefs

1.5.3.19 As discussed in paragraph 1.5.2.10, the assessment considers both the intertidal and subtidal elements of the Annex I reef feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The following sections discuss the sensitivities of the subtidal and intertidal elements of the Annex I reef features separately to reflect the

differing sensitivities of the associated communities and biotopes. It should however be noted that the final conclusions consider the Annex I reef feature as a whole.

1.5.3.20 The subtidal communities associated with the Annex I reef feature has an overall medium sensitivity to increases in SSC and associated deposition. As outlined in Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (Document Reference: F2.2), the subtidal communities associated with the Annex I reef feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC are likely to be sensitive to increased SSCs which may decrease light penetration and lead to either increase food supply or decrease feeding efficiency for suspension feeders. *Hiatella arctica,* a characteristic species is a filter feeding bivalve, and many other species of this type have efficient mechanisms to remove inorganic particles via pseudofaeces (Tillin *et al*., 2023a). Exposure to siltation pressures will be mediated by site-specific topography and hydrodynamics as silts may not accumulate on smooth surfaces, although some deposits may be trapped by epifauna and epifloral (where these occur) (Tillin *et al*., 2023a). As *H. arctica* are essentially sedentary with relatively short siphons, siltation from fine sediments rather than sands, even at low levels for short periods may increase mortality. Siltation by fine sediments would also prevent larval settlement for species which require hard substratum (Berghahn and Offermann, 1999). Hydroids have been found to be sensitive to silting (Gili and Hughes, 1995). Hughes (1977) found that maturing hydroids which had been smothered with silt lost most of their fine structure. After one month, the hydroids were seen to have recovered but although neither the growth rate nor the reproductive potential appeared to have been affected, the viability of the planulae may have been affected.

1.5.3.21 The intertidal communities associated with the Annex I reef feature has an overall medium sensitivity to increases in SSC and associated deposition. The representative biotope for the intertidal communities associated with Annex I reef feature is assessed by the Marine Evidence Based Sensitivity Assessment (MarESA) as being not sensitive to the effects of water quality change because this habitat is only submerged at high tide and therefore has limited exposure to this pressure (Tillin, 2016). Furthermore the characteristic red algal turf of this biotope is likely to be resistant to decreased light due to the regular shading which occurs during tidal submersion. An increase in suspended solids may lead to some sub-lethal abrasion of fronds but this will be compensated by the high growth rates exhibited by the characterizing species (Tillin, 2016). *Laminaria* sp. exhibit a decrease of 50% photosynthetic activity when turbidity increases by a light attenuation coefficient of 0.1/m (Staehr *et al*, 2009), the effect will be sublethal at the levels predicted for this site, especially at the coast. Siltation at this pressure benchmark may lower survival and germination of spores also causing mortality for algae in early life stages as well as reducing photosynthesis in adults (Tillin, 2016). These species however have been found to rapidly regrow from their holdfasts following damage (Tillin, 2016e). Smothering by 5 cm of sediment is likely to impact hydroids, ascidian and sponge species. However, it is likely that enough of the population would survive to recover quite rapidly should the thin layer of sediment be removed (Readman *et al*., 2023) such as will likely happen as the deposited sediments are winnowed away over time.

1.5.3.22 As outlined in paragraphs 1.5.3.8 to 1.5.3.15, the impact of increased SSC is predicted to be intermittent and during the construction phase of local spatial extent and spatially restricted to within approximately one tidal excursion (i.e. a plume envelope with a total width of approximately 20 km). Therefore, there is potential overlap with the Annex I reef feature of the SAC, and therefore potential for impacts to the Annex I reef feature. Within these distances average increases in SSCs of <300 mg/l are predicted during sandwave clearance and increases of between 50 and 1,000 mg/l are predicted during

offshore export cable installation, with levels dropping on subsequent tides. Sedimentation of deposited material associated with the dumping phase of sandwave clearance is focussed within 100 m of the release site with maximum depths of 0.5 to 1 m. During cable installation, sedimentation level is small (<0.5 mm) and greatest in the immediate vicinity of trenching as the coarser material settles. The impact will occur over the duration of the construction phase (up to four years), although at any one time only a small proportion of activities resulting in this impact will occur.

1.5.3.23 The Mona Offshore Cable Corridor and Access Areas does not overlap with any areas of Annex I reef within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (paragraph 1.5.2.17). As outlined in paragraph 1.5.3.13, for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC Annex I reef features to be affected by increases in SSC the principal wind direction would need to be from the northeast. Winds from this sector typically have a 6% occurrence and waves are fetch limited. Additionally, the influence of wind and wave action perpendicular to tidal flow will also increase dispersion and reduce SSC and any related deposition to levels indiscernible from background levels.

Sandbanks which are slightly covered by seawater all the time

1.5.3.24 The Annex I sandbanks feature has an overall low sensitivity to increases in SSC and associated deposition. As outlined in Table 2.21 of Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (Document reference F2.2) the MarESA determined that the communities associated with the Annex I sandbanks slightly covered by water all the time feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC are of low vulnerability and medium recoverability to this impact. The sensitivity of the receptor to increases in SSC and sediment deposition is therefore, considered to be low. The associated biotopes (*Nephtys cirrosa* and *Bathyporeia spp.* In infralittoral sand (SS.SSa.IFiSa.NcirBat) and *Abra prismatica*, *Bathyporeia elegans* and polychaetes in circalittoral fine sand (SS.SSa.CFiSa.ApriBatPo)) are deemed not sensitive to smothering and siltation rate changes (light) with both high resistance and resilience to the pressure. The biotope has medium resistance and high resilience to changes in suspended solids resulting in low sensitivity to the pressure. The SS.SSa.CFiSa.ApriBatPo biotope is deemed to have medium resistance and high resilience resulting with low sensitivity to the pressures outlined above.

1.5.3.25 The likely characterising species which live within the Annex I sandbank, including potentially *Nephtys cirrosa*, *Bathyporeia elegans* and *Abra prismatica*, are unlikely to be directly affected by an increased SSC. Within the mobile sands habitat storm events or spring tides may re-suspend or transport large amounts of material and therefore species are considered to be adapted to varying levels of suspended solids. Some species may experience short term effects from this impact, for example *Bathyporeia spp.* feed on diatoms within the sand grains (Nicolaisen and Kanneworff, 1969), an increase in suspended solids that reduced light penetration could alter food supply. Other characterising species such as the polychaete *Nephtys cirrosa* and amphipods are likely to be able to burrow through a 5 cm layer of fine sediments, reducing the likelihood of mortality from light smothering for short periods (Tillin *et al*., 2023a).

1.5.3.26 Seapen and burrowing megafauna communities are predicted to recover quickly from increases in SSC. Seapen species often live in sheltered areas, in fine sediments, subject to high suspended sediment loads. The potential effect of increased deposition of fine silt is uncertain but it is possible that feeding structures may become clogged. When tested, the seapen *Virgularia mirabilis* quickly seized and rejected inert particles

(Hoare and Wilson, 1977). Once siltation levels return to normal, feeding will be resumed therefore recovery will be immediate. Similarly, burrowing megafauna are unlikely to be affected adversely by changes in suspended sediment in the water column. *P. phosphorea* and *F. quadrangularis* were found to recover within 72 to 96 hours after experimental smothering by pots or creels for 24 hours (Kinnear *et al.*, 1996).

1.5.3.27 As outlined in paragraphs 1.5.3.8 to 1.5.3.15, the impact of increased SSC is predicted to be intermittent during the construction phase and of local spatial extent and spatially restricted to within approximately one tidal excursion (i.e. a plume envelope with a total width of approximately 20 km). Therefore, there is potential overlap with the Annex I sandbank feature of the SAC. Within these distances average increases in SSCs of <300 mg/l are predicted during sandwave clearance and increases of between 50 and 1,000 mg/l are predicted during offshore export cable installation, with levels dropping on subsequent tides. Sedimentation of deposited material associated with the dumping phase of sandwave clearance is focussed within 100 m of the release site with maximum depths of 0.5 to 1 m. During offshore export cable installation, sedimentation level is small (<0.5 mm) and greatest in the immediate vicinity of trenching as the coarser material settles. The Mona Offshore Cable Corridor and Access Areas does not overlap with any areas of Annex I sandbanks which are slightly covered by seawater all the time within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. As outlined in paragraph 1.5.3.13, for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy Annex I sandbanks which are slightly covered by seawater all the time SAC features to be affected by increases in SSC the principal wind direction would need to be from the northeast. Winds from this sector typically have a 6% occurrence and waves are fetch limited. Additionally, the influence of wind and wave action perpendicular to tidal flow will also increase dispersion and reduce SSC and any related deposition to levels indiscernible from background levels.

Conclusions

1.5.3.28 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of increases in SSC and associated sediment deposition during the construction and decommissioning phases. An assessment of the impact 'increased SSC and associated sediment deposition' against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented in Table 1.6 below.

Table 1.6: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for increases in SSC and associated sediment deposition during the construction and decommissioning phase.

Conservation Objective	Conclusion
The overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing	All increases in SSC and associated sediment deposition associated with offshore export cable installation within the SAC and associated activities (e.g. sandwave clearance and site preparation activities) outwith the SAC during construction and decommissioning activities will be limited in spatial extent (plume envelope for the offshore export cable installation has a width of approximately 20 km which corresponds with the tidal excursion) and intermittent in nature. Furthermore, as outlined in Table 1.5, a measure has been adopted as part of the Mona Offshore Wind Project to not undertake sandwave clearance within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC which will limit sediment disturbance within the SAC to that arising from the cable installation tool only within a 20 m corridor. The Mona Offshore Cable Corridor and Access Areas does not overlap with any Annex I designated features of the Menai

Conservation Objective	Conclusion
	Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. If increases in SSC do extend to reach the designated features beyond the Mona Offshore Cable Corridor and Access Areas, the levels of SSC and sediment deposition would be very low and likely indiscernible from natural variability. Therefore, these activities will not prevent the distribution or extent of identified Annex I habitat features or each of their main component parts from increasing or remaining stable.
The physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded	Increases in SSC and associated sediment deposition associated with offshore export cable installation within the SAC and associated activities (e.g. sandwave clearance and site preparation activities) occurring outwith the SAC will be temporary in nature, reversible and the corresponding biological communities associated with the Annex I habitats are predicted to recover. Offshore export cable installation and associated activities will, therefore, not result in the degradation of the physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time habitat features.
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	Increases in SSC and associated sediment deposition associated with offshore export cable installation within the SAC and associated activities (e.g. sandwave clearance, pre-lay preparation) occurring outwith the SAC will be temporary and the levels likely to reach the designated features will be low. Furthermore, the corresponding communities are predicted to recover from the low levels of SSC and sedimentation. The presence, abundance, condition and diversity of the typical benthic species associated with the Annex I features will, therefore, not be affected in such a way that the habitat quality will be degraded.

1.5.3.29 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of increases in SSC and associated deposition impacts with respect to the construction and decommissioning of the Mona Offshore Wind Project alone.

Operations and maintenance phase

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

1.5.3.30 The MDS for export cable maintenance for the Mona Offshore Cable Corridor and Access Areas as a whole is as outlined in Table 1.4. With regards to the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, the MDS assumes the repair and/or reburial of up to 8.1 km of subtidal export cable per repair/reburial event (assuming all four cables are repair/reburied), with a disturbance width of 20 m. This approach is considered highly precautionary as only 16 km of the total 360 km of offshore export cables are expected to require repair twice every five years and only 15 km of all offshore export cables will require reburial every five years therefore the actual extent of repair/reburial in the SAC is likely to be much less than assessed.

Reefs

1.5.3.31 The impact of increases in SSC and associated sediment deposition during the operations and maintenance phase on the Annex I reef feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be the same or less than those predicted for export cable installation in the construction phase (see paragraph 1.5.3.12 to 1.5.3.22) for each repair/reburial event. The frequency of impact will, however, be substantially reduced compared to the construction phase (i.e. up to eight repair events

every five years and in one reburial event every five years). The sensitivity of the feature to this impact is outlined in paragraph 1.5.3.19.

Sandbanks slightly covered by sea water all the time

1.5.3.32 The impact of increased SSC associated sediment deposition during the operations and maintenance phase on Annex I sandbank feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be the same or less than those predicted for export cable installation in the construction phase (see paragraph 1.5.3.12 to 1.5.3.22) for each repair/reburial event. The frequency of impact will, however, be substantially reduced compared to the construction phase (i.e. up to two repair events every five years per offshore export cable and in one reburial event every five years per offshore export cable). The sensitivity of the feature to this impact is outlined in paragraph 1.5.3.24.

Conclusions

1.5.3.33 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of increased SSC and sediment deposition during the operations and maintenance phase. An assessment of the impact 'increased SSC and associated sediment deposition' against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented in Table 1.7 below.

Table 1.7: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for increases in SSC and associated sediment deposition during the operations and maintenance phase.

Conservation Objective	Conclusion
The overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing	All increases in SSC and associated sediment deposition associated with offshore export cable maintenance activities will be limited in spatial extent (with a disturbance width of 20 m associated with export cable maintenance activities), and intermittent over the 35 year operational lifetime. The Mona Offshore Cable Corridor and Access Areas does not overlap with any Annex I designated features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. Increases in SSC and associated deposition, will be substantially lower than during the construction phase. If increases in SSC do extend to reach the designated features beyond the Mona Offshore Cable Corridor and Access Areas the levels of SSC and sediment deposition would be very low and likely indiscernible from natural variability. Therefore, these activities will not prevent the distribution or extent of the Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time habitat features, or each of their main component parts, from increasing or remaining stable.
The physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded	Increases in SSC and associated sediment deposition associated with offshore export cable maintenance activities will be intermittent over the 35 year operation lifetime, temporary in nature, reversible and the corresponding biological communities associated with the Annex I habitats are predicted to recover, if they are affected at all (noting that the Mona Offshore Cable Corridor and Access Areas does not overlap with any Annex I designated features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC). Therefore, maintenance activities will not result in the degradation of the physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time habitat features .

Conservation Objective	Conclusion
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	Increases in SSC and associated sediment deposition associated with offshore export cable maintenance activities will be intermittent over the 35 year operation lifetime, temporary and substantially lower then during the construction phase. Furthermore, the corresponding communities are predicted to recover from the very low levels of SSC and sedimentation predicted as a result of maintenance activities. Therefore, the presence, abundance, condition and diversity of the typical benthic species associated with the Annex I habitats will not be affected in such a way that the habitat quality will be degraded.

1.5.3.34 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of increases in SSC and associated sediment deposition impacts with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Increased risk of introduction and spread of invasive non-native species

1.5.3.35 The installation/presence of artificial structures and the movements of vessels may lead to an increased risk of introduction and spread of INNS across all phases of the Mona Offshore Wind Project.

1.5.3.36 The assessment of LSE during the HRA screening process identified that during the construction, operations and maintenance and decommissioning phases, LSE could not be ruled out for the potential impact of increased risk of introduction and spread of INNS for the Mona Offshore Cable Corridor and Access Areas. This relates to the following designated site and relevant Annex I habitat features:

- Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC
  - Reefs
  - Sandbanks which are slightly covered by seawater all the time.

1.5.3.37 The following sections explain how this potential impact on Annex I habitat features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC has been quantified and assessed.

1.5.3.38 The MDS considered for the assessment of the increased risk of introduction and spread of INNS on Annex I habitat features is presented in Table 1.8. It should be noted however that, whilst the MDS considers the proposed activities along the whole length of the Mona Offshore Cable Corridor and Access Areas, for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC the impact is largely only applicable to the 8.1 km of subtidal export cables that overlap with the SAC and the immediate surrounding area.

Table 1.8: MDS considered for the assessment of potential impacts on Annex I habitats (offshore and coastal) from increased risk of introduction and spread of INNS during the construction, operations and maintenance and decommissioning phases.

Phase	MDS	Justification
Construction phase	• Long term introduction of artificial structures (i.e. cable protection) in the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC: up to 8,100 m^2 associated with cable protection for up to 10% of the	Maximum surface area created by cable protection within the Menai Strait and

Phase	MDS	Justification
	8.1 km of cables within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC • Vessel movement: up to 2,215 vessel round trips in total over the construction phase for the Mona Offshore Wind Project as a whole. The number within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be less (i.e. up to 40 cable lay installation and support vessel movements may be required in total and some of those will occur within the SAC) • Maximum duration of the offshore construction phase is up to four years.	Conwy Bay/Y Fenai a Bae Conwy SAC and maximum number of vessel movements during construction, operations and maintenance and decommissioning phases.
Operations and maintenance phase	• Long term introduction of artificial structures (i.e. cable protection) in the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC: up to 8,100 m^2 associated with cable protection for up to 10% of the 8.1 km of cables within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC • Vessel return trips: Up to 849 vessel return trips per year during the operations and maintenance phase for the Mona Offshore Wind Project as a whole. The number within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be less • Operational phase up to 35 years.	
Decommissioning phase	• Permanent presence of artificial structures associated with cable protection left *in situ* post decommissioning: up to 8,100 m^2 associated with cable protection for up to 10% of the 8.1 km of cables within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC • Vessel return trips: Up to 2,215 decommissioning vessel return trips during the decommissioning phase for the Mona Offshore Wind Project as a whole. The number within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be less • Maximum duration of the offshore decommissioning phase is up to four years.	

Measures adopted as part of the Mona Offshore Wind Project

1.5.3.39 Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of potential impacts on Annex I habitat features from increased risk of introduction and spread of invasive non-native species are presented in Table 1.9.

Table 1.9: Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for Annex I habitat features from increased risk of introduction and spread of INNS.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
Development and adherence to an Offshore CMS which includes a CSIP that does not permit the percentage of export cable requiring cable protection to exceed 10% of the total length of the export cable within the Menai Strait and Conwy Bay SAC.	This commitment will minimise the impacts to the SAC whilst noting that there is no overlap between the Mona Offshore Cable Corridor and any designated features of the Menai Strait and Conwy Bay SAC.	The Offshore CMS is secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Development of, and adherence to, an Offshore EMP. This will include Biosecurity Risk Assessment and an INNS Management Plan, including actions to minimise INNS.	The plan will outline measures to ensure vessels comply with the International Maritime Organisation (IMO) ballast water management guidelines, it will consider the origin of vessels and contain standard housekeeping measures for such vessels as well as specific measures to be adopted in the event that a high alert species is recorded (e.g. carpet sea squirt *Didemnum vexillum*).	The Offshore EMP is secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Construction and decommissioning phases

Information to support assessment

1.5.3.40 The Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC overlaps with the Mona Offshore Cable Corridor and Access Areas for the Mona Offshore Wind Project and therefore some increased risk of introduction and spread of INNS may occur within the SAC. As outlined in paragraph 1.5.2.17 and 1.5.2.21, no designated features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC were recorded during the site specific surveys in the area of overlap with the Mona Offshore Cable Corridor and Access Areas. This supports NRW's mapped distribution of designated features within the SAC (NRW, 2016), as shown in Figure 1.2. Therefore, whilst none of the designated features of the SAC will be directly affected by increased risk of introduction and spread of INNS there is the potential for a stepping stone effect and for these features to be impacted.

1.5.3.41 As outlined in Table 1.8, the MDS for the Menai Strait and Conwy Bay/ Y Fenai a Bae Conwy SAC accounts for cable protection for up to 10% of the 8.1 km of export cables within the SAC with a width of 10 m. This results in the gradual introduction of up to

8,100 m^2 of cable protection available for colonisation, and potential introduction of INNS, within the SAC (0.003% of the total area of the SAC). Vessel movements will also occur within the SAC during the construction phase, and although it is not possible to quantify the amount of activity specifically in the SAC, the number will be considerably less than the total 2,215 vessel round trips during the construction phase associated with the whole Mona Offshore Wind Project (i.e. up to 40 cable lay installation and support vessel movements may be required in total and some of those will occur within the SAC). There is the potential that any INNS which colonise the cable protection in the area of the Mona Offshore Cable Corridor and Access Areas which overlaps with the Menai Strait and Conwy Bay/ Y Fenai a Bae Conwy SAC, may use this as a stepping stone to spread further in to the SAC and potentially affect the designated features of the site.

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

Reefs

1.5.3.42 The subtidal communities associated with the Annex I reef feature are considered by the MarESA to have no sensitivity to INNS however for the CR.MCR.CFaVS.CuSpH biotope there is no evidence regarding its sensitivity to INNS therefore this assessment has adopted a precautionary approach in concluding a high sensitivity (as per advice from NRW (see Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (Document Reference: F2.2)). This habitat is likely to experience high turbidity, reducing light penetration, further reducing the suitability of this habitat to potential INNS. The American piddock has been identified in this region of the UK and it has the appropriate adaptations to colonise this Important Ecological Feature (IEF). Displacement however is considered to be unlikely because *Hiatella arctica*, the native piddock, in this biotope occurs subtidally and on harder substrata and the American piddock is found intertidally. Additionally *Didemnum. vexillum* is an invasive colonial sea squirt native to Asia. *D. vexillum* can also grow over and smother the resident biological community including hydroids and sponges. Surveys within Holyhead Marina, North Wales have found *D. vexillum* growing on and smothering native tunicate communities (Holt and Cordingley, 2011).

1.5.3.43 As set out in Table 1.9, measures adopted as part of the Mona Offshore Wind Project include development of, and adherence to, an Offshore EMP. This will include Biosecurity Risk Assessment and an INNS Management Plan, including actions to minimise INNS. The INNS Management Plan will detail the measures to ensure vessels comply with the IMO ballast water management guidelines, it will consider the origin of vessels and contain standard housekeeping measures for such vessels as well as specific measures to be adopted in the event that a high alert species is recorded. This will ensure that the risk of potential introduction and spread of INNS will be minimised. The Mona Offshore Cable Corridor and Access Areas does not overlap with any areas of Annex I reef within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (paragraph 1.5.2.17). The nearest Annex I reef feature is located 2.4 km from the Mona Offshore Cable Corridor and Access Areas, therefore considering this distance the likelihood of a stepping stone effect is limited.

Sandbanks slightly covered by sea water all the time

1.5.3.44 The Annex I sandbank feature has been assessed by the MarESA as having a high sensitivity to the increased risk of introduction and spread of INNS. Few non-indigenous species are able to colonise mobile sands due to the high level of

disturbance (Tillin and Watson, 2023a). The assessment however highlights two specific species of concern, the slipper limpet *Crepidula. fornicata* which can settle on stones and other hard substrate such as bivalve shells to form dense carpets which smother the underlying bivalves (Tillin and Watson, 2023a). Ultimately this may result in a change to the overall substrate type which may make it unsuitable for the settlement of native larvae. The colonial ascidian *D. vexillum* is present in the UK but appears to be restricted to artificial surfaces, this species may, however, have the potential to colonise and smother offshore gravel habitats (Tillin and Watson, 2023a). Additionally, although not currently established in UK waters, the whelk *Rapana venosa* may spread to UK habitats from Europe (Tillin and Watson, 2023a). Both *C. fornicata* and *D. vexillum* have been identified on the north Wales coast and therefore have the potential to extend into this biotope. For the majority of the subtidal biotopes the sediments characterising these IEFs are likely to be too mobile or otherwise unsuitable for most of the recorded INNS currently recorded in the UK (Tillin and Rayment, 2023; Tillin *et al*., 2023a; Tillin and Watson, 2023a) however the greatest risk is associated with *C. fornicata*. *C. fornicata* was not recorded in any of the site specific surveys for the Mona benthic subtidal and intertidal ecology study area.

1.5.3.45 As outlined in paragraph 1.5.3.43, an Offshore EMP will be implemented, which will ensure that the risk of potential introduction and spread of INNS will be minimised. The Mona Offshore Cable Corridor and Access Areas does not overlap with any areas of Annex I sandbank within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (paragraph 1.5.2.21). The nearest Annex I sandbank feature is located 3.5 km from the Mona Offshore Cable Corridor and Access Areas, therefore considering this distance the likelihood of a stepping stone effect is limited.

Conclusions

1.5.3.46 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of from increased risk of introduction and spread of INNS during the construction and decommissioning phases. An assessment of the impact 'from increased risk of introduction and spread of INNS' against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented in Table 1.10 below.

Table 1.10: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for from increased risk of introduction and spread of INNS during the construction and decommissioning phases.

Conservation Objective	Conclusion
The overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing	The Mona Offshore Cable Corridor and Access Areas does not overlap with any Annex I features within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (paragraph 1.5.2.17 and 1.5.2.21). The nearest Annex I reef feature is located 2.4 km from the Mona Offshore Cable Corridor and Access Areas, therefore considering this distance the likelihood of a stepping stone effect is limited. As outlined in Table 1.9 and paragraph 1.5.3.43, measures adopted as part of the Mona Offshore Wind Project include development of, and adherence to, an Offshore EMP which will include Biosecurity Risk Assessment and an INNS Management Plan. With these measures in place, the risk of potential introduction and spread of INNS will be minimised. The overall distribution and extent of the habitat features within the site, and each of their main component parts will remain stable or increasing. The physical, biological and chemical structure and functions necessary for the long-term
The physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded	

Conservation Objective	Conclusion
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	maintenance and quality of the habitat will not be degraded and the presence, abundance, condition and diversity of typical species is such that habitat quality will not be degraded.

1.5.3.47 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of increased risk of introduction and spread of INNS impacts with respect to the construction and decommissioning phase of the Mona Offshore Wind Project alone.

Operations and maintenance phase

Information to support assessment

1.5.3.48 As outlined in paragraph 1.5.3.41, up to 8,100 m^2 of cable protection may be available for colonisation, and potential introduction of INNS, within the SAC (0.003% of the total area of the SAC) during the operations and maintenance phase. Vessel movements will also occur within the SAC during the operations and maintenance phase, and although it is not possible to quantify the amount of activity specifically in the SAC, the number will be much less than the total 29,715 vessels return trips during the 35 year operations and maintenance phase or 849 vessel return trips per year (Table 1.8) needed for the whole Mona Offshore Wind Project. There is the potential that any INNS which colonise the cable protection in the area of the Mona Offshore Cable Corridor and Access Areas which overlaps with the Menai Strait and Conwy Bay/ Y Fenai a Bae Conwy SAC, may use this as a stepping stone to spread further in to the SAC and potentially affect the designated features of the site.

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

Reefs

1.5.3.49 The sensitivity of the Annex I reef feature is outlined above for the construction phase in paragraph 1.5.3.42.

1.5.3.50 As outlined in paragraph 1.5.3.43, an Offshore EMP will be implemented, which will ensure that the risk of potential introduction and spread of INNS will be minimised. The Mona Offshore Cable Corridor and Access Areas does not overlap with any areas of Annex I reef within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (paragraph 1.5.2.17). The nearest Annex I reef feature is also located 2.4 km from the Mona Offshore Cable Corridor and Access Areas, therefore considering this distance the likelihood of a stepping stone effect is limited.

Sandbanks slightly covered by sea water all the time

1.5.3.51 The sensitivity of the Annex I sandbank feature is outlined above for the construction phase in paragraph 1.5.3.44.

1.5.3.52 As outlined in paragraph 1.5.3.43, an Offshore EMP will be implemented, which will ensure that the risk of potential introduction and spread of INNS will be minimised. The Mona Offshore Cable Corridor and Access Areas does not overlap with any areas of

Annex I sandbank within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (paragraph 1.5.2.21). The nearest Annex I sandbank feature is also located 3.5 km from the Mona Offshore Cable Corridor and Access Areas, therefore considering this distance the likelihood of a stepping stone effect is also limited.

Conclusions

1.5.3.53 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of from increased risk of introduction and spread of INNS during the operations and maintenance phase. An assessment of the impact 'from increased risk of introduction and spread of INNS' against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented in Table 1.11 below.

Table 1.11: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for from increased risk of introduction and spread of INNS during the operations and maintenance phase.

Conservation Objective	Conclusion
The overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing	The Mona Offshore Cable Corridor and Access Areas does not overlap with any Annex I features within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (paragraph 1.5.2.17 and 1.5.2.21). The nearest Annex I reef feature is also located 2.4 km and the nearest Annex I sandbank feature is located 3.5 km from the Mona Offshore Cable Corridor and Access Areas, therefore considering this distance the likelihood of a stepping stone effect is limited. As outlined in Table 1.9 and paragraph 1.5.3.43, an Offshore EMP will be implemented, which will include a Biosecurity Risk Assessment as well as an INNS Management Plan. With these measures in place, the risk of potential introduction and spread of INNS will be minimised. The overall distribution and extent of the habitat features within the site, and each of their main component parts will remain stable or increasing. The physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat will not be degraded and the presence, abundance, condition and diversity of typical species is such that habitat quality will not be degraded.
The physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded	
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	

1.5.3.54 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of increased risk of introduction and spread of INNS impacts with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

Changes in physical processes

1.5.3.55 Changes in physical processes may arise from the installation of infrastructure into the water column, including scour effects and changes in the sediment transport and wave regimes resulting in potential effects on benthic receptors. Volume 6, Annex 1.1: Physical processes technical report of the Environmental Statement (Document Reference: F6.1.1) provides a full description of the modelling used to inform this assessment.

1.5.3.56 The HRA Stage1 Screening Report determined that this potential impact pathway applies to the Mona Offshore Cable Corridor and Access Areas only. The Mona Array Area is at its closest point is located 26 km, from the Menai Strait and Conwy Bay/Y

Fenai a Bae Conwy SAC respectively which is beyond the ZoI for changes to physical processes resulting from the presence of infrastructure within the Mona Array Area as determined by the project-specific physical processes modelling (see the HRA Stage 1 Screening Report (Document Reference E1.4)). As the Mona Offshore Cable Corridor and Access Areas overlaps with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, only this element of the Mona Offshore Wind Project was screened in. It should be noted that this impact is relevant for the operations and maintenance phase and decommissioning phase and that whilst the MDS considers the proposed activities along the whole length of the Mona Offshore Cable Corridor and Access Areas, for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC the impact is largely only applicable to the 8.1 km of subtidal export cables that overlap with the SAC.

1.5.3.57 The assessment of LSE during the HRA screening process identified that during the operations and maintenance and decommissioning phases, LSE could not be ruled out for the potential impact of changes in physical processes for the Mona Offshore Cable Corridor and Access Areas. This relates to the following designated site and relevant Annex I habitat features:

- Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC
  - Reefs
  - Sandbanks which are slightly covered by seawater all the time.

1.5.3.58 The following sections explain how this potential impact on Annex I habitat features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC has been quantified and assessed.

1.5.3.59 The MDS considered for the assessment of changes in physical processes on Annex I habitat features is presented in Table 1.12.

Table 1.12: MDS considered for the assessment of potential impacts on Annex I habitats (offshore and coastal) from changes in physical processes during the operations and maintenance and decommissioning phases.

Phase	MDS	Justification
Operations and maintenance phase	• Offshore export cables: cable protection along 72 km of the Mona Offshore Cable Corridor and Access Areas, with a height of up to 3 m and up to 10 m width. For the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC cable protection may be required for up to 10% of the 8.1 km of export cables (i.e. 810 m total for all four export cables) with a width of 10m and a height of 0.7 m (see Table 1.13). • Up to 24 cable crossings, each crossing has a height of up to 3 m, a width of up to 30 m and a length of up to 50 m. Noting there are no cable crossings within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC.	This provides the largest obstruction to flow in the water column (noting that only 8.1 km of export cables overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and only 10% of these may require cable protection). See Volume 2, Chapter 6: Physical processes of the Environmental Statement (Document reference F2.1). MDS assumes that cable protection may be left *in situ* during decommissioning.
Decommissioning phase	• For the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC the cable protection that may be required for up to 10% of the 8.1 km of export cables (i.e. 810 m total for all four export cables) with a width of 10 m and a height of 0.7 m during the operations and maintenance phase may be left *in situ* post-decommissioning.	

Measures adopted as part of the Mona Offshore Wind Project

1.5.3.60 Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of potential impacts on Annex I habitat features from changes in physical processes during the operations and maintenance and decommissioning phases are presented in Table 1.13.

Table 1.13: Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for Annex I habitat features from changes in physical processes.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
Development of, and adherence to, an Offshore Construction Method Statement, including a CSIP which will include cable burial where possible and cable protection.	To minimise potential impact from the cables and removal of cables a commitment to bury cables where possible has been made in accordance with the specific policies set out in the Welsh Marine Plan (Welsh Government, 2019) and additionally the North West Inshore and North West Offshore Coast Marine Plans (MMO, 2021). The Applicant recognises that the best form of cable protection is achieved through cable burial to the required depths, according to the results of a Cable Burial Risk Assessment and Burial Assessment Study, which will be included within the CSIP. The burial methodology should select the appropriate tools to endeavour to achieve burial to the required depth of lowering in a single pass, seeking to avoid burial methods that require multiple passes with a burial tool in order to achieve lowering of the cable.	The Offshore CMS is secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Development and adherence to an Offshore CMS which includes a CSIP and details of scour protection management and cable protection management, to be used around offshore structures, cables and foundations to reduce scour, cable burial where possible and cable protection.	The purpose of this tertiary measure is to confirm the actual methodology that will be employed to construct the windfarm, provide details on aspects of the methodology not known at the application stage and confirm that the methodology falls within the parameters assessment in the EIA.	Secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Development and adherence to an Offshore CMS which includes a CSIP that does not permit the percentage of export cable requiring cable protection to exceed 10% of the total length of the export cable within the Menai Strait and Conwy Bay SAC.	This commitment will minimise the impacts to the SAC whilst noting that there is no overlap between the Mona Offshore Cable Corridor and any designated features of the Menai Strait and Conwy Bay SAC.	The Offshore CMS is secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Development and adherence to an Offshore CMS which includes a CSIP that does not	To minimise impacts on physical processes, particularly sediment transport regimes in the Menai Strait and Conwy Bay SAC.	The Offshore CMS is secured within the deemed marine licence in Schedule 14 of the draft DCO

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
permit cable protection higher than 70 cm to be installed within in the Menai Strait and Conwy Bay SAC.	If and where cable protection is required within the Menai Strait and Conwy Bay SAC the cable protection measure used will be with sufficiently low profile to cause minimal changes to wave, tide and sediment transport.	and expected to be secured within the standalone NRW marine licence.
No more than 5% reduction in water depth (referenced to Chart Datum) will occur at any point along the Mona Offshore Cable Corridor without prior written approval from the Licensing Authority in consultation with the Maritime and Coastguard Agency.	This will ensure any cable protection is sufficiently low profile to cause minimal changes to wave, tide and sediment transport.	Secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Operations and maintenance and decommissioning phases

Information to support assessment

1.5.3.61 As outlined in Table 1.13, there is a commitment to bury cables where possible. Where burial cannot be achieved to the required depth cable protection may be required. A Cable Burial Risk Assessment and Burial Assessment Study, which will be included within the CSIP, will establish these parameters. The detail of design and construction will be outlined within the CSIP and would also determine the likely extent of any potential scour and would aim to mitigate this through site specific detailed design of scour protection measures.

1.5.3.62 The results of the modelling presented in Volume 6, Annex 1.1: Physical processes technical report of the Environmental Statement (Document Reference: F6.1.1) indicated that, during the operations and maintenance phase, peak tidal flows are redirected in the immediate proximity of foundations and cable protection by a maximum variation of 5 cm/s which constitutes less than 5% of the peak flow. This is predicted to reduce significantly with distance from the structures with changes being significantly smaller in the areas where cable protection is present. Within 200 m of the installation changes are <2 mm which would be indiscernible from baseline conditions.

1.5.3.63 With regard to wave climate, the presence of the Mona Offshore Wind Project during the operations and maintenance phase (structures, foundations and cable protection) was seen to have the greatest influence when storms approached from the northerly sectors where baseline wave height were smallest. In all cases, however, the changes in wave climate would be imperceptible and would not interact with the shoreline or nearshore banks and morphology. Any effects would be imperceptible beyond the immediate vicinity of the Mona Offshore Cable Corridor and Access Areas. The limited nature of these changes would not influence the tidal regime which underpins sediment transport.

1.5.3.64 It is anticipated that trenching to the required depth in areas of sandwaves and in the vicinity of sandbanks should be achievable due to the nature of the sediment. This in turn will reduce the need for placement of material on the seabed in these areas which may potentially reduce transport until pathways are re-established. Ongoing

geophysical surveys within the Mona Offshore Cable Corridor and Access Areas will be used to determine cable protection requirements and inform detailed design parameters.

1.5.3.65 The activities in the intertidal zone will not result in any permanent structures above the sediment level, resulting in no change to tidal or residual currents. In the subtidal environment the impact on tidal and residual currents is expected to be minimal and highly localised. Therefore, changes to the tidal regime or residual currents are highly unlikely to result in notable change in the intertidal zone.

1.5.3.66 As outlined in Table 1.13, the percentage of export cable requiring cable protection will not exceed 10% of the total length of the export cable within the Menai Strait and Conwy Bay/ Y Fenai a Bae Conwy SAC. It is predicted that the potential impact will affect the Menai Strait and Conwy Bay/ Y Fenai a Bae Conwy SAC features directly. As outlined in Table 1.13, there is a committment to ensure that no cable protection higher than 70 cm will be installed within the Menai Strait and Conwy Bay/ Y Fenai a Bae Conwy SAC. There will also be no more than a 5% reduction in water depth (referenced to Chart Datum) at any point along the Mona Offshore Cable Corridor without prior written approval from the Licensing Authority in consultation with the MCA. These measures will minimise impacts on physical processes, particularly sediment transport regimes in the Menai Strait and Conwy Bay/ Y Fenai a Bae Conwy SAC. If and where cable protection is required within the Menai Strait and Conwy Bay/ Y Fenai a Bae Conwy SAC the cable protection measures used will be with sufficiently low profile to cause minimal changes to wave, tide and sediment transport. The magnitude of change in wave and tidal currents as well as sediment transport is consistent throughout the Mona Export Cable Corridor where there is cable protection.

1.5.3.67 As discussed in paragraph 1.5.3.61, the CSIP would determine the likely extent of any potential scour and would aim to mitigate this through site specific detailed design of scour protection measures. It is, therefore, likely that any secondary scour effects associated with cable protection and would be confined to within a few meters of the direct footprint of that scour protection material. During the operations and maintenance phase of the Mona Offshore Wind Project, routine annual inspections will be made of cable and scour protection in line with the Offshore Monitoring Plan. If secondary scour is identified remedial works may be undertaken to both mitigate environmental impacts and also provide asset security.

1.5.3.68 Whilst the MDS for this impact pathway assumes that cable protection may be left *in situ* during the decommissioning phase, in the event that the decommissioning strategy required the removal of cable protection from the Menai Strait and Conwy Bay/ Y Fenai a Bae Conwy SAC, the potential impacts including secondary scour would be reversible.

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

Reefs

1.5.3.69 The subtidal communities associated with the Annex I reef feature have an overall negligible sensitivity to changes in physical processes. The MarESA identifies the subtidal communities associated with the Annex I reef feature as being not sensitive to the relevant pressures associated with this impact. The key characterising species, *H. arctica* are protected from water flows within burrows, although they and other associated species may be indirectly affected by changes in water movement where it impacts the supply of food or larvae or other processes. There is little evidence regarding sponges and water flow changes, the important characterising hydroids are

typically found in places of low to moderate water movement. Hydroids can bend passively with water flow to reduce drag forces to prevent detachment and enhance feeding (Gili and Hughes, 1995), making them resilient to increases in flow. Overall, the range of flow rates experienced by the biotope is considered to indicate, by proxy, that the biotope would have high resistance and by high resilience to a change in water flow at the pressure benchmark (Tillin *et al*., 2023b).

1.5.3.70 Volume 6, Annex 1.1: Physical processes technical report of the Environmental Statement (Document Reference F6.1.1) indicated that peak tidal flows are redirected in the immediate proximity of cable protection however, they would be undetectable beyond the immediate vicinity of the Mona Offshore Cable Corridor and Access Areas. The limited nature of these changes would not influence the tidal regime which underpins sediment transport. In addition, the background hydrodynamic regime is highly variable through tidal cycles and due to meteorological conditions and the scale of impacts are well within the natural variation. As outlined in Table 1.13, no cable protection higher than 70 cm will be installed within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and no more than a 5% reduction in water depth (referenced to Chart Datum) will occur at any point along the Mona Offshore Cable Corridor. This will ensure any cable protection is sufficiently low profile to cause minimal changes to wave, tide and sediment transport . The changes to tidal currents, wave climate, littoral currents, and sediment transport, including the potential for secondary scour effects, are insignificant in terms of the hydrodynamic regime and would not alter reef features.

1.5.3.71 Potential impacts to reef features associated with the intertidal areas of the SAC will be even further reduced than in the subtidal as it is further from any infrastructure which could result in physical processes changes. The intertidal communities associated with the Annex I reef feature have an overall negligible sensitivity to changes in physical processes. The intertidal communities associated with the Annex I reef feature were also identified by the MarESA as being not sensitive to the relevant pressures. As water velocity increases characterising species *Mastocarpus stellatus* and *Chondrus crispus* can flex and reconfigure to align with the direction of flow, this minimises drag and reduce risk of dislodgement (Boller and Carrington, 2007). Changes in conditions are highly unlikely to lead to a major shift in conditions beyond the natural variation in the region ensuring the continues presence of this habitat within the SAC.

1.5.3.72 The Mona Offshore Cable Corridor and Access Areas does not overlap with any areas of Annex I reef within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (paragraph 1.5.2.17). The nearest Annex I reef feature is also located 2.4 km from the Mona Offshore Cable Corridor and Access Areas, therefore considering this distance the impacts of changes in physical processes on Annex I reef features are considered to be reduced.

Sandbanks which are slightly covered by seawater all the time

1.5.3.73 The Annex I sandbank feature has an overall negligible sensitivity to changes in physical processes. The MarESA also assessed the Annex I sandbank feature of the SAC as not sensitive to the relevant pressures associated with this impact. The mobile sands that characterise this biotope range from medium to fine, and a change at the pressure benchmark may lead to some changes in sediment sorting. This is unlikely to result in damage to this biotope. Instead demographic or spatial shifts may occur however would not be detrimental to this biotope especially with the minimal level of change expected.

1.5.3.74 Volume 6, Annex 1.1: Physical processes technical report of the Environmental Statement (Document Reference: F6.1.1) indicated that peak tidal flows are redirected

in the immediate proximity of cable protection however, they would be undetectable beyond the immediate vicinity of the Mona Offshore Cable Corridor and Access Areas. The limited nature of these changes would not influence the tidal regime which underpins sediment transport. In addition, the background hydrodynamic regime is highly variable through tidal cycles and due to meteorological conditions and the scale of potential impacts are well within the natural variation. As outlined in Table 1.13, any cable protection placed within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be minimised and will be less than 70 cm in height and no more than a 5% reduction in water depth (referenced to Chart Datum) will occur at any point along the Mona Offshore Cable Corridor. This will ensure any cable protection is sufficiently low profile to cause minimal changes to wave, tide and sediment transport. The changes to tidal currents, wave climate, littoral currents, and sediment transport, including the potential for secondary scour effects, are insignificant in terms of the hydrodynamic regime and would result in negligible impacts on the Annex I sandbank feature.

1.5.3.75 The Mona Offshore Cable Corridor and Access Areas does not overlap with any areas of Annex I sandbank within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (paragraph 1.5.2.21). The nearest Annex I sandbank feature is also located 3.5 km from the Mona Offshore Cable Corridor and Access Areas, therefore considering this distance the impacts of changes in physical processes on Annex I reef features are considered to be reduced.

Conclusions

1.5.3.76 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of changes in physical processes. An assessment of the impact 'changes in physical processes' against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented below in Table 1.14.

Table 1.14: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for changes in physical processes during the operations and maintenance and decommissioning phases.

Conservation Objective	Conclusion
Ensuring that the overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing	Changes in physical processes along the Mona Offshore Cable Corridor are predicted to be highly limited in spatial extent (i.e. in the immediate vicinity of cable protection), and due to meteorological conditions, the scale of potential impacts are predicted to be well within the natural variation. Therefore, these activities will not prevent the distribution or extent of identified Annex I habitat features, or each of their main component parts, from increasing or remaining stable.
Ensuring that the physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded	Changes in physical processes along the Mona Offshore Cable Corridor are predicted to be highly limited in spatial extent (i.e. in the immediate vicinity of cable protection), due to meteorological conditions and the scale of potential impacts are predicted to be well within the natural variation. Therefore, changes in physical processes will not result in the degradation of the physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time habitat features.

Conservation Objective	Conclusion
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (Document Reference: F2.2) assessed the qualifying features of the SAC and associated characterising species as not sensitive to the relevant pressures. It is not considered that the presence, abundance, condition and diversity of the typical benthic species associated with the Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time habitat features will be affected in such a way that the habitat quality will be degraded.

1.5.3.77 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of changes in physical processes with respect to the operations and maintenance and decommissioning of the Mona Offshore Wind Project alone.

Removal of hard structures

1.5.3.78 The removal of hard substrates associated during the decommissioning phase will have a direct effect, with the seabed returning to the predominantly coarse and mixed sediments following removal of structures.

1.5.3.79 The HRA Stage 1 Screening Report (Document Reference E1.4) determined that this potential impact pathway applies to the Mona Offshore Cable Corridor and Access Areas only. The Mona Array Area is at its closest point is located 26.8 km from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC has a small area of overlap with the Mona Offshore Cable Corridor and Access Areas, on the basis of the site-specific surveys described in paragraph 1.5.2.17 and 1.5.2.21 there are no Annex I habitat features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC present within the overlap with the Mona Offshore Cable Corridor and Access Areas (also see Volume 6, Annex 2.1: Benthic subtidal and intertidal ecology technical report of the Environmental Statement (Document reference F6.2.1)). This supports the NRW's mapped distribution of designated features within the SAC (NRW, 2016). The cable protection is expected to remain *in situ*. However, decommissioning best practice will be followed at the time and, therefore, there is the potential that hard structures, which may have become colonised by reef-associated species, could be removed from the SAC during decommissioning resulting in the loss of reef habitat. It was therefore concluded that there is the potential for LSE on the Annex I reef habitat feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of the removal of hard structures.

1.5.3.80 The assessment of LSE during the HRA screening process identified that during decommissioning, LSE could not be ruled out for the potential removal of hard substrates associated with the Mona Offshore Cable Corridor and Access Areas. This relates to the following designated site and relevant Annex I habitat features:

- Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC
  - Reefs.

1.5.3.81 The following sections explain how this potential impact on Annex I habitat features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC has been quantified and assessed.

1.5.3.82 The MDS considered for the assessment of potential impacts on Annex I habitat features from removal of hard substrates is presented in Table 1.15.

Table 1.15: MDS considered for the assessment of potential impacts on Annex I habitats (offshore and coastal) from removal of hard substrates during the decommissioning phase.

Phase	MDS	Justification
Decommissioning phase	Removal of up to 8,100 m^2 of cable protection from the SAC.	Cable protection will likely be left *in situ* following decommissioing however the MDS for benthic receptors is that all hard substrate could be removed.

Measures adopted as part of the Mona Offshore Wind Project

1.5.3.83 Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of potential impacts on Annex I habitat features from the removal of hard substrates during the decommissioning phase are presented below in Table 1.13.

Table 1.16: Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for Annex I habitat features from the removal of hard substrates.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
Development and adherence to an Offshore CMS which includes a CSIP that does not permit the percentage of export cable requiring cable protection to exceed 10% of the total length of the export cable within the Menai Strait and Conwy Bay SAC.	This commitment will minimise the impacts to the SAC whilst noting that there is no overlap between the Mona Offshore Cable Corridor and any designated features of the Menai Strait and Conwy Bay SAC.	The Offshore CMS is secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Decommissioning phase

Information to support an assessment

1.5.3.84 The MDS for removal of hard substrate is that all cable protection installed in the SAC during the construction phase will be removed. The MDS is for the removal of up to 8,100 m^2 of cable protection from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC.

1.5.3.85 The Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC overlaps with the Mona Offshore Cable Corridor and Access Areas for the Mona Offshore Wind Project and therefore the removal of hard substrate may occur within the SAC. As outlined in paragraph 1.5.3.79, no designated features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC were recorded during the site specific surveys in the area of overlap with the Mona Offshore Cable Corridor and Access Areas. This supports NRW's mapped distribution of designated features within the SAC (NRW, 2016), as shown in Figure 1.2.

1.5.3.86 The removal of cable protection would result in localised declines in biodiversity. However, areas of seabed where cable protection was not present prior to

decommissioning would be expected to recover, with benthic communities in these areas recolonising habitats previously lost beneath the offshore export cables. In time, these communities are predicted to revert to their pre-construction state. There is however, the potential that cable protection could become colonised by reef-associated species over the operations and maintenance phase and, if removed from the SAC during decommissioning, may result in the loss of reef habitat.

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

Reefs

1.5.3.87 The removal of cable protection during decommissioning would result in localised declines in biodiversity. However, areas of seabed where Mona Offshore Wind Project infrastructure was not present prior to decommissioning would be expected to recover, with benthic communities in these areas recolonising habitats previously lost beneath the offshore export cables. In time, these communities are predicted to revert to their pre-construction state. Recovery of the communities affected is likely to be high as a result of the recovery of their natural habitat (recovery will be similar to the temporary habitat disturbance impact which is described in Volume 2, Chapter 2: Benthic subtidal and intertidal ecology of the Environmental Statement (Document Reference F2.2)). A review undertaken by RPS (2019) found communities in coarse and mixed sediments are likely to recover within five years of disturbance (Desprez, 2000; Newell *et al.*, 1998; Pearce *et al.*, 2007), but in some cases, recovery has been reported as taking up to nine years following cessation of dredging (Foden *et al.*, 2009). Sandy sediments also recover quickly following cable installation, with little or no evidence of disturbance in the years following cable installation (RPS, 2019). There is however, the potential that cable protection could become colonised by reef-associated species over the operations and maintenance phase and, if removed from the SAC during decommissioning, may result in the loss of reef habitat.

1.5.3.88 Over the operations and maintenance phase, there is the potential that any cable protection installed within the SAC during the construction phase may become colonised by reef-associated species during the lifetime of the Mona Offshore Wind Project as a result of its proximity to the subtidal reef communities already present in the SAC leading to larval settlement. The sensitivity of any Annex I reef that may form over the cable protection in the SAC, should this occur, would be high. Therefore the approach regarding the removal of cable protection within the SAC (if required) will be discussed with the relevant SNCBs prior to the decommissioning phase to ensure the appropriate approach is taken depending on the nature of the habitats present at the time and to reduce impacts to any Annex I reef that may have developed on the cable protection.

Conclusions

1.5.3.89 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of the removal of hard substrates during the decommissioning phase. An assessment of the impact ‘removal of hard substrates’ against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented below in Table 1.17. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.17: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for removal of hard substrates during decommissioning phase.

Conservation Objective	Conclusion
Ensuring that the overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing. **Ensuring that the physical, biological, and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded.** **The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded.**	Cable protection installed within the SAC during the construction phase may potentially develop a reef like community. However, the approach regarding the removal of cable protection within the SAC (if required) will be discussed with the relevant SNCBs prior to the decommissioning phase to ensure the appropriate approach is taken depending on the nature of the habitats present at the time. If the cable protection was to be removed only a very small area would be affected, specifically the MDS assumes the removal of cable protection (10 m in width) from up to 10% of cables within the SAC, which equates to 0.003% of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. In addition, areas of the seabed where cable protection was not present prior to decommissioning would be expected to recover, with benthic communities in these areas recolonising habitats previously lost beneath offshore structures. In time, these communities are predicted to revert to their pre-construction state. Therefore, this impact will not restrict the distribution or extent of identified Annex I habitat features from increasing or remaining stable. The physical, biological and chemical structure and function of identified Annex I habitat features necessary for the long-term maintenance and quality of the habitat will not be degraded. The impact will also not affect the presence, abundance, condition and diversity of typical species and the habitat quality will not be degraded.

1.5.3.90 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC from the removal of hard substrates impact with respect to the decommissioning of the Mona Offshore Wind Project alone.

Accidental pollution

1.5.3.91 There is a risk of pollution being accidentally released during the construction phase of the Mona Offshore Wind Project from sources including vessels/vehicles and equipment/machinery. There is a also a risk of pollution being accidentally released during the operations and maintenance phase of the Mona Offshore Wind Project from sources including vessels/vehicles and equipment/machinery.

1.5.3.92 As outlined in the HRA Stage 2 ISAA Part 1 – Introduction (Document Reference E1.1), the Case C-323/17 People Over Wind, Peter Sweetman v Coillte Teoranta [2018] Ecr I-244), has been followed and measures adopted as part of the Mona Offshore Wind Project to reduce the likelihood, or magnitude, of an accidental pollution event occurring have not been taken into account at the screening stage. The approach taken in the HRA Stage 1 Screening Report (Document Reference E1.4) for the Mona Offshore Wind Project complied with this judgement and no mitigation measures were

considered at the LSE screening stage, therefore without mitigation measures LSE from accidental pollution could not be discounted.

1.5.3.93 The assessment of LSE during the HRA screening process identified that during the construction, operations and maintenance and decommissioning phases, LSE could not be ruled out for the potential impact of accidental pollution. This relates to the following designated site and relevant Annex I habitat features:

- Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC
  - Reefs
  - Sandbanks which are slightly covered by seawater all the time.

1.5.3.94 Given that accidental pollution events, if they were to occur, would be highly limited in spatial extent, any effects would be spatially restricted to within the boundaries of the Mona Offshore Wind Project and the immediate surrounding area. Therefore, only effects associated with the Mona Offshore Cable Corridor and Access Areas were screened into this HRA Stage 2 ISAA Part 2 – SAC assessments as a result of overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The following sections explain how this potential impact on Annex I habitat features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC been quantified and assessed.

1.5.3.95 The MDS for this impact for the Mona Offshore Wind Project as a whole is associated with the consumables that may contained within each wind turbine including for example grease (up to 2,000 litres), synthetic oil (up to 1,000 litres), hydraulic oil (up to 1,200 litres), gear oil (up to 4,000 litres), glycerol (up to 100,000 litres), transformer silicon/ester oil (up to 8,000 kg) and coolants (up to 2,000 litres). The Mona Array Area is located 26.8 km from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. Therefore, if an accidental pollution event were to occur, any pollutants associated with the consumables that may contained within the wind turbines would be diluted with increased distance from the source location and on reaching the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC would likely be present in indiscernible volumes and would not result in adverse impacts of the Annex I features.

1.5.3.96 As there will be no foundations within the Mona Offshore Cable Corridor and Access Areas, the MDS for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is only predicted to be associated with the potential spill of these consumables from vessels operating in, or transiting through, the SAC during all phases of the Mona Offshore Wind Project.

Measures adopted as part of the Mona Offshore Wind Project

1.5.3.97 Measures adopted as part of the Mona Offshore Wind Project (and the associated commitments) which are of relevance to the assessment of potential impacts on Annex I habitat features from accidental pollution during construction, operations and maintenance and decommissioning are presented in Table 1.18.

Table 1.18: Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for Annex I habitat features from accidental pollution.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Development and adherence to an Offshore EMP that will include a Marine Pollution Contingency Plan (MPCP) which will include planning for accidental spills, address all potential contaminant releases and include key emergency details.	This will ensure that the potential for release of pollutants from construction, operations and maintenance and decommissioning activities is reduced so far as reasonably practicable.	The Offshore EMP is secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Construction and decommissioning phases

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

Reefs

1.5.3.98 Effects of an accidental spill could potentially kill, smother or poison benthic fauna associated with Annex I reef features, although potential impacts are likely to affect sedentary organisms to a greater extent that mobile fauna which would be able to move away from the impact. The representative biotope associated with the Annex I reef feature *Mastocarpus stellatus* and *Chondrus crispus* on very exposed to moderately exposed lower eulittoral rock (LR.HLR.FR.Mas) the MarESA has not carried out a sensitivity assessment for the relevant impacts. However, aspects of the biotope have been assessed including *Chondrus crispus* which was assessed as having low sensitivity to hydrocarbon contamination (Rayment and Pizzola, 2008). Bokn *et al.* (1993) investigated the long term effects on *C. crispus* of exposure to mean hydrocarbon concentrations of 30.1 µg/l and 129.4 µg/l. After two years, there were no demonstrable differences in the abundance patterns of *C. crispus*. A study by Kaas (1980) (cited in Holt *et al.*, 1995) also concluded that the reproduction of adult *C. crispus* plants on the French coast was normal following the Amoco Cadiz oil spill. However, it was suggested that the development of young stages to adult plants was slow, with biomass still reduced two years after the event. Recovery of original growth rates is likely to be rapid when the hydrocarbons have dispersed so recoverability is assessed as very high but will be dependent on persistence of the pollutants (Rayment and Pizzola, 2008).

1.5.3.99 However, accidental pollution events are very unlikely and with the implementation of an Offshore EMP and MPCP (as outlined in Table 1.18) should an event occur, effects will be temporary, reversible and limited in spatial extent. Adverse effects on the Annex I designated feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC can be ruled out beyond reasonable scientific doubt.

Sandbanks which are slightly covered by seawater all the time

1.5.3.100 Effects of an accidental spill could potentially kill, smother or poison benthic fauna associated with Annex I sandbanks which are slightly covered by seawater all the time features, although potential impacts are likely to affect sedentary organisms to a worse extent that mobile fauna which would be able to move away from the impact. The representative biotope associated with the Annex I sandbank feature *Nephtys cirrosa* and *Bathyporeia* sp. in infralittoral sand (SS.SSa.IFiSa.NcirBat) has been used as a proxy for sensitivity for this feature. *Bathyporeia spp.* associated with this this biotope are assessed as having moderate sensitivity to synthetic compound contamination and hydrocarbon contamination (Budd and Curtis, 2007). Amphipods are known to be sensitive to oil (Suchanek, 1993). For example, following the Amoco Cadiz oil spill there was a reduction in both the number of amphipod species and the number of individuals (Cabioch *et al.*, 1978). Following a pollution event, mortality would be expected, attributable to toxicity and the effects of smothering, therefore intolerance has been assessed to be high (Budd and Curtis, 2007). Often populations do not return to pre-spill abundances for five or more years, which is most likely related to the persistence of oil within sediments (Southward, 1982), and recovery has been assessed to be moderate (Budd and Curtis, 2007).

1.5.3.101 However, accidental pollution events are very unlikely and with the implementation of measures such as an Offshore EMP and MPCP, should an event occur, effects will be temporary, reversible and limited in spatial extent. Adverse effects on the Annex I designated feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC can be ruled out beyond reasonable scientific doubt.

Conclusions

1.5.3.102 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of accidental pollution during the construction and decommissioning phases. An assessment of the impact 'accidental pollution' against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented below in Table 1.19. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.19: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for accidental pollution during the construction and decommissioning phase.

Conservation Objective	Conclusion
Ensuring that the overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing. **Ensuring that the physical, biological, and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded.** **The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded.**	The risk of accidental pollution is very low and this risk is further reduced by the implementation of measures adopted as part of the Mona Offshore Wind Project, such as an Offshore EMP and MPCP. Should a pollution event occur, effects will be temporary, reversible and limited in spatial extent. Therefore, this impact will not restrict the distribution or extent of identified Annex I habitat features from increasing or remaining stable. If a pollution event was to occur the physical, biological and chemical structure and function of identified Annex I habitat features necessary for the long-term maintenance and quality of the habitat will not be degraded. The impact will also not affect the presence, abundance, condition and diversity of typical species and the habitat quality will not be degraded.

1.5.3.103 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC from an accidental pollution impact with respect to the construction and decommissioning of the Mona Offshore Wind Project alone.

Operations and maintenance phase

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

Reefs

1.5.3.104 The sensitivity of the representative biotopes associated with the Annex I reef feature are outlined above in 1.5.3.98.

1.5.3.105 Effects associated with accidental pollution for the reef feature are considered to be consistent with, or of lower magnitude than, those outlined for the construction phase in paragraph 1.5.3.98 on the basis that the majority of maintenance activities will occur within the Mona Array Area.

Sandbanks which are slightly covered by seawater all the time

1.5.3.106 The sensitivity of the representative biotopes associated with the Annex I reef feature are outlined above in 1.5.3.100.

1.5.3.107 Effects associated with accidental pollution for the sandbanks which are slightly covered by seawater all the time feature are considered to be consistent or of lower magnitude than those outlined for the construction phase in paragraph 1.5.3.101 on the basis that the majority of maintenance activities will occur within the Mona Array Area.

Conclusions

1.5.3.108 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of accidental pollution during the operations and maintenance phase. An assessment of the impact ‘accidental pollution’ against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented below in Table 1.20.

Table 1.20: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for accidental pollution during the operations and maintenance phase.

Conservation Objectives	Conclusion
Ensuring that the overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing.	The risk of accidental pollution is very low and this risk is further reduced by the implementation of measures adopted as part of the Mona Offshore Wind Project, such as an Offshore EMP and MPCP. Should a pollution event occur, effects will be temporary, reversible and limited in spatial extent. Therefore, this impact will not restrict the distribution or extent of identified Annex I habitat features from increasing or remaining stable, the physical, biological and chemical structure and function of identified Annex I habitat features necessary for the long-term maintenance and quality of the habitat will not be degraded and the presence, abundance, condition and diversity of typical species and the habitat quality will not be degraded.
Ensuring that the physical, biological, and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded.	
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded.	

1.5.3.109 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC from accidental pollution with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

1.5.4 Assessment of adverse effects – in-combination with other plans and projects

1.5.4.1 The other developments (projects/plans) that could result in in-combination effects associated with the Mona Offshore Wind Project on Annex I benthic features of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC have been summarised in Table 1.21 and are shown in Figure 1.9.

1.5.4.2 As outlined in the HRA Stage 1 Screening Report (Document Reference E1.4), where the potential for LSE has been concluded alone, the potential for LSE has also been concluded in-combination (see paragraph 1.3.3.2). For effects discounted for LSE alone, there is either no pathway to effect, or the Mona Offshore Wind Project would result in only negligible or inconsequential effects that would not contribute (even collectively) materially to in-combination effects and therefore, no additional in-combination effects are identified.

1.5.4.3 On this basis, the potential impacts which have been brought forward for consideration in the in-combination assessment of the HR Stage 2 ISAA are:

- In-combination increases in SSC and sediment deposition (Mona Offshore Cable Corridor and Access Areas only)
- In-combination increased risk of introduction and spread of INNS (Mona Offshore Cable Corridor and Access Areas only)
- In-combination removal of hard substrates (Mona Offshore Cable Corridor and Access Areas only and Annex I reef only during the decommissioning phase)
- In-combination changes in physical processes (Mona Offshore Cable Corridor and Access Areas only)
- In-combination accidental pollution (Mona Offshore Cable Corridor and Access Areas only).

1.5.4.4 The following assessments of the effects of the Mona Offshore Wind Project, acting in-combination with other relevant plans and projects, on Annex I habitats have been informed by the detailed technical assessments presented in Volume 2, Chapter 6: Physical processes of the Environmental Statement (Document reference F2.1) and Volume 2, Chapter 2 Benthic subtidal and intertidal ecology of the Environmental Statement (Document reference F2.2). The Applicant has also made all reasonable efforts to ensure that the information included in the assessment relating to other projects is correct and sufficiently detailed, with any limitations on the information available acknowledged. The assessments have also drawn upon the sensitivity assessments of the relevant Annex I habitats, and their component biotopes, detailed in and Volume 2, Chapter 2 Benthic subtidal and intertidal ecology of the Environmental Statement (Document reference F2.2) which reference the best available literature and evidence with regards to sensitivity. In this regard, the Applicant is confident that the conclusions made on whether an adverse effect on integrity on a European site(s) and qualifying features can or cannot be ruled out as a result of the Mona Offshore Wind Project in-combination with other plans and projects have been

identified in light of the best scientific knowledge in the field and all reasonable scientific doubt can be ruled out.

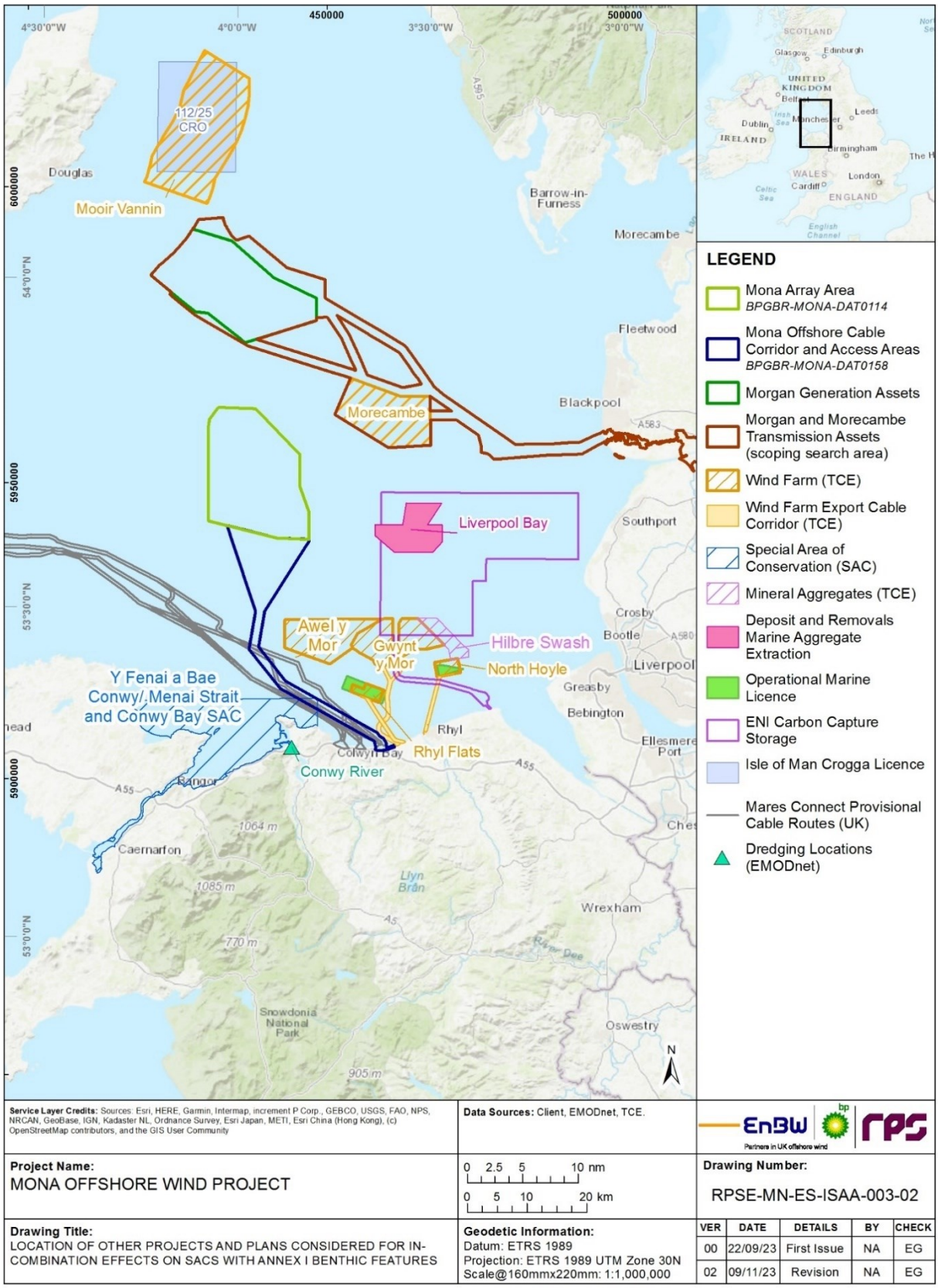

Figure 1.9: Location of other projects and plans considered for in-combination effects on SACs with Annex I habitat features[2].

[2] The Awel y Môr agreement for lease area extends further to the west than the application boundary presented, however Awel y Môr Offshore Wind Farm Ltd. have decided to develop in the area presented.

Table 1.21: List of other projects and plans with potential for in-combination effects on Annex I habitat features (offshore and coastal).

Project/Plan	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Tier 1- Offshore Wind Projects and Associated Cables							
Awel y Môr offshore wind farm	Consented	13.52	3.60	Offshore wind farm	2026 to 2030	2030 to 2055	Project Construction Phase overlaps with Mona Offshore Wind Project Construction Phase. Project Operation and Maintenance Phase overlaps with Mona Offshore Wind Project Operations and Maintenance Phase. Project Decommissioning Phase overlaps with Mona Offshore Wind Project Operations and Maintenance Phase.
Rhyl Flats offshore wind farm	Operational	24.8	3.8	Offshore wind farm	2004	2004 to 2024	Project Maintenance Phase overlaps with Mona Offshore Wind Project Construction and Operations and Maintenance Phases. Project Decommissioning Phase overlaps with Mona Offshore Wind Project

Project/Plan	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
							Operations and Maintenance Phase.
Gwynt y Môr offshore wind farm	Operational	17.8	9.9	Offshore wind farm	2008 to 2011	2011 to 2061	Project Maintenance Phase overlaps with Mona Offshore Wind Project Construction and Operations and Maintenance Phases. Project Decommissioning Phase overlaps with Mona Offshore Wind Project Operations and Maintenance Phase.
North Hoyle offshore wind farm	Operational	29.6	13.6	Offshore wind farm	2002 to 2003	2003 to 2028	Project Maintenance Phase overlaps with Mona Offshore Wind Project Construction Phase. Project Decommissioning Phase overlaps with Mona Offshore Wind Project Operations and Maintenance Phase.

Project/Plan	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Disposal Sites							
Conwy River	Operational	35.2	7.70	Dredging, no further information given.	n/a	2022 to 2037	Project Operational Phase overlaps with Mona Offshore Wind Project Construction and Operations and Maintenance Phases.
Aggregate Extraction							
Hilbre Swash	Operational	22.4	17.2	Licence to extract up to 12 million tonnes of aggregate (mainly sand) over 15 years.	n/a	2015 to 2029	Project Operational Phase overlaps with Mona Offshore Wind Project Construction Phase.
Tier 2-Offshore Wind Projects and Associated Cables							
Morgan Offshore Wind Project Generation Assets	Pre-application	5.52	32.93	Offshore wind farm	2028 to 2029	2030 to 2065	Project Construction Phase overlaps with Mona Offshore Wind Project Construction Phase. Project Operation and Maintenance Phase overlaps with Mona Offshore Wind Project Operations and Maintenance Phase. Project Decommissioning Phase overlaps with Mona Offshore Wind Project Decommissioning Phase.

Project/Plan	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Morecambe Offshore Windfarm: Generation Assets (hereafter referred to as the Morecambe Generation Assets)	Pre-application	8.9	21.53	Offshore wind farm	2026 to 2028	2029 to 2089	Project Construction Phase overlaps with Mona Offshore Wind Project Construction Phase. Project Operation and Maintenance Phase overlaps with Mona Offshore Wind Project Operations and Maintenance Phase. Project Decommissioning Phase overlaps with Mona Offshore Wind Project Decommissioning Phase.
Morgan and Morecambe Offshore Windfarms: Transmission Assets	Pre-application PEIR submitted	8.92	21.53	Morgan Offshore Wind Project and Morcambe Offshore Windfarm Transmission Assets	2028 to 2029	2030 to 2065	Project Construction Phase overlaps with Mona Offshore Wind Project Construction Phase. Project Operation and Maintenance Phase overlaps with Mona Offshore Wind Project Operations and Maintenance Phase. Project Decommissioning Phase overlaps with Mona Offshore Wind Project Decommissioning Phase.

Project/Plan	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Mooir Vannin Offshore Wind Farm	Pre-application	34.5	59.90	Orsted have signed an Agreement for Lease (AfL) to develop a 700 MW (annual output 3,000 GWh) wind farm on the east coast and have undertaken initial surveys since 2016.	2030 to 2032	Aiming for the start of the operations and maintenance phase in 2032. End of this phase unknown.	This project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project.
Carbon Capture and Storage (CCS)							
Eni Hynet CCS	Pre-application	12.1	9.52	CCS project in the east Irish Sea. Works will include installation of a new cable, a new Douglas CCS platform and work on the existing Hamilton, Hamilton North and Lennox wellhead platforms.	unknown	unknown	Project Construction Phase overlaps with Mona Offshore Wind Project Construction Phase.

Project/Plan	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Aggregate Extraction							
Liverpool Bay Area 457	Pre-application	11.0	11.0	Westminster Gravels will be renewing their aggregate extraction licence in Area 457 in Liverpool Bay. Their Environmental Statement is planned to be submitted in 2024. Proposed extraction of 18 million tonnes of aggregate (mainly sand and fine sediment) over 15 years.	unknown	unknown	Project Operational Phase overlaps with Mona Offshore Wind Project Construction Phase.
Tier 3- Subsea Cables (Telecommunications and Interlinks)							
MaresConnect - Wales-Ireland Interconnector Cable	Pre-application	16.4	0.0	A proposed subsea and underground electricity interconnector system linking the existing electricity grids in Ireland and Great Britain.	2025	2027 – 2037	Project Construction Phase overlaps with Mona Offshore Wind Project Construction Phase. Project Operation and Maintenance Phase overlaps with Mona Offshore Wind Project Operations and Maintenance Phase.

In-combination increases in SSC and associated sediment deposition

1.5.4.5 There is the potential for increases in SSC and associated sediment deposition as a result of activities associated with the construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project in-combination with activities associated with the following projects/plans:

- Tier 1:
  - Awel y Môr Offshore Wind Farm
  - Rhyl Flats Offshore Wind Farm
  - Gwynt y Môr Offshore Wind Farm
  - North Hoyle Offshore Wind Farm
  - Hilbre Swash
  - Conwy River dredging/disposal site
- Tier 2:
  - Morgan Generation Assets
  - Morecambe Offshore Windfarm Generation Assets
  - Morgan and Morecambe Offshore Wind Farms: Transmission Assets
  - Eni Hynet CCS storage project
  - Liverpool Bay aggregate extraction area 457
- Tier 3:
  - MaresConnect Interconnector cable.

Construction and decommisioning phases

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

Tier 1

1.5.4.6 The construction phase of the Mona Offshore Wind Project may coincide with the maintenance activities of the Rhyl Flats Offshore Wind Farm, Gwynt y Môr Offshore Wind Farm and North Hoyle Offshore Wind Farm. Operations and maintenance activities may result in increased SSC, however these activities would be of limited spatial extent and frequency and unlikely to interact with sediment plumes from the Mona Offshore Wind Project.

1.5.4.7 The construction phase of the Mona Offshore Wind Project may coincide with the construction of the Awel y Môr Offshore Wind Farm. Construction activities may result in increased SSC; however, these activities would be of limited spatial extent and frequency and unlikely to interact with sediment plumes from the Mona Offshore Array Area. The Mona Offshore Cable Corridor and Access Areas runs adjacent to Awel y Môr array area and the cable corridors are parallel. Therefore, interaction of SSC plumes on spring tide events may occur should trenching activities be undertaken simultaneously. Resultant overlapping plumes may have increased SSC between 2 mg/l on the outer extent of the plume. Overlap is, however, considered to be unlikely as SSC plumes would most likely reach background levels before overlapping with the

Awel y Môr development area, when travelling on the flood tide as they would run in parallel.

1.5.4.8 The in-combination effects assessment encompasses aggregate extraction at both Hilbre Swash licensed areas located within 17.2 km of the Mona Offshore Cable Corridor and Access Areas. Resultant plumes from the disposal of dredged material and extraction of aggregate would be advected on the tidal current running in parallel and not coincide.

1.5.4.9 Similarly, the in-combination effects assessment considers sea disposal of dredged material at the Conwy River disposal site, located 7.7 km from the Mona Offshore Cable Corridor and Access Areas. If the offshore cable installation and dredge material dumping coincided both resultant plumes would be advected on the tidal currents, they would travel in parallel, and not towards one another, and are unlikely to interact if offshore cable installation coincides with the use of the licensed sea disposal site.

1.5.4.10 The potential for in-combination increases in SSCs and associated deposition for the Menai Strait and Conwy Bay/ Y Fenai a Bae Conwy SAC is limited as most projects are located outside the boundary of the SAC. As outlined in paragraph 1.5.4.7 to 1.5.4.9 only small increases in SSC are expected to occur which will be of limited spatial extent. As set out above, it's unlikely that these would combine with the plumes arising from the Mona Offshore Cable Corridor and Access Areas. Any in-combination impacts would be short term, intermittent and reversible and as discussed in section 1.5.3 the Annex I reef and sandbank habitats of the SAC and associated communities have low sensitivity to this impact.

Tier 2

1.5.4.11 During the construction phase of the Mona Offshore Wind Project there is the potential for in-combination impacts with two proposed offshore wind farm installations (the Morgan Offshore Wind Project Generation Assets and the Morecambe Offshore Windfarm Generation Assets) and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets. Construction activities may result in increased SSC; however, these activities would be of limited spatial extent and frequency and unlikely to interact with sediment plumes from the Mona Offshore Wind Project. As described in section 1.5.3, SSC plumes are localised to within the immediate vicinity of the construction activity and returning to background levels therefore travelling on the tide in parallel will most likely avoid interception of the most concentrated suspended sediment part of each plume.

1.5.4.12 Scoping reports have been submitted to the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) in relation to the Eni Hynet CCS storage project. Although limited information is available on the project it is likely that it may involve the installation of cables via trenching to accommodate the redevelopment of existing pipelines for CCS. The construction phase of the Mona Offshore Wind Project coincides with that of the Eni Hynet project located 12.1 km east of the Mona Array Area and 9.5 km from the Mona Offshore Cable Corridor and Access Areas. As such, interaction between suspended sediment plumes may occur should trenching activities be undertaken simultaneously, however, this is unlikely given the length of construction phase and range of activities. SSC plumes are expected to reach background levels before overlapping and additionally plumes would not directly interact as they would run in parallel.

1.5.4.13 A scoping report is available regarding potential aggregate extraction at Liverpool Bay aggregate extraction area 457. The existing site is the north of the two mineral

extraction sites in Figure 1.9, located 11 km to the east of Mona Array Area and 11 km from the Mona Offshore Cable Corridor and Access Areas. Aggregate extraction activities are typically intermittent and given their nature, to remove rather than deposit material, spilled material will be kept to a minimum. Due to the distance from the Mona Array Area and Mona Offshore Cable Corridor and Access Areas sediment plumes will be greatly dispersed and SSC low when the extraction site is reached meaning that in combination impacts are unlikely.

1.5.4.14 Decommissioning of the Morecambe Offshore Windfarm Generation Assets, the Morgan Offshore Wind Project Generation Assets and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets will most likely occur on the same projected timeline as the Mona Offshore Wind Project. Decommissioning activity may result in increased SSC; however, this would be localised and of a lesser magnitude than the construction phase. If decommissioned prior to the Mona Offshore Wind Project, the residual infrastructure on the seabed would not cause an in-combination increase in suspended sediment concentration.

Tier 3

1.5.4.15 During the Mona Offshore Wind Project construction phase, the MaresConnect cable may be in construction which may result in increased SSC. The MaresConnect crosses the Mona Offshore Cable Corridor and Access Areas. The trenching activities for both projects may run concurrently and interaction of SSC plumes on spring tide events may occur. However, the concentration of suspended sediment reduces significantly moving further from the activity with levels of less than 10 mg/l around 8 km away. Therefore the potential overlap of resultant plumes would be low as it would be unlikely that both projects would be installing cables within 8 km of each other at the same time.

Conclusions

1.5.4.16 Adverse effects on the qualifying features which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of in-combination increased SSC and associated sediment deposition during the construction and decommissioning phases of the Mona Offshore Wind Project. An assessment of the impact ‘increased SSC and associated sediment deposition’ against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented below in Table 1.22. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.22: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for in-combination increases in SSC during the construction and decommissioning phase.

Conservation Objective	Conclusion
Ensuring that the overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing. **Ensuring that the physical, biological, and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded.** **The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded.**	Any in-combination effects associated with increased SSC and associated sediment deposition will be limited spatial extent, short term duration, intermittent in nature. The potential for in-combination increases in SSCs and associated deposition for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is limited as most projects are located outside the boundary of the SAC. Only small increases in SSC are expected to occur which will be of limited spatial extent as a result of other projects/plans. As set out above, it's unlikely that these would combine with the plumes arising from the Mona Offshore Cable Corridor and Access Areas. Any in-combination impacts would be short term, intermittent and reversible. These activities will not restrict the distribution or extent of identified Annex I habitat features from increasing or remaining stable. Ensuring that the physical, biological, and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded.

1.5.4.17 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of increases in SSC and associated sediment deposition impacts with respect to the Mona Offshore Wind Project during the construction phase in-combination with other plans/projects.

Operations and maintenance phase

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

Tier 1

1.5.4.18 The operations and maintenance phase of the Mona Offshore Wind Project may coincide with the maintenance activities associated with the Awel y Môr Offshore Wind Farm, Rhyl Flats Wind Farm and Gwynt y Môr Offshore Wind Farm. Maintenance activities may result in increased suspended sediment concentration however, these activities would be of limited spatial extent and frequency and unlikely to interact with sediment plumes from the Mona Offshore Wind Project maintenance activities. With resultant plumes from the operations and maintenance phase of the Mona Offshore Wind Project being smaller in scale than the construction phase, potential in-combination impacts are less likely to occur during the operations and maintenance phase.

1.5.4.19 Awel y Môr, Rhyl Flats and Gwynt y Môr Offshore Wind Farms may also be decommissioned during the operation and maintenance phase of the Mona Offshore Wind Project however as highlighted above any potential increase in SSC would be advected on tidal current running in parallel and not overlap. Residual structures remaining from the decommissioning of these wind farms would not have an in-combination impact on suspended sediment concentrations.

1.5.4.20 Potential in-combination impacts may relate to maintenance of offshore cables coinciding with the use of the Conwy River disposal site. Maintenance activities are both intermittent and a smaller scale than that of the construction phase and therefore any potential in-combination impacts are less likely to occur and be on a smaller scale.

1.5.4.21 The operation and maintenance phase of the Mona Offshore Wind Project may coincide with the decommissioning activities associated with the North Hoyle Offshore Wind Farm. Decommissioning activities would result in increased suspended sediment concentration however, these activities would be of limited spatial extent and frequency and unlikely to interact with sediment plumes from the Mona Offshore Wind Project given the significant distance separating the sites (13.8 km).

1.5.4.22 The majority of the in-combination projects in this assessment will be in their operations and maintenance phase during the operations and maintenance of the Mona Offshore Wind Project. As discussed previously, maintenance activities will result in elevated levels of SSC which are of a lower magnitude than those arising during the construction phase. In addition, maintenance activities will be highly intermittent over the lifetime of each project, which further reduces the likelihood of interaction between projects. The in-combination impacts would therefore be of a lesser magnitude than those described for the tier 1 assessment during the construction phase in paragraph 1.5.4.6 to 1.5.4.10 (i.e. also negligible).

Tier 2

1.5.4.23 The Morgan Offshore Wind Project Generation Assets and the Morecambe Offshore Windfarm Generation Assets, along with the Morgan and Morecambe Offshore Wind Farms: Transmission Assets will all be within their operational and maintenance phases during the operation and maintenance phase of the Mona Offshore Wind Project, therefore, maintenance activities may result in increased SSC, however these activities would be of limited spatial extent and frequency. The in-combination impacts would therefore be of a lesser magnitude than those described for the tier 2 assessment during the construction phase in paragraph 1.5.4.11 to 1.5.4.14 (i.e. negligible).

1.5.4.24 During the operations and maintenance phase it is likely that the Liverpool Bay aggregate extraction area 457 will be operational. Given the intermittent nature of both activities and the 11 km separation of the sites, in-combination impacts are very unlikely.

Conclusions

1.5.4.25 Adverse effects on the qualifying features which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of in-combination increased SSC and associated sediment deposition during the operations and maintenance phase of the Mona Offshore Wind Project. An assessment of the impact ‘increased SSC and associated sediment deposition’ against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented below in Table 1.23. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.23: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for in-combination increases in SSC during the operations and maintenance phase.

Conservation Objective	Conclusion
Ensuring that the overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing. **Ensuring that the physical, biological, and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded.** **The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded.**	Any in-combination effects associated with increased SSC and associated sediment deposition during the operations and maintenance phase of the Mona Offshore Wind Project will be limited in spatial extent, of short term duration, and intermittent in nature. The potential for in-combination increases in SSCs and associated deposition for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is limited as most projects are located outside the boundary of the SAC. Only small increases in SSC are expected to occur which will be of limited spatial extent as a result of other projects/plans. As set out above, it's unlikely that these would combine with the plumes arising from the Mona Offshore Cable Corridor and Access Areas. Any in-combination impacts would be short term, intermittent and reversible. Therefore, these activities will not restrict the distribution or extent of the Annex I reef or sandbank features from increasing or remaining stable. This will ensure that the physical, biological, and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded.

1.5.4.26 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of increases in SSC and associated sediment deposition impacts with respect to the Mona Offshore Wind Project during the operations and maintenance phase in-combination with other plans/projects.

In-combination increased risk of introduction and spread of INNS

1.5.4.27 There is the potential for increased risk of introduction and spread of INNS as a result of activities associated with the Mona Offshore Wind Project in-combination with activities associated with the following projects/plans which overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC:

- Tier 1
  - Conwy River dredging site
- Tier 2
  - MaresConnect Interconnector cable.

1.5.4.28 All other projects are considered to be of sufficient distance from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC to not contribute to in-combination effects for this impact pathway.

Construction and operations and maintenance phases

1.5.4.29 The Conwy River dredging site is located within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, however there would be no introduction of hard substrates associated with dredging activity which is the primary pathway for the introduction and spread of INNS. There is therefore no pathway for an in-combination impact to occur with this tier 1 project.

Tier 3

1.5.4.30 The MaresConnect interconnector cable may overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, depending on the route selected, but there is currently no information on the impacts or whether cable protection would be required. If it was, the project will likely need to minimise the extent of cable protection placed within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC in order to reduce impacts. No other projects spatially overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, all other projects/plans are located at an increased distance from the SAC than the Mona Offshore Cable Corridor and Access Areas and therefore there is limited pathway for them to contribute to in-combination effects.

1.5.4.31 As set out in paragraphs 1.5.3.42 to 1.5.3.45 and Table 1.9, an Offshore EMP will be implemented, which will secure measures to reduce the likelihood of the introduction and spread of INNS so far as reasonably practicable. Included in the Offshore EMP will be a Biosecurity Risk Assessment as well as an INNS Management Plan which will detail the measures to ensure vessels comply with the IMO ballast water management guidelines, it will consider the origin of vessels and contain standard housekeeping measures for such vessels as well as specific measures to be adopted in the event that a high alert species is recorded. This will ensure that the risk of potential introduction and spread of INNS will be minimised. The Mona Offshore Cable Corridor and Access Areas does not overlap with any areas of Annex I reef or Annex I sandbank within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (paragraph 1.5.2.17 and 1.5.3.23). The nearest Annex I reef feature is also located 2.4 km from the Mona Offshore Cable Corridor and Access Areas, therefore considering this distance the likelihood of a stepping stone effect is limited.

Conclusions

1.5.4.32 Adverse effects on the qualifying features which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of in-combination increased risk of introduction and spread of INNS during the construction and operations and maintenance phases of the Mona Offshore Wind Project. An assessment of the impact 'increased risk of introduction and spread of INNS' against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented below in Table 1.24. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.24: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for in-combination increased risk of introduction and spread of INNS during the construction and operations and maintenance phases.

Conservation Objective	Conclusion
Ensuring that the overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing. **Ensuring that the physical, biological, and chemical structure and functions necessary for the long-term**	The Mona Offshore Cable Corridor and Access Areas does not overlap with any Annex I features within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The nearest Annex I reef feature is located 2.4 km from the Mona Offshore Cable Corridor and Access Areas, therefore considering this distance the likelihood of a stepping stone effect is limited. The Mona Offshore Wind Project is also committed to ensuring the percentage of export cable requiring cable protection will not exceed 10% of the total length of the export cable within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The only other project that may overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and has the potential to introduce hard substrate is the MaresConnect

Conservation Objective	Conclusion
maintenance and quality of the habitat are not degraded. **The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded.**	interconnector cable. There is however no information currently available on this project, but if cable protection is required in the SAC, similar measures will likely be required to minimise the extent of cable protection. As outlined in Table 1.9, an Offshore EMP will be implemented, which will include a Biosecurity Risk Assessment as well as an INNS Management Plan. With these measures in place, the risk of potential introduction and spread of INNS will be minimised. It is also likely that the MaresConnect interconnector cable would also be required to implement similar measures to reduce the risk from INNS. Therefore, the overall distribution and extent of the habitat features within the site, and each of their main component parts will remain stable or increasing. The physical, biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat will not be degraded and the presence, abundance, condition and diversity of typical species is such that habitat quality will not be degraded.

1.5.4.33 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of the introduction and spread of INNS with respect to the Mona Offshore Wind Project during the construction and operations and maintenance phases in-combination with other plans/projects.

In-combination changes in physical processes

1.5.4.34 There is no potential for changes in physical processes as a result of the Mona Offshore Wind Project to act together with other projects/plans and result in an in-combination effect on the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The alone assessment presented in paragraph 1.5.3.76 concluded that there would be no adverse effects on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC from the Mona Offshore Wind Project alone. This was concluded on the basis that effects for the Mona Offshore Wind Project alone are predicted to be limited to the immediate vicinity of the cable protection (i.e. within the boundary of the Mona Offshore Cable Corridor and Access Areas) and similarly for other projects (e.g. Awel y Môr) changes to physical processes are predicted to be similarly limited in extent and will not extend into the SAC. As such there is no potential for in-combination effects from other projects as all other projects are outwith the boundary of the SAC.

In-combination removal of hard substrates

1.5.4.35 There are no other projects/plans which overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC which will be active during the decommissioning phase on the Mona Offshore Wind Project based on current knowledge. Therefore there is no potential for in-combination impacts as a result of the removal of hard substrates from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and no further assessment has been undertaken.

In-combination accidental pollution

1.5.4.36 There is the potential for accidental pollution as a result of activities associated with the Mona Offshore Wind Project in-combination with activities associated with the following projects/plans:

- Tier 1
  - Awel y Môr Offshore Wind Farm
  - Rhyl Flats Offshore Wind Farm
  - Gwynt y Môr Offshore Wind Farm
  - Hilbre Swash
  - Conwy River dredging site
- Tier 2
  - Morgan Offshore Wind Project: Generation Assets
  - Morecambe Offshore Windfarm: Generation Assets
  - Morgan and Morecambe Offshore Wind Farms: Transmission Assets
  - Eni Hynet CCS storage project
  - MaresConnect Interconnector cable.

1.5.4.37 All other projects are considered to be of sufficient distance from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC to not contribute to in-combination effects.

All phases

Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC

Tier 1

1.5.4.38 As outlined in section 1.5.3 for the Mona Offshore Wind Project alone assessment, accidental pollution associated with the Mona Offshore Wind Project is considered very unlikely given the implementation of measures adopted a part of the Mona Offshore Wind Project (i.e. an Offshore EMP and MPCP). Should an accidental pollution event occur, effects will be temporary, reversible and limited in spatial extent. It is expected that all tier 1 projects outlined in paragraph 1.5.4.36 (e.g. Awel y Môr Offshore Wind Farm) would be required to have similar tertiary measures to those outlined above for the Mona Offshore Wind Project. Therefore accidental pollution incidents associated with these projects is also considered very unlikely. If an event were to occur at these projects, effects would also be temporary, reversible and limited in spatial extent. In addition, all other tier 1 projects are located further away from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC than the Mona Offshore Cable Corridor and Access Areas (see Table 1.21), therefore if an accidental pollution event were to occur at any of the tier 1 projects, the likelihood of any pollutants reaching the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is very low.

Tier 2

1.5.4.39 As outlined in section 1.5.3 for the Mona Offshore Wind Project alone assessment, accidental pollution associated with the Mona Offshore Wind Project is considered very unlikely given the implementation of measures adopted a part of the Mona Offshore

Wind Project (i.e. an Offshore EMP and MPCP). Should an accidental pollution event occur, effects will be temporary, reversible and limited in spatial extent. It is expected that all tier 2 projects outlined in paragraph 1.5.4.36 (e.g. Morgan Offshore Wind Project Generation Assets, Morecambe Offshore Windfarm Generation Assets, Morgan and Morecambe Offshore Wind Farms: Transmission Assets, Eni Hynet CCS storage project) would be required to have similar tertiary measures to those outlined above for the Mona Offshore Wind Project. Therefore, accidental pollution incidents associated with these projects is also considered very unlikely. If an event were to occur at these projects, effects would also be temporary, reversible and limited in spatial extent. In addition, all other tier 2 projects are located further away from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC than the Mona Offshore Cable Corridor and Access Areas (see Table 1.21), therefore if an accidental pollution event were to occur at any of the tier 2 projects, the likelihood of any pollutants reaching the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is very low.

Conclusions

1.5.4.40 Adverse effects on the qualifying features which undermine the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will not occur as a result of in-combination accidental pollution. An assessment of the impact 'accidental pollution' against each relevant conservation objective (as presented in paragraph 1.5.2.23 to 1.5.2.33) is presented below in Table 1.25. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.25: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for in-combination accidental pollution across all phases of the Mona Offshore Wind Project.

Conservation Objective	Conclusion
Ensuring that the overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing	The risk of any in-combination effects associated with accidental pollution is very low however, should an event occur, any effects will be temporary, reversible, limited in spatial extent. All other projects/plans considered will also likely implement similar standard measures to the measures adopted as part of the Mona Offshore Wind Project in Table 1.18, such as an Offshore EMP and MPCP. These measures will further reduce the likelihood of an accidental pollution event occurring. Therefore, these activities will not restrict the distribution or extent of identified Annex I habitat features from increasing or remaining stable. accidental pollution effects will not affect the physical, biological and chemical structure and function of the Annex I reef and sandbanks features. The typical species associated with the Annex I reef and sandbanks features will not be affected in such a way that the habitat quality will be degraded.
Ensuring that the physical, biological, and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded	
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	

1.5.4.41 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of accidental pollution with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

1.6 Assessment of potential Adverse Effect on Integrity: Annex II diadromous fish species

1.6.1 Overview

1.6.1.1 The HRA Stage 1 Screening Report (Document Reference E1.4) identified the potential for LSEs on the following European sites designated for Annex II fish features and freshwater pearl mussel (Figure 1.10):

- Dee Estuary/Aber Dyfrdwy SAC
- River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC
- River Ehen SAC
- River Eden SAC
- Afon Gwyrfai a Llyn Cwellyn SAC
- River Kent SAC
- River Derwent and Bassenthwaite Lake SAC
- Solway Firth SAC
- River Bladnoch SAC.

1.6.1.2 LSEs on these European sites were identified for the following impacts:

- During the construction and decommissioning phases
  - Underwater sound impacting fish and shellfish receptors
  - In-combination effects.
- During the operations and maintenance phase
  - EMF from subsea electric cables
  - In-combination effects.

1.6.1.3 The ZoI used for increases in SSC and associated sediment deposition in the HRA Stage 1 Screening Report (Document Reference: E1.4) submitted alongside PEIR was one mean tidal excursion from the Mona PEIR Array Area and the Mona PEIR Offshore Cable Corridor. Since the Mona HRA Stage 1 Screening Report published alongside PEIR was produced, modelling has been undertaken to inform the Environmental Statement and application for consent and is presented in Volume 6, Annex 6.1: Physical processes technical report of the Environmental Statement (Document reference F6.1.1). This has modelled the predicted increases in SSC and associated sediment deposition for construction activities including sandwave clearance, drilling for foundation installation and cable installation, which has refined the ZoI. On the basis of the modelling outlined above, there are no European sites with Annex II diadromous fish features within the ZoI and so these impacts were screened out in the HRA Stage 1 Screening Report (Document Reference: E1.4) and are therefore not considered in HRA Stage 2 ISAA Part 2 – SAC assessments (Document Reference E1.2).

1.6.1.4 This section presents the Stage 2 assessments (considering effects both alone and in-combination) for these sites. A summary of all Appropriate Assessments undertaken within this report is provided in the concluding section of this report (section 1.8). Freshwater pearl mussel has been considered within this chapter (specifically as a qualifying feature of the River Ehen SAC and River Kent SAC) because part of its life stage is reliant on salmonid species such as Atlantic salmon, sea trout and brown trout. The potential for adverse effects to freshwater pearl mussel, if they occur at all, would be indirect and would occur as a result of direct effects on salmonid species such as Atlantic salmon, sea trout or brown trout, which are relevant host species for freshwater pearl mussel within the SACs assessed.

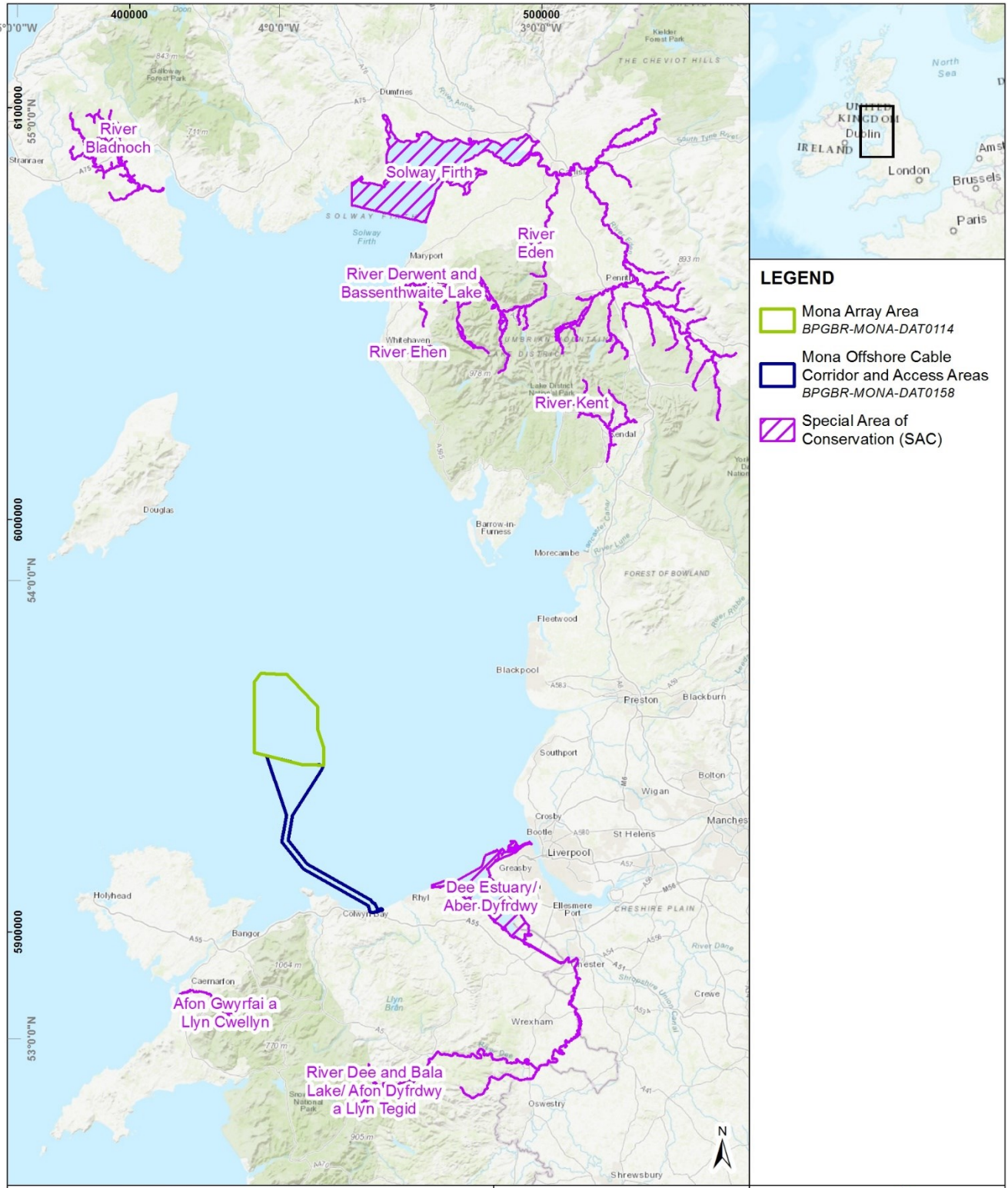

Figure 1.10: Locations of European sites designated for Annex II diadromous fish features for which an Appropriate Assessment is required.

1.6.2 Baseline information

1.6.2.1 Baseline information on the Annex II diadromous fish features of the European sites identified for further assessment within the HRA process has been gathered through a comprehensive desktop study of existing studies and datasets, using the latest available information on diadromous fish. Full details are presented within Volume 2 Chapter 8: Fish and shellfish ecology of the Environmental Statement (Document reference F3.1) and Volume 6, Annex 8.1: Fish and shellfish technical report of the Environmental Statement (Document reference F6.3.1).

Dee Estuary/Aber Dyfrdwy SAC

Site description

1.6.2.2 The Dee Estuary Aber Dyfrdwy SAC is located 39.3 km from the Mona Array Area and 13.2 km from the Mona Offshore Cable Corridor and Access Areas. River lamprey and sea lamprey, which migrate through the SAC, are Annex II species present as qualifying features, but are not a primary reason for selection of the SAC.

Feature accounts

Sea lamprey

1.6.2.3 The sea lamprey is a primitive, jawless fish resembling an eel and is the largest of the lamprey species found in the UK. It occurs in estuaries and easily accessible rivers and is an anadromous species (i.e. spawning in freshwater but completing its life cycle in the sea) (JNCC, 2022e).

1.6.2.4 Sea lamprey are present in the River Dee which forms an essential part of their migratory route. Records of sea lamprey caught at the fish trap at Chester Weir indicate that mature adults migrate upstream almost exclusively during the months of May and June (Potter and Hatton-Ellis, 2003).

River lamprey

1.6.2.5 The river lamprey is found in coastal waters, estuaries and accessible rivers. Some populations are permanent freshwater residents; however, the species is normally anadromous (i.e. spawning in freshwater but completing part of its life cycle in the sea) (JNCC, 2022e). They live on hard bottoms or attached to larger fish such as cod and herring due to their parasitic feeding behaviour, with spawning taking place in pre-excavated pits in riverbeds. Due to their preference for estuarine and nearshore coastal waters, it is unlikely that river lamprey will be found within the Mona Offshore Wind Project Boundary.

1.6.2.6 River lamprey are also present in the River Dee and must therefore use the Dee Estuary as part of their migratory route. As mentioned above lampreys are known to congregate in large estuaries of major rivers, although this feeding behaviour has not yet been documented for the Dee Estuary. However, it is known that several potential river lamprey prey species are found within the Dee Estuary including herring *Clupea harengus*, sprat *Sprattus sprattus*, flounder *Platichthys flesus* and small gadoids (Henderson, 2003). Records of river lamprey caught at the fish trap at Chester weir indicate that mature adults undertake their upstream migration at two different periods of the year, either early spring (March to April) or late summer/autumn (August to November).

Condition assessment

1.6.2.7 Table 1.26 outlines the indicative condition assessments of the relevant qualifying features of the Dee Estuary/Aber Dyfrdwy SAC, overall the condition assessment deemed that both river and sea lamprey are in unfavourable condition (NRW, 2022a). Water quality issues are likely to be contributing to the condition of the lamprey features at this SAC (NRW, 2022a)[3].

Table 1.26: Condition assessment of relevant Annex II diadromous fish species of the Dee Estuary/Aber Dyfrdwy SAC.

Component of species feature assessed	Indicative assessment (favourable, unfavourable, unknown)	Level of agreement	Confidence in evidence	Component confidence level
River lamprey				
Freshwater population variables	Favourable	High	Medium	Medium
Marine habitat	Unfavourable	High	High	High
Sea lamprey				
Freshwater population variables	Unfavourable	High	High	High
Marine habitat	Unfavourable	High	High	High

Conservation objectives

1.6.2.8 The conservation objective for the river lamprey feature of the Dee Estuary SAC is to maintain the feature in a favourable condition, as defined below (Natural England and CCW, 2010)[4]:

- The river lamprey feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
  - The migratory passage of both adult and juvenile river lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality
  - The five year mean count of river lampreys recorded by the Chester Weir fish trap is no less than 55 under the monitoring regime[5] in use prior to notification

[3] https://cdn.cyfoethnaturiol.cymru/media/684383/dee-estuary-sac-ica-2018.pdf

[4] https://naturalresources.wales/media/673576/Dee%20Estuary-Reg33-Volume%201-English-091209_1.pdf

[5] Monitoring regime at Chester Weir fish trap: Over the five years for which data are available prior to notification (1993, 1997- 2000) Chester Fish trap operated for a mean of 394 hours per month, throughout the year, each year (I. Davidson, pers. comm.). Any change in the operation of the fish trap especially changes in the total hours the trap is active for per month or per year may require the count in the objective to be revised.

(i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000)

– The abundance of prey species[6] forming the sea lamprey's food resource within the estuary, is maintained.

1.6.2.9 The conservation objective for the sea lamprey feature of the Dee Estuary SAC is to maintain the feature in a favourable condition, as defined below:

- The sea lamprey feature will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met:
  – The migratory passage of both adult and juvenile sea lampreys through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality
  – The five year mean count of sea lampreys recorded by the Chester Weir fish trap is no less than 18 under the monitoring regime[9] in use prior to notification. (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000)
  – The abundance of prey species[10] forming the sea lamprey's food resource within the estuary, is maintained.

1.6.2.10 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC, or the supporting habitats and processes on which the qualifying species (Annex II diadromous fish qualifying features) of the SAC rely have been assessed in section 1.6.3. Conservation objectives relating exclusively to the qualifying habitats of the SAC have not been considered, as the qualifying Annex I habitats of the following European sites were screened out within the HRA Stage 1 Screening (Document reference: E1.4) on the basis of distance from the Mona Offshore Wind Project.

River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC

Site description

1.6.2.11 The River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC, which is 64.4 km from the Mona Array Area and 40.7 km from the Mona Offshore Cable Corridor and Access Areas, extends from Llyn Tegid encompassing the Bala lake and its banks and outfalls into the River Dee. The site extends downstream to where it joins the Dee Estuary Site of Special Scientific Interest (SSSI). Several Dee tributaries are also included within the site, specifically the Ceiriog, Meloch, Tryweryn, and Mynach. Atlantic salmon, are a primary reason for the selection of the River Dee and Bala Lake SAC, with the Mynach, Meloch and Ceiriog tributaries being the most prevalent salmon spawning tributaries in the Dee catchment. Other diadromous fish species present as qualifying features of the site are river lamprey and sea lamprey present as qualifying features but not a primary reason for site selection.

[6]. In the estuaries of major rivers river lamprey feed on a variety of fish, particularly herring *Clupea harengus*, sprat *Sprattus sprattus* and flounder *Platichthys flesus* (Maitland, 2003). Sprats are present in the Dee Estuary throughout the year and it is likely that they are one of the most important prey species for river lamprey during the winter months when the adults move inshore (Henderson, 2003). From November to March herring are also common. During the summer months other fish such as flounder and small gadoids such as whiting *Merlangius merlangus* and pouting *Trisopterus luscus* are potential prey (Henderson, 2003). They are also known to feed off sea trout *Salmo trutta* (Bird, 2008).

Feature accounts

Atlantic salmon

1.6.2.12 Atlantic salmon are anadromous (i.e. spawns in freshwater but completes its life cycle in the sea). They spend two to three years in freshwater, with downstream migration (to open sea) occurring between April and May. Atlantic salmon remain at sea for one to three years. Upstream migration into freshwater occurs year-round, with a peak in late summer/early autumn (NRW, 2022).

1.6.2.13 Figure 1.11 presents the likely migration routes for anadromous fish reaching UK rivers. These migration routes have been considered when assessing the potential for an adverse effect on integrity on the SACs listed in paragraph 1.6.1.2 in section 1.6.3 and 1.6.4.

1.6.2.14 No site specific information is available for this feature.

Sea lamprey

1.6.2.15 No site specific information is available for this feature. An overview of the ecology of the species is provided in paragraph 1.6.2.3.

River lamprey

1.6.2.16 No site specific information is available for this feature. An overview of the ecology of the species is provided in paragraph 1.6.2.5 and 1.6.2.6.

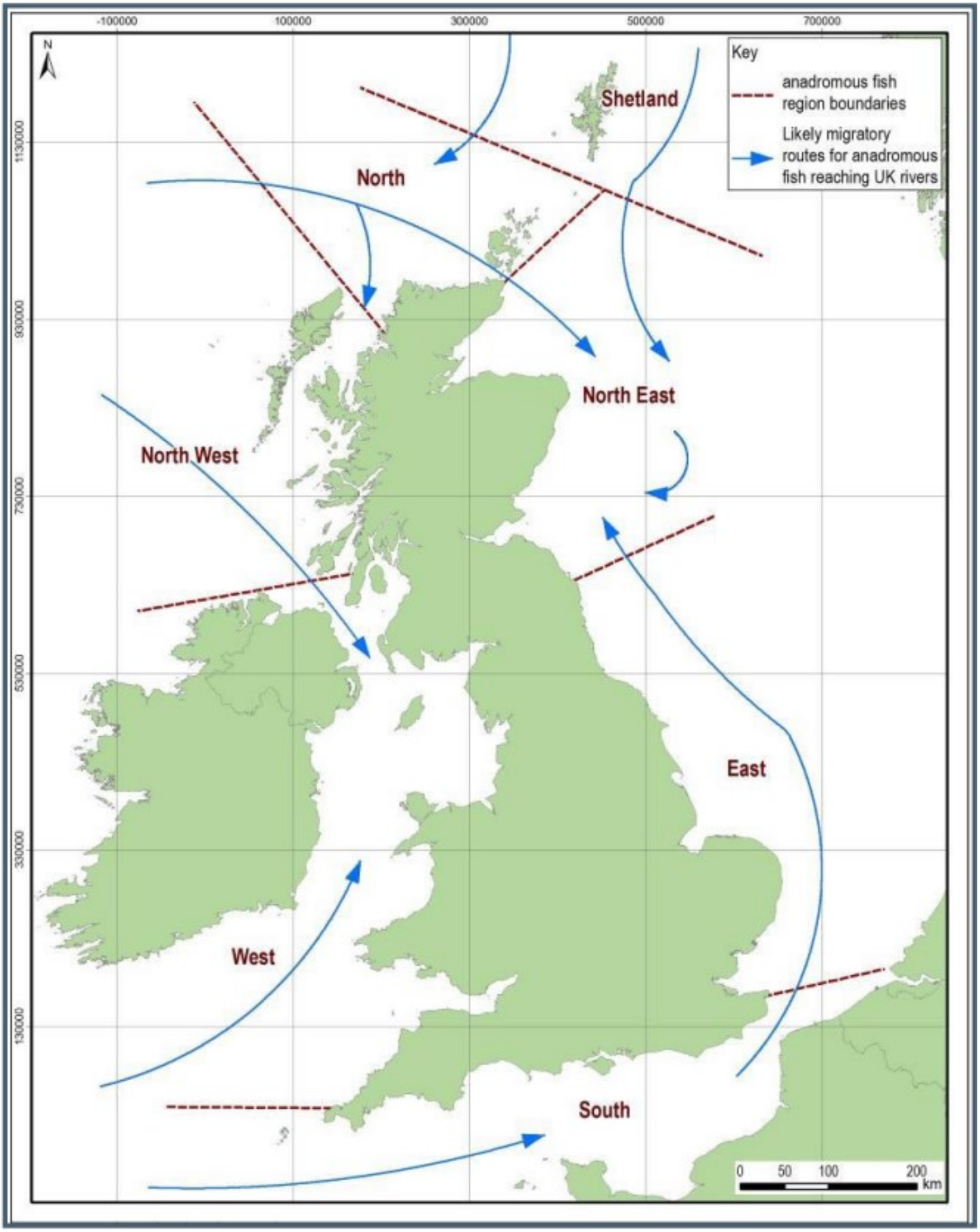

Figure 1.11: Likely migration routes for anadromous fish reaching UK rivers (ABPmer, 2014).

Condition assessment

1.6.2.17 Table 1.27 outlines the indicative condition assessment for the Atlantic salmon qualifying feature of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. There is not sufficient information to assess the population size and dynamics of the sea lamprey and river lamprey feature. However overall, the condition assessment deemed that Atlantic salmon, river and sea lamprey features are all in unfavourable condition (NRW, 2022b)[7].

Table 1.27: Condition assessment of relevant Annex II diadromous fish species of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC.

Attribute	Pass	Fail
Atlantic salmon		
Juvenile population densities	✓	
Adult run		×
Overall assessment		×

Conservation objectives

1.6.2.18 The conservation objectives for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (NRW, 2022) are outlined below.

Atlantic salmon

- The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:
  - The parameters defined in the vision for the watercourse as defined in (NRW, 2022) must be met
  - The SAC feature populations will be stable or increasing over the long term
  - The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future
  - There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis
  - All known, controllable factors, affecting the achievement of these conditions are under control (many factors may be unknown or beyond human control).

Sea lamprey and river lamprey

- The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied:
  - The parameters defined in the vision for the watercourse as defined above must be met
  - The SAC feature populations will be stable or increasing over the long term

[7] https://afonyddcymru.org/wp-content/uploads/2022/11/river_dee___bala_lake_32_plan.pdf

- The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future
- There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis
- All factors affecting the achievement of these conditions are under control.

1.6.2.19 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.6.3, conservation objectives relating to the qualifying habitats of the SAC will not be considered.

River Ehen SAC

Site description

1.6.2.20 The River Ehen SAC which is 83 km from the Mona Array Area and 106.4 km from the Mona Offshore Cable Corridor and Access Areas, forms the outfall from Ennerdale Water and flows some 20 km to Sellafield where it meets the Irish Sea. The SAC is located between Ennerdale Water and the convergence with the River Keekle. This part of the river supports outstanding populations of the freshwater pearl mussel *Margaritifera margaritifera* of which is the primary reason for the selection of the site. These populations likely result from high amount of tree shade along the banks, which is thought to be of importance for mussel habitat (Natural England, 2019). The SAC is also designated for Atlantic salmon which is present as a qualifying feature but not a primary reason for site selection and plays an important role in the lifecycle of the freshwater pearl mussel (Natural England. 2019).

Feature accounts

Freshwater pearl mussel

1.6.2.21 The freshwater pearl mussel is an endangered species of freshwater mussel. It is widely distributed in Europe but has suffered widespread decline and is highly vulnerable in every part of its former range. A Scottish national survey undertaken in 2015 found that freshwater pearl mussel had been lost from a number of rivers. More widely, since 1999 a total of 11 rivers in Scotland have seen their freshwater pearl mussel populations become extinct (JNCC, 2022a).

1.6.2.22 Freshwater pearl mussel are similar in shape to common marine mussels but grow much larger and live far longer. They can grow as large as 20 cm and live for more than 100 years, making them one of the longest-lived invertebrates (Skinner *et al*., 2003). These mussels live on the beds of clean, fast flowing rivers, where they can be buried partly of wholly in coarse sand or fine gravel. Mussels have a complex life cycle, living on the gills of young Atlantic salmon or sea trout, for their first year, without causing harm to the fish (Skinner *et al*., 2003). While there is no potential for direct impacts on this species from the Mona Offshore Wind Project (as this is an entirely freshwater species), indirect impacts may occur due to effects on their host species (i.e. Atlantic salmon and sea trout) during their marine phase.

1.6.2.23 The River Ehen supports the largest freshwater pearl mussel population (>100,000) in England with high densities of greater than 100 m^2 found in some locations. The conservation importance of the site is further enhanced by the presence of juvenile pearl mussels, indicating recruitment since 1990 (JNCC, 2022a).

Atlantic salmon

1.6.2.24 The River Ehen holds a significant population of Atlantic salmon the environment agency has classified the population as 'probably at risk' based on the 2017 assessment and was predicted to remain in that status over the following five years. Recent estimates suggest that the salmon migration flow-range in the River Ehen is estimated to be between 90 to 390 ml/d with peak migration occurring around 240 ml/d. October through to the end of January is the principal time for salmon migration in to the River Ehen SAC (Natural England, 2022a).

Condition assessment

1.6.2.25 A condition assessment was carried out for units of the River Ehen (Ennerdale Water to Keekle Confluence) (SSSI) which overlaps with the River Ehen SAC. For both units of the SSSI assessed, the freshwater pearl mussel was deemed to be in unfavourable declining condition and the Atlantic salmon feature was deemed to be in unfavourable no change condition (Natural England, 2022b)[8].

Conservation objectives

1.6.2.26 The conservation objectives for the River Ehen SAC (Natural England, 2019a)[9] are outlined below.

- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:
  - The extent and distribution of the habitats of qualifying species
  - The structure and function of the habitats of qualifying species
  - The supporting processes on which the habitats of qualifying species rely
  - The populations of qualifying species
  - The distribution of qualifying species within the site.

River Eden SAC

Site description

1.6.2.27 The River Eden SAC is located 86.5 km from the Mona Array Area and 104.8 km from the Mona Offshore Cable Corridor and Access Areas. Atlantic salmon, bullhead *Cottus gobio*, and sea lamprey, river lamprey and brook lamprey *Lampetra planeri* are all present as qualifying features that are the primary reason for selection of the site. The Eden maintains a large population of salmon owing to the extensive suitable habitat available including areas of gravel and finer silt owing to the highly erodible nature of the rock within the river, which provide conditions for spawning and nursery areas (Natural England, 2019a). The river Eden also supports Brook and river lampreys and a large population of sea lamprey in the middle to lower regions of the river. The

[8] https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK0030057&SiteName=river%20ehen&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

[9] http://publications.naturalengland.org.uk/publication/4544671464292352

extensive areas of gravel outlined above, and generally good quality water, provides habitat for bullheads and the tributaries, specifically those flowing over limestone, also hold high numbers of bullhead (Natural England, 2019b).

Feature accounts

Atlantic salmon

1.6.2.28 The Eden represents one of the largest populations of Atlantic salmon in north England. The varied, base-rich geology and large range in altitude results in the development of distinct habitat types, supporting diverse plant and invertebrate communities. The high ecological value of the river system and the fact that the salmon are able to use the majority of the catchment mean that the Eden supports a large population of salmon (JNCC, 2022b).

Sea lamprey

1.6.2.29 The highly erodible nature of the rock within the Eden results in extensive areas of gravel and finer silts being deposited throughout the system, which provide suitable habitats for spawning and nursery areas. A large and healthy population of sea lamprey is therefore supported in the middle to lower regions of the river (JNCC, 2022b).

River lamprey

1.6.2.30 The highly erodible nature of the rock within the Eden results in extensive areas of gravel and finer silts being deposited throughout the system, which provide suitable habitats for spawning and nursery areas. The high quality of these habitats and their accessibility results in the river hosting a large, healthy population of river lamprey (JNCC, 2022b).

Condition assessment

1.6.2.31 A condition assessment was carried out for units of the River Eden and Tributaries SSSI which overlaps with the River Eden SAC. For the assessment an average of the condition across all units has been taken for each qualifying species, therefore on this basis sea lamprey and river lamprey are deemed to be unfavourable recovering and Atlantic salmon is deemed to be in favourable condition (Natural England, 2022c)[10].

Conservation objectives

1.6.2.32 The conservation objectives for the River Eden SAC (Natural England, 2019b)[11] are outlined below.

- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:

[10] https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK0012643&SiteName=river%20eden&countyCode=&responsiblePerson=&SeaArea=&IFCAArea=

[11] http://publications.naturalengland.org.uk/publication/5935614042046464b

- The extent and distribution of qualifying natural habitats and the habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The supporting processes on which the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site.

1.6.2.33 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.6.3, conservation objectives relating to the qualifying habitats of the SAC will not be considered on the basis of the findings of the HRA Stage 1 Screening.

Afon Gwyrfai a Llyn Cwellyn SAC

Site description

1.6.2.34 The Afon Gwyrfai a Llyn Cwellyn SAC is located 92.3 km from the Mona Array Area and 91.2 km from the Mona Offshore Cable Corridor and Access Areas. This SAC encompasses the Afon Gwyrfai and Llyn Cwellyn. The Gwyrfai flows out of Llyn y Gader near Rhyd Ddu and passes through Llyn Cwellyn before reaching the sea at, Caernarfon Bay. The lake Llyn Cwellyn is a deep oligotrophic lake, recognised for its conservation importance. The Gwyrfai river system is recognised for outstanding ecological and water quality and is designated for an extensive Atlantic salmon population (the primary reason for selection of the site), one of the best supporting rivers in the United Kingdom (Countryside Council for Wales, 2008).

Feature accounts

Atlantic salmon

1.6.2.35 The Afon Gwyrfai in northwest Wales is representative of the small montane rivers in the region. The river contains a largely unexploited salmon population with a characteristically late run (JNCC, 2022c). Electrofishing data from the Environment Agency indicates the presence of healthy juvenile populations downstream of Llyn Cwellyn within the SAC (JNCC, 2022c).

Condition assessment

1.6.2.36 The condition assessment for the Atlantic salmon feature of the Afon Gwyrfai a Llyn Cwellyn SAC deemed the feature to be unfavourable: unclassified (Countryside Council for Wales, 2008). The current unfavourable status results from an assessment of feature distribution and abundance within the SAC, specifically salmon catch and juvenile surveys (Countryside Council for Wales, 2008)[12].

[12] https://naturalresources.wales/media/670697/Afon%20Gwyrfai%20a%20Llyn%20Cwellyn%20Management%20%20Plan%20_English_.pd

Conservation objectives

1.6.2.37 The conservation objectives for the Afon Gwyrfai a Llyn Cwellyn SAC (Countryside Council for Wales, 2008)[13] are outlined below.

- The conservation objective for the water course as outlined in Countryside Council Wales (2008) must be met
- The population of the feature in the SAC is stable or increasing over the long term
- The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future
- The Gwyrfai will continue to be a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.

River Kent SAC

Site description

1.6.2.38 The River Kent SAC is located 96.7 km from the Mona Array Area and 105.1 km from the Mona Offshore Cable Corridor and Access Areas. The River Kent's main tributaries have their catchments in the south east Lake District fells which provide natural mineral enrichment in the form the calcium necessary for growth (Natural England, 2005a). Due to high water quality, heavy rainfall on the catchment fells and a short distance from the headwaters to the mouth of the river, a high degree of flushing occurs throughout the river which maintains the river bed free of silt and algal growth. The high water quality, fast flow regime, cool temperatures and suitable areas of habitat, also provide sufficient habitat for freshwater pearl mussels found primarily in one of the upper tributaries and also present as a qualifying feature of the SAC, but not a primary reason for site selection (Natural England, 2005b).

Feature accounts

Freshwater pearl mussel

1.6.2.39 The freshwater pearl mussel requires clean, fast flowing, highly oxygenated rivers and burrows into sand/gravel substrates, often between boulders and pebbles (Geist and Auerswald, 2007). The freshwater pearl mussel is currently found in only one tributary of the Kent, Dubbs Beck (unit 102) which is situated between two reservoirs (Natural England, 2005b). The mussel requires a salmonid fish host for its larval (glochidial) stage; it is thought that the host species within the River Kent SAC is brown trout, although in line with a precautionary approach for the basis of this assessment Atlantic salmon is also considered to be a host species. A pollution incident and consequent recruitment failure (lack of juvenile mussels) have resulted in declines in the population within the river in the last decade (Natural England, 2005b).

Condition assessment

1.6.2.40 A condition assessment was carried out for a unit of the River Kent and Tributaries SSSI which overlaps with the River Kent SAC. Within this unit the freshwater pearl

[13] https://afonyddcymru.org/wp-content/uploads/2022/11/afon-gwyrfai-a-llyn-cwellyn-management-plan-_english_.pdf

mussel feature was deemed to be in unfavourable condition (Natural England, 2022c)[14].

Conservation objectives

1.6.2.41 The conservation objectives for the River Kent SAC (Natural England, 2018e)[15] are outlined below.

- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:
  - The extent and distribution of qualifying natural habitats and habitats of qualifying species
  - The structure and function (including typical species) of qualifying natural habitats
  - The structure and function of the habitats of qualifying species
  - The supporting processes on which the habitats of qualifying species rely
  - The populations of qualifying species
  - The distribution of qualifying species within the site.

1.6.2.42 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.6.3, conservation objectives relating to the qualifying habitats of the SAC will not be considered on the basis of the findings of the HRA Stage 1 Screening.

River Derwent and Bassenthwaite Lake SAC

Site description

1.6.2.43 The River Derwent and Bassenthwaite SAC is located 99.7 km from the Mona Array Area and 119.7 km from the Mona Offshore Cable Corridor and Access Areas. The SAC consists of the River Derwent, a large oligotrophic river system with high water quality and a natural channel (Natural England, 2019c). The Derwent flows through two lakes Derwentwater and Bassenthwaite, with presence of aquatic flora is typical of oligotrophic/mesotrophic lake. Designated fish species present within the SAC include Atlantic salmon, sea lamprey, river lamprey and brook lamprey *Lampetra planeri* which are all a primary reason for the selection of the SAC. The site encompasses various important salmon spawning areas as well as extensive sea and river lamprey nursery grounds (Natural England, 2019c).

Feature accounts

Atlantic salmon

1.6.2.44 The Derwent represents Atlantic salmon populations in northwest England and is a particularly good example of a large oligotrophic river flowing over base-poor geology, providing a contrast to the more mesotrophic River Eden (Natural England, 2019c).

[14] https://designatedsites.naturalengland.org.uk/SiteSACFeaturesMatrix.aspx?SiteCode=UK0030256&SiteName=River%20Kent%20SAC

[15] http://publications.naturalengland.org.uk/publication/5256393649029120

Low intensity land-use in the catchment means there is good water quality throughout much of the system. This water quality, coupled with the presence of extensive gravel shoals, makes it a particularly suitable river for breeding and enables it to support a large population (JNCC, 2022b).

Sea lamprey

1.6.2.45 The Derwent represents sea lamprey in a high-quality oligotrophic river in north England. The presence of gravels and silts in the middle to lower reaches of this river means that it supports a large population of sea lamprey (Natural England, 2019c; JNCC, 2022b).

River lamprey

1.6.2.46 The Derwent represents river lamprey in an oligotrophic river in north England. High numbers of this species are known to occur and this river has features that provide the necessary habitats for both spawning and nursery areas (gravel shoals, good water quality and areas of marginal silt) (Natural England, 2019c; JNCC, 2022b).

Condition assessment

1.6.2.47 Condition assessments are not available for the River Derwent and Bassenthwaite SAC.

Conservation objectives

1.6.2.48 The conservation objectives for the Derwent and Bassenthwaite Lake SAC (Natural England, 2019c)[16] are outlined below.

- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:
  - The extent and distribution of the habitats of qualifying species
  - The structure and function of the habitats of qualifying species
  - The supporting processes on which the habitats of qualifying species rely
  - The populations of qualifying species
  - The distribution of qualifying species within the site.

1.6.2.49 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.6.3, conservation objectives relating to the qualifying habitats of the SAC will not be considered on the basis of the findings of the HRA Stage 1 Screening.

Solway Firth SAC

Site description

1.6.2.50 The Solway Firth SAC is located 114.5 km from the Mona Array Area and 134.8 km from the Mona Offshore Cable Corridor and Access Areas. The Solway is a large,

[16] http://publications.naturalengland.org.uk/publication/6086221126172672

complex estuary with moderately strong tidal streams and wave action (Natural England, 2005a). The sediment habitats present throughout the estuary consist mainly of dynamic sandflats and subtidal reefs. There are unusually large areas of upper marsh which is predominantly characterised by saltmarsh rush *Juncus gerardii* community with smaller areas of the saltmarsh-grass /*fescue Puccinellia/Festuca* communities (Natural England, 2005). The sublittoral sediment communities are typically sparse in the inner estuary, due to high levels of sediment mobility coupled with low and variable salinity whilst intertidal sediments are characterised by flats of fine sands, rather than muds. The estuary also provides a migratory passage for sea lamprey and river lamprey to and from their spawning and nursery grounds, which are present as qualifying features and primary reasons for the selection of the SAC (Natural England, 2005a).

Feature accounts

Sea lamprey

1.6.2.51 The Solway Firth provides migratory passage for sea lamprey sea lamprey to and from spawning and nursery grounds in a number of rivers, including the Eden which is also designated as a SAC for the species (JNCC, 2022c).

River lamprey

1.6.2.52 The Solway Firth provides migratory passage for river lamprey to and from spawning and nursery grounds in a number of rivers, including the Eden which is also designated as a SAC for the species (JNCC, 2022c).

Condition assessment

1.6.2.53 The condition of the sea lamprey and river lamprey features of the Solway Firth SAC have not been assessed (NatureScot, 2022)[17].

Conservation objectives

1.6.2.54 The conservation objectives for the Solway Firth SAC (Natural England, 2018e)[18] are outlined below.

- Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring:
  - The extent and distribution of qualifying natural habitats and habitats of qualifying species
  - The structure and function (including typical species) of qualifying natural habitats
  - The structure and function of the habitats of qualifying species
  - The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely

[17] https://sitelink.nature.scot/site/8377

[18] http://publications.naturalengland.org.uk/publication/6556237919420416

- The populations of qualifying species
- The distribution of qualifying species within the site.

1.6.2.55 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.6.3, conservation objectives relating to the qualifying habitats of the SAC will not be considered.

River Bladnoch SAC

Site description

1.6.2.56 The River Bladnoch SAC is located 121.5 km from the Mona Array Area and 141.4 km from the Mona Offshore Cable Corridor and Access Areas. The River Bladnoch flows from Mayberry Loch in South Ayrshire for seven miles to Wigtown Bay. The River Bladnoch is designated for Atlantic salmon (present as a primary reason for the selection of the site) and the site supports a high-quality salmon population and a spring run of salmon (JNCC, 2022d). The river's ecological and water quality characteristics are influenced by a moderate-sized catchment with diverse upland and lowland areas (JNCC, 2022d).

Feature accounts

Atlantic salmon

1.6.2.57 The River Bladnoch is located in south west Scotland and a supports a high-quality salmon population and a spring run of salmon which is considered unusual for rivers in this region. There are issues associated with acidification upstream however these are subject to national and local initiatives which are both reducing and ameliorating the worst effects of this pollution source (JNCC, 2022e).

Condition assessment

1.6.2.58 The condition of the Atlantic salmon feature was assessed as part of the Nature Scot's site condition monitoring programme. The feature was assessed as unfavourable recovering in September 2011 (NatureScot, 2020)[19].

Conservation objectives

1.6.2.59 The conservation objectives for the River Bladnoch SAC (Nature Scot, 2020)[20] are outlined below.

- To ensure that the qualifying feature of the River Bladnoch SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status
- To ensure that the integrity of the River Bladnoch SAC is restored by meeting objectives 2a, 2b and 2c for the qualifying feature

[19] https://sitelink.nature.scot/site/8355

[20] https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwid37n-qqv8AhU7_bsIHcEgDcQQFnoECAwQAw&url=https%3A%2F%2Fapps.snh.gov.uk%2Fsitelink-api%2Fv1%2Fsites%2F8355%2Fdocuments%2F66%23%3A~%3Atext%3DThe%2520aim%2520at%2520this%2520SAC%2Cto%2520its%2520wider%2520conservation%2520status.&usg=AOvVaw20NFyWFxG9_8pC4bhyzJCM&cshid=1672746684001234

- Restore the population of the species, including range of genetic types, as a viable component of the site
- Restore the distribution of the species throughout the site
- Restore the habitats supporting the species within the site and availability of food.

1.6.3 Assessment of adverse effects alone

1.6.3.1 The following assessments of the effects of the Mona Offshore Wind Project alone on Annex II diadromous fish have been informed by the detailed project-specific underwater sound modelling presented in Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1) and the technical assessments presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3). The assessments have also drawn upon the sensitivity assessments of the relevant fish species detailed in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) which reference the best available literature and evidence with regards to sensitivity. In this regard, the Applicant is confident that the conclusions made on whether an adverse effect on integrity on a European site(s) and qualifying features can or cannot be ruled out have been identified in light of the best scientific knowledge in the field and all reasonable scientific doubt can be ruled out.

Underwater sound impacting fish and shellfish receptors

1.6.3.2 Some activities associated with the construction of the Mona Offshore Wind Project will generate underwater sound which has the potential to result in mortality, injury and/or disturbance to diadromous fish. Elevated underwater sound also has the potential to disrupt the migration of fish to their preferred spawning habitats (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3). The greatest potential impacts from underwater sound emissions are predicted to result from piling activities (for the installation of wind turbines and Offshore Substation Platform (OSP) foundations) and UXO clearance including detonation within the Mona Array Area. Underwater sound modelling for all relevant activities has been undertaken for the Mona Offshore Wind Project and full details are presented in Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1). All other sound sources including cable installation, foundation drilling and pre-construction site investigation surveys are non-percussive and will result in much lower sound levels and therefore much smaller injury ranges (in most cases no injury is predicted) than those predicted for piling operations (see Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1).

1.6.3.3 No piling or UXO activities will be carried out during the decommissioning phase and therefore potential impacts related to underwater sound impacting fish and shellfish receptors during this phase are predicted to be lower than for the construction phase, and thus impacts on Annex II diadromous fish features of the relevant European sites during the decommissioning phase are predicted to be no greater than those associated with the construction phase. Therefore, the assessment presented below groups both the construction and decommissioning phases and does not specifically assess impacts associated with the decommissioning phase.

1.6.3.4 The assessment of LSE during the HRA screening process identified that during construction and decommissioning, LSE could not be ruled out for the potential impact

of underwater sound impacting fish and shellfish receptors. This relates to the designated sites and relevant Annex II diadromous fish features listed in Table 1.28.

Table 1.28: European sites and relevant Annex II diadromous fish features from which the potential for an LSE could not be ruled out in relation to underwater sound.

SAC	Annex II diadromous fish features
Dee Estuary/Aber Dyfrdwy SAC	Sea lamprey River lamprey
River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC	Sea lamprey River lamprey Atlantic salmon
River Ehen SAC	Atlantic salmon Freshwater pearl mussel
River Eden SAC	Sea lamprey River lamprey Atlantic salmon
Afon Gwyrfai a Llyn Cwellyn SAC	Atlantic salmon
River Kent SAC	Freshwater pearl mussel
River Derwent and Bassenthwaite Lake SAC	Sea lamprey River lamprey Atlantic salmon
Solway Firth SAC	Sea lamprey River lamprey
River Bladnoch SAC	Atlantic salmon

1.6.3.5 The following sections explain how this potential impact on Annex II diadromous fish features of the European sites listed above has been quantified and assessed.

1.6.3.6 For the purposes of the assessment sea lamprey and river lamprey have been assessed together due to their similar sensitivity to underwater sound and the fact that their conservation objectives are the same for both species at all European sites assessed and therefore effects and associated conclusions are considered to be alike.

1.6.3.7 The MDS considered for the assessment of potential impacts on Annex II diadromous fish features is presented in Table 1.29.

Table 1.29: MDS considered for the assessment of potential impacts on diadromous fish from underwater sound.

Phase	MDS	Justification
Construction phase	Piled foundations: • Wind turbines – Installation of up to 64 wind turbine foundations with four-legged jacket foundations (256 piles, diameter of each pile = 3.8 m) installed by impact piling – Gravity base foundations: up to 32 gravity base foundations with 10 requiring piling for ground strengthening purposes, leading to up to 150 piles, with	For pin piles the largest hammer energy and maximum spacing between concurrent piling events would lead to the largest spatial extent of ensonification at any one time. Minimum spacing between concurrent piling represents the highest risk of injury to fish and shellfish as sound

Phase	MDS	Justification
	15 piles per foundation (maximum diameter of 4 m per pile) • OSPs: installation of four OSPs with foundations consisting of four-legged jacket foundations, with three piles per leg (48 piles, maximum diameter of 3.5 m per pile) installed by impact piling • Maximum hammer energy of up to 4,400 kJ • Up to two vessels piling concurrently with a maximum hammer energy of 3,000 kJ (minimum distance 1.4 km, maximum distance 15 km, between piling vessels) • Maximum of up to 4.5 hours of piling per pile with a cumulative total of up to 1,818 hours across wind turbine foundations (jackets and gravity base foundations) and OSP foundations, with a maximum of one foundation (four piles) per day • Consecutive piling of two foundations (eight piles) using a maximum of two vessels over each 24 hour period • Four piles installed per 24 hours per vessel = 114 days (64 days for wind turbine foundations, 37.5 days for gravity base foundations, and 12 days for OSP foundation piles) for a single vessel (maximum temporal) or 57 days for two vessels (maximum spatial) • Total piling phase (foundation installation) of up to two years within a four-year construction phase. Geophysical site investigation • Geophysical site investigation activities will include the following activities: – Multi-beam echo-sounder (MBES) – Sidescan Sonar (SSS) – Single Beam Echosounder (SBES) – Sub-Bottom Profilers (SBP) – Sparker (as an example of Ultra High Resolution Seismic (UHRS) (0.05 – 4 kHz; 182 dB re 1µPa^{2}s SEL). For further detail regarding geophysical sound sources and levels, see Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1). UXO: • Clearance of up to 23 UXOs (estimated) within the Mona Array Area of Offshore Cable Corridor • A range of UXO sizes assessed from 25 kg up to 907 kg with 130 kg the most likely (common) maximum • For high order detonation donor charges of 1.2 kg (most common) and 3.5 kg (single barracuda blast charge) • Up to 0.5 kg Net Explosive Quantity (NEQ) clearance shot for neutralisation of residual explosive material at each location • Clearance during daylight hours only. MDS is for high order clearance but assessment also considered: • Low order clearance charge size of 0.08 kg	from adjacent foundations could combine to produce a greater radius of effect compared to a single piling event. Number of OSPs (four) chosen for the assessment in MDS due to having largest hammer energy. For jacket foundations and gravity base foundations the maximum temporal scenario was assessed on the greatest number of days on which piling could occur based on the number of piles that could be installed within a 24-hour period. As gravity base foundations do not use piled foundations, gravity base foundations will not give rise to effects on fish and shellfish ecology that are not already considered within the range of assessed foundations. Consecutive piling is assumed to install a maximum of eight piles over a maximum period of 24 hours. Range of geophysical and geotechnical activities likely to be undertaken using equipment typically employed for these types of surveys.

Phase	MDS	Justification
	• Low yield clearance configurations of 0.75 kg charges (up to 4x0.75 kg).	

Measures adopted as part of the project

1.6.3.8 Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of potential impacts on Annex II diadromous fish features from underwater sound during construction and decommissioning are presented in Table 1.30.

Table 1.30: Measures adopted as part of the project which are relevant to the assessment of adverse effect on European sites designated for Annex II diadromous fish features from underwater sound.

Measure	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
Development of and adherence to a Marine Mammal Mitigation Protocol (MMMP), based on the Outline MMMP (Document Reference J21) that requires implementation of an initiation stage of a piling soft start and ramp-up.	This measure will minimise the likelihood of injury from elevated underwater sound to marine mammal and some fish species in the immediate vicinity of piling operations, allowing reactive individuals to move away from the area before sound levels reach a level at which injury may occur.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Development of and adherence to a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J21)) which sets a maximum separation limit of 15 km for concurrent piling.	Commitments made around maximum separation during concurrent piling will minimise the likelihood of disturbance to marine mammal and fish species in the immediate vicinity of piling operations, by limiting the ensonified area during concurrent piling. Where piling occurs concurrently a maximum separation distance of 15 km is used to limit the ensonified area as there is greater overlap when closer together.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Development of and adherence to a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J21)) which sets a minimum separation limit of 1.4 km for concurrent piling.	Commitments made around minimum separation during concurrent piling will minimise the likelihood of injury to marine mammal and fish species in the immediate vicinity of piling operations, by limiting the spatial overlap of areas of ensonification during concurrent piling. Where piling occurs concurrently, a minimum separation distance of 1.4 km is used to minimise the potential for effects due to direct overlap of concurrent piling.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Development of and adherence to a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J21)) which sets the limit on maximum hammer energy used during concurrent piling at 3,000 kJ and during the single event piling at 4,400 kJ.	Commitments made around concurrent piling will minimise the likelihood of injury to marine mammal and fish species in the immediate vicinity of piling operations, by reducing the ensonified area during concurrent piling.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Measure	Justification	How the measure will be secured
Development and adherence to a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J21)) that requires implementation of a mitigation hierarchy with regard to UXO clearance that follows: • Avoid UXO • Clear UXO with low order techniques • Clear UXO with high order techniques. Low order techniques or avoidance of confirmed UXO are not always possible and are dependent upon the individual situations surrounding each UXO.	Low order techniques generate less underwater sound than high order techniques and therefore present a lower risk to sound-sensitive receptors such as marine mammals and fish during UXO clearance. Noting the position statement from statutory authorities on UXO clearance (UK Government, 2022), the option to clear UXOs with low order techniques has been considered as a potential primary mitigation measure as part of this assessment. Note, however, that low order techniques are not always possible and are dependent upon the individual situations surrounding each UXO. Given that it is possible that high order detonation may be used, the Outline MMMP includes mitigation to reduce the likelihood of injury from UXO clearance. Please see below. The Outline underwater sound management strategy (Document Reference J.16) includes potential further mitigation options, should the measures in the MMMP (Document Reference J21) not reduce impacts, such that there will be no residual significant effect from the project.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Development of and adherence to a MMMP, which will be developed in accordance with the Outline MMMP (Document Reference J21) included as part of the application. The Outline MMMP (Document Reference J21) present appropriate mitigation for activities that could potentially lead to injurious effects on marine mammals including: piling, UXO clearance and some types of geophysical activities. Piling: for the purpose of developing the MMMP (Document Reference J21) as an annex of the Underwater sound management strategy (Document Reference J.16), a mitigation zone will be defined based on the maximum predicted injury range from the dual metric sound modelling for the maximum spatial scenario (pin piles) and across all marine mammal species. The Outline MMMP (Document Reference J21) sets out the measures to apply in advance of	The implementation of an approved MMMP will mitigate for the risk of physical or permanent auditory injury to marine mammals within a pre-defined 'mitigation zone' for each activity. The mitigation zone is determined considering the largest injury zone across all species for each relevant activity. The use of an approved MMMP will also minimise the potential for collision risk, or potential injury to, marine mammals and other marine megafauna (e.g. basking shark and sea turtles). The MMMP will include visual and acoustic monitoring as a minimum over the defined mitigation zones to ensure animals are clear before the activity commences. Additional measures to deter animals from injury risk zones may be applied in some instances (e.g. ADDs or soft start charges). The MMMP will be developed on the basis of the most recent published statutory guidance and in consultation with key stakeholders. Benefits derived from the MMMP are also expected to apply to some fish species.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Measure	Justification	How the measure will be secured
and during piling activity including the use of: • Marine Mammal Observers (MMOs) • Passive Acoustic Monitoring (PAM) • Acoustic Deterrent Devices (ADD) Therefore following the latest JNCC guidance (JNCC, 2010a). UXO clearance: Measures including visual and acoustic monitoring, the use of an ADD and soft start charges will be applied to deter animals from the mitigation zone as defined by sound modelling for the largest possible UXO following the latest JNCC guidance (JNCC, 2010b). Geophysical surveys: Mitigation for injury during high resolution geophysical surveys using a sub-surface sensor from a conventional vessel will involve the use of MMOs and PAM to ensure that the risk of injury over the defined mitigation zone is reduced in line with JNCC guidance (JNCC, 2017). Soft start is not possible for SBP equipment but will be applied for other high resolution surveys where possible. Note also, some multi-beam surveys in shallow waters (<200 m) are not subject to the Development of and adherence requirements of mitigation.		
Development of and adherence to an Underwater sound management strategy (document reference J16) that includes for consideration of NAS as part of mitigation options. A commitment to considering NAS as part of mitigation options in the Underwater sound management strategy, which will be developed in accordance with the Outline underwater sound management strategy (Document Reference J.16), will be made as part of a stepped strategy post consent and following the mitigation hierarchy - avoid, reduce, mitigate.	To mitigate for the likelihood of physical or permanent auditory injury or behavioural impacts to fish and marine mammals.	Underwater sound management strategy secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Construction and decommissioning phases

Information to support assessment

Hearing sensitivity of Annex II diadromous fish features

1.6.3.9 The Sound Exposure Guidelines for Fishes and Sea Turtles (Popper *et al*., 2014) are considered to be the most relevant and best available guidelines for impacts of underwater sound on fish species (see Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1)). The Popper *et al*. (2014) guidelines broadly group fish into the following categories according to their hearing sensitivity, and in particular the presence or absence of a swim bladder and on the potential for that swim bladder to improve the hearing sensitivity and range of hearing:

- Group 1: Fishes lacking swim bladders (e.g. elasmobranchs and flatfish, lamprey). These species are only sensitive to particle motion, not sound pressure and show sensitivity to only a narrow band of frequencies
- Group 2: Fishes with a swim bladder but the swim bladder does not play a role in hearing (e.g. salmonids and some Scombridae). These species are considered to be more sensitive to particle motion than sound pressure and show sensitivity to only a narrow band of frequencies
- Group 3: Fishes with swim bladders that are close, but not connected, to the ear (e.g. gadoids and eels). These fishes are sensitive to both particle motion and sound pressure and show a more extended frequency range than Groups 1 and 2, extending to about 500 GWh
- Group 4: Fishes that have special structures mechanically linking the swim bladder to the ear (e.g. clupeids such as herring, sprat and shad). These fishes are sensitive primarily to sound pressure, although they also detect particle motion. These species have a wider frequency range, extending to several kHz and generally show higher sensitivity to sound pressure than fishes in Groups 1, 2 and 3.

1.6.3.10 Sea lamprey are considered to be a Group 1 fish in terms of hearing sensitivity (Popper *et al*. 2014) and therefore have relatively low sensitivity to underwater sound. River lamprey is, like sea lamprey, classified as a Group 1 fish for the purposes of hearing sensitivity and as such the assessment for sea lamprey presented above also applies to river lamprey. Atlantic salmon are a Group 2 fish in terms of hearing sensitivity (Popper *et al.,* 2014) and therefore also have relatively low sensitivity to underwater sound.

Underwater sound modelling for the Mona Offshore Wind Project

1.6.3.11 To understand the magnitude of sound emissions from piling and UXO clearance during construction activity, underwater sound modelling has been undertaken. Full details of the modelling undertaken are presented in Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1). A summary of the underwater sound modelling has been provided below in paragraphs 1.6.3.13 to 1.6.3.17 and additional detail is also included in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3), including full details of sound exposure criteria used to inform the assessment, in line with Popper *et al*. (2014).

Piling – mortality and injury

1.6.3.12 Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) predicted that the impact of underwater sound on most fish and shellfish receptors during the construction phase would be of regional spatial extent, relatively short term duration, intermittent and of high reversibility, with the soundscape returning to near-baseline conditions upon completion of construction activities.

1.6.3.13 Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) presents the predicted mortality and injury ranges for Group 1 and Group 2 fish associated with the installation of one 5.5 m diameter pin pile for the OSP with a hammer energy of 4,400 kJ, using the Peak Sound Pressure Level (SPL_{pk}) metric. Further, the predicted mortality and injury ranges using the cumulative sound exposure levels (SEL_{cum}) metric for fish are modelled as both receptors moving away from the sound source (therefore excluding stationary receptors), and as static or stationary receptors. The potential sound impacts of installing a pin pile with a hammer energy of 3,000 kJ were also modelled for all the same parameters as the 4,400 kJ piling scenario, but the scenario based upon a single pin pile using a hammer energy of 4,400 kJ resulted in the greatest realistic predicted mortality and injury ranges and therefore forms the focus of the assessment and the spatial MDS.

1.6.3.14 For SPL_{pk} when piling energy is at its maximum (i.e. 4,400 kJ), mortality and recoverable injury to fish may occur within a maximum of 404 m of the piling activity for Group 2 Fish (e.g. Atlantic salmon) and within 223 m for Group 1 fish (e.g. sea lamprey and river lamprey; see Table 1.31). It should be noted that these ranges are the maximum ranges for the maximum hammer energy, and it is unlikely that injury will occur in this range due to the implementation of soft starts during piling operations, which will allow some fish to move away from the areas of highest sound levels, before they reach a level that would cause an injury. The injury ranges based on the first strike for soft start initiation will be smaller than those maximum ranges presented (i.e. with a maximum of 83 m, depending on the fish species group considered; see Table 1.31).

Table 1.31: Fish mortality and injury ranges for single pin pile installation at 4,400 kJ based on the SPL_{pk} metric.

Hearing group	Response	Threshold (SPL_{pk}, dB re 1 µPa)	Range (m)	
			First Strike	Max
Group 1 Fish: No swim bladder (particle motion detection)	Mortality	213	46	223
	Recoverable injury	213	46	223
Group 2 Fish: Swim bladder not involved in hearing (particle motion detection)	Mortality	207	83	404
	Recoverable injury	207	83	404
Fish eggs and larvae	Mortality	207	83	404

1.6.3.15 For SEL_{cum}, mortality and injury ranges were calculated for piling activities wherein fish are modelled as both receptors moving away from the source and as static receptors. These mortality and injury ranges indicate that when fish are modelled as receptors moving away from the sound source with the implementation of soft start initiation, the

mortality injury ranges are considerably smaller than those predicted for SPL_{pk}. Specifically, the mortality thresholds were not exceeded for any of the Group 1 or Group 2 fish. The injury recoverability ranges were exceeded for the more sensitive Group 2 fish, with ranges of 66 m in these cases (Table 1.32).

1.6.3.16 However, when fish were modelled as static receptors using the SEL_{cum} metric, ranges for recoverable injury and mortality were significantly higher than when fish were modelled as receptors moving away from the source. Specifically, the modelling showed a maximum mortality range of up to 369 m and 1,260 m in Group 1 and Group 2 fish, respectively and a recoverable injury range of up to 556 m and 3,180 m in Group 1 and Group 2 fish, respectively (Table 1.33).

Table 1.32: Fish mortality and injury ranges for single pin pile installation at 4,400 kJ based on SEL_{cum} for fish moving away from the sound source (N/E – threshold not exceeded).

Hearing group	Response	Threshold (SEL_{cum}, dB re 1 μPa^2s)	Range (m)
Group 1 Fish: No swim bladder (particle motion detection)	Mortality	219	N/E
	Recoverable injury	216	N/E
Group 2 Fish: Swim bladder not involved in hearing (particle motion detection)	Mortality	210	N/E
	Recoverable injury	203	66

Table 1.33: Fish mortality and injury ranges for single pin pile installation at 4,400 kJ based on SEL_{cum} for static fish (N/E – threshold not exceeded).

Hearing group	Response	Threshold (SEL, dB re 1 μPa^2s)	Range (m)
Group 1 Fish: No swim bladder (particle motion detection)	Mortality	219	369
	Recoverable injury	216	556
Group 2 Fish: Swim bladder not involved in hearing (particle motion detection)	Mortality	210	1,260
	Recoverable injury	203	3,180
Fish eggs and larvae	Mortality	210	1,260

1.6.3.17 The injury ranges presented indicate that injury may occur out to ranges of hundreds of metres for SPL_{pk} (Table 1.31). However, in reality, the risk of fish injury overall will be considerably lower due to the hammer energies being lower than the absolute maximum modelled, as demonstrated by the lower injury ranges associated with first strikes as part of the soft start procedure (Table 1.31). The expected behaviour of some species of fish moving away from the area affected when exposed to high levels of sound and the soft start procedure, modelled and presented in Table 1.32, mean that it is likely that reactive fish will have sufficient time to vacate the areas where injury may occur prior to sound levels reaching a level causing mortality, with only recoverable injury predicted for Group 2 fish out to 66 m. If the fish were to remain in the area and not have any behavioural response to the piling sound (which is considered to be unlikely), the potential range for both mortality and recoverable injury

would be much greater, for Group 2 fish mortality could occur out to 1,260 m and recoverable injury could occur out to 3,181 m (see, Table 1.33).

1.6.3.18 Other than mortality and recoverable injury, the Temporary Threshold Shift (TTS) level of impact was modelled on each group of fish, with this being defined as a temporary reduction in hearing sensitivity caused by exposure to intense sound. Normal hearing ability returns following cessation of the sound causing TTS, though the recovery period is variable, during which fish may have decreased fitness due to a reduced ability to communicate, detect predators or prey, and/or assess their environment.

1.6.3.19 In assessing the potential for TTS impacts, modelling was carried out on the single 4,400 kJ and concurrent 3,000 kJ piling scenarios, with the single 4,400 kJ piling scenario causing the largest potential impact in all cases. For this assessment, the single piling scenario ranges are presented alongside the lower hammer energy concurrent piling scenario for comparison and as evidence of the larger impact of the single piling scenario.

1.6.3.20 Table 1.34 outlines the predicted ranges of effect for TTS for all fish groups modelled as receptors moving away from the sound source which may occur as a result of piling for one pin pile at a maximum hammer energy of 4,400 kJ. In this single piling scenario, when fish are modelled as moving away from the sound source, TTS is predicted to occur to a maximum range of 15,800 m from piling operations for Group 1 and Group 2 fish. The TTS ranges predicted for fish species modelled as static receptors for the same parameters are also presented in Table 1.35, with maximum ranges of 19,800 m from piling operations.

Table 1.34: TTS injury ranges for fish moving away from the sound source due to single 4,400 kJ and concurrent 3,000 kJ pin pile installation based on the Cumulative SEL Metric.

Hearing group	Response	Threshold (SEL, dB re 1 μPa^2s)	Range (m) – single piling	Range (m) – concurrent piling
Group 1 Fish: No swim bladder (particle motion detection)	TTS	186	15,800	14,100
Group 2 Fish: Swim bladder not involved in hearing (particle motion detection)	TTS	186	15,800	14,100

Table 1.35: TTS injury ranges for static fish due to single 4,400 kJ and concurrent 3,000 kJ pin pile installation based on the Cumulative SEL Metric.

Hearing group	Response	Threshold (SEL, dB re 1 μPa^2s)	Range (m) – singe piling	Range (m) – concurrent piling
Group 1 Fish: No swim bladder (particle motion detection)	TTS	186	19,800	18,100
Group 2 Fish: Swim bladder not involved in hearing (particle motion detection)	TTS	186	19,800	18,100

1.6.3.21 As outlined in paragraph 1.6.2.6, river lamprey prey may include herring, sprat, flounder and small gadoids (Henderson, 2003). For the basis of this assessment herring is also considered to be a prey species for sea lamprey. Therefore, as herring

is considered a prey species for both sea lamprey and river lamprey underwater sound impacts on herring are also considered within this HRA Stage 2 ISAA for indirect effects on the Annex II sea lamprey and river lamprey features. Volume 2, chapter 3: Fish and shellfish ecology of the Environmental Statement (Document reference F2.3) concluded the magnitude of the impact of underwater sound for herring to be low, and the sensitivity of herring as high. The effect was, therefore, concluded to be of moderate adverse significance, which is significant in EIA terms. This was due to the hearing sensitivity of herring, coupled with the presence of discrete high and low intensity spawning grounds within range of underwater sound levels which may give rise to an effect. Even though these spawning grounds have relatively small amounts of overlap with sound contours from piling at levels which may lead to behavioural effects, the precautionary approach adopted for this assessment still indicates a potential moderate adverse effect. It should however be noted that the moderate adverse significance conclusion is only for the herring spawning period (late September for three to four weeks; Dickey-Collas *et al.*, 2001). Outside of the spawning period, the overall significance is expected to be minor adverse. Although, there is evidence that lamprey features may prey on herring, herring is predicted to form only a very small proportion of sea and river lamprey's diet with lamprey predicted to be able to target other species such as sprat, flounder and small gadoids.

1.6.3.22 As noted above in paragraph 1.6.3.21, Volume 2, chapter 3: Fish and shellfish ecology of the Environmental Statement's (Document reference F2.3) project alone assessment predicts significant effects to herring as a result of underwater sound generated by piling during the herring spawning period. Tertiary mitigation is proposed through development of an Underwater sound management strategy (Document reference J16). This strategy is proposed to be developed with stakeholder input post-consent and will be used to define appropriate measures to reduce the magnitude of impact such that any potential residual significant effects from the project are reduced to a non-significant level (in this case, negligible or low). In doing so, this is anticipated to reduce the significance of effect to herring to minor adverse, which is not significant in EIA terms. Measures may include temporal or spatial planning of piling activities, and if required, will explore other measures such as noise abatement technology. No commitments are made with regards to specific measures at the time of Application. An Outline underwater sound management strategy (Document reference J16) will be submitted with the Application, with the full document to be developed post-consent.

UXO clearance

1.6.3.23 UXO clearance (including detonation) also has the capability to cause injury and/or disturbance to Annex II diadromous fish features. Clearance will be completed prior to the construction phase (pre-construction). Until detailed pre-construction site investigation surveys are completed within the Mona Offshore Wind Project, the precise number of potential UXO which will need to be cleared is unknown. For the purposes of this assessment, it has been assumed that the MDS will be clearance of UXO with a NEQ of 907 kg for the Mona Offshore Wind Project, cleared by either low order or high order techniques. Many of these may be left *in situ* and micro-sited around. Detonation of UXO would represent a short term (i.e. seconds) increase in underwater sound (i.e. sound pressure levels and particle motion) which will be elevated to levels which may result in injury or behavioural effects on fish and shellfish species.

1.6.3.24 To understand the magnitude of underwater sound emissions from piling and UXO clearance during construction activity, underwater sound modelling has been undertaken considering the key parameters summarised above. Full details of the

modelling undertaken are presented in Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1). Modelling was undertaken for a range of orders of detonation, from a realistic worse case high order detonation to low order detonations (e.g. deflagration and clearance shots) to be used as mitigation to minimise sound levels. Table 1.36 the injury ranges for fish of all groups in relation to various orders of detonation. For the purposes of this assessment, it has been assumed that the MDS will be clearance of UXO with a NEQ of 907 kg cleared by either low order or high order techniques.

Table 1.36: Injury ranges for all fish groups relating to varying orders of detonation.

Detonation size (kg)	PTS range (m)	
	Fish Lower Range	Fish Higher Range
Low Order and Low Yield Detonations		
0.08 (donor charge)	44	27
0.5 (clearing shot)	81	49
0.75 (x2)	117	70
0.75 (x4)	147	88
High Order Detonations		
1.2 (disposal donor)	108	65
3.5 (disposal donor)	154	93
25	297	179
130	514	309
907	985	590

Behaviour in response to sound

1.6.3.25 With respect to behaviour, fish species responses to construction-related underwater sound include a wide variety of behaviours, including startle (C-turn) responses; strong avoidance behaviour; changes in swimming or schooling behaviour, or changes of position in the water column. The Popper *et al*. (2014) guidelines provide qualitative behavioural criteria for fish from a range of sound sources. These categorise the risks of effects in relative terms as ‘high’, ‘moderate’ or ‘low’ at three distances from the source: “near” (i.e. tens of metres), “intermediate” (i.e. hundreds of metres) or “far” (i.e. thousands of metres).

1.6.3.26 While behavioural effect thresholds proposed by Popper *et al*. (2014) are qualitative, a more quantitative assessment is presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3), using sound modelling outputs for SPL_{pk} for single and concurrent scenarios around the Mona Array Area. The contours showed SPL_{pk} associated with the greatest hammer energy for a single pin pile. Based on the studies summarised within Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3), behavioural effects on fish species could be expected within the 160 dB re 1 µPa SPL_{pk} contours (see Figure 1.12); noting that this contour is likely to be conservative given that McCauley *et al*. (2000) noted behavioural effects on a range of species at approximately 168 dB re 1 µPa SPL_{pk}. For Group 1 and Group 2 fish species this is likely to be highly precautionary as these are known to be less sensitive

to underwater sound (Popper *et al*., 2014). Sound contours in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) indicated that these contours were expected to be present only in the immediate vicinity of the Mona Array Area, and did not extend to the coast of Wales, England or the Isle of Man and as such would not represent a barrier to migration for those fish moving though the Irish Sea to/from the relevant SACs discussed below. Further, the sound contours are for the greatest hammer energy (4,400 kJ) and therefore in most scenarios this hammer energy will not be used, and therefore smaller contours (and more limited behavioural effects) would be expected, with lower risk of barrier effects. In addition, as noted in Table 1.29, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase). As such, there is minimal risk of disruption to migration of lamprey species or Atlantic salmon.

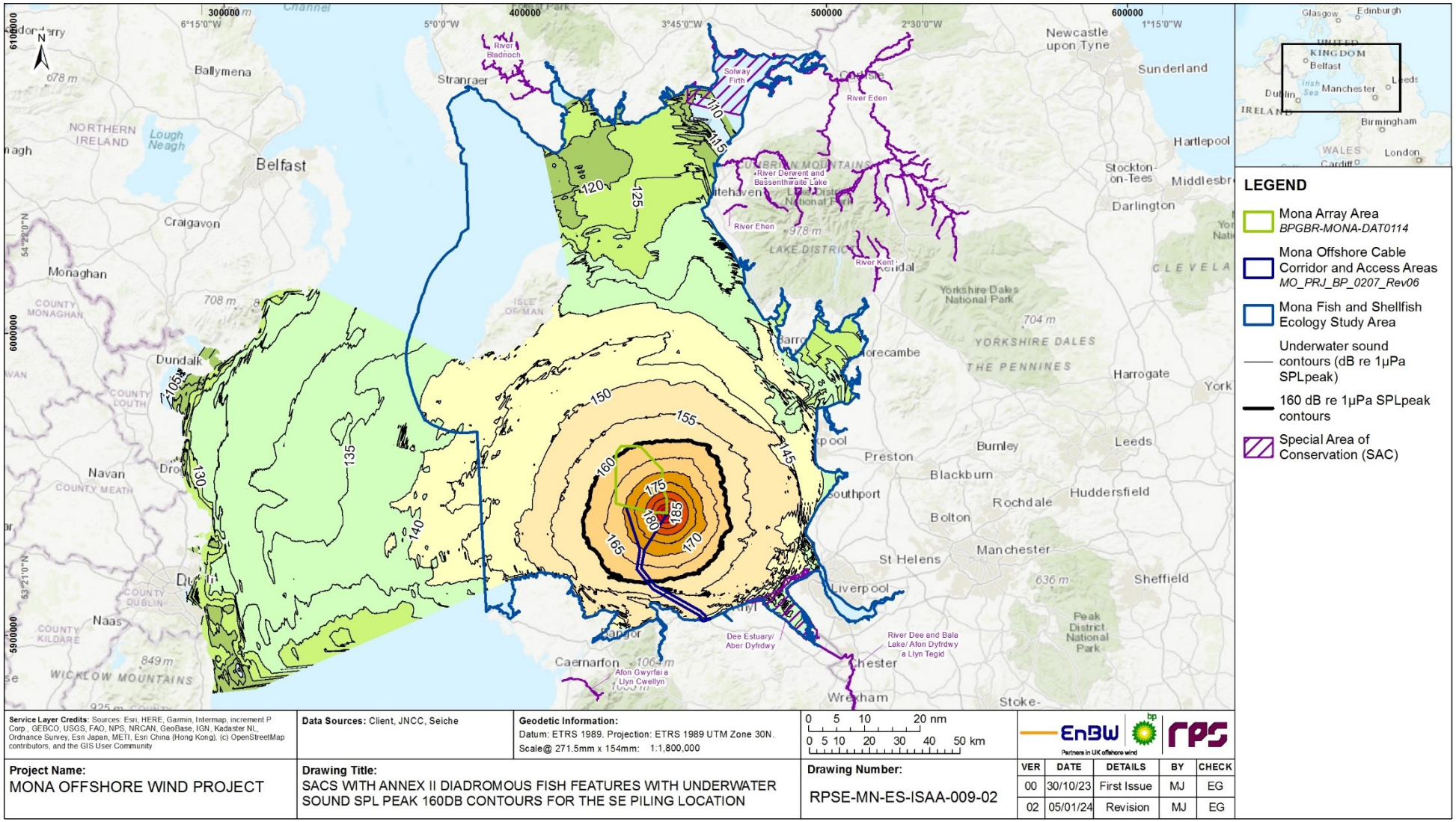

Figure 1.12: SACs with Annex II diadromous fish features overlaid with the SPL peak underwater sound contours associated a 4,400 kJ hammer energy for a single pin pile at the SE piling location. Behavioural effects on fish species could be expected within the 160 dB re 1µPa SPL_{pk} contours.

Dee Estuary/Aber Dyfrdwy SAC

Sea lamprey and River lamprey

1.6.3.27 Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) predicted that the impact of underwater sound on most fish and shellfish receptors during the construction phase would be of regional spatial extent, relatively short term duration, intermittent and of high reversibility, with the soundscape returning to near-baseline conditions upon completion of construction activities.

1.6.3.28 Sea lamprey features within close proximity to piling operations may experience injury or mortality. In terms of injury and mortality, for SPL_{pk}, when piling energy is at its maximum (i.e. 4,400 kJ), the threshold for Group 1 fish is not exceeded. For SEL_{cum}, mortality and injury ranges were calculated for piling activities wherein fish are modelled as both receptors moving away from the source and as static receptors. These mortality and injury ranges indicate that when fish are modelled as receptors moving away from the sound source with the implementation of soft start initiation, the mortality injury ranges are considerably smaller than those predicted for static receptors; specifically, the mortality and injury thresholds were not exceeded for Group 1. For static receptors, this modelling showed a maximum mortality range of up to 369 m in Group 1 fish, and a recoverable injury range of up to 556 m for Group 1 fish. The injury ranges presented indicate that injury may occur out to ranges of hundreds of metres based on the SPL_{pk} metric. However, in reality, the risk of fish injury overall will be considerably lower due to the hammer energies used being lower than the absolute maximum modelled. The expected behaviour of some species of fish moving away from the area affected when exposed to high levels of sound and the soft start procedure, also mean that it is likely that reactive fish will have sufficient time to vacate the areas and under this scenario injury and mortality thresholds would not be exceeded for Group 1 fish.

1.6.3.29 However, given the highly mobile nature of sea lamprey and their tendency to only utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration (sea lamprey migrate up rivers to spawn in spring and early summer, whilst river lamprey migrate to rivers during autumn and winter (NatureScot, 2020), the impact is unlikely to result in significant mortality of lamprey species. The measures adopted as part of the Mona Offshore Wind Project (see Table 1.30 which outlines the development and adherence to an MMMP which requires implementation of an initiation stage of a piling soft start and ramp-up) will also allow individuals in close proximity to piling to move away from the ensonified area, further reducing the likelihood of injury and mortality on sea lamprey features.

1.6.3.30 Lamprey species associated with the Dee Estuary/Aber Dyfrdwy SAC may experience behavioural effects in response to piling sound, including a startle response, disruption of feeding, or avoidance of an area. For lamprey species (considered the least sensitive to underwater sound compared with other diadromous fish species) behavioural responses may occur within a range of hundreds of metres to a few kilometres from piling operations.

1.6.3.31 Lamprey species are known to have relatively simple ear structures (Popper and Hoxter, 1987), with very few responses to auditory stimuli noted overall (Popper, 2005), except a slight swimming speed increase and decrease in resting behaviour when exposed to continuous low frequency sound of 50 to 200 GWh (Mickle *et al*., 2019), suggesting a low vulnerability to sound impacts overall.

1.6.3.32 The sound modelling outputs (including contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)) discussed in the previous sections indicated that piling related underwater sound would result in behavioural responses (e.g. as indicated by the 160 dB re 1 µPa peak contours; which is likely to be highly precautionary for lamprey) in the vicinity of the Mona Array Area and these would not extend close to the coasts of north Wales (i.e. Dee Estuary/Aber Dyfrdwy SAC).

1.6.3.33 This would therefore not result in barriers to migration to and from the Dee Estuary/Aber Dyfrdwy SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase). As such, there is negligible risk of disruption to migration of the lamprey qualifying species of the Dee Estuary/Aber Dyfrdwy SAC. There is also no pathway for underwater sound to result in adverse effects on the habitats of the qualifying species or the water quality of the rivers.

Conclusions

1.6.3.34 Adverse effects on the qualifying Annex II diadromous fish features of the Dee Estuary/Aber Dyfrdwy SAC which undermine the conservation objectives of the SAC will not occur as a result of underwater sound during construction and decommissioning activities. An assessment of the impact 'underwater sound impacting fish and shellfish receptors' against each relevant conservation objective (as presented in paragraph 1.6.2.8 to 1.6.2.10) is presented below in Table 1.37. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.37: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality	Diadromous fish species may experience behavioural effects in response to piling in the vicinity of the Mona Array Area however, modelling indicates these effects would not result in barriers to migration to and from this SAC, and sound potential impacts will be short-term and intermittent during the construction phase. There is no route to impact for underwater sound to affect water quality or to physically obstruct the migratory passage of lamprey species. As such there is negligible risk of disruption to migration of lamprey. Therefore, the migratory passage of both adult and juvenile river lamprey through the Dee Estuary between Liverpool Bay and the River Dee will be unobstructed by physical barriers and/or poor water quality.
The five year mean count of river lampreys recorded by the Chester Weir fish trap is no less than 55 under the monitoring regime in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997-2000)	Sea lamprey and river lamprey within close proximity to piling operations may experience injury or mortality. However, given they are highly mobile, , they tend to only utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted. Diadromous fish species may experience behavioural effects in response to piling in the vicinity of the Mona Array Area however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 39.3 km from the Mona Array Area), and potential impacts from underwater sound will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of lamprey. Therefore, underwater sound associated with the Mona Offshore Wind Project will not result in the reduction of sea lamprey or river lamprey populations.

Conservation Objective	Conclusion
The abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, is maintained.	Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) concluded that for prey species of the sea lamprey and river lamprey potential impacts from underwater sound would be of minor adverse significance, which is not significant in EIA terms with the exception of herring which was concluded to be moderate adverse during the herring spawning season only. Although, there is evidence that lamprey features may prey on herring, herring is predicted to form only a very small proportion of sea and river lamprey's diet with lamprey predicted to be able to switch prey to other species such as sprat, flounder and small gadoids. Furthermore, the development of an Underwater sound management strategy (with an Outline underwater sound management strategy submitted as part of the application, Document Reference J16), secured in the deemed marine licence, to reduce the magnitude associated with significant impacts (in this case to negligible or low) such that there will be no residual significant effect for the project alone. In doing so, this is anticipated to reduce the significance of effect to herring to minor adverse. In this way, underwater sound will not prevent the abundance of prey species forming the river and sea lamprey's food resource within the estuary from being maintained.

1.6.3.35 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC as a result of underwater sound with respect to construction and decommissioning of the Mona Offshore Wind Project alone.

River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC

Sea lamprey and River lamprey

1.6.3.36 Potential impacts of underwater sound on the sea lamprey and river lamprey features of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC are predicted to be similar to those described for the Dee Estuary/Aber Dyfrdwy SAC (39 km from the Mona Array Area) in paragraph 1.6.3.27 to 1.6.3.35 due to the proximity of the locations (see Figure 1.12). That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Mona Offshore Wind Project, but that these would not extend close to the coasts of North Wales and Northwest England and therefore would not represent a barrier to migration (see paragraph 1.6.2.32) to and from the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.6.3.37 In addition, as the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (64 km from the Mona Array Area) is located at an Increased distance from the Mona Offshore Wind Project than the Dee Estuary/Aber Dyfrdwy SAC it is considered that effects would be of similar if not of a lower magnitude.

1.6.3.38 Therefore, the impact is not predicted to result in significant mortality of lamprey and there is negligible risk of disruption to migration of the lamprey qualifying species of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. As such no adverse effect on integrity for the lamprey features of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC can also be concluded.

Atlantic salmon

1.6.3.39 Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) predicted that the impact of underwater sound on most fish and shellfish receptors during the construction phase would be of regional spatial extent, relatively short term duration, intermittent and of high reversibility, with the soundscape returning to near-baseline conditions upon completion of construction activities.

1.6.3.40 As outlined in paragraphs 1.6.3.11 to 1.6.3.18 Atlantic salmon within close proximity to piling operations may experience injury or mortality.

1.6.3.41 For SPL_{pk}, when piling energy is at its maximum (i.e. 4,400 kJ), mortality and recoverable injury for Group 2 fish may occur within a maximum of 404 m. For SEL_{cum}, mortality and injury ranges were calculated for piling activities wherein fish are modelled as both receptors moving away from the source and as static receptors. These mortality and injury ranges indicate that when fish are modelled as receptors moving away from the sound source with the implementation of soft start initiation, the mortality injury ranges are considerably smaller than those predicted for static receptors. Specifically, the mortality thresholds were not exceeded for Group 2 fish with recoverable injury occurring within a maximum of 66 m. For static receptors using the SEL_{cum} metric, this modelling for Group 2 fish showed a maximum mortality range of up to 1,260 m in , and a recoverable injury range of up to 3,180 m. The injury ranges presented indicate that injury may occur out to ranges of hundreds of metres for SPL_{pk}. However, in reality, the risk of fish injury overall will be considerably lower due to the hammer energies used being lower than the absolute maximum modelled. The expected behaviour of some species of fish moving away from the area affected when exposed to high levels of sound and the soft start procedure, also mean that it is likely that reactive fish will have sufficient time to vacate the areas where injury may occur prior to sound levels reaching a level causing mortality.

1.6.3.42 However, considering the highly mobile nature of Atlantic salmon and that they only tend to utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration, it is unlikely to result in significant mortality of Atlantic salmon. The measures adopted as part of the Mona Offshore Wind Project (see Table 1.30 outlining the use of soft start piling procedures) will also allow some individuals in close proximity to piling to move away from the ensonified area, which further reduces the likelihood of injury and mortality on Atlantic salmon features.

1.6.3.43 Research from Harding *et al.* (2016) failed to produce physiological or behavioural responses in Atlantic salmon when subjected to sound similar to piling. However, the sound levels tested were estimated at <160 dB re 1µPa Root Mean Square (RMS) (SPL_{pk}, or approximately <135 to 140 dB re 1 μPa^2s SEL_{cum}), below the level at which injury or behavioural disturbance would be expected for Atlantic salmon. Nedwell *et al*. (2006) used the slightly less sensitive sea trout as a model for comparison to Atlantic salmon, and found no significant behavioural response from piling activities, with modelling suggesting a similar response in Atlantic salmon and sea trout. Physical impacts on migrating salmonids have been noted from piling producing sounds of 218 dB re $1\mu Pa^2s$ @ 1 m (Bagocius, 2015), although at these sound levels, it would be expected that avoidance reactions would occur, thus avoiding injury effects.

1.6.3.44 The underwater sound modelling outputs discussed in paragraph 1.6.3.11 to 1.6.3.26 indicated that piling related underwater sound would result in behavioural responses in the vicinity of the Mona Array Area although these would not extend close to the coasts of north Wales and therefore would not represent a barrier to migration for

Annex II features travelling to/from the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. Further, the potential underwater sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase). As such, there is negligible risk of disruption to migration of these species. There is also no pathway for underwater sound to result in adverse effects on the habitats of the qualifying species or the water quality of the rivers.

Conclusions

1.6.3.45 Adverse effects on the qualifying Annex II diadromous fish features of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC which undermine the conservation objectives of the SAC will not occur as a result of underwater sound during construction and decommissioning activities. An assessment of the impact 'underwater sound impacting fish and shellfish receptors' against each relevant conservation objective (as presented in paragraph 1.6.2.18 to 1.6.2.18) is presented below in Table 1.38. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.38: Conclusions against the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The parameters defined in the vision for the watercourse as defined in (NRW, 2022) must be met. **There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis.**	Due to the nature of the impact, and the distance of the Mona Array Area (located 64.4 km from the Mona Array Area) from the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC there is no route to impact and underwater sound will not prevent the defined vision for the watercourse from being met. There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis.
The SAC feature populations will be stable or increasing over the long term **The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.**	Sea lamprey and river lamprey within close proximity to piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted. Diadromous fish species may experience behavioural effects in response to piling in the vicinity of the Mona Array Area however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 64.4 km from the Mona Array Area), and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of lamprey. Therefore, underwater sound associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying diadromous fish species from remaining stable or increasing in the long term. On the basis of the above, the natural range of features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future as a result of underwater sound associated with the Mona Offshore Wind Project.
All factors affecting the achievement of these conditions are under control.	Given the conclusions made for the conservation objectives above, it is considered that all factors affecting the achievement of these conditions will remain under control.

1.6.3.46 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Dee and Bala Lake/Afon Dyfrdwy a

Llyn Tegid SAC as a result of underwater sound with respect to construction and decommissioning of the Mona Offshore Wind Project alone.

River Ehen SAC

Atlantic salmon

1.6.3.47 Potential impacts of underwater sound on Atlantic salmon features of the River Ehen SAC are predicted to be similar to those associated with the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (64 km from the Mona Array Area) outlined in paragraph 1.6.3.39 to 1.6.3.46, due to the proximity of the locations. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Mona Offshore Wind Project, these would not extend close to the coasts of north Wales and northwest England and therefore would not represent a barrier to migration (see paragraphs 1.6.3.9 to 1.6.3.26) to and from the River Ehen SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.6.3.48 In addition, as the River Ehen SAC (83 km from the Mona Array Area) is located at an increased distance from the Mona Offshore Wind Project than the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC it is considered that effects would be of similar if not of a lower magnitude.

1.6.3.49 Therefore, the impact is not predicted to result in significant mortality of Atlantic salmon and there is negligible risk of disruption to migration of the Atlantic salmon qualifying species of the River Ehen SAC. As such no adverse effect on integrity for the Atlantic salmon feature of the River Ehen SAC can also be concluded

Freshwater pearl mussel

1.6.3.50 Adult freshwater pearl mussel are confined to freshwater habitats therefore there is no pathway for direct effects to this species during construction and decommissioning of the Mona Offshore Wind Project as a result of underwater sound.

1.6.3.51 There is potential however for indirect adverse effects on the larval stage of freshwater pearl mussel if there are adverse effects on the individual salmon (their host species for the first year of their life) to which they are attached. The assessment for Atlantic salmon above for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (paragraph 1.6.3.39 to 1.6.3.46) concluded that underwater sound will not lead to adverse effects on the population, distribution and supporting habitats of Atlantic salmon, therefore it can also be concluded that there will be no adverse indirect impacts on freshwater pearl mussel.

Conclusions

1.6.3.52 Adverse effects on the qualifying Annex II diadromous fish and freshwater pearl mussel features of the River Ehen SAC which undermine the conservation objectives of the SAC will not occur as a result of underwater sound impacting fish and shellfish receptors during construction and decommissioning activities. An assessment of the impact ‘underwater sound’ against each relevant conservation objective (as presented in paragraph 1.6.2.26) is presented below in Table 1.39. Where the justifications and

supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.39: Conclusions against the conservation objectives of the River Ehen SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are restored].**	There is no pathway for underwater sound to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound associated with the Mona Offshore Wind Project will not prevent the extent and distribution, structure and function or the supporting processes on which the habitats of the qualifying diadromous fish species rely, from being restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are restored].**	Atlantic salmon within close proximity to piling operations may experience injury or mortality. However, given they are highly mobile, will only travel through the potential ZoI during migration and the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted. Atlantic salmon may experience behavioural effects in response to piling in the vicinity of the Mona Array Area however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 86.5 km from the Mona Array Area), and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Mona Offshore Wind Project will not prevent the populations or the distributions of Atlantic salmon or freshwater pearl mussel species from being restored.

1.6.3.53 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Ehen SAC as a result of underwater sound with respect to construction and decommissioning of the Mona Offshore Wind Project alone.

River Eden SAC

Sea lamprey and River lamprey

1.6.3.54 Potential impacts of underwater sound on sea lamprey and river lamprey features of the River Eden SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (39 km from the Mona Array Area) outlined in paragraph 1.6.3.27 to 1.6.3.35. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Mona Offshore Wind Project, these would not extend close to the coasts of north Wales and northwest England and therefore would not represent a barrier to migration (see paragraphs 1.6.3.9 to 1.6.3.26) to and from the River Eden SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.6.3.55 In addition, as the River Eden SAC (87 km from the Mona Array Area) is located at an increased distance from the Mona Offshore Wind Project than the Dee Estuary/Aber Dyfrdwy SAC it is considered that effects would be of similar if not of a lower magnitude although specific consideration of conservation objectives for this SAC are presented in Table 1.40. As such no adverse effect on integrity for the sea lamprey and river lamprey features of the Riven Eden SAC can also be concluded.

Atlantic salmon

1.6.3.56 Potential impacts of underwater sound on Atlantic salmon features of the River Eden SAC are predicted to be similar to those associated with the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (64 km from the Mona Array Area) outlined in paragraph 1.6.3.39 to 1.6.3.46 due to the proximity of the locations. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Mona Offshore Wind Project, these would not extend close to the coasts of north Wales and northwest England and therefore would not represent a barrier to migration (see paragraphs 1.6.3.9 to 1.6.3.26) to and from the River Eden SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.6.3.57 In addition, as the River Eden SAC (87 km from the Mona Array Area) is located at an increased distance from the Mona Offshore Wind Project than the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC it is considered that effects would be of similar if not of a lower magnitude. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable, although specific consideration of conservation objectives for this SAC are presented in Table 1.40. As such no adverse effect on integrity for the Atlantic salmon feature of the River Eden SAC can also be concluded.

Conclusions

1.6.3.58 Adverse effects on the qualifying Annex II diadromous fish features of the River Eden SAC which undermine the conservation objectives of the SAC will not occur as a result of underwater sound during construction and decommissioning activities. An assessment of the impact ‘underwater sound impacting fish and shellfish receptors’ against each relevant conservation objective (as presented in paragraph 1.6.2.32 to 1.6.2.33) is presented below in Table 1.40. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.40: Conclusions against the conservation objectives of the River Eden SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].**	There is no pathway for underwater sound to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound associated with the Mona Offshore Wind Project will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying diadromous fish species rely, from being maintained or restored.

Conservation Objective	Conclusion
The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].	
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Sea lamprey, river lamprey and Atlantic salmon within close proximity to piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted. Diadromous fish species may experience behavioural effects in response to piling in the vicinity of the Mona Array Area however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 86.5 km from the Mona Array Area), and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of sea lamprey, river lamprey or Atlantic salmon. Therefore, underwater sound associated with the Mona Offshore Wind Project will not prevent the populations or the distributions of the qualifying diadromous fish species from being maintained or restored.

1.6.3.59 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Eden SAC as a result of underwater sound with respect to construction and decommissioning of the Mona Offshore Wind Project alone.

Afon Gwyrfai a Llyn Cwellyn SAC

Atlantic salmon

1.6.3.60 Potential impacts of underwater sound on Atlantic salmon features of the Afon Gwyrfai a Llyn Cwellyn SAC are predicted to be similar to those associated with the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (64 km from the Mona Array Area) outlined in paragraph 1.6.3.39 to 1.6.3.46 due to the proximity of the locations. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Mona Offshore Wind Project, these would not extend close to the coasts of north Wales and northwest England and therefore would not represent a barrier to migration to and from the Afon Gwyrfai a Llyn Cwellyn SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.6.3.61 In addition, ss the Afon Gwyrfai a Llyn Cwellyn SAC (92 km from the Mona Array Area) is located at an increased distance from the Mona Offshore Wind Project than the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC it is considered that effects would be of similar if not of a lower magnitude although specific consideration of conservation objectives for this SAC are presented in Table 1.41. As such no adverse

effect on integrity for the Atlantic salmon feature of the Afon Gwyrfai a Llyn Cwellyn SAC can also be concluded.

Conclusions

1.6.3.62 Adverse effects on the qualifying Annex II diadromous fish features of the Afon Gwyrfai a Llyn Cwellyn SAC which undermine the conservation objectives of the SAC will not occur as a result of underwater sound impacting fish and shellfish receptors during construction and decommissioning activities. An assessment of the impact 'underwater sound' against each relevant conservation objective (as presented in paragraph 1.6.2.37) is presented below in Table 1.41.

Table 1.41: Conclusions against the conservation objectives of the Afon Gwyrfai a Llyn Cwellyn SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The conservation objective for the water course as defined in Countryside Council for Wales (2008) must be met.	Due to the nature of the impact, and the distance of the Mona Array Area from the Afon Gwyrfai a Llyn Cwellyn SAC this impact will not prevent the defined vision for the watercourse from being met.
The population of the feature in the SAC is stable or increasing over the long term.	Atlantic salmon within close proximity to piling operations may experience injury or mortality. However, given they are highly mobile, , they tend to only utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted. Atlantic salmon may experience behavioural effects in response to piling in the vicinity of the Mona Array Area however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 92.3 km from the Mona Array Area), and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying diadromous fish species from remaining stable or increasing in the long term.
The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.	Atlantic salmon within close proximity to piling operations may experience injury or mortality, with behavioural effects occurring over a wider area. However, given they are highly mobile, they tend to only utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted and behavioural effects will not affect this species' ability to migrate to and from this SAC.
The Gwyrfai will continue to be a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.	Due to the nature of the impact, and the distance of the Mona Array Area from the Afon Gwyrfai a Llyn Cwellyn SAC there will be no reduction in the area or quality of habitat for the feature populations. The Gwyrfai will continue to be a sufficiently large habitat to maintain the feature's population in the Afon Gwyrfai a Llyn Cwellyn SAC on a long-term basis.

1.6.3.63 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Afon Gwyrfai a Llyn Cwellyn SAC as a result

of underwater sound with respect to construction and decommissioning of the Mona Offshore Wind Project alone.

River Kent SAC

Freshwater pearl mussel

1.6.3.64 Adult freshwater pearl mussel are confined to freshwater habitats therefore there is no pathway for direct effects to this species during construction and decommissioning of the Mona Offshore Wind Project as a result of underwater sound.

1.6.3.65 There is potential however for indirect adverse effects on the larval stage of freshwater pearl mussel if there are adverse effects on the individual salmon (their host species for the first year of their life) to which they are attached. The assessment for Atlantic salmon above for the River Derwent and Bassenthwaite SAC (paragraph 1.6.3.68 to 1.6.3.72) concluded that underwater sound will not lead to significant adverse effects on the population, distribution and supporting habitats of Atlantic salmon, therefore it can also be concluded there will be no significant indirect effects to freshwater pearl mussel associated with the River Kent SAC.

Conclusions

1.6.3.66 Adverse effects on the qualifying freshwater pearl mussel feature of the River Kent SAC which undermine the conservation objectives of the SAC will not occur as a result of underwater sound during construction and decommissioning activities. An assessment of the impact 'underwater sound impacting fish and shellfish receptors' against each relevant conservation objective (as presented in paragraph 1.6.2.41 to 1.6.2.42) is presented below in Table 1.42. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.42: Conclusions against the conservation objectives of the River Kent SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are restored].**	There is no pathway for underwater sound to result in adverse effects on the habitats of the freshwater pearl mussel feature. Therefore underwater sound associated with the Mona Offshore Wind Project will not prevent the extent and distribution, structure and function or the supporting processes on which the habitats of the qualifying diadromous fish species rely, from being restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are restored].**	Atlantic salmon within the River Kent SAC (the species considered to be the host species for freshwater pearl mussel within the River Kent SAC, see paragraph 1.6.2.39) within close proximity to piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration. In addition, the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted. Atlantic salmon within the River Kent SAC may experience behavioural effects in response to piling in the vicinity of the Mona Array Area however, modelling indicates these effects

Conservation Objective	Conclusion
	would not result in barriers to migration to and from this SAC (which is located 96.7 km from the Mona Array Area), and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of Atlantic salmon to and from the River Kent and freshwater pearl mussel will not be indirectly impacted as a result of impacts to Atlantic salmon. Therefore, underwater sound associated with the Mona Offshore Wind Project will not prevent the populations or the distributions of the freshwater pearl mussel from being restored.

1.6.3.67 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Kent SAC as a result of underwater sound with respect to construction and decommissioning of the Mona Offshore Wind Project alone.

River Derwent and Bassenthwaite Lake SAC

Sea lamprey and River lamprey

1.6.3.68 Potential impacts of underwater sound on sea lamprey and river lamprey features of the River Derwent and Bassenthwaite Lake SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (39 km from the Mona Array Area) as outlined in paragraphs 1.6.3.27 to 1.6.3.35). That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Mona Offshore Wind Project, these would not extend close to the coasts of north Wales and northwest England and therefore would not represent a barrier to migration (see paragraphs 1.6.3.9 to 1.6.3.26) to and from the River Derwent and Bassenthwaite Lake SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

In addition, the River Derwent and Bassenthwaite Lake SAC (100 km from the Mona Array Area) is located at an increased distance from the Mona Offshore Wind Project than the Dee Estuary/Aber Dyfrdwy SAC (39 km from the Mona Array Area). It is therefore considered that effects on the lamprey features of this site would be of lower magnitude than those described in paragraph 1.6.3.27 to 1.6.3.35 for the Dee Estuary/Aber Dyfrdwy SAC. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable, although specific consideration of conservation objectives for this SAC are presented in Table 1.43. As such no adverse effect on integrity for the sea lamprey and river lamprey features of the River Derwent and Bassenthwaite Lake SAC can also be concluded.

Atlantic salmon

1.6.3.69 Potential impacts of underwater sound on the Atlantic salmon feature of the River Derwent and Bassenthwaite Lake SAC are predicted to be similar to those associated with the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (64 km from the Mona Array Area) outlined in paragraph 1.6.3.39 to 1.6.3.46). That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish

and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Mona Offshore Wind Project, these would not extend close to the coasts of north Wales and northwest England and therefore would not represent a barrier to migration (see paragraphs 1.6.3.9 to 1.6.3.26) to and from the River Derwent and Bassenthwaite Lake SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.6.3.70 In addition, the Derwent and Bassenthwaite Lake SAC (100 km from the Mona Array Area) is located at an increased distance from the Mona Offshore Wind Project than the Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (64 km from the Mona Array Area). It is therefore considered that effects on the Atlantic salmon feature of this site would be of lower magnitude that those described in paragraph 1.6.3.39 to 1.6.3.44 for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC, although specific consideration of conservation objectives for this SAC are presented in Table 1.43. As such no adverse effect on integrity for the Atlantic salmon feature of the River Derwent and Bassenthwaite Lake SAC can also be concluded.

Conclusions

1.6.3.71 Adverse effects on the qualifying Annex II diadromous fish features of the River Derwent and Bassenthwaite SAC which undermine the conservation objectives of the SAC will not occur as a result of underwater sound impacting fish and shellfish receptors during construction and decommissioning activities. An assessment of the impact 'underwater sound' against each relevant conservation objective (as presented in paragraph 1.6.2.48 to 1.6.2.49) is presented below in Table 1.43. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.43: Conclusions against the conservation objectives of the River Derwent and Bassenthwaite SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound to result in adverse effects on the habitats of the qualifying species. Therefore underwater sound associated with the Mona Offshore Wind Project will not prevent the extent and distribution, structure and function or the supporting processes on which the habitats of the qualifying diadromous fish species rely, from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Sea lamprey and river lamprey and Atlantic salmon within close proximity to piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration. In addition the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted.

Conservation Objective	Conclusion
	Diadromous fish species may experience behavioural effects in response to piling in the vicinity of the Mona Array Area however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 99.7 km from the Mona Array Area), and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of lamprey and Atlantic salmon. Therefore, underwater sound associated with the Mona Offshore Wind Project will not prevent the populations or distributions of the qualifying diadromous fish species from being maintained or restored.

1.6.3.72 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Derwent and Bassenthwaite SAC as a result of underwater sound with respect to construction and decommissioning of the Mona Offshore Wind Project alone.

Solway Firth SAC

Sea lamprey and River lamprey

1.6.3.73 Potential impacts of underwater sound on sea lamprey and river lamprey features of the Solway Firth SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC (39 km from the Mona Array Area) outlined in paragraph 1.6.3.27 to 1.6.3.35 due to the proximity of the locations. That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Mona Offshore Wind Project, these would not extend close to the coasts of north Wales and northwest England and therefore would not represent a barrier to migration (see paragraphs 1.6.3.9 to 1.6.3.26) to and from the Solway Firth SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.6.3.74 In addition, as the Solway Firth SAC (115 km from the Mona Array Area) is located at an increased distance from the Mona Offshore Wind Project than the Dee Estuary/Aber Dyfrdwy SAC it is considered that effects would be of similar if not of a lower magnitude although specific consideration of conservation objectives for this SAC are presented in Table 1.44. As such no adverse effect on integrity for the sea lamprey and river lamprey features of the Solway Firth SAC can also be concluded.

Conclusions

1.6.3.75 Adverse effects on the qualifying Annex II diadromous fish features of the Solway Firth SAC which undermine the conservation objectives of the SAC will not occur as a result of underwater sound during construction and decommissioning activities. An assessment of the impact ‘underwater sound impacting fish and shellfish receptors’ against each relevant conservation objective (as presented in paragraph 1.6.2.54 to 1.6.2.55) is presented below in Table 1.44. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.44: Conclusions against the conservation objectives of the Solway Firth SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound to result in adverse effects on the habitats of the qualifying species. Therefore underwater sound associated with the Mona Offshore Wind Project will not prevent the extent and distribution, structure and function or the supporting processes on which the habitats of the qualifying diadromous fish species rely, from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Sea lamprey and river lamprey within close proximity to piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration. In addition the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted. Diadromous fish species may experience behavioural effects in response to piling in the vicinity of the Mona Array Area however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 114.5 km from the Mona Array Area), and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of sea and river lamprey. Therefore, underwater sound associated with the Mona Offshore Wind Project will not prevent the populations or the distributions of sea lamprey and river lamprey from being maintained or restored.

1.6.3.76 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Solway Firth SAC as a result of underwater sound with respect to construction and decommissioning of the Mona Offshore Wind Project alone.

River Bladnoch SAC

Atlantic salmon

1.6.3.77 Potential impacts of underwater sound on the Atlantic salmon feature of the River Bladnoch SAC are predicted to be similar to those associated with the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (64 km from the Mona Array Area) outlined in paragraph 1.6.3.39 to 1.6.3.46). That is, the sound modelling outputs (including sound contours presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) demonstrates that although piling-related underwater sound would result in behavioural responses in the vicinity of the Mona Offshore Wind Project, these would not extend close to the coasts of north Wales and northwest England and therefore would not represent a barrier to migration (see paragraphs 1.6.3.9 to 1.6.3.26) to and from the River Bladnoch SAC. Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 114 days over a two year piling phase).

1.6.3.78 In addition, the River Bladnoch SAC (122 km from the Mona Array Area) is located at an increased distance from the Mona Offshore Wind Project than the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (64 km). It is therefore considered that effects on the Atlantic salmon feature of this site would be of lower magnitude than those described in paragraph 1.6.3.39 to 1.6.3.46 for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC although specific consideration of conservation objectives for this SAC are presented in Table 1.45. As such no adverse effect on integrity for the Atlantic salmon feature of the River Bladnoch SAC can also be concluded.

Conclusions

1.6.3.79 Adverse effects on the qualifying Annex II diadromous fish features of the River Bladnoch SAC which undermine the conservation objectives of the SAC will not occur as a result of underwater sound during construction and decommissioning activities. An assessment of the impact 'underwater sound impacting fish and shellfish receptors' against each relevant conservation objective (as presented in paragraph 1.6.2.59) is presented below in Table 1.45. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.45: Conclusions against the conservation objectives of the River Bladnoch SAC from underwater sound during the construction and decommissioning phase.

Conservation Objective	Conclusion
Restore the population of the species, including range of genetic types, as a viable component of the site. **Restore the distribution of the species throughout the site.**	Atlantic salmon within close proximity to piling operations may experience injury or mortality. However, given they are highly mobile, they tend to only utilise the environment within the Mona fish and shellfish ecology study area to pass through during migration. In addition the use of soft start piling procedures will potentially allow individuals in close proximity of piling to move away from the ensonified area, significant mortality or injury is not predicted. Diadromous fish species may experience behavioural effects in response to piling in the vicinity of the Mona Array Area however, modelling indicates these effects would not result in barriers to migration to and from this SAC (which is located 121.5 km from the Mona Array Area), and potential sound impacts will be short-term and intermittent during the construction phase. As such there is negligible risk of disruption to migration of Atlantic salmon. Therefore, underwater sound associated with the Mona Offshore Wind Project will not prevent the populations or distributions of the qualifying diadromous fish species from being restored.
Restore the habitats supporting the species within the site and availability of food.	There is no pathway for underwater sound to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) concluded that for prey species of Atlantic salmon potential impacts from underwater sound would be of minor adverse significance, which is not significant in EIA terms with the exception of herring which was concluded to be moderate adverse during the herring spawning season only. Although, there is evidence that adult Atlantic salmon may prey on herring, herring is predicted to form only a very small proportion of Atlantic salmon's diet and Atlantic salmon are predicted to be able to switch prey to other small fish species if required. Furthermore, the development of an Underwater sound management strategy with an Outline underwater sound management strategy submitted as part of the application, Document Reference J16), secured in the deemed marine licence, to reduce the magnitude associated with significant impacts (in this case to negligible or low) such that there will be no residual significant effect for the project alone. Therefore underwater sound associated with the Mona Offshore Wind Project will not prevent the habitats supporting the species within the site and availability of food from being restored.

1.6.3.80 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Bladnoch SAC as a result of underwater sound with respect to construction and decommissioning of the Mona Offshore Wind Project alone.

EMF from subsea electric cables

1.6.3.81 The presence and operation of inter-array, interconnector and offshore export cables within the Mona Array Area and Mona Offshore Cable Corridor and Access Areas will lead to localised potential EMF impacts, which may affect Annex II diadromous fish features.

1.6.3.82 The assessment of LSE during the HRA screening process identified that during the operations and maintenance phase, LSE could not be ruled out for the potential impact of EMF. This relates to the European sites and relevant Annex II features listed in Table 1.46.

Table 1.46: European sites and relevant Annex II diadromous fish features from which potential for an LSE could not be ruled out in relation to EMF impacts.

SAC	Annex II diadromous fish features
Dee Estuary/Aber Dyfrdwy SAC	Sea lamprey River lamprey
River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC	Sea lamprey River lamprey Atlantic salmon
River Ehen SAC	Atlantic salmon Freshwater pearl mussel
River Eden SAC	Sea lamprey River lamprey Atlantic salmon
Afon Gwyrfai a Llyn Cwellyn SAC	Atlantic salmon
River Kent SAC	Freshwater pearl mussel
River Derwent and Bassenthwaite Lake SAC	Sea lamprey River lamprey Atlantic salmon
Solway Firth SAC	Sea lamprey River lamprey
River Bladnoch SAC	Atlantic salmon

1.6.3.83 The following sections explain how this potential impact on Annex II diadromous fish features of the identified SACs has been quantified and assessed.

1.6.3.84 The MDS considered for the assessment of potential impacts on Annex II diadromous fish features from EMF from subsea electric cables effects is presented in Table 1.47.

1.6.3.85 For the purposes of the assessment sea lamprey and river lamprey have been assessed together due to their similar sensitivity to EMF and the fact that their

conservation objectives are the same for both species at all European sites assessed and therefore effects and associated conclusions are considered to be alike.

Table 1.47: MDS considered for the assessment of potential impacts on diadromous fish from EMF from subsea electric cables.

Phase	MDS	Justification
Operations and maintenance phase	Presence of inter-array, interconnector and offshore export cables: • Inter-array cables: up to 325 km of inter-array cables of 66 kV or 132 kV • Interconnector cables: up to 50 km of 275 kV High Voltage Alternating Current (HVAC) cables • Offshore export cables: up to 360 km of 275 kV HVAC cables • Minimum burial depth 0.5 m • The MDS assumes up to 10% of inter-array cables, 20% of interconnector cables, and 20% of export cables may require cable protection • Cable protection: cables will also require cable protection at asset crossings (up to 67 crossings for inter-array cables, 10 crossings for interconnector cables and up to 24 crossings for offshore export cables) • Operations and maintenance phase of up to 35 years.	Maximum length of cables across the Mona Array Area and offshore export cable route and minimum burial depth (the greater the burial depth, the more the EMF is attenuated).

Measures adopted as part of the project

1.6.3.86 Table 1.48 outlines the measures adopted as part of the Mona Offshore Wind Project which are relevant to EMF from subsea electric cables effects on Annex II diadromous fish features during the operations and maintenance phase.

Table 1.48: Measures adopted as part of the project which are relevant to EMF from subsea electric cables effects.

Measure	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
Development and adherence to an Offshore CMS including CSIP which will include cable burial where possible and cable protection.	To minimise potential impact from the cables and removal of cables a commitment to bury cables where possible has been made in accordance with the specific policies set out in the Welsh Marine Plan (Welsh Government, 2019) and additionally the North West Inshore and North West Offshore Coast Marine Plans (MMO, 2021). The Applicant recognises that the best form of cable protection is achieved through cable burial to the required depths, according to the results of a Cable Burial Risk Assessment and Burial Assessment Study, which will be included within the CSIP. The burial methodology should select the appropriate tools to endeavour to achieve burial to the required depth of lowering in a single pass, seeking to avoid burial methods that require	Offshore CMS secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence as a condition.

Measure	Justification	How the measure will be secured
	multiple passes with a burial tool in order to achieve lowering of the cable. While burial of cables will not reduce the strength of EMF, it does increase the distance between cables and fish and shellfish receptors, thereby potentially reducing the effect on those receptors.	
Development and adherence to an Offshore CMS which includes a CSIP which require material arising from drilling and/or sandwave clearance to be deposited in close proximity to the works.	To retain material within the sediment cell and maintain sediment transport regimes.	The Offshore CMS is secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Development of and adherence to a Decommissioning Programme in accordance with the Energy Act 2004. A Decommissioning Programme is required under the provisions of the Energy Act 2004 and this must be approved by the Secretary of State before works commence.	The aim of this plan is to adhere to the existing UK legislation and guidance. Overall, this will ensure the legacy of the Mona Offshore Wind Project will result in the minimum amount of long-term disturbance to the environment. While this measure has been committed to as part of the Mona Offshore Wind Project, the MDS for the decommissioning phase has been considered in each of the relevant impact assessments.	Decommissioning Programme secured as a requirement in Schedule 2 of the draft DCO and is a requirement of the Energy Act 2004.

Operations and maintenance phase

Information to support assessment

1.6.3.87 EMF comprise both the electrical fields, measured in volts per metre (V/m), and the magnetic fields, measured in microtesla (μT) or milligauss (mG). It is common practice to block the direct electrical field using conductive sheathing, meaning that the only EMFs that are emitted into the marine environment are the magnetic field and the resultant induced electrical field. It is generally considered impractical to assume that cables can be buried at depths that will reduce the magnitude of the magnetic field, and hence the sediment-sea water interface induced electrical field, to below that at which these fields could be detected by certain marine organisms on or close to the seabed (Gill *et al*., 2005; Gill *et al*., 2009). By burying a cable, the magnetic field at the seabed is reduced due to the distance between the cable and the seabed surface as a result of field decay with distance from the cable (CSA, 2019).

1.6.3.88 A variety of design and installation factors affect EMF levels in the vicinity of the cables. These include current flow, distance between cables, cable insulation, number of conductors and configuration of cable and burial depth. The flow of electricity associated with an Alternating Current (AC) cable (proposed for the Mona Offshore Wind Project) changes direction (as per the frequency of the AC transmission) and creates a constantly varying electric field in the surrounding marine environment (Huang, 2005), which can be contained with a metallic screen or sheath.

1.6.3.89 The strength of the magnetic field (and consequently, induced electrical fields) decreases rapidly radially with distance from the source according to the inverse square law. A recent study conducted by CSA (2019) found that inter-array and offshore export cables buried between depths of 1 m to 2 m reduces the magnetic field at the seabed surface four-fold. For cables that are unburied and instead protected by thick concrete mattresses or rock berms, the field levels were found to be similar to buried cables.

1.6.3.90 Background measurements of the magnetic field are approximately 50 µT (i.e. 500 mG) for example in the North Sea and Irish Sea (Tasker *et al.*, 2010; Eirgrid, 2015); Earth's iron core provides its own fluctuations over time, and solar flares also cause EMF impacts. Comparatively, EMFs created from cables could be considered insignificant.

1.6.3.91 Further information on the EMF levels associated with offshore wind farm power cables is included within Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3).

Dee Estuary/Aber Dyfrdwy SAC

Sea lamprey and River lamprey

1.6.3.92 EMFs may interfere with the navigation of sensitive diadromous species. Lamprey possess specialised ampullary electroreceptors that are sensitive to weak, low frequency electric fields (Bodznick and Northcutt, 1981; Bodznick and Preston, 1983), which are hypothesised to be used for prey-detection, although further research is required in this area (Tricas and Carlston, 2012). Chung-Davidson *et al*. (2008) found that weak electric fields may play a role in the reproduction of sea lamprey and it was suggested that electrical stimuli mediate different behaviours in in the feeding-stage and spawning-stage of individuals. This study showed that migration behaviour of sea lamprey was affected (i.e. adults did not move) when stimulated with electrical fields of intensities of between 2.5 and 100 mV/m, with normal behaviour observed at electrical field intensities higher and lower than this range (Chung-Davidson *et al*., 2008). It should be noted, however, that these levels are considerably higher than modelled induced electrical fields expected from AC subsea cables. There is currently no evidence of lamprey responses to magnetic B fields (Gill and Bartlett, 2010).

1.6.3.93 As outlined in paragraph 1.6.3.92, EMF may influence the behaviour of lamprey species. These effects may be detrimental if they result in the creation of a barrier to migration routes to and from natal rivers. However, diadromous species such as lamprey are highly mobile and are considered to be capable of changing course during migration between natal rivers and the open sea.

1.6.3.94 Lamprey species are considered to have significantly reduced sensitivity to EMFs in comparison with fish species, such as elasmobranchs, and should effects occur, these would be limited to within a few metres of the buried cable and migration will not be significantly affected. While burial of cables will not reduce the strength of EMF, it does increase the distance between cables and Annex II diadromous fish features, thereby reducing the effect on those receptors.

1.6.3.95 Any effects of EMF from subsea electric cables will be localised in context with the wider Irish Sea region, will be reversible on decommissioning of the cable and will not result in any barriers to migration to and from the SAC. Any behavioural effects will be further minimised by the Offshore CMS which includes a CSIP.

1.6.3.96 Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) concluded that for prey species of the sea lamprey and river lamprey (herring and sprat) impacts from EMF would be of minor adverse significance, which is not significant in EIA terms. The abundance of prey species forming the food source of river lamprey/sea lamprey will not be significantly affected by EMF effects.

1.6.3.97 There is also no pathway for EMF to result in adverse effects on the habitats of the qualifying species or the water quality of the rivers.

Conclusions

1.6.3.98 Adverse effects on the qualifying Annex II diadromous fish features of the River Dee Estuary/Aber Dyfrdwy SAC which undermine the conservation objectives of the SAC will not occur as a result of EMF from subsea electric cables during operations and maintenance activities. An assessment of the impact 'EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraph 1.6.2.8 to 1.6.2.10) is presented below in Table 1.49. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.49: Conclusions against the conservation objectives of the River Dee Estuary/Aber Dyfrdwy SAC from EMF during the operations and maintenance phase.

Conservation Objective	Conclusion
The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality.	Lamprey species are considered to have low sensitivity to EMF effects and Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) concluded EMF impacts would not result in a barrier to migration of the qualifying diadromous fish species. There is no impact pathway from EMF to affect water quality or to physically obstruct a migratory pathway. As such, the migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee will remain unobstructed by physical barriers and/or poor water quality
The five year mean count of river lampreys recorded by the Chester Weir fish trap is no less than 55 under the monitoring regime in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000).	Given that lamprey species are considered to have low sensitivity to EMF effects and that the assessment concluded EMF impacts would not result in a barrier to migration of the qualifying diadromous fish species, the population or distributions of the qualifying species will not be prevented from being maintained or restored.
The abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, is maintained.	Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) concluded that for prey species of the sea lamprey and river lamprey (herring and sprat) impacts from EMF would be of minor adverse significance, which is not significant in EIA terms. The impact will be localised and reversible on decommissioning of the cables. The abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, is maintained.

1.6.3.99 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC as a result

of EMF from subsea electric cables with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC

Sea lamprey and River lamprey

1.6.3.100 EMF from subsea electric cables effects on sea lamprey and river lamprey features of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC are predicted to be similar to those associated with the Dee Estuary/Aber Dyfrdwy SAC as outlined in paragraph 1.6.3.92 to 1.6.3.94 due to the proximity of the locations.

1.6.3.101 As the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC is located at an increased distance from the Mona Offshore Wind Project (located 59 km from the Mona Array Area) than the Dee Estuary/Aber Dyfrdwy SAC it is considered that effects would be of similar if not lower magnitude.As described in paragraphs 1.6.3.95, any EMF effects will be localised in context with the wider Irish Sea region and will not present a barrier to migration to and from the SAC. Any behavioural effects will be further minimised by the Offshore CMS which includes a CSIP (see Table 1.48 and Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)).

Atlantic salmon

1.6.3.102 Atlantic salmon have both been found to possess magnetic material of a size suitable for magnetoreception, and these species can use the earth's magnetic field for orientation and direction-finding during migration (Gill and Bartlett, 2010; CSA, 2019). Mark and recapture experiments undertaken at the Nysted operational offshore wind farm showed that eel did cross the offshore export cable (Hvidt *et al*., 2003).

1.6.3.103 Studies on European eel in the Baltic Sea have highlighted some limited effects of subsea cables (Westerberg and Lagenfelt, 2008), with evidence of direct detection of EMF through the lateral line of this species (Moore and Riley, 2009). The swimming speed during migration was shown to change in the short term (tens of minutes) with exposure to AC electric subsea cables, even though the overall direction remained unaffected (Westerberg and Langenfelt, 2008). The authors concluded that any delaying effect (i.e. on average 40 minutes) would not be likely to influence fitness in a 7,000 km migration, with little to no impact on migratory behaviour noted beyond 500 m from wind farm development infrastructure (Ohman *et al*., 2007). While this study was undertaken on European eel, this indicates that fish behavioural effects in response to EMF are limited both temporally and spatially and these do not cause barriers to migration.

1.6.3.104 Research in Sweden on the effects of a High Voltage Direct Current (HVDC) cable on the migration patterns of a range of fish species, including salmonids, failed to find any effect (Westerberg *et al*., 2007; Wilhelmsson *et al*., 2010). Research conducted at the Trans Bay cable, a DC undersea cable near San Francisco, California, found that migration success and survival of chinook salmon *Oncorhynchus tshawytscha* was not impacted by the cable. However, behavioural changes were noted when these fish were near the cable with salmon appearing to remain around the cable for longer periods (Kavet *et al*., 2016). These studies demonstrate that while DC subsea power cables can result in altered patterns of fish behaviour, these changes are temporary and do not interfere with migration success or population health.

1.6.3.105 As outlined in paragraph 1.6.3.93 the Mona Offshore Wind Project could potentially cause Atlantic salmon features to alter their migration route, however as discussed above it is considered more likely that migratory behaviour will not be altered in terms of direction and rather that swimming speed may be reduced when in proximity to EMF from subsea electric cables effects.

1.6.3.106 Any EMF from subsea electric cables effects will be localised in context with the wider Irish Sea region and will not present a barrier to migration to and from the SAC. Any behavioural effects will be further minimised by measures adopted as part of the Mona Offshore Wind Project including the development and adherence to an Offshore CMS including CSIP which will include cable burial where possible and cable protection. There is no pathway for effect between EMF from subsea electric cables and the extent or quality of the habitats of the qualifying species.

Conclusions

1.6.3.107 Adverse effects on the qualifying Annex II diadromous fish features of the River Dee River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC which undermine the conservation objectives of the SAC will not occur as a result of EMF from subsea electric cables during the operations and maintenance phase. An assessment of the impact 'EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraph 1.6.2.18 to 1.6.2.19 is presented below in Table 1.50. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.50: Conclusions against the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC from EMF during the operations and maintenance phase.

Conservation Objective	Conclusion
The parameters defined in the vision for the watercourse as defined above must be met.	Due to the nature of the impact, and the distance of the Mona Array Area from the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (64.4 km) this impact will not prevent the defined vision for the watercourse from being met.
The SAC feature populations will be stable or increasing over the long term. **The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.**	Given that lamprey and Atlantic salmon are considered to have low sensitivity to EMF from subsea electric cables and that the assessment concluded EMF from subsea electric cables impacts would not result in a barrier to migration of the qualifying diadromous fish species, the population of the qualifying species will not be prevented from remaining stable or increasing in the long term and the features natural range will neither be reduced or likely be reduced in the foreseeable future.
There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis.	There is no pathway for effect between EMF from subsea electric cables and the habitats of the qualifying species. Therefore, there will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis.
All factors affecting the achievement of these conditions are under control.	Given the conclusions made above, it is considered that all factors affecting the achievement of these conditions will remain under control.

1.6.3.108 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC as a result of EMF from subsea electric cables with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

River Ehen SAC

Atlantic salmon

1.6.3.109 As the River Ehen SAC is located at an increased distance (located 83 km from the Mona Array Area) from the Mona Offshore Wind Project than the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC, it is considered that effects would be of similar if not lower magnitude as described in paragraphs 1.6.3.102 to 1.6.3.107. Considering the likely migration routes of diadromous fish shown in Figure 1.11, the Mona Offshore Wind Project is unlikely to present a barrier to migration.

Freshwater pearl mussel

1.6.3.110 The freshwater pearl mussel has been considered within the HRA Stage 2 ISAA as Atlantic salmon are host species during a critical parasitic phase of the mussel's lifecycle. There could therefore be an indirect impact upon the freshwater pearl mussel feature of the site if the salmon population is adversely affected. However, as outlined in paragraph 1.6.3.109 it is not anticipated that Atlantic salmon will be adversely affected. Therefore, no adverse effects on the freshwater pearl mussel can also be concluded.

Conclusions

1.6.3.111 Adverse effects on the qualifying Annex II diadromous fish and freshwater pearl mussel features of the River Ehen SAC which undermine the conservation objectives of the SAC will not occur as a result of EMF from subsea electric cables during the operations and maintenance phase. An assessment of the impact 'EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraph 1.6.2.26) is presented below in Table 1.51. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.51: Conclusions against the conservation objectives of the River Ehen SAC from EMF during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and the habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for effect between EMF from subsea electric cables impacts and the habitats of the qualifying species. Therefore, EMF from subsea electric cables impacts will not prevent the extent and distribution, structure and function or supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species. **The distribution of qualifying species within the site.**	Given that Atlantic salmon are considered to have low sensitivity to EMF from subsea electric cables effects and that the assessment concluded EMF from subsea electric cables impacts would not result in a barrier to migration of the qualifying diadromous fish species, the populations or distributions of the Atlantic salmon and freshwater pearl mussel within the site will not be prevented from being maintained or restored.

1.6.3.112 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Ehen SAC as a result of EMF from subsea electric cables with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

River Eden SAC

Sea lamprey and River lamprey

1.6.3.113 The River Eden SAC is located at an increased distance from the Mona Offshore Wind Project (located 83 km from the Mona Array Area) than the Dee Estuary/Aber Dyfrdwy SAC. It is therefore considered that effects on lamprey features of this site would be of lower magnitude than those described in paragraphs 1.6.3.92 to 1.6.3.99 for the Dee Estuary/Aber Dyfrdwy SAC. Due to the location of the River Eden SAC in respect to the Mona offshore Wind Project it is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable. No adverse effect on integrity was concluded for the Dee Estuary/Aber Dyfrdwy SAC (see paragraph 1.6.3.99) therefore no adverse effect on the sea lamprey and river lamprey features of the River Eden SAC can also be concluded.

Atlantic salmon

1.6.3.114 The River Eden SAC is located at an increased distance from the Mona Offshore Wind Project than the River Dee and Bala Lake/Afon Dyfrdwy SAC. It is therefore considered that effects on the Atlantic salmon feature of this site would be of lower magnitude than those described in paragraphs 1.6.3.102 to 1.6.3.109 for the River Dee and Bala Lake/Afon Dyfrdwy SAC. Due to the location of the River Eden SAC in respect to the Mona Offshore Wind Project it is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable. No adverse effect on integrity was concluded for the River Dee and Bala Lake/Afon Dyfrdwy SAC (see paragraph 1.6.3.108) therefore no adverse effect on the Atlantic salmon feature of the River Eden SAC can also be concluded.

Conclusions

1.6.3.115 Adverse effects on the qualifying Annex II diadromous fish features of the River Eden SAC which undermine the conservation objectives of the SAC will not occur as a result of EMF from subsea electric cables during the operations and maintenance phase. An assessment of the impact ‘EMF from subsea electric cables’ against each relevant conservation objective (as presented in paragraph 1.6.2.32 to 1.6.2.33) is presented below in Table 1.52. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.52: Conclusions against the conservation objectives of the River Eden SAC from EMF during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and the habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for effect between EMF from subsea electric cables and the habitats of the qualifying species. Therefore, EMF from subsea electric cables will not prevent the extent and distribution, structure and function or supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that sea lamprey, river lamprey and Atlantic salmon are considered to have low sensitivity to EMF from subsea electric cables and that the assessment concluded EMF from subsea electric cables would not result in a barrier to migration of the qualifying diadromous fish species, the populations and distributions of the qualifying features within the site will not be prevented from being maintained or restored.

1.6.3.116 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Eden SAC as a result of EMF from subsea electric cables with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

Afon Gwyrfai a Llyn Cwellyn SAC

Atlantic salmon

1.6.3.117 The Afon Gwyrfai a Llyn Cwellyn SAC is located at an increased distance from the Mona Offshore Wind Project (located 92 km from the Mona Array Area) than the River Dee and Bala Lake/Afon Dyfrdwy SAC. It is therefore considered that effects on the Atlantic salmon feature of this site would be of lower magnitude than those described in paragraphs 1.6.3.102 to 1.6.3.108 for the River Dee and Bala Lake/Afon Dyfrdwy SAC. Due to the location of the Afon Gwyrfai a Llyn Cwellyn SAC in respect to the Mona Offshore Wind Project it is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable. No adverse effect on integrity was concluded for the River Dee and Bala Lake/Afon Dyfrdwy SAC (see paragraph 1.6.3.108) therefore no adverse effect on the Atlantic salmon feature of the Afon Gwyrfai a Llyn Cwellyn SAC can also be concluded.

Conclusions

1.6.3.118 Adverse effects on the qualifying Annex II diadromous fish features of the Afon Gwyrfai a Llyn Cwellyn SAC which undermine the conservation objectives of the SAC will not occur as a result of EMF from subsea electric cables during the operations and maintenance phase. An assessment of the impact 'EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraph 1.6.2.37) is presented below in Table 1.53. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.53: Conclusions against the conservation objectives of the Afon Gwyrfai a Llyn Cwellyn SAC from EMF during the operations and maintenance phase.

Conservation Objective	Conclusion
The conservation objective for the water course as defined in Countryside Council for Wales (2008) must be met.	There is no pathway for effect between EMF from subsea electric cables and the watercourse. Therefore, EMF from subsea electric cables will not prevent the conservation objectives for the water course as defined in Countryside Council for Wales (2008) from being met.
The population of the feature in the SAC is stable or increasing over the long term. **The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.**	Given that Atlantic salmon are considered to have low sensitivity to EMF from subsea electric cables effects and that the assessment concluded EMF from subsea electric cables impacts would not result in a barrier to migration of the qualifying diadromous fish species, the populations of the qualifying features within the site will not be prevented from remaining stable or increasing over time. The natural range of the feature in the SAC will neither be reduced nor is likely to be reduced for the foreseeable future.
The Gwyrfai will continue to be a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.	There is no pathway for effect between EMF from subsea electric cables and the habitats of the qualifying species. Therefore, EMF from subsea electric cables will not prevent the Gwyrfai from continuing to be a sufficiently large habitat to maintain the feature's population in the SAC on a long term basis.

1.6.3.119 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Afon Gwyrfai a Llyn Cwellyn SAC as a result of EMF from subsea electric cables impacts with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

River Kent SAC

Freshwater pearl mussel

1.6.3.120 This site is only designated for freshwater pearl mussel, brown trout is thought to be the host species within the River Kent SAC, however Atlantic salmon are also present within the river (Natural England, 2019), and the site was therefore screened in on a precautionary basis.

1.6.3.121 For the SACs outlined above where Atlantic salmon is a qualifying feature no adverse effects have been concluded in relation to EMF from subsea electric cables. EMF impacts to brown trout and Atlantic salmon (the host species) for freshwater pearl mussel within the River Kent SAC are considered to be similar to those for Atlantic salmon. See paragraph 1.6.3.102 to 1.6.3.105, as the River Kent SAC is located at an increased distance from the Mona Offshore Wind Project (located 96 km from the Mona Array Area) than the River Dee and Bala Lake/Afon Dyfrdwy SAC it is considered that effects would be of lower magnitude. Due to the location of the River Kent in respect to the Mona Offshore Wind Project it is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable. No adverse effect on integrity was concluded for the River Dee and Bala Lake/Afon Dyfrdwy SAC (see paragraph 1.6.3.108) therefore no adverse effect on the Atlantic salmon feature of the River Kent can also be concluded.

Conclusions

1.6.3.122 Adverse effects on the qualifying Annex II freshwater pearl mussel features of the River Kent SAC which undermine the conservation objectives of the SAC will not occur as a

result of EMF from subsea electric cables during the operations and maintenance phase. An assessment of the impact 'EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraph 1.6.2.41 to 1.6.2.42) is presented below in Table 1.54. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.54: Conclusions against the conservation objectives of the River Kent SAC from EMF during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and the habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for effect between EMF from subsea electric cables and the habitats of the qualifying species. Therefore, EMF from subsea electric cables will not prevent the extent and distribution, structure and function or supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Atlantic salmon and brown trout are considered to be the host species for freshwater pearl mussel within the SAC. EMF impacts on brown trout will not occur to brown trout as the species is purely freshwater resident and do not migrate to the marine environment. Given that Atlantic salmon are considered to have low sensitivity to EMF from subsea electric cables and that the assessment concluded EMF from subsea electric cables would not result in a barrier to migration of the qualifying diadromous fish species, the populations and distributions of the qualifying features within the site will not be prevented from being maintained or restored.

1.6.3.123 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Kent SAC as a result of EMF from subsea electric cables with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

River Derwent and Bassenthwaite Lake SAC

Sea lamprey and river lamprey

1.6.3.124 The Derwent and Bassenthwaite Lake SAC is located at an increased distance from the Mona Offshore Wind Project (95 km from the Mona Array Area) than the Dee Estuary/Aber Dyfrdwy SAC. It is therefore considered that effects on the lamprey features of this site would be of lower magnitude than those described in paragraphs 1.6.3.92 to 1.6.3.94 for the Dee Estuary/Aber Dyfrdwy SAC. Due to the location of the Derwent and Bassenthwaite Lake SAC in respect to the Mona Offshore Wind Project it Is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable. No adverse effect on integrity was concluded for the Dee Estuary/Aber Dyfrdwy SAC (see paragraph 1.6.3.99) therefore no adverse effect on the sea lamprey and river lamprey features of the Derwent and Bassenthwaite Lake SAC can also be concluded.

Atlantic salmon

1.6.3.125 The Derwent and Bassenthwaite Lake SAC is located at an increased distance from the Mona Offshore Wind Project (located 95 km from the Mona Array Area) than the River Dee and Bala Lake/Afon Dyfrdwy SAC. It is therefore considered that effects on the Atlantic salmon feature of this site would be of lower magnitude than those described in paragraphs 1.6.3.102 to 1.6.3.108 for the River Dee and Bala Lake/Afon Dyfrdwy SAC. Due to the location of the Derwent and Bassenthwaite Lake SAC in respect to the Mona Offshore Wind Project it is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable. No adverse effect on integrity was concluded for the River Dee and Bala Lake/Afon Dyfrdwy SAC (see paragraph 1.6.3.108) therefore no adverse effect on the Atlantic salmon feature of the Derwent and Bassenthwaite Lake SAC can also be concluded.

Conclusions

1.6.3.126 Adverse effects on the qualifying Annex II diadromous fish features of the River Derwent and Bassenthwaite SAC which undermine the conservation objectives of the SAC will not occur as a result of EMF from subsea electric cables during the operations and maintenance phase. An assessment of the impact 'EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraph 1.6.2.48 to 1.6.2.49) is presented below in Table 1.55. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.55: Conclusions against the conservation objectives of the River Derwent and Bassenthwaite SAC from EMF during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and the habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for effect between EMF from subsea electric cables impacts and the habitats of the qualifying species. Therefore, EMF from subsea electric cables impacts will not prevent the extent and distribution, structure and function or supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that sea lamprey, river lamprey and Atlantic salmon are considered to have low sensitivity to EMF from subsea electric cables and that the assessment concluded EMF from subsea electric cables would not result in a barrier to migration of the qualifying diadromous fish species, the populations and distributions of the qualifying features within the site will not be prevented from being maintained or restored.

1.6.3.127 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Derwent and Bassenthwaite SAC as a result of EMF from subsea electric cables with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

Solway Firth SAC

Sea lamprey and river lamprey

1.6.3.128 The Solway Firth SAC is located at an increased distance from the Mona Offshore Wind Project (located 109 km from the Mona Array Area) than the Dee Estuary/Aber Dyfrdwy SAC. It is therefore considered that effects on the lamprey features of this site would be of lower magnitude than those described in paragraphs 1.6.3.92 to 1.6.3.97 for the Dee Estuary/Aber Dyfrdwy SAC. Due to the location of the Solway Firth SAC in respect to the Mona Offshore Wind Project it is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable. No adverse effect on integrity was concluded for the Dee Estuary/Aber Dyfrdwy SAC (see paragraph 1.6.3.99) therefore no adverse effect on the sea lamprey and river lamprey features of the Solway Firth SAC can also be concluded.

Conclusions

1.6.3.129 Adverse effects on the qualifying Annex II diadromous fish features of the Solway Firth SAC which undermine the conservation objectives of the SAC will not occur as a result of EMF from subsea electric cables during the operations and maintenance phase. An assessment of the impact 'EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraph 1.6.2.54 to 1.6.2.55) is presented below in Table 1.56. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.56: Conclusions against the conservation objectives of the River Kent SAC from EMF during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and the habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for effect between EMF from subsea electric cables impacts and the habitats of the qualifying species. Therefore, EMF from subsea electric cables impacts will not prevent the extent and distribution, structure and function or supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that sea lamprey and river lamprey are considered to have low sensitivity to EMF from subsea electric cables and that the assessment concluded EMF from subsea electric cables would not result in a barrier to migration of the qualifying diadromous fish species, the populations and distributions of the qualifying features within the site will not be prevented from being maintained or restored.

1.6.3.130 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Solway Firth SAC as a result of EMF from subsea electric cables with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

River Bladnoch SAC

Atlantic salmon

1.6.3.131 The River Bladnoch SAC is located at an increased distance from the Mona Offshore Wind Project (115 km from the Mona Array Area) than the River Dee and Bala Lake/Afon Dyfrdwy SAC. It is therefore considered that effects on the Atlantic salmon feature of this site would be of lower magnitude than those described in paragraphs 1.6.3.102 to 1.6.3.108 for the River Dee and Bala Lake/Afon Dyfrdwy SAC. Due to the location of the River Bladnoch SAC in respect to the Mona Offshore Wind Project it is unlikely to present a barrier to migration. In addition, the conservation objectives for the two SACs are the same and therefore considered comparable. No adverse effect on integrity was concluded for the River Dee and Bala Lake/Afon Dyfrdwy SAC (see paragraph 1.6.3.108) therefore no adverse effect on the Atlantic salmon feature of the River Bladnoch SAC can also be concluded.

Conclusions

1.6.3.132 Adverse effects on the qualifying Annex II diadromous fish features of the River Bladnoch SAC which undermine the conservation objectives of the SAC will not occur as a result of EMF from subsea electric cables during the operations and maintenance phase. An assessment of the impact 'EMF from subsea electric cables' against each relevant conservation objective (as presented in paragraph 1.6.2.59) is presented below in Table 1.57. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.57: Conclusions against the conservation objectives of the River Bladnoch SAC from EMF during the operations and maintenance phase.

Conservation Objective	Conclusion
Restore the population of the species, including range of genetic types, as a viable component of the site. **Restore the distribution of the species throughout the site.**	Given that Atlantic salmon are considered to have low sensitivity to EMF from subsea electric cables and that the assessment concluded EMF from subsea electric cables would not result in a barrier to migration of the qualifying diadromous fish species, the populations of the qualifying features (including range of genetic types) within the site will not be prevented from being restored as a viable component within the site. The distribution of the species throughout the site will not be prevented from being restored.
Restore the habitats supporting the species within the site and availability of food.	There is no pathway for effect between EMF from subsea electric cables and the habitats of the qualifying species. Therefore, EMF from subsea electric cables will not prevent the habitats supporting the species within the site and availability of food from being restored.

1.6.3.133 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Bladnoch SAC as a result of EMF from subsea electric cables impacts with respect to the operations and maintenance phase of the Mona Offshore Wind Project alone.

1.6.4 Assessment of adverse effects in-combination with other plans and projects

1.6.4.1 The other developments (projects/plans) that could result in-combination effects associated with the Mona Offshore Wind Project on Annex II diadromous fish features

of the designated sites identified have been summarised in Table 1.58 and shown in Figure 1.13.

1.6.4.2 As outlined in The Stage 1 HRA Screening Report (Document reference E1.4), where the potential for LSE has been concluded with respect to the Mona Offshore Wind Project alone, the potential for LSE has also been concluded in-combination. For impacts where LSE has been ruled out with respect to the Mona Offshore Wind Project alone, there is either no pathway to effect, or the Mona Offshore Wind Project would result in only negligible or inconsequential effects that would not contribute (even collectively) or materially to in-combination effects and therefore, no additional in-combination impacts are taken forward to the in-combination assessment.

1.6.4.3 On this basis, the potential impacts identified for assessment as part of Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3), and which have been brought forward for consideration in the in-combination assessment of the HRA Stage 2 ISAA are:

- In-combination underwater sound impacting fish and shellfish receptors
- In-combination EMF from subsea electric cables.

1.6.4.4 The following assessments of the effects of the Mona Offshore Wind Project, acting in-combination with other relevant plans and projects, on Annex II diadromous fish habitats have been informed by the detailed project-specific underwater sound modelling presented in Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1) and the technical assessments presented in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3). The Applicant has also made all reasonable efforts to ensure that the information included in the assessment relating to other plans and projects is correct and sufficiently detailed, with any limitations on the information available acknowledged. The assessments have also drawn upon the sensitivity assessments of the relevant fish species detailed in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) which reference the best available literature and evidence with regards to sensitivity. In this regard, the Applicant is confident that the conclusions made on European site integrity from the Mona Offshore Wind Project in-combination with other plans and projects have been identified in light of the best available scientific knowledge and all reasonable scientific doubt can be ruled out.

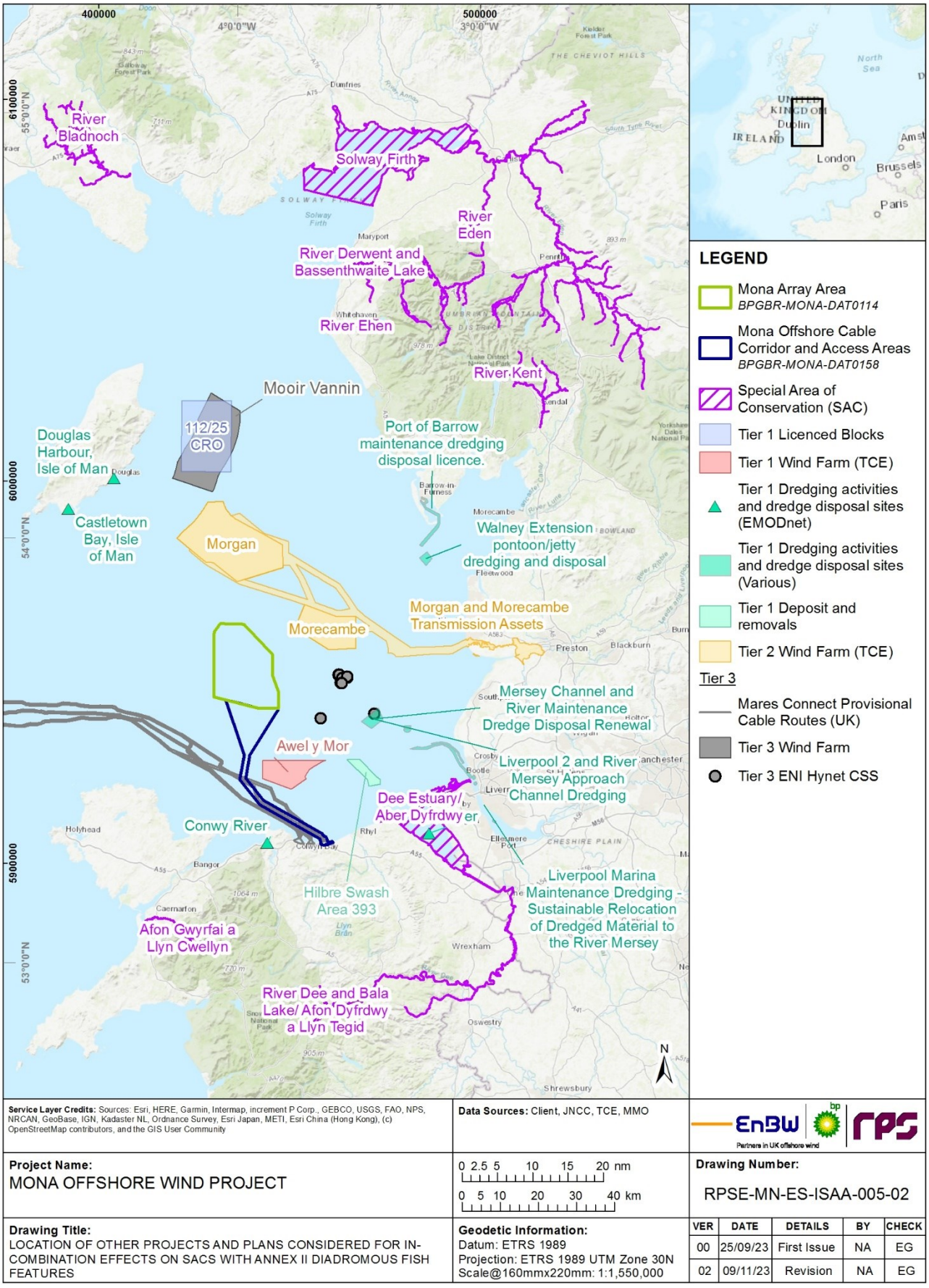

Figure 1.13: Locations of other projects and plans considered for in-combination effects on SACs with Annex II diadromous fish features.

Table 1.58: List of other projects and plans with potential for in-combination effects on Annex II diadromous fish features.

Project/plan	Status	Distance from the Mona array area (km)	Distance from the Mona offshore/onshore cable corridor (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Tier 1							
Offshore renewables							
Awel y Môr Offshore Wind Farm[1]	Consented	13.52	3.60	Offshore wind farm	2026 to 2030	2030 to 2055	The construction, operations and maintenance and decommissioning phases of this project will overlap with the construction and operations and maintenance of the Mona Offshore Wind Project.
Dredging activities and dredge disposal sites							
Liverpool 2 and River Mersey approach channel dredging (MLA/2018/00536/8)	Operational	22.1	22.44	Capital dredging in front of the proposed terminal to create a berth pocket.	n/a	2019 to 2028	Dredging and disposal activities associated with this project will overlap with the construction phase of the Mona Offshore Wind Project, and all phases in terms of vessel movements.
Mersey channel and river maintenance dredge disposal renewal (MLA/2021/00202)	Operational	22.1	22.53	The Mersey Docks and Harbour Company Ltd, as the Harbour Authority for the Port of Liverpool has an obligation to dredge the approaches to	n/a	2021 to 2031	Dredging and disposal activities associated with this project will overlap with the construction and operations and maintenance phases

Project/plan	Status	Distance from the Mona array area (km)	Distance from the Mona offshore/onshore cable corridor (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
				Liverpool in order to maintain navigation into the Mersey Estuary for all river users.			of the Mona Offshore Wind Project, and all phases in terms of vessel movements.
Conwy River	Operational	35.2	7.70	Dredging, no further information given.	n/a	2022 to 2037	Dredging and disposal activities associated with this project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project, and all phases in terms of vessel movements.
Douglas Harbour, IoM	Operational	43.1	67.0	Dredging to deepen harbour channels and capital dredging in front of the proposed terminal to create a berth pocket.	n/a	2016 to 2031	Dredging and disposal activities associated with this project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project, and all phases in terms of vessel movements.
Walney Extension pontoon/jetty dredging and disposal (MLA/2018/00403)	Operational	46.0	55.28	Twice yearly dredging campaigns over the next 10 years at each of the two dredge locations.	n/a	2019 to 2029	Dredging and disposal activities associated with this project overlaps with the construction phase of the Mona Offshore Wind Project, and all

Project/plan	Status	Distance from the Mona array area (km)	Distance from the Mona offshore/onshore cable corridor (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
							phases in terms of vessel movements.
Castletown Bay, IoM	Operational	47.6	64.42	Dredging to deepen harbour channels.	n/a	2022 to 2037	Dredging and disposal activities associated with this project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project, and all phases in terms of vessel movements.
Port of Barrow maintenance dredging disposal licence (MLA/2015/00458/1)	Operational	48.1	58.07	Dredging is required to maintain the Port of Barrow and its approach channel at its advertised navigational depth for all vessels entering and leaving the port.	n/a	2016 to 2026	Dredging and disposal activities associated with this project will overlap with the construction phase of the Mona Offshore Wind Project, and all phases in terms of vessel movements.
Dee River	Operational	51.3	26.71	Dredging, no further information given.	n/a	2022 to 2037	Dredging and disposal activities associated with this project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project, and all phases in terms of vessel movements.

Project/plan	Status	Distance from the Mona array area (km)	Distance from the Mona offshore/onshore cable corridor (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Liverpool Marina Maintenance Dredging–- sustainable relocation of dredged material to the River Mersey (MLA/2020/00492)	Operational	59.5	41.48	Annual campaigns of maintenance dredging over the next ten years using small hydraulic dredger.	n/a	2021 to 2030	Dredging and disposal activities associated with this project will overlap with the construction and operations and maintenance phase of the Mona Offshore Wind Project, and all phases in terms of vessel movements.
RNLI Regional Maintenance (MLA/2015/00016)	Operational	59.9	31.76	Low impact maintenance works to RNLI operated lifeboat stations and associated slipways, berths and other infrastructure.	n/a	2019 to 2029	Dredging and disposal activities associated with this project will overlap with the construction phase of the Mona Offshore Wind Project, and all phases in terms of vessel movements.
Deposit and removals							
Hilbre Swash (NRW) (Marine aggregate extraction area number 392/393)	Operational	22.4	17.20	Licence to extract up to 12 million tonnes of aggregate (mainly sand) over 15 years.	n/a	2015 to 2029	Aggregate extraction activities associated with this project will overlap with the construction phase of the Mona Offshore Wind Project, and all phases in terms of vessel movements.

Project/plan	Status	Distance from the Mona array area (km)	Distance from the Mona offshore/onshore cable corridor (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Other works – oil and gas							
Isle of Man Crogga Licence: 112/25	Operational	33.92	61.60	Block reference 112/25. Within IoM territorial waters. 266 km^2 offshore the northeast coast of the IoM.	n/a	2017 to 2048	Drill appraisal well operations will overlap with the construction of the Mona Offshore Wind Project, and all phases in terms of vessel movements.
Tier 2							
Offshore Renewables Projects							
Morgan Offshore Wind Project: Generation Assets	Pre-application	5.52	32.93	Offshore Wind Farm	2026 to 2028	2029 to 2089	The construction, operations and maintenance and decommissioning phases of this project will overlap with the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project.
Morecambe Offshore Windfarm Generation Assets	Pre-application	8.9	21.53	Offshore Wind Farm	2026 to 2028	2029 to 2089	The construction, operations and maintenance and decommissioning phases of this project will overlap with the construction, operations and maintenance and decommissioning

Project/plan	Status	Distance from the Mona array area (km)	Distance from the Mona offshore/onshore cable corridor (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
							phases of the Mona Offshore Wind Project.
Mooir Vannin Offshore Wind Farm	Pre-application	34.5	59.9	Orsted have signed an agreement for lease to develop a 700 MW (annual output 3000 GWh) wind farm on the east coast and have undertaken initial surveys since 2016.	2030 to 2032	Aiming for the start of the operations and maintenance phase in 2032. End of this phase unknown.	The operations and maintenance phase of this project is anticipated to overlap with the operation and maintenance phase of the Mona Offshore Wind Project.
Cables and piplines							
Morgan and Morecambe Offshore Wind Farms Transmission Assets	Pre-application	8.9	21.53	Morgan and Morecambe Offshore Wind Farms Transmission Assets	2026 to 2028	2029 to 2064	Project construction phase overlaps with Mona Offshore Wind Farm construction phase.
Oil and gas							
ENI HyNet Carbon Capture and Storage (CCS)	Pre-application	12.1	9.52	CCS project in the east Irish Sea. Works will include installation of a new Douglas CCS platform and work on the existing Hamilton, Hamilton North and Lennox wellhead platforms.	2024 to mid 2020s	Mid 2020s	The construction and operations and maintenance phases of this project may overlap with the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project.

Project/plan	Status	Distance from the Mona array area (km)	Distance from the Mona offshore/onshore cable corridor (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Deposit and removals							
Liverpool Bay Area 457	Pre-application	10.99	11.01	Westminster Gravels will be renewing their aggregate extraction licence in Area 457 in Liverpool Bay. Their Environmental Statement is planned to be submitted in 2024. Proposed extraction of 18 million tonnes of aggregate (mainly sand and fine sediment) over 15 years.	N/A	Unknown	Aggregate extraction activities associated with this project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project, and all phases in terms of vessel movements.
Tier 3							
Cables and pipelines							
MaresConnect – Wales-Ireland Interconnector Cable	Electricity licence from Ofgem, but no scoping report at this stage	16.4	0.0	A proposed subsea and underground electricity interconnector system linking the existing electricity grids in Ireland and Great Britain.	N/A	N/A	This project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project.

In-combination underwater sound impacting fish and shellfish receptors

1.6.4.5 There is potential for impacts from underwater sound to impact fish and shellfish receptors as a result of activities associated with the Mona Offshore Wind Project during construction, in-combination with activities associated with the following projects/plans: tier 1 projects, the construction of the Awel y Môr Offshore Wind Farm and tier 2 projects, Morecambe Offshore Windfarm Generation Assets, Morgan Offshore Wind Project Generation Assets, and the Morgan and Morecambe Offshore Wind Farms Transmission Assets.

Tier 1

1.6.4.6 The construction phase of the Awel y Môr Offshore Wind Farm will temporally and spatially overlap with the Mona Offshore Wind Project in terms of construction sound (specifically piling and UXO clearance), potentially resulting in in-combination effects. The assessment of sound impacts associated with the Mona Offshore Wind Project alone has been presented in section 1.6.4.

1.6.4.7 For Awel y Môr, based on the MDS presented in the Awel y Môr Fish and Shellfish Chapter, maximum hammer piling energy of up to 5,000 kJ is planned for monopiles, with up to 50 of these monopiles being installed over up to a maximum 74 day period (single vessel), with a maximum duration of 896 hours of piling expected. When considered in-combination with the Mona Offshore Wind Project this would equate to a relatively short term duration of up to 188 days and 2,048 hours of piling intermittently over the construction phases of several years (i.e. three and four years for Awel y Môr and Mona, respectively).

1.6.4.8 Sound modelling undertaken for the Awel y Môr project indicated similar patterns as those for the Mona Offshore Wind Project, with injury and mortality to ranges of up to 1,200 m for Group 1 fish, <100 m for Group 2 fish, if modelled as static receptors (RWE, 2022). In all cases, modelling the fish as receptors moving away from the sound source significantly reduced mortality distances, down to <100 m even for group 3 fish. TTS ranges were calculated to reach out to up to 11,800 m for group 3 static receptors, with this again reducing to 100 m when fish were modelled as receptors moving away from the sound source, with similar patterns for all other groups of fish (i.e. Group 1 and 2).

1.6.4.9 As with the Mona Offshore Wind Project, mitigation has been secured including soft starts will reduce the risk of injury and mortality to some fish receptors. With respect to behavioural effects, the Awel y Môr project indicated behavioural effects to similar ranges as those predicted for the Mona Offshore Wind Project, with behavioural effects expected to a range of approximately up to tens of kilometres from the piling location at the maximum hammer energies. Diadromous fish species were not examined separately for the Awel y Môr Offshore Wind Farm, but evidence did indicate for fish motivated by strong biological drivers, as would be the case for diadromous fish on their spawning migrations, the effect was not significant.

1.6.4.10 As outlined in paragraph 1.6.4.7, when Awel y Môr is considered in-combination with the Mona Offshore Wind Project this would equate to up to 188 days and 2,048 hours of piling over construction phases of several years (i.e. three and four years for Mona and Awel y Môr, respectively). Underwater sound impacts associated with piling at Awel y Môr and the Mona Offshore Wind Project are however considered to be short-term and intermittent across the relevant construction phases (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference:

F2.3)). Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) concluded the cumulative impact to be minor adverse for all diadromous fish species. This was concluded on the basis that piling from both projects is unlikely to occur concurrently or result in major disruption to movement of diadromous fish species undertaking migration activities for spawning. In the event that piling did occur concurrently, whilst there is the potential for some overlap of disturbance contours, the disturbance would not be additive in those areas of overlap and would not result in greater disturbance to migratory fish. Furthermore, the likelihood of concurrent piling occurring at both projects for significant durations is considered to be low. Considering the location of the SACs with Annex II diadromous fish features considered in Figure 1.13 and the nature of the in-combination underwater sound effects outlined above, barriers to migrating Annex II diadromous fish features to/from the SACs assessed are not predicted to occur.

Tier 2

1.6.4.11 The construction phases of the Morgan Offshore Wind Project Generations Assets, the Morecambe Offshore Wind Farm, and the Morgan and Morecambe Offshore Wind Farms: Transmission Assets may have temporal and spatial overlap with the Mona Offshore Wind Farm in terms of construction sound, potentially resulting in an in-combination impact.

1.6.4.12 For the Morgan Offshore Wind Farm, sound modelling indicated similar patterns as those for the Mona Offshore Wind Project, with distances to threshold values for mortality effects for the Mona Offshore Wind Project of up to 745 m for Group 1 fish and 2,120 m for Group 2 fish, if modelled as static receptors (Morgan Offshore Wind Ltd., 2023). In all cases, modelling the fish as receptors moving away from the sound source significantly reduced distances to threshold values for mortality. Injury distances were calculated to reach up to 4,760 m for Group 2 to 4 static receptors, with this again reducing to <100 m in all cases when fish were modelled as receptors moving away from the sound source, with similar patterns for all other groups of fish.

1.6.4.13 For the Morecambe Offshore Windfarm: Generation Assets, sound modelling indicated similar patterns as those for the Mona Offshore Wind Project, with injury and mortality from sound produced within the Morecambe Offshore Windfarm: Generation Assets for a single monopile (maximum hammer energy of 5000 kJ to ranges of up to 830 m for Group 1 fish, 2,900 m for Group 2 fish, if modelled as static receptors (Morecambe Offshore Windfarm Ltd., 2023). Injury distances were calculated to reach out to up to 6,700 m for Group 2 static receptors with similar patterns for all other groups of fish.

1.6.4.14 For the Morgan and Morecambe Offshore Wind Farms: Transmission Assets, sound modelling also indicated similar patterns to the Mona Offshore Wind Project, wherein peak sound pressure levels when piling energy is at its maximum (i.e., 5,500 kJ) has been modelled to cause mortality and recoverable injury to fish within a maximum of 648 m of the piling activity. When fish are modelled as moving receptors, the mortality injury ranges are considerably smaller than those predicted for SPL_{pk}, in that the mortality thresholds were exceeded only for fish eggs and larvae, within a range of up to 2.02 km. When fish were modelled as static receptors, mortality and recoverable injury ranges were significantly higher than for both SPL_{pk} and SEL_{cum} when fish are modelled as receptors moving away from the source, with a maximum mortality range of up to 755 m for Group 1 fish and 2 km for Group 2 fish, whilst the recoverable injury range was up to 4.34 km for Group 2 fish.

1.6.4.15 Underwater sound impacts associated with piling at Morgan Offshore Wind Project Generation Assets, the Morecambe Offshore Windfarm Generation Assets, and the

Morgan and Morecambe Offshore Wind Farms: Transmission Assets are considered to be short-term and intermittent across the relevant construction phases (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) concluded the cumulative impact to be minor adverse for all diadromous fish species. Whilst piling from all tier 2 projects may occur concurrently, this would only occur intermittently during the construction phase of the Mona Offshore Wind Project. This is, therefore, not predicted to result in disruption to the movement of diadromous fish species undertaking migration activities for spawning. Considering the location of the SACs with Annex II diadromous fish features considered in Figure 1.13 and the nature of the in-combination underwater sound effects outlined above barriers to migrating Annex II diadromous fish features to/from the SACs assessed are not predicted to occur.

Dee Estuary/Aber Dyfrdwy SAC

1.6.4.16 Any in-combination effects are predicted to be of relatively short-term duration, intermittent over the construction phase of the Mona Offshore Wind Project and diadromous fish species such as sea lamprey and river lamprey are assessed as having low sensitivity to the impact (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have mitigation measures including soft starts which will further reduce the potential for in-combination sound effects.

Conclusions

1.6.4.17 Adverse effects on the qualifying features which undermine the conservation objectives of the SAC will not occur as a result of in-combination underwater sound. An assessment of the impact 'underwater sound impacting fish and shellfish receptors' against each relevant conservation objective (as presented in paragraph 1.6.2.8 to 1.6.2.10) is presented in Table 1.59. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.59: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC for in-combination underwater sound.

Conservation objective	Conclusion
The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality.	Underwater sound associated with the Mona Offshore Wind Project in-combination with other projects will be intermittent, all projects will likely implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee will therefore remain unobstructed by physical barriers and/or poor water quality.
The five year mean count of river lampreys recorded by the Chester Weir fish trap is no less than 55 under the monitoring regime in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000).	Underwater sound associated with the Mona Offshore Wind Project in-combination with other projects will be intermittent, all projects are likely to implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect. Therefore the Mona Offshore Wind Project in-combination with other projects will not result in the reduction of sea lamprey or river lamprey populations.

Conservation objective	Conclusion
The abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, is maintained.	Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) concluded that impacts to herring (considered to be a prey species for sea lamprey and river lamprey) from underwater sound resulting from tier 2 projects were moderate adverse which is significant in EIA terms during the herring spawning season only. However, as stated for the project alone assessment, herring is predicted to form only a very small proportion of sea and river lamprey's diet with lamprey predicted to be able to switch prey to other species such as sprat, flounder and small gadoids. The development of an Underwater sound management strategy with an Outline underwater sound management strategy submitted as part of the application, Document Reference J16), secured in the deemed marine licence, to reduce the magnitude associated with significant impacts (in this case to negligible or low) such that there will be no residual significant effect for the project alone. In doing so, this is anticipated to reduce the significance of effect to herring to minor adverse. Other tier 2 projects are also likely to implement mitigation measures such as soft starts which will further reduce any potential impacts on herring. Therefore the abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, will be maintained.

1.6.4.18 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC as a result of underwater sound impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC

1.6.4.19 Any in-combination effects are predicted to be of relatively short-term duration, intermittent over the construction phase of the Mona Offshore Wind Project and diadromous fish species are assessed as having low sensitivity to the impact (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.6.4.20 Adverse effects on the qualifying features which undermine the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC will not occur as a result of in-combination underwater sound. An assessment of the impact 'underwater sound impacting fish and shellfish receptors' against each relevant conservation objective (as presented in paragraph 1.6.2.18 to 1.6.2.19) is presented in Table 1.60. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.60: Conclusions against the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC for in-combination underwater sound.

Conservation objective	Conclusion
The parameters defined in the vision for the watercourse as defined in Countryside Council for Wales (2012) must be met.	There is no pathway for underwater sound associated with the Mona Offshore Wind Project to result in adverse effects on the habitats of the qualifying species. Therefore underwater sound associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the parameters defined in the vision for the watercourse as outlined in (Countryside Council for Wales (2008) from being met.
The SAC feature populations will be stable or increasing over the long term. **The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.**	Given that underwater sound impacts associated with the Mona Offshore Wind Project in-combination with other projects will be intermittent, all projects are likely to implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the impact, the feature populations within the site will not be prevented from remaining stable or increasing in the long term. The feature's natural range will neither be reduced or is likely to be reduced in the foreseeable future.
There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis.	There is no pathway for underwater sound in-combination effects to affect the habitats of the qualifying features, therefore, there will be no reduction in the area or quality of habitat for the feature populations in the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC on a long-term basis.
All factors affecting the achievement of these conditions are under control.	Given that the in-combination assessment has concluded that underwater sound impacts will not undermine any of the above conservation objectives, it follows that all factors affecting the achievement of these conditions will remain under control.

1.6.4.21 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Dee and Bala Lake/Dyfrdwy a Llyn Tegid SAC as a result of underwater sound impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Ehen SAC

1.6.4.22 The in-combination effect on diadromous fish is predicted to be of relatively short-term duration and intermittent over the construction phase of the Mona Offshore Wind Project. Diadromous fish species are assessed as having low sensitivity to the impact (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)), thereby adverse effects on freshwater pearl mussel features, for which diadromous fish are the host species, are not predicted to occur. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.6.4.23 Adverse effects on the qualifying features which undermine the conservation objectives of the River Ehen SAC will not occur as a result of in-combination underwater sound. An assessment of the impact 'underwater sound impacting fish and shellfish receptors' against each relevant conservation objective (as presented in paragraph 1.6.2.26) is presented in Table 1.61. Where the justifications and supporting

evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.61: Conclusions against the conservation objectives of the River Ehen SAC for in-combination underwater sound

Conservation objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects to affect the habitats of the qualifying features, therefore the extent and distribution, structure and function and supporting processes on which the habitats of qualifying species rely will not be prevented from being maintained or restored.
Th populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that underwater sound associated with the Mona Offshore Wind Project in-combination with other projects will be intermittent, all projects are likely to implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the impact, the populations and distributions of the qualifying species will not be prevented from being maintained or restored.

1.6.4.24 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Ehen SAC as a result of underwater sound impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Eden SAC

1.6.4.25 The in-combination effect is predicted to be of relatively short-term duration, intermittent over the construction phase of the Mona Offshore Wind Project and diadromous fish species are assessed as having low sensitivity to the impact (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.6.4.26 Adverse effects on the qualifying features which undermine the conservation objectives of the River Eden SAC will not occur as a result of in-combination underwater sound. An assessment of the impact ‘underwater sound impacting fish and shellfish receptors’ against each relevant conservation objective (as presented in paragraph 1.6.2.32 to 1.6.2.33) is presented in Table 1.62. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.62: Conclusions against the conservation objectives of the River Eden SAC for in-combination underwater sound.

Conservation objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects to affect the habitats of the qualifying features, therefore the extent and distribution, structure and function and supporting processes on which the habitats of qualifying species rely will not be prevented from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that underwater sound associated with the Mona Offshore Wind Project in-combination with other projects will be intermittent, all projects are likely to implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect, the populations and distributions of the qualifying species will not be prevented from being maintained or restored.

1.6.4.27 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Eden SAC as a result of underwater sound impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Afon Gwyrfai a Llyn Cwellyn SAC

1.6.4.28 The in-combination effect is predicted to be of relatively short-term duration, intermittent over the construction phase of the Mona Offshore Wind Project and diadromous fish species are assessed as having low sensitivity to the impact (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.6.4.29 Adverse effects on the qualifying features which undermine the conservation objectives of the Afon Gwyrfai a Llyn Cwellyn SAC will not occur as a result of in-combination underwater sound. An assessment of the impact ‘underwater sound’ against each relevant conservation objective (as presented in paragraph 1.6.2.37) is presented in Table 1.63. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.63: Conclusions against the conservation objectives of the Afon Gwyrfai a Llyn Cwellyn SAC for in-combination underwater sound.

Conservation objective	Conclusion
The conservation objective for the water course must be met.	Considering the distance from the Mona Offshore Wind Project to the Afon Gwyrfai a Llyn Cwellyn SAC (92 km) and the nature of the impact there is no pathway for effects to the watercourse to occur. Therefore, underwater sound effect will not prevent the conservation objectives for the water course from being met.
The population of the feature in the SAC is stable or increasing over the long term. **The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.**	Given that underwater sound associated with the Mona Offshore Wind Project in-combination with other projects will be intermittent, all projects are likely to implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the impact, the population of the qualifying species will not be prevented from remaining stable or increasing in the long term. The natural range of the feature in the SAC will neither be reduced nor is likely to be reduced for the foreseeable future.
The Gwyrfai will continue to be a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.	There is no pathway for sound in-combination effects to affect the habitats of the SAC, the Gwyrfai will continue to be a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis.

1.6.4.30 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Afon Gwyrfai a Llyn Cwellyn SAC as a result of underwater sound impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Kent SAC

1.6.4.31 The in-combination effect is predicted to be of relatively short-term duration, intermittent over the construction phase of the Mona Offshore Wind Project and Annex II diadromous fish (in this case Atlantic salmon which is considered to be the host species for the freshwater pearl mussel feature of the River Kent SAC) are assessed as having low sensitivity to the impact (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project will are likely to mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.6.4.32 Adverse effects on the qualifying features which undermine the conservation objectives of the River Kent SAC will not occur as a result of in-combination underwater sound. An assessment of the impact 'underwater sound impacting fish and shellfish receptors' against each relevant conservation objective (as presented in paragraph 1.6.2.41 to 1.6.2.42) is presented in Table 1.64. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.64: Conclusions against the conservation objectives of River Kent SAC for in-combination underwater sound.

Conservation objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects to affect the habitats of the qualifying features, therefore the extent and distribution, structure and function and supporting processes on which the habitats of qualifying species rely will not be prevented from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that underwater sound associated with the Mona Offshore Wind Project in-combination with other projects will be intermittent, all projects are likely to implement mitigation measures such as soft starts in-combination impacts are not predicted to result in adverse impacts on Atlantic salmon (the host species for freshwater pearl mussel within the River Kent SAC) Therefore, the populations and distributions of the freshwater pearl mussel feature will not be prevented from being maintained or restored.

1.6.4.33 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Kent SAC as a result of underwater sound impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Derwent and Bassenthwaite Lake SAC

1.6.4.34 The in-combination effect is predicted to be of relatively short-term duration, intermittent over the construction phase of the Mona Offshore Wind Project and diadromous fish species are assessed as having low sensitivity to the impact (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.6.4.35 Adverse effects on the qualifying features which undermine the conservation objectives of the River Derwent and Bassenthwaite Lake SAC will not occur as a result of in-combination underwater sound. An assessment of the impact ‘underwater sound impacting fish and shellfish receptors’ against each relevant conservation objective (as presented in paragraph1.6.2.48 to 1.6.2.49) is presented in Table 1.65. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.65: Conclusions against the conservation objectives of the River Derwent and Bassenthwaite Lake SAC for in-combination underwater sound.

Conservation objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects to affect the habitats of the qualifying features, therefore the extent and distribution, structure and function and supporting processes on which the habitats of qualifying species rely will not be prevented from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that underwater sound associated with the Mona Offshore Wind Project in-combination with other projects will be intermittent, all projects are likely to implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the impact, the populations and distributions of the qualifying species will not be prevented from being maintained or restored.

1.6.4.36 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Derwent and Bassenthwaite Lake SAC as a result of underwater sound impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Solway Firth SAC

1.6.4.37 The in-combination effect is predicted to be of relatively short-term duration, intermittent over the construction phase of the Mona Offshore Wind Project and diadromous fish species are assessed as having low sensitivity to the impact (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.6.4.38 Adverse effects on the qualifying features which undermine the conservation objectives of the Solway Firth SAC will not occur as a result of in-combination underwater sound. An assessment of the impact ‘underwater sound impacting fish and shellfish receptors’ against each relevant conservation objective (as presented in paragraph 1.6.2.54 to 1.6.2.55) is presented in Table 1.66. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.66: Conclusions against the conservation objectives of Solway Firth SAC for in-combination underwater sound.

Conservation objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects to affect the habitats of the qualifying features, therefore the extent and distribution, structure and function and supporting processes on which the habitats of qualifying species rely will not be prevented from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that underwater sound associated with the Mona Offshore Wind Project in-combination with other projects will be intermittent, all projects are likely to implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the impact, the populations and distributions of the qualifying species will not be prevented from being maintained or restored.

1.6.4.39 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Solway Firth SAC as a result of underwater sound impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Bladnoch SAC

1.6.4.40 The in-combination effect is predicted to be of relatively short-term duration, intermittent over the construction phase of the Mona Offshore Wind Project and diadromous fish species are assessed as having low sensitivity to the impact (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.6.4.41 Adverse effects on the qualifying features which undermine the conservation objectives of the River Bladnoch SAC will not occur as a result of in-combination underwater sound. An assessment of the impact 'underwater sound impacting fish and shellfish receptors' against each relevant conservation objective (as presented in paragraph 1.6.2.59) is presented in Table 1.67. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.67: Conclusions against the conservation objectives of River Bladnoch SAC for in-combination underwater sound.

Conservation objective	Conclusion
Restore the population of the species, including range of genetic types, as a viable component of the site. **Restore the distribution of the species throughout the site.**	Given that underwater sound associated with the Mona Offshore Wind Project in-combination with other projects will be intermittent, all projects will likely implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the impact, the population of the qualifying species will not be prevented from being restored as a viable component of the site. The distribution of the qualifying species will not be prevented from being restored throughout the site.
Restore the habitats supporting the species within the site and availability of food.	There is no pathway for underwater sound in-combination effects to prevent the habitats supporting the species within the site and availability of food from being restored. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) concluded that impacts to herring (considered to be a prey species for Atlantic salmon) from underwater sound resulting from tier 2 projects were moderate adverse which is significant in EIA terms during the herring spawning season only. However, as stated for the project alone assessment, herring is predicted to form only a very small proportion of Atlantic salmon's diet and Atlantic salmon are predicted to be able to switch prey to other species such as sprat, flounder and small gadoids. The development of an Underwater sound management strategy with an Outline underwater sound management strategy submitted as part of the application, Document Reference J16), secured in the deemed marine licence, to reduce the magnitude associated with significant impacts (in this case to negligible or low) such that there will be no residual significant effect for the project alone. In doing so, this is anticipated to reduce the significance of effect to herring to minor adverse. Other tier 2 projects are also likely to implement mitigation measures such as soft starts which will further reduce any potential impacts on herring. Therefore in-combination underwater sound will not prevent the habitats supporting the species within the site and availability of food from being restored.

1.6.4.42 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Bladnoch SAC as a result of underwater sound impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination EMF from subsea electric cables

1.6.4.43 There is potential for EMF impacts as a result of activities associated with the Mona Offshore Wind Project during the operations and maintenance phase, in-combination with activities associated with the following projects/plans: tier 1 Awel y Môr Offshore Wind Farm; the tier 2 Morecambe Offshore Windfarm Generation Assets, Morgan Offshore Wind Project Generation Assets, the Morgan and Morecambe Offshore Wind Farms Transmission Assets, and the Mooir Vannin Offshore Wind Farm and the tier 3 MaresConnect Wales-Ireland Interconnector Cable.

Operations and maintenance phase

Tier 1

1.6.4.44 The maximum EMF impacts associated with the tier 1 Awel y Môr Offshore Wind Farm will originate from the project's inter-array, interconnector, and offshore export cables, which have the potential for creating a long-term in-combination effect with the cables of the Mona Offshore Wind Project during the 35-year operational lifetime of the Mona Offshore Wind Project. For the Awel y Môr Offshore Wind Farm this is likely to result from the operation of the 145 km of inter-array cables, and 81 km of export cables (RWE, 2021a). The minimum burial depth for cables for Awel y Môr is planned to be 1 m, likely limiting EMFs to the range of up to 10 m from the cable, in line with the predictions for the Mona Offshore Wind Project. It should be noted that, this is also considered to be the case for any cable crossings required with the Awel y Môr Offshore Wind Farm cables as crossings will be protected with cable protection and will therefore not result in the emissions of EMFs above what is be predicted for buried cables. There are also inter-array, interconnector, and offshore export cables associated with other tier 1 projects in the region, however all other tier 1 projects are operational and therefore considered part of the baseline. These other tier 1 projects have not been assessed here.

1.6.4.45 In summary, in-combination impacts from EMF associated with Awel y Môr Offshore Wind Farm and the Mona Offshore Wind Project will be spatially limited and restricted to within the relevant project boundaries (EMF are expected to extend up to 10 m from the cables as outlined in paragraph 1.6.4.44). The Awel y Môr Offshore Wind Farm is located 13.52 km and 3.6 km from the Mona Array Area and Mona Offshore Cable Corridor, respectively, therefore in-combination impacts associated with the Mona Offshore Cable Corridor could potentially occur. However, considering the location of the SACs with Annex II fish features considered in Figure 1.13, these potential in-combination EMF impacts will not lead to barriers to migration to/from any of the relevant SACs. Cables associated with both projects are also predicted be buried or have cable protection which will also act to increase the distance between the cable and the water column, thereby reducing the potential for in-combination impacts on Annex II diadromous fish to occur.

Tier 2

1.6.4.46 The maximum EMF impacts associated with the tier 2 projects will originate from the inter-array and interconnector cables of the Morgan Offshore Wind Project Generation Assets and the Morecambe Offshore Windfarm Generation Assets, and the Morgan and Morecambe Transmission Assets. For the Morgan Offshore Wind Project this is likely to result from the operation of the 450 km and 500 km of 66 kV to 132 kV inter-array cables respectively, and up to 60 km of 275 kV HVAC interconnector cable. The minimum burial depth for cables will be 0.5 m, likely limiting EMFs to the range of metres from the cable, with impacts expected to be similar to the Mona Offshore Wind Project, due to the similar sizes and extents of the projects (Morgan Offshore Wind Ltd, 2023). In-combination effects will be long-term for the duration of the overlapping operations and maintenance phases.

1.6.4.47 For the Morecambe Offshore Windfarm, the maximum EMF impacts will originate from the inter-array and interconnector cables. This is likely to result from the operation of up to 110 km of up to 132 kV inter-array cables and 10 km of up to 132 kV platform link cables. The burial depth for cables will be between 0.5 and 3 m with a target burial depth of 1.5 m.

1.6.4.48 For the Morgan and Morecambe Offshore Wind Farms Transmission Assets, there will be up to 60 km of 275 kV HVAC interconnector cable and up to 610 km of 220 kV or 275 kV HVAC offshore export cables. The minimum burial depth for cables will be 0.5 m. These HVAC interconnector cables are considered in assessments for the Morgan offshore Wind Project Generation Assets, Morecambe Offshore Windfarm Generation Assets and the Morecambe Offshore Wind Farms Transmission Assets, therefore this assessment is deemed to be highly conservative.

1.6.4.49 The operation and maintenance phases of the Mooir Vannin Offshore Wind Farm will temporally overlap with the operations and maintenance phase of the Mona Offshore Wind Project, resulting in an in-combination effect. Specifically, the Mooir Vannin Offshore Wind Farm inter-array, interconnector and export cables are expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available for either project. However, cables are likely to be buried or positioned under cable protection to minimise EMF emissions such that the overall potential in-combination effect is expected to be small and limited to directly around the cables, with very little overlap between them and the Mona Offshore Wind Project.

1.6.4.50 As outlined in paragraph 1.6.4.44, any cable crossings associated with the tier 2 projects will have cable protection and will therefore not result in the emissions of EMFs above what is be predicted for buried cables in paragraph 1.6.4.44.

1.6.4.51 In summary, in-combination impacts from EMF associated Morgan Offshore Wind Project Generation Assets and the Morecambe Offshore Windfarm Generation Assets, and the Morgan and Morecambe Offshore Windfarms: Transmission Assets and the Mona Offshore Wind Project will be spatially limited and restricted to within the relevant project boundaries (EMFs are expected to extend up to 10 m from the cables as outlined in paragraph 1.6.4.44). The Morgan Offshore Wind Project Generation Assets is located 3.6 km from the Mona Array Area, the Morecambe Offshore Windfarm Generation Assets is located 8.9 km from the Mona Array Area and the Morgan and Morecambe Offshore Windfarms: Transmission Assets is located 8.9 km from the Mona Array Area therefore in-combination impacts associated with these projects and the relevant Mona infrastructure could potentially occur. It should be noted, however, that none of the cables associated with these projects will overlap so the EMF effects associated with each project are considered to be sufficiently localised that they will not act together in such a way so as to increase the effect over the wider area for diadromous fish. Considering the location of the SACs with Annex II fish features shown in Figure 1.13, potential in-combination EMF impacts will not lead to barriers to migration to/from any of the relevant SACs. Cables associated with all projects are also predicted be buried or have cable protection which will also act to increase the distance between the cable and the water column, thereby reducing the potential for in-combination impacts on Annex II diadromous fish to occur.

Tier 3

1.6.4.52 The proposed operation of the MaresConnect Interconnector Cable will temporally overlap with the operations and maintenance phase of the Mona Offshore Wind Project, potentially resulting in long-term in-combination effect. Specifically, the MaresConnect Wales-Ireland Interconnector Cable is expected to continuously produce EMFs during operation, although exact specifications are not currently publicly available for the project. However, the overall potential in-combination effect is expected to be small and limited to directly around the cables, with very little overlap between them and the Mona Offshore Wind Project.

1.6.4.53 As outlined in paragraph 1.6.4.44, any cable crossings required for the MaresConnect Interconnector Cable and the Mona Offshore Wind Project cables will have cable protection and will therefore not result in the emissions of EMFs above what is be predicted for buried cables in paragraph 1.6.4.44.

1.6.4.54 The MaresConnect Interconnector Cable is located 16.4 km from the Mona Array Area and overlaps with the Mona Offshore Cable Corridor, therefore there is potential for in-combination EMF impacts to occur. However, considering the location of the SACs with Annex II fish features considered in Figure 1.13, these potential in-combination EMF impacts will not lead to barriers to migration to/from any of the relevant SACs. Cables associated with the MaresConnect Interconnector Cable are also predicted be buried or have cable protection in situ which will also act to increase the distance between the cable and the water column, thereby reducing the potential for in-combination impacts on Annex II diadromous fish to occur.

Dee Estuary/Aber Dyfrdwy SAC

1.6.4.55 Whilst any in-combination effects are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability from EMF effects. EMF effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea cables as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect are likely to implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMFs, thereby reducing the effect of EMFs on diadromous fish.

Conclusions

1.6.4.56 Adverse effects on the qualifying features which undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC will not occur as a result of in-combination EMF. An assessment of the impact 'EMF' against each relevant conservation objective (as presented in paragraph 1.6.2.8 to 1.6.2.10) is presented in Table 1.68. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.68: Conclusions against the conservation objectives of Dee Estuary/Aber Dyfrdwy SAC for in-combination EMF from subsea electric cables.

Conservation objective	Conclusion
The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee is unobstructed by physical barriers and/or poor water quality.	EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent, all projects will likely implement mitigation measures such as cable burial. In addition, Annex II diadromous fish are considered to have low sensitivity to EMF. The migratory passage of both adult and juvenile river lamprey/sea lamprey through the Dee Estuary between Liverpool Bay and the River Dee will therefore remain unobstructed by physical barriers and/or poor water quality.

Conservation objective	Conclusion
The five year mean count of river lampreys recorded by the Chester Weir fish trap is no less than 55 under the monitoring regime in use prior to notification (i.e. 100% of the mean annual count during the five years for which data are available prior to notification: 1993, 1997 to 2000).	Given that EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent, all projects are likely to implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of lamprey species will not be reduced.
The abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, is maintained.	Given that EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent, all projects are likely to implement mitigation measures such as cable burial, the abundance of prey species forming the river lamprey/sea lamprey's food resource within the estuary, will be maintained.

1.6.4.57 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC as a result of EMF impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC

1.6.4.58 Whilst any in-combination effects are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability from EMF effects. EMF effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea cables as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect are likely to implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMFs, thereby reducing the effect of EMFs on diadromous fish.

Conclusions

1.6.4.59 Adverse effects on the qualifying features which undermine the conservation objectives of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC will not occur as a result of in-combination EMF. An assessment of the impact 'EMF' against each relevant conservation objective (as presented in paragraph 1.6.2.18 to 1.6.2.19) is presented in Table 1.69. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.69: Conclusions against the conservation objectives of River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC for in-combination EMF from subsea electric cables.

Conservation objective	Conclusion
The parameters defined in the vision for the watercourse as defined in Countryside Council for Wales (2008) must be met.	There is no pathway for EMF associated with the Mona Offshore Wind Project to result in adverse effects on the habitats of the qualifying species. Therefore, EMF associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the parameters

Conservation objective	Conclusion
	defined in the vision for the watercourse as outlined in Countryside Council for Wales (2008) from being met.
The SAC feature populations will be stable or increasing over the long term **The natural range of the features in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.**	Given that EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent. all projects are likely to implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the feature populations within the site will not be prevented from remaining stable or increasing in the long term. The feature's natural range will neither be reduced or likely be reduced in the foreseeable future.
There will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis.	There is no pathway for EMF in-combination effects to affect the habitats of the qualifying features, there will be no reduction in the area or quality of habitat for the feature populations in the SAC on a long-term basis.
All factors affecting the achievement of these conditions are under control.	Given that the in-combination assessment has concluded that EMF impacts will not undermine any of the above conservation objectives, it follows that all factors affecting the achievement of these conditions will remain under control.

1.6.4.60 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC as a result of EMF impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Ehen SAC

1.6.4.61 Whilst any in-combination effects are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability from EMF effects. EMF effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea cables as they are pelagic and swim in the water column rather than along the seabed. On the basis of no adverse impacts to the host species, adverse impacts to freshwater pearl mussel are also not predicted to occur. All projects which may contribute to an in-combination effect are likely to implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMFs, thereby reducing the effect of EMFs on diadromous fish.

Conclusions

1.6.4.62 Adverse effects on the qualifying features which undermine the conservation objectives of the River Ehen SAC will not occur as a result of in-combination EMF. An assessment of the impact 'EMF' against each relevant conservation objective (as presented in paragraph 1.6.2.26 to 1.6.2.54) is presented in Table 1.70. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.70: Conclusions against the conservation objectives of River Ehen SAC for in-combination EMF from subsea electric cables.

Conservation objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for EMF in-combination effects to affect the habitats of the qualifying features, therefore the extent and distribution, structure and function or the supporting processes of the habitats of qualifying species will not be prevented from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent. all projects are likely to implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population or the distribution of the qualifying species will not be prevented from being maintained or restored.

1.6.4.63 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Ehen SAC as a result of EMF impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Eden SAC

1.6.4.64 Whilst any in-combination effects are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability from EMF effects. EMF effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea cables as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect are likely to implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMFs, thereby reducing the effect of EMFs on diadromous fish.

Conclusions

1.6.4.65 Adverse effects on the qualifying features which undermine the conservation objectives of the River Eden SAC will not occur as a result of in-combination EMF. An assessment of the impact ‘EMF’ against each relevant conservation objective (as presented in paragraph 1.6.2.32 to 1.6.2.33) is presented in Table 1.71. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.71: Conclusions against the conservation objectives of River Eden SAC for in-combination EMF from subsea electric cables.

Conservation objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for EMF in-combination effects to affect the habitats of the qualifying features, therefore the extent and distribution, structure and function or the supporting processes of the habitats of qualifying species will not be prevented from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent, all projects are likely to implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population or distribution of the qualifying species will not be prevented from being maintained or restored.

1.6.4.66 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Eden SAC as a result of EMF impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Afon Gwyrfai a Llyn Cwellyn SAC

1.6.4.67 Whilst any in-combination effects are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability from EMF effects. EMF effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea cables as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect are likely to implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMFs, thereby reducing the effect of EMFs on diadromous fish.

Conclusions

1.6.4.68 Adverse effects on the qualifying features which undermine the conservation objectives of the Afon Gwyrfai a Llyn Cwellyn SAC will not occur as a result of in-combination EMF. An assessment of the impact 'EMF' against each relevant conservation objective (as presented in paragraph 1.6.2.37) is presented in Table 1.72. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.72: Conclusions against the conservation objectives of Afon Gwyrfai a Llyn Cwellyn SAC for in-combination EMF from subsea electric cables.

Conservation objective	Conclusion
The conservation objective for the water course must be met.	Considering the distance from the Mona Offshore Wind Project to the Afon Gwyrfai a Llyn Cwellyn SAC (92 km) and the nature of the impact there is no pathway for effects to the watercourse to occur. Therefore EMF in-combination effects will not prevent the conservation objectives for the water course from being met.
The population of the feature in the SAC is stable or increasing over the long term. **The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for the foreseeable future.**	Given that EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent. all projects are likely to implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of the qualifying species will not be prevented from remaining stable or increasing in the long term. The natural range of the feature in the SAC will neither be reduced nor is likely to be reduced for the foreseeable future. The Gwyrfai will continue to be a sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis. There is no pathway for EMF in-combination effects to affect the habitats of the SAC, the Gwyrfai will continue to be a sufficiently large habitat to maintain the feature's population in the Afon Gwyrfai a Llyn Cwellyn SAC on a long-term basis.

1.6.4.69 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Afon Gwyrfai a Llyn Cwellyn SAC as a result of EMF impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Kent SAC

1.6.4.70 Whilst any in-combination effects are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species (in this case Atlantic salmon which is considered to be the host species for freshwater pearl mussel within the River Kent SAC) have been assessed as having low sensitivity and high recoverability from EMF effects. EMF effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea cables as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect are likely to implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMFs, thereby reducing the effect of EMFs on diadromous fish. On the basis of no adverse impacts to the host species, adverse impacts to freshwater pearl mussel are also not predicted to occur.

Conclusions

1.6.4.71 Adverse effects on the qualifying features which undermine the conservation objectives of the River Kent SAC will not occur as a result of in-combination EMF. An assessment of the impact 'EMF' against each relevant conservation objective (as presented in paragraph 1.6.2.41 to 1.6.2.42) is presented in Table 1.73. Where the

justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.73: Conclusions against the conservation objectives of River Kent SAC for in-combination EMF from subsea electric cables.

Conservation objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for EMF in-combination effects to affect the habitats of the qualifying features, therefore the extent and distribution, structure and function or the supporting processes of the habitats of qualifying species will not be prevented from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent. all projects are likely to implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population and distribution of the qualifying species will not be prevented from being maintained or restored.

1.6.4.72 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Kent as a result of EMF impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Derwent and Bassenthwaite Lake SAC

1.6.4.73 Whilst any in-combination effects are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability from EMF effects. EMF effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea cables as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect are likely to implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMFs, thereby reducing the effect of EMFs on diadromous fish.

Conclusions

1.6.4.74 Adverse effects on the qualifying features which undermine the conservation objectives of the SAC will not occur as a result of in-combination EMF. An assessment of the impact ‘EMF’ against each relevant conservation objective (as presented in paragraph 1.6.2.48 to 1.6.2.49) is presented in Table 1.74. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.74: Conclusions against the conservation objectives of River Derwent and Bassenthwaite Lake SAC for in-combination EMF from subsea electric cables.

Conservation objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for EMF in-combination effects to affect the habitats of the qualifying features, therefore the extent and distribution, structure and function or the supporting processes of the habitats of qualifying species will not be prevented from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent. all projects are likely to implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population or distributions of the qualifying species will not be prevented from being maintained or restored.

1.6.4.75 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Derwent and Bassenthwaite Lake SAC as a result of EMF impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Solway Firth SAC

1.6.4.76 Whilst any in-combination effects are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability from EMF effects. EMF effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea cables as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect are likely to implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMFs, thereby reducing the effect of EMFs on diadromous fish.

Conclusions

1.6.4.77 Adverse effects on the qualifying features which undermine the conservation objectives of the SAC will not occur as a result of in-combination EMF. An assessment of the impact ‘EMF’ against each relevant conservation objective (as presented in paragraph 1.6.2.54 to 1.6.2.55) is presented in Table 1.75. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.75: Conclusions against the conservation objectives of Solway Firth SAC for in-combination EMF from subsea electric cables.

Conservation objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for EMF in-combination effects to affect the habitats of the qualifying features, therefore the extent and distribution, structure and function or the supporting processes of the habitats of qualifying species will not be prevented from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent. all projects are likely to implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population and distribution of the qualifying species will not be prevented from being maintained or restored.

1.6.4.78 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Solway Firth SAC as a result of EMF impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

River Bladnoch SAC

1.6.4.79 Whilst any in-combination effects are predicted to be of long term duration, and continuous during the operation of the relevant projects, they are also predicted to be of local spatial extent. Diadromous fish species have been assessed as having low sensitivity and high recoverability from EMF effects. EMF effects will be confined to the close vicinity of cables for all relevant projects and diadromous fish species are considered to be less likely to interact with emitted EMF from subsea cables as they are pelagic and swim in the water column rather than along the seabed. All projects which may contribute to an in-combination effect are likely to implement mitigation including cable burial. The burial of cables will increase the distance between cables and diadromous fish, the increased distance will attenuate EMFs, thereby reducing the effect of EMFs on diadromous fish.

Conclusions

1.6.4.80 Adverse effects on the qualifying features which undermine the conservation objectives of the River Bladnoch SAC will not occur as a result of in-combination EMF. An assessment of the impact 'EMF' against each relevant conservation objective (as presented in paragraph 1.6.2.59) is presented in Table 1.76. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.76: Conclusions against the conservation objectives of River Bladnoch SAC for in-combination EMF from subsea electric cables.

Conservation objective	Conclusion
Restore the population of the species, including range of genetic types, as a viable component of the site. **Restore the distribution of the species throughout the site.**	Given that EMF effects associated with the Mona Offshore Wind Project in-combination with other projects will be localised in spatial extent. all projects are likely to implement mitigation measures such as cable burial and that Annex II diadromous fish are considered to have low sensitivity to EMF, the population of the qualifying species will not be prevented from being restored as a viable component of the site. The distribution of the qualifying species will not be prevented from being restored throughout the site.
Restore the habitats supporting the species within the site and availability of food.	There is no pathway for EMF in-combination effects to affect the habitats of the qualifying features, therefore the habitats supporting the species within the sites and availability of food will not be prevented from being restored.

1.6.4.81 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the River Bladnoch SAC as a result of EMF impacts with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

1.7 Assessment of potential Adverse Effect on Integrity: Annex II marine mammals

1.7.1 Overview

1.7.1.1 Screening of European sites (HRA Stage 1 Screening Report (Document Reference E1.4)), together with consultation feedback from NRW (see section 1.3), identified potential for LSEs on the qualifying Annex II marine mammal features of all European sites within the same MU, as the Mona Offshore Wind Project for each Annex II marine mammal species.

1.7.1.2 The screening exercise (HRA Stage 1 Screening Report (Document Reference E1.4)) therefore identified the potential for LSEs on the European sites (Figure 1.14) designated for Annex II marine mammal features which are listed in Table 1.77.

Table 1.77: European sites and relevant Annex II marine mammal features for which the potential for LSE could not be ruled out and therefore considered in the Appropriate Assessment.

SAC/SCI	Annex II marine mammal features
Twelve sites in the United Kingdom	
North Anglesey Marine SAC	Harbour porpoise
North Channel SAC	Harbour porpoise
Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC	Bottlenose dolphin Grey seal
Strangford Lough SAC	Harbour seal
Murlough SAC	Harbour seal
Cardigan Bay/Bae Ceredigion SAC	Bottlenose dolphin
The Maidens SAC	Grey seal

SAC/SCI	Annex II marine mammal features
Pembrokeshire Marine/Sir Benfro Forol SAC	Grey seal
Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC	Harbour porpoise
Lundy SAC	Grey seal
Isles of Scilly Complex SAC	Grey seal
West Wales Marine/Gorllewin Cymru Forol SAC	Harbour porpoise
Four sites in Ireland	
Rockabill to Dalkey Island SAC	Harbour porpoise
Roaringwater Bay and Islands SAC	Harbour porpoise
Blasket Islands SAC	Harbour porpoise
Saltee Islands SAC	Grey seal
17 sites in France	
Mers Celtiques - Talus du golfe de Gascogne	Harbour porpoise
Abers - Côte des légendes	Harbour porpoise
Ouessant-Molène	Harbour porpoise
Côte de Granit rose-Sept-Iles	Harbour porpoise
Anse de Goulven, dunes de Keremma	Harbour porpoise
Tregor Goëlo	Harbour porpoise
Côtes de Crozon	Harbour porpoise
Chaussée de Sein	Harbour porpoise
Cap Sizun	Harbour porpoise
Récifs du talus du golfe de Gascogne	Harbour porpoise
Anse de Vauville	Harbour porpoise
Cap d'Erquy-Cap Fréhel	Harbour porpoise
Baie de Saint-Brieuc – Est	Harbour porpoise
Banc et récifs de Surtainville	Harbour porpoise
Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard	Harbour porpoise
Estuaire de la Rance	Harbour porpoise
Baie du Mont Saint Michel	Harbour porpoise

1.7.1.3 Following feedback from Natural England in the Marine Mammal EWG meetings for the Mona Offshore Wind Project, the potential for an adverse effect is considered for all Annex II marine mammal SACs located within English, English/Welsh waters and Northern Irish waters (sections 1.7.3 and 1.7.4). However, for European sites located exclusively in Welsh, Irish or French waters, the approach recommended by NRW has been adopted. The recommended approach by NRW follows an iterative process that

assesses, in the first instance, the impacts on the European site within the relevant MU for each qualifying species which is closest to the Mona Offshore Wind Project. The conclusion from the site closest to the Mona Offshore Wind Project is then applied to assess the remaining sites. In the event that the assessment concluded an adverse effect on integrity for the closest site, the next closest site should then be considered in full, and so on (NRW, 2022c). If it can be concluded that there is no adverse effect on integrity for the closest site, then any impact on European sites located at a greater distance from the Mona Offshore Wind Project would be of a lower magnitude and therefore an adverse effect on integrity can also be ruled out on those European sites. On the basis that there is no overlap with any SAC for marine mammals, for sites at increased distances from the Mona Offshore Wind Project the risks are very low and the key impacts will relate to disturbance effects (and consequential impacts to the characteristics of the population, viability of the species as a component of the site etc.) and therefore the conclusions made for the closest site are deemed applicable to the conservation objectives of all more distant sites for the same features. This iterative approach, as recommended by NRW, allows for a more proportionate HRA Stage 2 ISAA to be prepared, and ensures that the focus is on European sites for which potential impacts are considered to be greater.

1.7.1.4 As detailed in paragraph 1.7.1.3, the approach recommended by NRW advisory services for harbour porpoise was, in the first instance, to assess the impacts on the European site within the Celtic and Irish Seas MU which is closest to the Mona Offshore Wind Project (i.e. North Anglesey Marine/Gogledd Môn Forol SAC) and use those conclusions to assess the remaining sites. In the event that the assessment concluded an adverse effect on integrity for the closest site, the next closest site should then be considered, and so on. Therefore, the North Anglesey Marine/Gogledd Môn Forol SAC is assessed for relevant impacts in section 1.7.3.

1.7.1.5 The same approach has also been recommended for bottlenose dolphin within the Irish Sea MU, therefore Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC has been assessed below. The NRW position paper on the use of marine mammal MUS for screening and assessment in HRA for SACs with marine mammal features (NRW, 2022c) also suggests that Cardigan Bay/Bae Ceredigion SAC should be assessed based on photo-ID evidence which shows that most individual dolphins move between the two SACs, suggesting that the populations of the two SACs are highly connected, and that there is likely a single generic population across the management unit. The Cardigan Bay/Bae Ceredigion SAC has therefore also been considered in section 1.7.3.

1.7.1.6 For grey seal and harbour seal, as per the HRA Stage 1 Screening Report (Document Reference E1.4) and consultation with NRW, all sites within the relevant MUs for each species were brought forward to the HRA Stage 2 ISAA (i.e. the Wales MU, North West England MU, SW Scotland and Northern Ireland MU for grey seal and the Wales and North West England MU for harbour seal). The relevant MUs were also considered in parallel with the OSPAR Region III MU. Additional sites were also identified following feedback from NRW to consider foraging ranges from Carter *et al.* (2022) and telemetry data from (Wright and Sinclair, 2022). On this basis, for grey seal, the Isles of Scilly Complex SAC, Lundy SAC, The Maidens SAC and Saltee Islands SAC were carried forward to the HRA Stage 2 ISAA. For harbour seal, Strangford Lough SAC and Murlough SAC were also brought forward to this HRA Stage 2 ISAA. As above, an iterative approach to assessment will be undertaken starting with the closest site to the Mona Offshore Wind Project (Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC for grey seal and Strangford Loch SAC for harbour seal) being assessed in the first instance. In addition, in line with the NRW position paper (NRW, 2022c) the

Pembrokeshire Marine/Sir Benfro Forol SAC will also be considered as the SAC supports the greatest grey seal pupping within the Celtic and Irish Seas part of the OSPAR Region III area.

1.7.1.7 In light of paragraph 1.7.1.3 to 1.7.1.6, the list of the European sites considered in full for the Appropriate Assessment along with relevant Annex II marine mammal qualifying features are listed in Table 1.78.

Table 1.78: List of the European sites considered in full for the Appropriate Assessment along with relevant Annex II marine mammal qualifying features.

SAC	Annex II marine mammal features
North Anglesey Marine SAC	Harbour porpoise
North Channel SAC	Harbour porpoise
Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC	Bottlenose dolphin Grey seal
Strangford Lough SAC	Harbour seal
Murlough SAC	Harbour seal
Cardigan Bay/Bae Ceredigion SAC	Bottlenose dolphin
The Maidens SAC	Grey seal
Pembrokeshire Marine/Sir Benfro Forol SAC	Grey seal
Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC	Harbour porpoise
Lundy SAC	Grey seal
Isles of Scilly Complex SAC	Grey seal

1.7.1.8 As outlined in paragraph 1.7.1.7, for the sites listed above a full assessment has been undertaken using information supplied in Volume 2 Chapter 9: Marine mammals of the Environmental Statement (Document Reference F2.4). For European sites located exclusively in Welsh, Irish or French waters an iterative approach has been followed, whereby a conclusion for the potential for an adverse effect is provided for each site based on the distance from the Mona Offshore Wind Project.

1.7.1.9 LSEs on these European sites were identified for the following impacts:

- During the construction and decommissioning phases
  - Injury and disturbance from underwater sound generated from piling
  - Injury and disturbance from underwater sound generation from UXO detonation
  - Injury and disturbance from underwater sound from pre-construction site investigation surveys
  - Injury and disturbance from underwater sound from vessels and other (non-piling) sound producing activities
  - Changes in fish and shellfish communities affecting prey availability
- During the operations and maintenance phase
  - Underwater sound from vessels and other vessel activities.

1.7.1.10 Baseline information is provided in section 1.7.2 for the European sites identified in paragraph 1.7.1.7, including information to support the Appropriate Assessment such as site descriptions, feature information, conservation objectives and condition assessments for the relevant European sites.

1.7.1.11 Section 1.7.3 presents the Stage 2 assessments (considering effects both alone and in-combination) for these European sites. A summary of all Appropriate Assessments undertaken within this report is provided in the concluding section of this report (section 1.8).

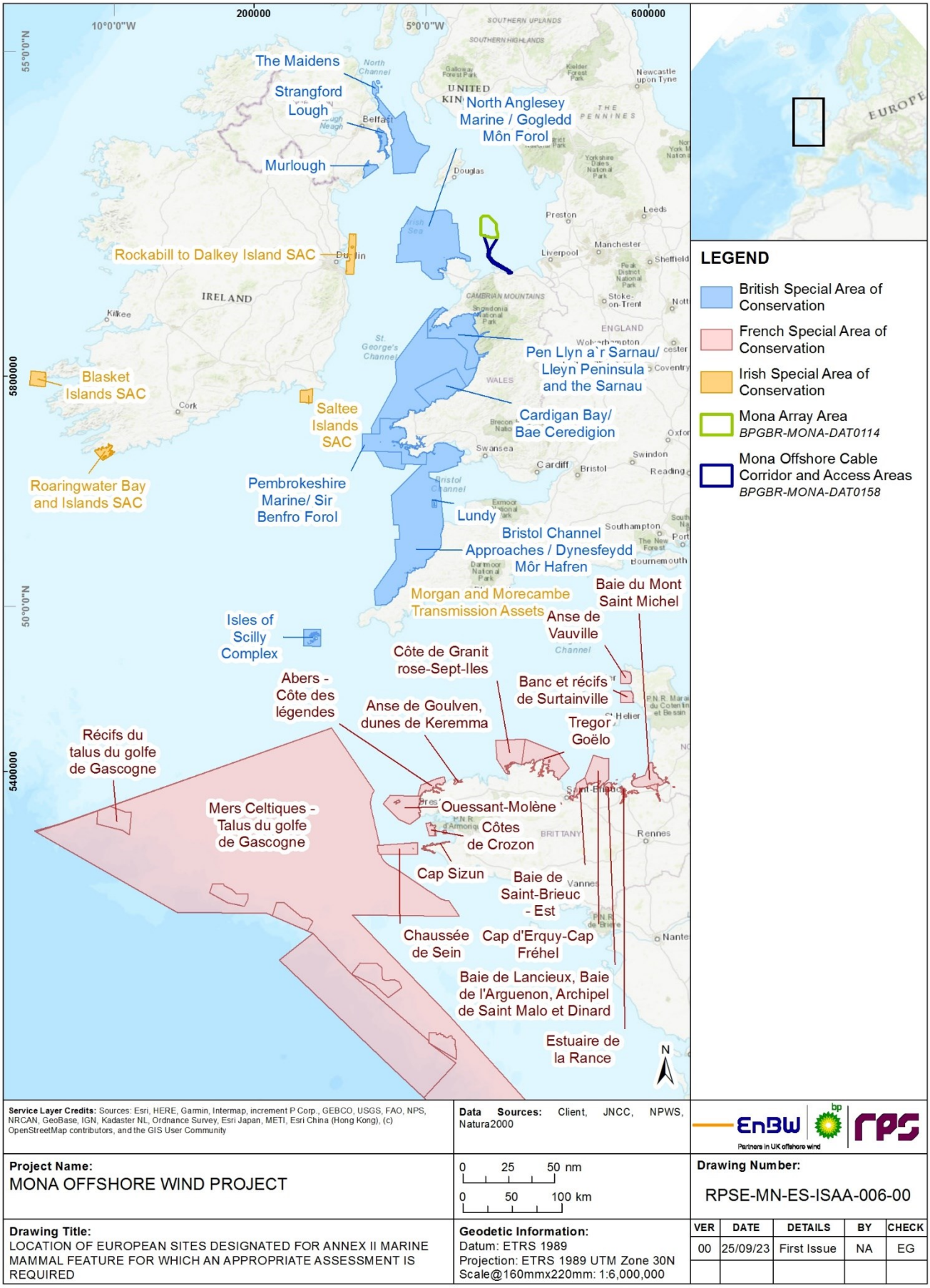

Figure 1.14: Location of European Sites designated for Annex II marine mammal features for which an Appropriate Assessment is required.

1.7.2 Baseline information

1.7.2.1 Baseline information on the Annex II marine mammal features of the European sites identified for further assessment within the HRA process has been gathered through a comprehensive desktop study of existing studies and datasets, using the latest available information on marine mammals in the Irish Sea. The baseline is informed by the 24-month site-specific aerial survey data and baseline characterisation presented in Volume 6, Annex 4.1: Marine mammal technical report of the Environmental Statement (Document Reference: F.6.4.1) and Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference: F2.4).

North Anglesey Marine/Gogledd Môn Forol SAC

Site description

1.7.2.2 The North Anglesey Marine/Gogledd Môn Forol SAC is 22.5 km away from the Mona Array Area and 17.5 km away from the Mona Offshore Cable Corridor and Access Areas. The North Anglesey Marine/Gogledd Môn Forol SAC covers an area of 3,249 km2 and extends from Anglesey in a northwest direction into the Irish Sea. The site is designated for harbour porpoise. Water depths within the site range from mean low water tide level to 100 m with average depths of around 40-50 km across the site (NRW and JNCC, 2016). Seabed substrates across the SAC include rock, coarse sediment, sand and muds. These physical characteristics of the site are well aligned to the environmental variables determining the probability of presence and the density of harbour porpoise and the site has been recognised as an area with predicted persistent high densities of harbour porpoise (NRW and JNCC, 2016). The SAC provides important summer habitat for porpoises and is identified as part of the top 10% persistent high density areas for the summer seasons within the UK (NRW and JNCC, 2016).

Feature accounts

Harbour porpoise

1.7.2.3 Harbour porpoise are the most common and widespread cetacean in Welsh waters (Baines and Evans, 2012) with hot spots identified off the Pembrokeshire coast; the Lleyn Peninsula (to a lesser extent); in south Cardigan Bay; and in the Bristol Channel off the south coast of Wales (around the Gower Peninsula and in Newport Bay) (Baines and Evans, 2012).

1.7.2.4 As outlined above, the North Anglesey Marine/Gogledd Môn Forol site was identified as being within the top 10% of persistent high density areas for harbour porpoise in UK waters during the summer season (Heinänen and Skov, 2015). The Small Cetacean Abundance in the North Sea (SCANS) SCANS-II surveys in 2005 estimated that the site supports approximately 1084 individuals (95% Confidence Interval: 557 to 2111) for at least part of the year and represents approximately 4% of the population within the UK part of the Celtic and Irish Sea MU (JNCC, NRW and DAERA, 2019). This however cannot be considered as a site population estimate as this estimate is from a one-month survey in a single year (JNCC, NRW and DAERA, 2019).

Condition assessment

1.7.2.5 There is no condition assessment available for the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC.

Conservation objectives

1.7.2.6 The conservation objectives as outlined in JNCC, NRW and Department for Environment, Food and Rural Affairs (DAERA) (2019)21 and considered in the assessment which are relevant to the harbour porpoise feature are outlined below.

1.7.2.7 To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining FCS for Harbour Porpoise in UK waters.

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

- Harbour porpoise is a viable component of the site
- There is no significant disturbance of the species
  - Noise disturbance within an SAC from a plan/project individually or in-combination is significant if it excludes harbour porpoises from more than:
    - 20% of the relevant area[22] of the site in any given day[23]
    - an average of 10% of the relevant area of the site over a season[24][25]
- The condition of supporting habitats and processes, and the availability of prey is maintained.

North Channel SAC

Site description

1.7.2.9 The North Channel SAC, which is 81.5 km away from the Mona Array Area and 94.5 km away from the Mona Offshore Cable Corridor and Access Areas, is located in between the North Channel and the northwest Irish Sea between Northern Ireland, Scotland and the Isle of Man and covers an area of 1,604 km2. The SAC runs along the east coast of Northern Ireland, connects with the Maidens SAC to the north and stands in proximity to the Murlough SAC and Strangford Lough SAC to the southwest. The SAC extends from coastal to offshore waters with most of the site ranging between 10 to 40 m deep with a maximum of 150 m to the east boundary. Seabed substrates across the SAC include mainly of coarse or sandy sediments, with patches of rock and mud and the site overlaps with the Pisces Reef Complex SAC.

[21] https://data.jncc.gov.uk/data/f4c19257-2341-46b3-8e29-49665cd8f3d2/NorthAnglesey-Conservation-Advice.pdf

[22] The relevant area is defined as that part of the SAC that was designated on the basis of higher persistent densities for that season (summer defined as April to September inclusive, winter as October to March inclusive).

[23] Applicable only in Habitats Regulations Assessments (HRA) due to impracticality of daily noise limit management of activities, but retrospective compliance analysis advised

[24] Summer defined as April to September inclusive, winter as October to March inclusive

[25] For example, a daily footprint of 19% for 95 days would result in an average of 19x95/183 days (summer) =9.86%

Feature accounts

Harbour porpoise

1.7.2.10 Harbour porpoise are listed as Annex II species present as a qualifying feature and a primary reason for site selection.

1.7.2.11 The site provides important winter habitat for harbour porpoise and some of the largest groups of harbour porpoise (up to 100 individuals) around Northern Ireland have been observed within the site. The site has been recognised as an area with predicted persistent high densities of harbour porpoise (IAMMWG, 2015). The SAC is estimated to support 1.2% of the UK Celtic and Irish Seas MU population and to be within the top 10% of persistent high density areas for the MU during the winter season (Heinänen and Skov, 2015). The SCANS-II surveys in 2005 estimated that the site supports approximately 537 individuals (95% Confidence Interval: 276 to 1046) for at least part of the year (JNCC and DAERA, 2017). This however cannot be considered as a site population estimate as this estimate is derived from a one-month survey in a single year (JNCC and DAERA, 2017).

Condition assessment

1.7.2.12 There is no condition assessment available for the harbour porpoise feature of the North Channel SAC at the time of writing.

Conservation objectives

1.7.2.13 The conservation objectives as outlined in JNCC and DAERA (2019)[26] and considered in the assessment which are relevant to the harbour porpoise feature are outlined below.

1.7.2.14 To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining FCS for harbour porpoise in UK waters.

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

- Harbour porpoise is a viable component of the site
- There is no significant disturbance of the species
  - Noise disturbance within an SAC from a plan/project individually or in-combination is significant if it excludes harbour porpoises from more than
    - 20% of the relevant area of the site in any given day
    - an average of 10% of the relevant area of the site over a season
- The condition of supporting habitats and processes, and the availability of prey is maintained.

Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau

Site description

1.7.2.16 The Pen Llŷn a'r Sarnau SAC is 94.1 km away from the Mona Array Area and 93 km away from the Mona Offshore Cable Corridor and Access Areas. The Pen Llŷn a'r

[26] https://data.jncc.gov.uk/data/be0492aa-f1d6-4197-be22-e9a695227bdb/NorthChannel-conservation-advice.pdf

Sarnau SAC is located in northwest Wales and extends from Nefyn on the north coast of Llŷn along the Meirionnydd coast to Clarach in Ceredigion south of the Dyfi estuary (NRW, 2018d). The site covers an area of about 146,023ha (NRW, 2018d).

1.7.2.17 The nature of the seabed and coast and the range of environmental conditions present vary throughout the SAC with great differences in rock and sediment type, aspect, sediment movement, exposure to tidal currents and wave action, water clarity and salinity throughout the site. This diverse environment has created a wide range of habitats and associated communities, some of which are unique to Wales (NRW, 2018d).

Feature accounts

1.7.2.18 Both bottlenose dolphin and grey seal are listed as Annex II species present as a qualifying feature, but not a primary reason for site selection. Accounts of each of the features are provided below.

Grey seal

1.7.2.19 Grey seals present within the SAC are thought to be a part of a wider north Wales population. Grey seals range throughout the open coast areas of the site and beyond but are commonly observed within the SAC around the Llŷn, Bardsey Island and the islands along the south Llŷn coast (NRW, 2018d).

1.7.2.20 The SAC contains several important pupping sites which are located around the northwest of the SAC including Bardsey Island, with the majority of pups born from September to October, but with some pupping activity occurring from early August to the end of November (NRW, 2018d). Haul-out sites are distributed throughout the SAC and non-pupping seals are present year-round at these haul out sites. Haul out sites are predominantly located on intertidal rocky outcrops, rock and boulder/cobble beaches, sea caves that are tidally exposed, and occasionally sandy beaches and tidally exposed sandflats (NRW, 2018d).

Bottlenose dolphin

1.7.2.21 Bottlenose dolphins do not form a discrete site-based population within the Lleyn Peninsula and the Sarnau SAC/Pen Llŷn a'r Sarnau SAC but are seen as part of a wider population that ranges across waters of southwest UK and Ireland, and includes the Cardigan Bay SAC (NRW, 2018d). Important characteristics relating to population dynamics are deemed to be common to bottlenose dolphins in both the Lleyn Peninsula and the Sarnau SAC/Pen Llŷn a'r Sarnau SAC and the Cardigan Bay/Bae Ceredigion/SAC as both sites are within Cardigan Bay. Population estimates for the bottlenose dolphins of the Cardigan Bay/Bae Ceredigion SAC in the years 2001 to 2007 (obtained from mark-recapture surveys), provided an estimate of 210 individuals for the population using Cardigan Bay SAC in 2007. A higher estimate of 379 individuals is made when calculated for the whole period 2001 to 2007 (NRW, 2018d).

1.7.2.22 As reported in Lohrengel *et al.* (2018) there has been an overall increase in the population size between 2001 to 2007 and a decline since then to 2001 levels but there is considerable variability between years and low confidence in some estimates (and the apparent trends are not significant). The decline in recent years may be related to animals moving away from the study area and spending the majority of their time in other parts of Wales or beyond. The population is said to be declining in the short term (10 years), but stable in the medium term (since 2001).

1.7.2.23 Bottlenose dolphins are present in Welsh coastal waters year round, with a strong peak in numbers in summer. In Cardigan Bay they are most commonly seen within 10 miles of the coast, and most concentrated within two miles near headlands and estuaries. Calving has been documented within Cardigan Bay and newborn and very young calves have been reported in the bay from April to September, suggesting a seasonal pattern to calving (NRW, 2018d).

Condition assessment

1.7.2.24 Table 1.79 outlines the indicative condition assessments of the relevant qualifying features of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, overall the condition assessment deemed that grey seal and bottlenose dolphin are in favourable condition although the condition of supporting habitats is currently unknown (NRW, 2022a)[27]. There are no activities identified as having a direct impact on the site condition (NRW, 2022a).

Table 1.79: Condition assessment of the relevant Annex II marine mammal features of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC.

Component of species feature assessed	Indicative assessment	Key evidence type used	Level of agreement	Confidence in evidence	Component confidence level
Grey seal					
Population (e.g. size, structure, production, condition of species within site, contaminant burdens)	Favourable	Reports and expert judgement	Medium	Medium	Medium
Range (within site)	Favourable	Reports and expert judgement	Medium	Medium	Medium
Bottlenose dolphin					
Population (e.g. size, structure, production, condition of species within site, contaminant burdens)	Favourable	Monitoring data, reports	Medium	Medium	Medium
Range (within site)	Favourable	Monitoring data, reports	Medium	Medium	Medium

Conservation objectives

1.7.2.25 The conservation objectives relevant for grey seal and bottlenose dolphin features of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC are outlined below (NRW, 2018d)[28].

1.7.2.26 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.9.3, conservation

[27] https://cdn.cyfoethnaturiol.cymru/media/684243/indicative-condition-assessment-2018-for-pen-llyn-ar-sarnau-sacv2.pdf

[28] https://cdn.cyfoethnaturiol.cymru/media/688001/eng-pen-llyn-ar-sarnau-reg-37-report-2018.pdf

objectives relating to the qualifying habitats of the SAC have been screened out in the HRA Stage 1 Screening Report (Document Reference E1.4).

1.7.2.27 To achieve favourable conservation status all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve favourable conservation status.

Typical Species

1.7.2.28 The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded. Important elements include:

- Species richness
- Population structure and dynamics
- Physiological heath
- Reproductive capacity
- Recruitment
- Mobility
- Range.

1.7.2.29 As part of this objective it should be noted that:

- Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum sustainable yield and secure in the long term
- The management and control of activities or operations likely to adversely affect the habitat feature is appropriate for maintaining it in favourable condition and is secure in the long term.

Restoration and recovery

1.7.2.30 As part of this objective it should be noted that; for the reefs feature the potential for expansion of the horse mussel *Modiolus modiolus* community off the north Llŷn coast is not inhibited.

Species Features

- Grey seal *Halichoerus* grypus
- Bottlenose dolphin *Tursiops truncatus*
- Otter *Lutra lutra*.

Populations

1.7.2.31 The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include:

- Population size
- Structure, production
- Condition of the species within the site.

1.7.2.32 As part of this objective it should be noted that for bottlenose dolphin and grey seal:

- Contaminant burdens derived from human activity are below levels that may cause physiological damage, or immune or reproductive suppression.

1.7.2.33 For grey seal populations should not be reduced as a consequence of human activity.

1.7.2.34 Important elements include:

- Population size
- Structure
- Production
- Condition of the species within the site.

1.7.2.35 As part of this objective it should be noted that for bottlenose dolphin and grey seal:

- Contaminant burdens derived from human activity are below levels that may cause physiological damage, or immune or reproductive suppression
- For grey seal populations should not be reduced as a consequence of human activity.

Range

1.7.2.36 The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.

1.7.2.37 As part of this objective it should be noted that for bottlenose dolphin and grey seal:

- Their range within the SAC and adjacent inter-connected areas is not constrained or hindered
- There are appropriate and sufficient food resources within the SAC and beyond
- The sites and amount of supporting habitat used by these species are accessible and their extent and quality is stable or increasing.

Supporting habitats and species

1.7.2.38 The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing. Important considerations include:

- Distribution
- Extent
- Structure
- Function and quality of habitat
- Prey availability and quality.

1.7.2.39 As part of this objective it should be noted that:

- The abundance of prey species subject to existing commercial fisheries needs to be equal to or greater than that required to achieve maximum sustainable yield and secure in the long term

- The management and control of activities or operations likely to adversely affect the species feature is appropriate for maintaining it in favourable condition and is secure in the long term
- Contamination of potential prey species should be below concentrations potentially harmful to their physiological health
- Disturbance by human activity is below levels that suppress reproductive success, physiological health or long-term behaviour.

1.7.2.40 For otter there are sufficient sources within the SAC and beyond of high-quality freshwater for drinking and bathing.

Restoration and recovery

1.7.2.41 As part of this objective, it should be noted that for the bottlenose dolphin and otter, populations should be increasing.

1.7.2.42 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.7.3, conservation objectives relating to the qualifying habitats of the SAC have been screened out in the HRA Stage 1 Screening Report (Document Reference E1.4).

Strangford Lough SAC

Site description

1.7.2.43 The Strangford Lough SAC, which is 112.2 km away from Mona Array Area and 125.1 km away from Mona Offshore Cable Corridor and Access Areas extends from the north end, 15 km east of Central Belfast, to Downpatrick in the southwest corner. The lough is a large marine inlet spanning 150 km^2 on the east coast of County Down, of which about 50 km^2 lies between high water mark mean tide and low water mark mean tide. The lough is separated from the Irish Sea by the Ards Peninsula to the east and is connected to the open sea by the Strangford Narrows. The triangular area around the lough mouth is exposed to high wave energy and this area has rock platforms, steeply-shelving rocky shores and a sandy seabed.

Feature accounts

Harbour seal

1.7.2.44 Harbour seal is a qualifying feature of the Strangford Lough SAC, however, is not a primary reason for site selection.

1.7.2.45 A review conducted by Culloch *et al.* (2018) reported that in Strangford Lough, there was a 2.01% and a 1.31% annual decrease in harbour seal adults and pups, respectively (using data from 1995 to 2014, inclusive). Although it is highly likely that varying effort across years and areas has played an influential role in the trends identified.

Condition assessment

1.7.2.46 Overall the condition assessment deemed that harbour seal are in unfavourable, declining condition although the condition of supporting habitats is currently unknown (Daera, 2019)[29].

Conservation objectives

1.7.2.47 The conservation objectives outlined in DAERA (2018a)[30] and considered in the assessment which are relevant to the harbour seal feature are outlined below.

- To maintain (or restore where appropriate) the harbour seal feature to favourable condition
- Maintain and enhance, as appropriate, the harbour seal population
- Maintain and enhance, as appropriate, physical features used by harbour seal within the site.

Murlough SAC

Site description

1.7.2.48 The Murlough SAC, which is 115.9 km away from Mona Array Area and 127.1 km away from Mona Offshore Cable Corridor and Access Areas, is located on the southeast coast of Northern Ireland. The SAC encompasses the shallow waters of the Dundrum Bay which represents the largest area of shallow sub-littoral sandbanks in Northern Ireland. The SAC spans over 119 km^2 in the northwest Irish Sea.

Feature accounts

Harbour seal

1.7.2.49 Harbour seal is a qualifying feature of the Murlough SAC, however is not a primary reason for site selection.

1.7.2.50 The SAC is recognised as an important haul-out site for harbour seal with yearly maximum counts of 141 individuals. With a 25% maximum decline from the baseline values, a target to maintain a favourable condition of 106 individuals is set (DAERA, 2018b).

Condition assessment

1.7.2.51 There is no condition assessment available for the harbour seal feature of the Murlough SAC.

[29] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/DAERA%20report%20-%20Strangford%20Lough%20subtidal%20Special%20Area%20of%20Conservation%20%28SAC%29%20Condition%20Assessment%202019%20-%20V2.0%20January%202022%20-%20Web.pdf

[30] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/Strangford%20Lough%20SAC%20Conservation%20Objectives%202018_.pdf

Conservation objectives

1.7.2.52 The conservation objectives outlined in DAERA (2018b)[31] and considered in the assessment which are relevant to the harbour seal feature are outlined below:

- To maintain (or restore where appropriate) the harbour seal feature to favourable condition
- To maintain (and if feasible enhance) population numbers and distribution of harbour seal
- To maintain and enhance, as appropriate, physical features used by harbour seals within the site.

Cardigan Bay/Bae Ceredigion SAC

Site description

1.7.2.53 The Cardigan Bay/Bae Ceredigion SAC which is 162.5 km from the Mona Array Area and 161.5 from the Mona Offshore Cable Corridor and Access Areas, is located off the north Pembrokeshire coast in the south region of Cardigan Bay. The SAC encompasses approximately 960 km^2 and extends 12 miles offshore. The SAC has a wide range of sediment types from well sorted highly homogenous sands to well mixed muddy gravels, pebbles and cobbles. Sediments associated with coastal areas are predominantly sands with some intrusions of gravel (NRW, 2018f). The majority of the SAC is less than 30 m deep but reaches 50 m in the outer parts of the bay towards St. George's Channel. Species interactions within the SAC are complex and inter-related with bottlenose dolphin and grey seal being the primary top predators and therefore likely to be affected by changes at lower trophic levels (NRW, 2018f).

Feature accounts

Bottlenose dolphin

1.7.2.54 Bottlenose dolphin are present all year round in the Cardigan Bay/Bae Ceredigion SAC, with peak numbers and group size (of more than 60 individuals) observed during September and October. Recent estimates suggest that the Cardigan Bay population is made up of around 100 to 300 individuals (NRW, 2018f). Of individuals present within the SAC, 30% have also been identified in the Pen Llyn a'r Sarnau SAC as well as to the north around the Isle of Anglesey, indicating the large home ranges of some individuals. Some individuals however show a more local residency pattern and exhibit smaller home ranges (NRW, 2018f). In coastal waters bottlenose dolphins tend to favour habitats with uneven topography and/or strong tidal currents, acoustic monitoring has also suggested the presence of reef and sandbanks for foraging. There have been high frequency of sightings along the coast from Aberaeron to Cardigan and around Fishguard which suggests these areas are of particular significance to bottlenose dolphin foraging.

[31] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/Murlough%20SAC%20Conservation%20Objectives%202018%20%28002%29.pdf

Grey seal

1.7.2.55 Grey seal individuals present within the Cardigan Bay/Bae Ceredigion SAC do not forma discrete population, they are thought to be part of the southwest England and Wales management unit (MU). The southwest Wales population is determined from pup counts and has been estimated at around 5,000 individuals; pup production within the Cardigan Bay SAC represents a small proportion of this (NRW, 2018f). Seals are widely distributed within the site and also travel outside of the site. Small numbers of the population also make foraging trips further offshore and into the deeper waters of the Irish Sea. Most pupping occurs towards the southwest end of the SAC but takes place throughout the site at suitable locations such as undisturbed rocky beaches, coves and caves. Moulting and resting haul out sites are also located throughout the site although seals are usually seen haling out as individuals or in small groups rather than large groups (NRW, 2018f).

1.7.2.56 It should be noted that although grey seal is a designated feature of the Cardigan Bay/Bae Ceredigion SAC, as outlined in 1.7.1.3 to 1.7.1.8 in line with the iterative process followed this feature is not assessed fully in section 1.7.3 and 1.7.4 for this SAC as the feature is assessed in full for the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau which is located at a reduced distance from the Mona Offshore Wind Project.

Condition assessment

1.7.2.57 Table 1.80 outlines the indicative condition assessments of the relevant qualifying features of the Cardigan Bay/Bae Ceredigion SAC, overall the condition assessment deemed that bottlenose dolphin are in favourable condition although the condition of supporting habitats is currently unknown (NRW, 2022b)[32]. There are no activities identified as having a direct impact on the site condition (NRW, 2022b).

Table 1.80: Condition assessment of the relevant Annex II marine mammal features of the Cardigan Bay/Bae Ceredigion SAC.

Component of species feature assessed	Indicative assessment	Key evidence type used	Level of agreement	Confidence in evidence	Component confidence level
Bottlenose dolphin					
Population (e.g. size, structure, production, condition of species within site and contaminant burdens)	Favourable	Monitoring data, reports	Medium	High	Medium
Range (within site)	Favourable	Monitoring data, reports	Medium	Medium	Medium

[32] https://cdn.cyfoethnaturiol.cymru/media/684241/indicative-condition-assessment-2018-cardigan-bay-sacv2.pdf

Conservation objectives

1.7.2.58 The conservation objectives outlined in NRW (2018f)[33] and considered in the assessment which are relevant to the bottlenose dolphin feature are outlined below.

1.7.2.59 To achieve favourable conservation status all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve favourable conservation status.

Typical Species

1.7.2.60 The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded. Important elements include:

- Species richness
- Population structure and dynamics
- Physiological heath
- Reproductive capacity
- Recruitment
- Mobility
- Range.

1.7.2.61 As part of this objective it should be noted that:

- Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum sustainable yield and secure in the long term
- The management and control of activities or operations likely to adversely affect the habitat feature is appropriate for maintaining it in favourable condition and is secure in the long term.

Species Features

- Grey seal
- Bottlenose dolphin
- River lamprey
- Sea lamprey.

Populations

- The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include
  - Population size
  - Structure, production

[33] https://cdn.cyfoethnaturiol.cymru/media/687993/eng-cardigan-bay-reg-37-report-2018.pdf

  - Condition of the species within the site
- As part of this objective it should be noted that for bottlenose dolphin and grey seal
  - Contaminant burdens derived from human activity are below levels that may cause physiological damage, or immune or reproductive suppression
- For grey seal populations should not be reduced as a consequence of human activity.

Range

- The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future
- As part of this objective it should be noted that for bottlenose dolphin and grey seal
  - Their range within the SAC and adjacent inter-connected areas is not constrained or hindered
  - There are appropriate and sufficient food resources within the SAC and beyond
  - The sites and amount of supporting habitat used by these species are accessible and their extent and quality is stable or increasing.

Supporting habitats and species

- The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing. Important considerations include
  - Distribution
  - Extent
  - Structure
  - Function and quality of habitat
  - Prey availability and quality
- As part of this objective it should be noted that
  - The abundance of prey species subject to existing commercial fisheries needs to be equal to or greater than that required to achieve maximum sustainable yield and secure in the long term
  - The management and control of activities or operations likely to adversely affect the species feature is appropriate for maintaining it in favourable condition and is secure in the long term
  - Contamination of potential prey species should be below concentrations potentially harmful to their physiological health
  - Disturbance by human activity is below levels that suppress reproductive success, physiological health or long-term behaviour.

1.7.2.62 Restoration and recovery

- As part of this objective it should be noted that for the bottlenose dolphin populations should be increasing.

1.7.2.63 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.7.3, conservation objectives relating to the qualifying habitats of the SAC have either been screened out or are addressed in section 1.5.

The Maidens SAC

Site description

1.7.2.64 The Maidens SAC, which is 166.8 km away from Mona Array Area and 179.8 km away from the Mona Offshore Cable Corridor and Access Areas, is located in the North Channel to the northeast coast of Northern Ireland. The SAC groups small rocky reefs either awash or just emergent detached from the coast. Two rocks within the SAC can be considered islands (i.e. West Maiden and East Maiden). There are four reef areas in addition to the reef plateau between the Maiden islands. The SAC extends over 74.6 km^2 and ranges between Mean High Water and 200 m deep and can experience currents of up to 4 knots.

Feature accounts

Grey seal

1.7.2.65 Grey seal is a qualifying feature of The Maidens SAC, however, is not a primary reason for site selection.

1.7.2.66 The emergent rocks, islands and waters within the SAC is recognised as important to provide haul-out site, resting sites and foraging areas for grey seal with a maximum count of 70 individuals recorded during a survey in July 2000. A target to maintain a favourable condition of 50 individuals is set (DAERA, 2017). Surveys in 2009 observed pupping and breeding on the site. In 2002, the SAC was one of the three regions with the largest numbers of grey seal around the coast of Northern Ireland (Northern Ireland Environment Agency (NIEA), 2012).

Condition assessment

1.7.2.67 There is no condition assessment available for the grey seal feature of The Maidens SAC.

Conservation objectives

1.7.2.68 The conservation objectives outlined in DAERA (2017)[34] and considered in the assessment which are relevant to the harbour seal feature are outlined below:

- To maintain (or restore where appropriate) the grey seal feature to favourable condition

[34] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/The%20Maidens%20SAC%20Conservation%20Objectives%202017.PDF

- To maintain (and if feasible enhance) population numbers and distribution of grey seal
- To maintain and enhance, as appropriate, physical features used by grey seal within the site.

Pembrokeshire Marine/Sir Benfro Forol SAC

Site description

1.7.2.69 The Pembrokeshire Marine/Sir Benfro Forol SAC which is 211.7 km from the Mona Array Area and 210.7 km from the Mona Offshore Cable Corridor and Access Areas, extends from north of Abereiddy on the north Pembrokeshire coast to the east of Manorbier in the south and encompasses the coasts of the islands of Ramsey, Skomer, Grassholm, Skokholm, the Bishops and Clerks and The Smalls. The SAC also overlaps wholly or in part with several other designated sites including the Skomer MCZ and several SPAs. Sediments across the site range from very fine, muds in sheltered area such as Milford Haven waterway, sands and gravels to pebbles and cobbles in deep subtidal areas which are subject stronger currents (NRW, 2018h). There are also strong tidal streams within the SAC.

Feature accounts

Grey seal

1.7.2.70 Grey seal are present as an Annex II species that are a primary reason for selection of this site.

1.7.2.71 Pembrokeshire in southwest Wales is representative of grey seal colonies in the southwest part of the breeding range in the UK. It is the largest breeding colony on the west coast, south of the Solway Firth, representing over 2% of annual UK pup production. The southwest Wales population size is also determined from pup counts and has been estimated at approximately 5,000 individuals (Baines *et al.*, 1995). There was a steady increase in pup production from 2009 to 2015 with the greatest increase being at the mainland sites, although in 2014 and 2015 increases at the island sites have also been recorded (NRW, 2018h). Pup production from 2015 to 2018 has shown the highest totals ever recorded with average production for 2013 to 2015 at 357 pups (NRW, 2018h). Pupping primarily takes place in the southwest end of the SAC (NRW, 2018h).

1.7.2.72 Grey seals are highly mobile species, which can travel great distances (SCOS, 2018; Carter *et al.*, 2022). Seals are widely distributed within and travel far beyond the boundary of the Pembrokeshire Marine/Sir Benfro Forol SAC. Moulting and resting haul-out sites are distributed throughout the site, with a small number of sites are regularly used as haul-outs by large numbers of seals. Known winter moulting haul-outs and non-moulting/resting haul-outs are primarily located on offshore islands and remote, undisturbed and inaccessible rocky shores and beaches (NRW, 2018h).

Condition assessment

1.7.2.73 Table 1.81 outlines the indicative condition assessments of the relevant qualifying features of the Pembrokeshire Marine/Sir Benfro Forol SAC, overall the condition assessment deemed that grey seal are in favourable condition although the condition

of supporting habitats is currently unknown (NRW, 2018i)[35]. There are no activities identified as having a direct impact on the site condition (NRW, 2018i).

Table 1.81: Condition assessment of the relevant Annex II marine mammal features of the Pembrokeshire Marine/Sir Benfro Forol SAC.

Component of species feature assessed	Indicative assessment	Key evidence type used	Level of agreement	Confidence in evidence	Component confidence level
Grey seal					
Population (e.g. size, structure, production, condition of species within site, contaminant burdens).	Favourable	Reports and expert judgement	High	Medium	Medium
Range (within site).	Favourable	Reports and expert judgement	Medium	Medium	Medium

Conservation objectives

1.7.2.74 The conservation objectives outlined in NRW (2018h)[36] considered in the assessment which are relevant to the grey seal feature are outlined below.

- To achieve favourable conservation status all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve favourable conservation status.

Typical Species

- The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded. Important elements include
  - Species richness
  - Population structure and dynamics
  - Physiological health
  - Reproductive capacity
  - Recruitment
  - Mobility
  - Range

[35] https://cdn.cyfoethnaturiol.cymru/media/684242/indicative-condition-assessment-2018-pembrokeshire-marine-sacv2.pdf

[36] https://cdn.cyfoethnaturiol.cymru/media/687999/eng-pembrokeshire-marine-reg-37-report-2018.pdf

- As part of this objective it should be noted that:
  - Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum
  - Sustainable yield and secure in the long term the management and control of activities or operations likely to adversely affect the habitat feature is appropriate for maintaining it in favourable condition and is secure in the long term

Restoration and recovery

- For the inlets and bays features this includes the need for some restoration of the populations of several typical species which are severely depleted with respect to historical levels as a consequence primarily of human exploitation
- In the Milford Haven waterways complex inputs of nutrients and contaminants to the water column and sediments derived from human activity must remain at or below levels at the time the site became a candidate SAC.

Species Features

- Grey Seal
- Otter
- Allis shad
- Twaite shad
- River lamprey
- Sea lamprey
- Shore dock.

Populations

- The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include
  - Population size
  - Structure, production
  - Condition of the species within the site.

1.7.2.75 As part of this objective it should be noted that for otter and grey seal:

- Contaminant burdens derived from human activity are below levels that may cause physiological damage, or immune or reproductive suppression.

1.7.2.76 For grey seal and otter, populations should not be reduced as a consequence of human activity.

Range

- The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future

- As part of this objective it should be noted that for otter and grey seal
  - Their range within the SAC and adjacent inter-connected areas is not constrained or hindered
  - There are appropriate and sufficient food resources within the SAC and beyond
  - The sites and amount of supporting habitat used by these species are accessible and their extent and quality is stable or increasing.

Supporting habitats and species

- The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing. Important considerations include:
  - Distribution
  - Extent
  - Structure
  - Function and quality of habitat
  - Prey availability and quality
- As part of this objective it should be noted that:
  - The abundance of prey species subject to existing commercial fisheries needs to be equal to or greater than that required to achieve maximum sustainable yield and secure in the long term
  - The management and control of activities or operations likely to adversely affect the species feature is appropriate for maintaining it in favourable condition and is secure in the long term
  - Contamination of potential prey species should be below concentrations potentially harmful to their physiological health
- Disturbance by human activity is below levels that suppress reproductive success, physiological health or long-term behaviour
- For otter there are sufficient sources within the SAC and beyond of high quality freshwater for drinking and bathing.

Restoration and recovery

- In the Milford Haven waterways complex inputs of nutrients and contaminants to the water column and sediments derived from human activity must remain at or below levels at the time the site became a candidate SAC
- As part of this objective it should be noted that for the otter, populations should be increasing.

1.7.2.77 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.7.3, conservation objectives relating to the qualifying habitats of the SAC have either been screened out or are addressed in section 1.5.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Site description

1.7.2.78 Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC, which is 274.8 km away from the Mona Array Area and 273.8 km away from the Mona Offshore Cable Corridor and Access Areas, is located in English and Welsh waters, to the east of the Celtic Sea in the Bristol Channel. The SAC extends from the north coast of Cornwall in England to Carmarthen Bay in Wales and covers an area of 5,850 km^2 with depths ranging from Mean Low Water to 70 m on the west edge of the SAC. The site is composed of diverse habitats comprising small areas of rocky reefs, sandbanks, sea caves, sand/mudflats and salt meadows but it is mostly characterised by sandy and coarse sediment seabed. Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC encompasses the Lundy SAC which has grey seal as a qualifying feature and is described below.

Feature accounts

Harbour porpoise

1.7.2.79 Harbour porpoise are listed as Annex II species present as a qualifying feature as a primary reason for site selection.

1.7.2.80 While harbour porpoise is present year round within the boundaries of the SAC, the site provides important winter habitat for harbour porpoise with persistent higher densities throughout the site compared to other regions of the UK Celtic and Irish Seas MU (within top 10% densities of those for the MU in winter) (IAMMWG, 2015). The SAC is estimated to support 4.7% of the UK Celtic and Irish Seas MU population. The SCANS-II surveys in 2005 estimated that the site supports approximately 2100 individuals (95% Confidence Interval: 805 to 5,661) for at least part of the year (JNCC, Natural England and NRW, 2016). This however cannot be considered as a site population estimate as this estimate is from a one-month survey in a single year (JNCC, Natural England and NRW, 2016) and seasonal differences are likely to occur.

Condition assessment

1.7.2.81 There is no condition assessment available for the harbour porpoise feature of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC.

Conservation objectives

1.7.2.82 The conservation objectives as outlined in JNCC, Natural England, DAERA (2019)[37] and considered in the assessment which are relevant to the harbour porpoise feature are outlined below.

1.7.2.83 To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining FCS for harbour porpoise in UK waters.

[37] https://data.jncc.gov.uk/data/505b3bab-a974-41e5-991c-c29ef3e01c0a/BCA-ConsAdvice.pdf

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

- Harbour porpoise is a viable component of the site
- There is no significant disturbance of the species
  - Noise disturbance within an SAC from a plan/project individually or in-combination is significant if it excludes harbour porpoises from more than
    - 20% of the relevant area of the site in any given day, and
    - An average of 10% of the relevant area of the site over a season
- The condition of supporting habitats and processes, and the availability of prey is maintained.

Lundy SAC

Site description

1.7.2.85 The Lundy SAC, which is 309.5 km away from Mona Array Area and 308.5 km away from Mona Offshore Cable Corridor and Access Areas, is located in the outer Bristol Channel off north Devon. The Lundy SAC covers an area of 30.7 km^2 around the small rocky island of Lundy. The site supports important granite reefs habitats that are biologically extremely rich. This SAC sits within the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC described above in paragraph 1.7.2.78.

Feature accounts

Grey seal

1.7.2.86 Grey seal is a qualifying feature of the Lundy SAC, however, is not a primary reason for site selection.

1.7.2.87 The SAC supports an average population of year round resident grey seals between 70 and 81 (2006 to 2013) with a maximum recorded of 239 in August 2011 (JNCC, 2015a; MacDonald, 2013). Pupping was observed on the site with 19 pups recorded on average between 2006 and 2013 with a maximum of 38 recorded in 2012 (MacDonald, 2013). Grey seals from the site have been functionally linked to at least 7 other sites along the north Cornwall and Devon coast (Chapman and Tyldesley, 2016; Sayer *et al.*, 2018) and supports an important presence of grey seal within the whole West England and Welsh MU.

Condition assessment

1.7.2.88 There is no condition assessment available for the grey seal feature of the Lundy SAC.

Conservation objectives

1.7.2.89 The conservation objectives as outlined in Natural England (2018b)[38] and considered in the assessment which are relevant to the harbour porpoise feature are outlined below.

[38] http://publications.naturalengland.org.uk/publication/6356698386137088

1.7.2.90 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the FCS of its qualifying features, by maintaining or restoring:

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site.

1.7.2.91 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.7.3, conservation objectives relating to the qualifying habitats of the SAC have either been screened out or are addressed in section 1.5.

Isles of Scilly Complex SAC

Site description

1.7.2.92 The Isles of Scilly Complex, which is located 439.3 km away from the Mona Array Area and 438.3 km away from the Mona Offshore Cable Corridor and Access Areas, spans over 268.5 km^2 in the Atlantic ocean 40 km southwest of Cornwall (England). The SAC surrounds the Isles of Scilly archipelago and supports extensive areas of intertidal and subtidal sandflats which host an exceptionally rich biodiversity. The islands are surrounded by reefs and rocky islets which provide exposed and sheltered coasts to the Atlantic currents and waves.

Feature accounts

Grey seal

1.7.2.93 Grey seal is a qualifying feature of the Isles of Scilly Complex SAC, however it is not a primary reason for site selection.

1.7.2.94 The SAC is considered to support a significant presence of grey seal with Eastern Isles, Northern Rocks and Western Rocks as the main haul-out sites. A total of 272 to 350 resident individuals year round (JNCC, 2015b; Lambert, 2001), and a maximum of 565 individuals in October 2016 (Sayer and Witt, 2018), have been recorded. Grey seals from the site have been functionally linked to at least 16 other sites across southwest England and Wales (Sayer and Witt, 2018). The SAC grey seal population accounts for around 40% of the pups born in southwest England region (Duck, 1996) with an increase from 111 to 227 pups born between 2010 and 2016 (Sayer and Witt, 2018).

Condition assessment

1.7.2.95 There is no condition assessment available for the grey seal feature of the Isles of Scilly Complex SAC.

Conservation objectives

1.7.2.96 The conservation objectives as outlined in Natural England (2018c)[39] and considered in the assessment which are relevant to the harbour porpoise feature are outlined below.

1.7.2.97 Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the FCS of its qualifying features, by maintaining or restoring

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species
- The distribution of qualifying species within the site.

1.7.2.98 Only conservation objectives relevant to the qualifying species (Annex II marine mammal qualifying features) of the SAC will be assessed in section 1.7.3, conservation objectives relating to the qualifying habitats of the SAC have either been screened out or are addressed in section 1.5.

Reference populations

1.7.2.99 When considering the potential for an adverse effect on site integrity for the identified SACs with Annex II marine mammal features the reference population used for assessment is the population of the MU in which the SAC is located.

1.7.2.100 For harbour porpoise, this is consistent with advice from stakeholders, the conservation advice for SACs which states that 'harbour porpoise in UK waters are considered part of a wider European population and the highly mobile nature of this species means that the concept of a 'site population' is not considered an appropriate basis for expressing conservation objectives for this species' (NRW, 2022d).

1.7.2.101 The MU population has also been used for bottlenose dolphin on the basis that photo-ID data strongly supports the theory that there is a single population across the MU. Photo-ID data has identified that individual dolphins move between the two SACs in North Wales Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau and Cardigan Bay/Bae Ceredigion) and are highly connected (Feingold and Evans, 2014; Lohrengel *et al.,* 2018; Pesante *et al.,* 2008).

1.7.2.102 The same approach is also considered appropriate for grey seal and harbour seal. Advice from stakeholders was to consider OSPAR Region III as the relevant MU. Evidence shows that individual grey seals move between the SACs, supporting the idea that there is connectivity between the Welsh SACs with a single population throughout the North West England and Wales MU present rather than distinct SAC populations. Recent telemetry studies conducted by Wright and Sinclair (2022) were

[39] http://publications.naturalengland.org.uk/publication/6399318084812800

then used to identify SACs within the relevant MU (for harbour seals) and OSPAR Region III (for grey seal) with connectivity to the Mona Offshore Wind Project.

1.7.2.103 The reference populations used within the Appropriate Assessment in section 1.7.3 and 1.7.4 are presented within Table 1.82.

Table 1.82: Information on reference populations for Annex II marine mammal features used within the Appropriate Assessment.

Annex II marine mammal feature	Relevant MU	Abundance in MU
Harbour porpoise	Celtic and Irish Seas (IAMMWG, 2021)	62,517
Bottlenose dolphin	Irish Seas (IAMMWG, 2021)	293
Harbour seal	Wales, NW England, N. Ireland SMUs (Wright and Sinclair, 2022)	1,424
Grey seal	OSPAR Region III / Wales, NW England, N. Ireland, SW Scotland SMU (Wright and Sinclair, 2022), *plus* Isle of Man reference population (Howe, 2018), *plus* East Ireland and Southeast Ireland regions (Duck and Morris, 2019) hereafter known as 'Grey Seal Reference Population' (GSRP)	60,780 12,910

1.7.3 Assessment of adverse effects alone

1.7.3.1 The following assessments of the effects of the Mona Offshore Wind Project alone on Annex II marine mammals have been informed by the detailed project-specific underwater sound modelling presented in Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1) and the technical assessments presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4). The assessments have also drawn upon the sensitivity assessments of the relevant marine mammals detailed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) which reference the best available literature and evidence with regards to sensitivity. In this regard, the Applicant is confident that the conclusions made on whether an adverse effect on integrity on a European site(s) and qualifying features can or cannot be ruled out have been identified in light of the best scientific knowledge in the field and all reasonable scientific doubt can be ruled out.

Injury and disturbance from underwater sound generated during piling

1.7.3.2 During the construction phase sound emissions from the piling of foundations may lead to auditory injury and disturbance of marine mammals.

1.7.3.3 The assessment of LSE during the HRA screening process identified that during construction and decommissioning, LSE could not be ruled out for the potential impact of injury and disturbance from underwater sound generated during piling. This relates to the European sites and Annex II marine mammal features as listed in Table 1.78.

1.7.3.4 The following sections explain how this potential impact on Annex II marine mammal features of the SACs outlined in Table 1.78 have been quantified and assessed.

1.7.3.5 The MDS considered for the assessment of potential impacts on Annex II marine mammal features from underwater sound generated during piling is presented in Table 1.83.

Table 1.83: Maximum design scenario considered for the assessment of potential impacts on marine mammals from injury and disturbance from underwater sound generated during piling during the construction phase.

Phase	Maximum design scenario	Justification
Construction phase	**Construction phase:** **Maximum temporal scenario:** Single piling at up to 78 locations comprising: 64 wind turbine four-legged jacket foundations, four OSP three-legged jacket foundations and up to 10 gravity based foundations (strengthening piles). Total of 113.5 days of piling (64 days for wind turbines, 37.5 days for gravity based foundations, and 12 days for OSPs) estimated as follows: • Wind turbines: – Installation of up to 64 four legged-jacket foundations (with one pile per leg) = a total of 256 piles. – Each pile with a diameter of 3.8 m installed by impact piling. – Maximum hammer energy of 4,400 kJ for 16 locations, and 3,000 kJ for 48 locations. – Average duration of up to 4.5 hours piling per pile, with a maximum of one foundation (four piles) per day = cumulative total of 64 days (64 foundations x four legs x 1 pile per leg x 4.5 hours duration per pile = 1,152 hours) • Gravity base foundations : – Installation of up to 32 gravity base foundations, up to 10 of which could require piling for ground strengthening, leading to = maximum of 150 piles. 15 piles per foundation, each with maximum 4 m diameter. – Maximum hammer energy of up to 3,000 kJ. – Average duration four hours per pile, leading to a maximum cumulative total of up to 37.5 days (10 foundations x 15 piles x four hours duration per pile = 600 hours) (limited by four piles per day). • OSPs – Installation of up to four OSPs (one per 375 MW OSP) with 4-legged jacket foundations, with three piles per leg = a total of 48 piles). – Each pile with a diameter of 3.5 m installed by impact piling. – Maximum hammer energy of up to 4,400 kJ. – Average duration of up to 4.5 hours piling per pile with a cumulative total of up to 216 hours; installation of OSP over 12 days (limited by four piles per day). **Maximum spatial scenario:** Concurrent piling with two vessels at a minimum distance of 1.4 km and a maximum distance of 15 km Only concurrent piling at a maximum hammer energy of 3,000 kJ (i.e. no concurrent piling where a 4,400 kJ hammer is required). Only concurrent piling at wind turbines jacket foundations; gravity based foundations will be installed using a single vessel. Total piling phase (foundation installation) of up to two years within a four year construction programme.	The maximum temporal scenario was assessed on the greatest number of days on which piling could occur based on the number of piles that could be installed within a 24-hour period (four per day). Of the total of 96 wind turbine locations there would be a maximum of 64 jackets and the remaining 32 would be gravity bases, of which up to 10 may require piling to strengthen the foundations. Consecutive piling is assumed over a maximum period of 24 hours. For the maximum spatial scenario concurrent piling events would lead to the largest spatial extent of ensonification at any one time. The project has committed to not using the maximum hammer energy (4,400 kJ) for any concurrent piling and therefore only a 3,000 kJ + 3,000 kJ scenario has been modelled). Minimum spacing between concurrent piling represents the highest risk of injury to marine mammals as sound from adjacent foundations could combine to produce a greater radius of effect compared to a single piling event. Maximum spacing between concurrent piling represents the highest risk of potential behavioural effects to marine mammals as a larger area would be ensonified at any one time.

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.6 Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of potential impacts on Annex II marine mammals from underwater sound during construction are presented in Table 1.84.

Table 1.84: Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for Annex II marine mammal features from underwater sound during the construction phase.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
Development of and adherence to an MMMP which will be developed in accordance with the Outline MMMP (Document Reference J21) that requires implementation of an initiation stage of a piling soft start and ramp-up.	This measure will minimise the likelihood of injury from elevated underwater sound to marine mammal and fish species in the immediate vicinity of piling operations, allowing individuals to move away from the area before sound levels reach a level at which injury may occur. Compliance with these guidelines will, in most cases, reduce the likelihood of injury to marine mammals to negligible levels.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Development and adherence to a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J21)) which sets a maximum separation limit of 15 km for concurrent piling.	Commitments made around maximum separation during concurrent piling will minimise the likelihood of disturbance to marine mammal and fish species in the immediate vicinity of piling operations, by limiting the ensonified area during concurrent piling. Where piling occurs concurrently a maximum separation distance of 15 km is used to limit the ensonified area as there is greater overlap when closer together.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Development and adherence to a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J21)) which sets a minimum separation limit of 1.4 km for concurrent piling.	Commitments made around minimum separation during concurrent piling will minimise the likelihood of injury to marine mammal and fish species in the immediate vicinity of piling operations, by limiting the spatial overlap of areas of ensonification during concurrent piling. Where piling occurs concurrently, a minimum separation distance of 1.4 km is used to minimise the potential for additive effects due to direct overlap of concurrent piling.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Development and adherence to a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J21)) which sets the limit on maximum hammer energy used during concurrent piling at 3,000 kJ and during the single event piling at 4,400 kJ.	Commitments made around concurrent piling will minimise the likelihood of injury to marine mammal and fish species in the immediate vicinity of piling operations, by reducing the ensonified area during concurrent piling.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
Development and adherence to a MMMP (to be developed in accordance with the Outline MMMP (Document Reference J21)) that requires implementation of a mitigation hierarchy with regard to UXO clearance that follows: • Avoid UXO • Clear UXO with low order techniques • Clear UXO with high order techniques. Low order techniques or avoidance of confirmed UXO are not always possible and are dependent upon the individual situations surrounding each UXO.	Low order techniques generate less underwater sound than high order techniques and therefore present a lower risk to sound-sensitive receptors such as marine mammals during UXO clearance. Noting the position statement from statutory authorities on UXO clearance (DEFRA, 2021), the option to clear UXOs with low order techniques has been considered as a potential primary mitigation measure as part of this assessment. Note, however, that low order techniques are not always possible and are dependent upon the individual situations surrounding each UXO. Given that it is possible that high order detonation may be used, the Outline MMMP includes mitigation to reduce the likelihood of injury from UXO clearance. The Outline underwater sound management strategy (Document Reference J16) includes potential further mitigation options, should the measures in the MMMP (Document Reference J21) not reduce impacts, such that there will be no residual significant effect from the project.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Development of and adherence to a MMMP, which will be developed in accordance with the Outline MMMP (Document Reference J21) included as part of the application. The Outline MMMP (Document Reference J21) present appropriate mitigation for activities that could potentially lead to injurious effects on marine mammals including: piling, UXO clearance and some types of geophysical activities. Piling: for the purpose of developing the MMMP (Document Reference J21) as an annex of the Underwater sound management strategy (Document Reference J16), a mitigation zone will be defined based on the maximum predicted injury range from the dual metric sound modelling for the maximum spatial scenario (pin piles) and across	The implementation of an approved MMMP will mitigate for the risk of physical or permanent auditory injury to marine mammals within a pre-defined 'mitigation zone' for each activity. The mitigation zone is determined considering the largest injury zone across all species for each relevant activity. The use of an approved MMMP will also minimise the potential for collision risk, or potential injury to, marine mammals and other marine megafauna (e.g. basking shark). The MMMP will include visual and acoustic monitoring as a minimum over the defined mitigation zones to ensure animals are clear before the activity commences. Additional measures to deter animals from injury risk zones may be applied in some instances (e.g. ADDs or soft start charges). The MMMP will be developed on the basis of the most recent published statutory guidance and in consultation with key stakeholders.	MMMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
all marine mammal species. The Outline MMMP (Document Reference J21) sets out the measures to apply in advance of and during piling activity including the use of: • MMOs • (PAM • (ADD. Therefore following the latest JNCC guidance (JNCC, 2010a). UXO clearance: Measures including visual and acoustic monitoring, the use of an ADD and soft start charges will be applied to deter animals from the mitigation zone as defined by sound modelling for the largest possible UXO following the latest JNCC guidance (JNCC, 2010b). Geophysical surveys Mitigation for injury during high resolution geophysical surveys using a sub-surface sensor from a conventional vessel will involve the use of MMOs and PAM to ensure that the risk of injury over the defined mitigation zone is reduced in line with JNCC guidance (JNCC, 2017). Soft start is not possible for SBP equipment but will be applied for other high resolution surveys where possible. Note also, some multi-beam surveys in shallow waters (<200 m) are not subject to the requirements of mitigation.		
Development of and adherence to an Underwater sound management strategy that incudes for consideration of NAS as part of mitigation options, which will be developed in accordance with the Outline underwater sound management strategy (Document Reference J21), and which will be made as part of a stepped strategy post consent and following the mitigation hierarchy - avoid, reduce, mitigate. Consequently, if NAS is required	To mitigate for the likelihood of physical or permanent auditory injury to marine mammals.	Underwater sound management strategy secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Measures adopted as part of the Mona Offshore Wind Project	Justification	How the measure will be secured
as an option a detailed exploration of available technologies will be undertaken post consent and information presented to demonstrate how such technology would contribute to the reduction in underwater sound from piling.		
Development of, and adherence to an Offshore EMP including measures to minimise disturbance to marine mammals and rafting birds from transiting vessels (Document Reference J17), requiring them to: • Not deliberately approach marine mammals as a minimum • Avoid abrupt changes in course or speed should marine mammals approach the vessel to bow-ride, where appropriate and possible taking into account all technical considerations. The Offshore EMP will include a commitment that the site induction processes will incorporate the principles of the Wildlife Safe (WiSe) Scheme to ensure that key personnel are aware of the need to follow the WiSe Code of Conduct. The WiSe Scheme (https://www.wisescheme.org/), is a UK national training scheme for minimising disturbance to marine life. Key measures from the scheme will reduce disturbance of vessel transits on marine mammals and rafting birds visible at the water surface, or as otherwise agreed with the SNCBs.	To minimise the potential for collision risk, or potential injury to, marine mammals and megafauna.	Offshore EMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.

Information to support assessment

Construction phase

Injury

1.7.3.7 The assessment of effects on marine mammals from piling considered both a maximum spatial and maximum temporal scenario for pin pile foundations. Maximum spatial scenarios assume concurrent piling of pin piles (leading to the largest area of effect at any one time) whilst maximum temporal scenarios are for single piling (leading to the greatest number of days of piling). For full details on the piling scenarios assessed, see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4).

1.7.3.8 The maximum spatial effect was predicted for pin piles with a hammer energy of 4,400 kJ. At hammer initiation instantaneous injury leading to PTS, based on SPL_{pk}, could occur out to a maximum range of 136 m across all species, with the maximum range predicted for harbour porpoise (Table 1.85). Using the same metric the maximum range of injury was predicted at 662 m at full hammer energy (although this assumes animals do not move away at the start of piling, which is unlikely).

1.7.3.9 The maximum temporal effect was predicted as the longest duration for pin piles. Whilst the effect of PTS is considered to result in permanent injury to animals, the risk of animals being exposed to sound levels leading to auditory injury would occur during piling only. Piling will be intermittent over a two year piling phase and will occur on a maximum of up to 114 days for pin piles.

1.7.3.10 Tertiary mitigation in the form of a MMMP (Document Reference J21) (as an annex of the Underwater sound management strategy (Document Reference J16)) will be implemented to reduce the likelihood of PTS. Such mitigation will include deployment of an ADD, as recommended in the JNCC guidelines (2010).

1.7.3.11 For marine mammals, injury thresholds are based on both peak sound pressure levels (SPL_{pk}) (i.e. un-weighted) and marine mammal hearing-weighted cumulative sound exposure level (SEL_{cum}) as per the latest guidance (Southall *et al*., 2019) (see Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement).

Table 1.85: Summary of SPL_{pk} PTS injury ranges and areas of effect for marine mammals for single pin pile installation (N/E = threshold not exceeded).

Species	Threshold (unweighted peak)	Hammer energy level	3,000 kJ Maximum hammer energy		4,400 kJ Maximum hammer energy	
			Range of effect (m)	Area of effect (km^2)	Range of effect (m)	Area of effect (km^2)
Harbour porpoise (VHF)	202 dB re 1 µPa (pk)	Initiation (first strike)	136	0.06	136	0.06
		Full energy (maximum)	525	0.87	662	1.38
Bottlenose dolphin (High Frequency (HF))	230 dB re 1 µPa (pk)	Initiation (first strike)	N/E	0.00	N/E	0.00
		Full energy (maximum)	33	0.00	41	0.01

Species	Threshold (unweighted peak)	Hammer energy level	3,000 kJ Maximum hammer energy		4,400 kJ Maximum hammer energy	
			Range of effect (m)	Area of effect (km^2)	Range of effect (m)	Area of effect (km^2)
Phocids (Grey seal and harbour seal) Phocid Carnivores in Water (PCW)	218 dB re 1 µPa (pk)	Initiation (first strike)	28	0.00	25	0.00
		Full energy (maximum)	108	0.04	136	0.06

Table 1.861: Summary of SEL_{cum} PTS injury ranges and areas of effect for marine mammals for pin pile installation (4,400 kJ and 3,000 kJ) (N/E = threshold not exceeded).

Species	Threshold (SEL weighted)	Scenario	Hammer energy	Range of effect (m)	Area of effect (km^2)
Harbour porpoise (VHF)	PTS - 155 dB re 1 µPa2s	Single	4,400 kJ	N/E	0.00
			3,000 kJ	N/E	0.00
		Concurrent	3,000 kJ + 3,000 kJ	N/E	0.00
		Consecutive	4,400 kJ	N/E	0.00
			3,000 kJ	N/E	0.00
Bottlenose dolphin (HF)	PTS - 185 dB re 1 µPa2s	Single	4,400 kJ	N/E	0.00
			3,000 kJ	N/E	0.00
		Concurrent	3,000 kJ + 3,000 kJ	N/E	0.00
		Consecutive	4,400 kJ	N/E	0.00
			3,000 kJ	N/E	0.00
Phocids (Grey seal and harbour seal) (PCW)	PTS - 185 dB re 1 µPa2s	Single	4,400 kJ	N/E	0.00
			3,000 kJ	N/E	0.00
		Concurrent	3,000 kJ + 3,000 kJ	N/E	0.00
		Consecutive	4,400 kJ	N/E	0.00
			3,000 kJ	N/E	0.00

Harbour porpoise

1.7.3.12 For harbour porpoise, with primary and tertiary mitigation applied, no animals would be affected by peak pressure (SPL_{pk}) as they would move away at first strike (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)). Similarly, cumulative exposure (SEL_{cum}) would not result in injury to any individuals. Even without the use of an ADD the modelling suggested that there would be no risk of injury from cumulative exposure (SEL_{cum}), however peak pressure

leading to injury would be experienced out to 136 m (at hammer initiation) and 662 m (at full hammer).

1.7.3.13 The range of effect is predicted to be localised to within the Mona Array Area and therefore there is no potential for spatial overlap with the North Anglesey Marine SAC- the closest site designated for harbour porpoise - which is located at a distance of approximately 22.58 km.

1.7.3.14 Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) shows that the use of an ADD reduced the maximum injury zones based on the SEL_{cum} metric at pin piles with respect to harbour porpoise (however the threshold had still been exceeded for the species) suggesting that there is a residual risk of injury to animals.

1.7.3.15 Activation of an ADD 30 minutes prior to commencement of piling of pin piles reduced the likelihood of PTS to a level not exceeding the injury thresholds during single, concurrent and consecutive piling for harbour porpoise, and there is no residual risk of injury during piling.

Bottlenose dolphin

1.7.3.16 For bottlenose dolphin, with primary and tertiary mitigation applied, no animals would be affected by peak pressure (SPL_{pk}) as they would move away at first strike. Similarly, cumulative exposure (SEL_{cum}) would not result in injury to any individuals (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)).

1.7.3.17 Even without the use of an ADD the modelling suggested that there would be no risk of injury from cumulative exposure (SEL_{cum}), however peak pressure leading to injury would be experienced out to 41 m (at full hammer energy) (the threshold was not exceeded at first strike hammer energy). Since injury will be fully mitigated via primary and tertiary mitigation there is no residual risk of injury.

Grey seal

1.7.3.18 For grey seal, with primary and tertiary mitigation applied, no animals would be affected by peak pressure (SPL_{pk}) as they would move away at first strike. Similarly, cumulative exposure (SEL_{cum}) would not result in injury to any individuals.

1.7.3.19 Even without the use of an ADD the modelling suggested that there would be no risk of injury from cumulative exposure (SEL_{cum}), however peak pressure leading to injury would be experienced out to 28 m (at first strike) and 136 m (at full hammer). Since injury will be fully mitigated via primary and tertiary mitigation there is no residual risk of injury during piling.

Harbour seal

1.7.3.20 For harbour seal, with primary and tertiary mitigation applied, no animals would be affected by peak pressure (SPL_{pk}) as they would move away at first strike. Similarly, cumulative exposure (SEL_{cum}) would not result in injury to any individuals.

1.7.3.21 Even without the use of an ADD the modelling suggested that there would be no risk of injury from cumulative exposure (SEL_{cum}), however peak pressure leading to be injury would be experienced out to 28 m (at first strike) and 136 m (at full hammer). Since injury will be fully mitigated via primary and tertiary mitigation there is no residual risk of injury during piling.

Disturbance

1.7.3.22 Disturbance during piling was predicted to have far-reaching potential effects across the north part of the Irish Sea, noting however, that the extent is likely to be an overestimate as it assumes that the sound maintains its impulsive characteristics at large distances, which is considered unlikely to be the case (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)). For this reason, the potential number of animals predicted to be disturbed should be interpreted with caution and subject to the caveats highlighted by Southall *et al.,* (2021) with respect to environmental context (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)), as assuming impulsive characteristics by comparing predicted sound levels for the whole contour range with impulsive related thresholds is likely to overestimate predicted impact distances.

1.7.3.23 An unweighted sound threshold of 143 dB re 1µPa^{2}s single strike sound exposure level (SEL_{ss}) (Brandt *et al*. 2018; Heinis *et al*. 2019) for harbour porpoise was also recommended in NRW's position statement on assessing behavioural disturbance of harbour porpoise from underwater sound (NRW, 2023). In particular, the fixed sound unweighted threshold of 143 dB re 1 µPa^{2}s SEL_{ss} is relevant to the HRA as an area-based approach and in this respect is similar to the Natural England and JNCC guidance on the use of EDRs which have also been applied to the HRA in reference to harbour porpoise SACs only. For more information on the unweighted threshold of 143 dB re 1 µPa^{2}s SEL_{ss} threshold, see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4). The derived threshold presented by Tougaard (2021) was reported for harbour porpoise and there are limited studies to support the derivation of similar thresholds for other marine mammal species.

1.7.3.24 Therefore, for all other marine mammal species considered in this HRA Stage 2 ISAA, the National Marine Fisheries Service (NMFS) level-B harassment threshold of 160 dB re 1µ Pa SPL(root mean square (rms)) (strong disturbance) will be applied for piling for area-based assessment alongside the relevant EDR (NMFS, 2005). For more information on the 160 dB re 1µ Pa SPL_{rms} (strong disturbance) threshold see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4).

1.7.3.25 Contours with the unweighted sound threshold of 143 dB re 1µPa^{2}s SEL_{ss} are presented for the north (N) location, for the southeast (SE) location (Figure 1.15 and Figure 1.16) and for the southwest (SW) location (Figure 1.17).

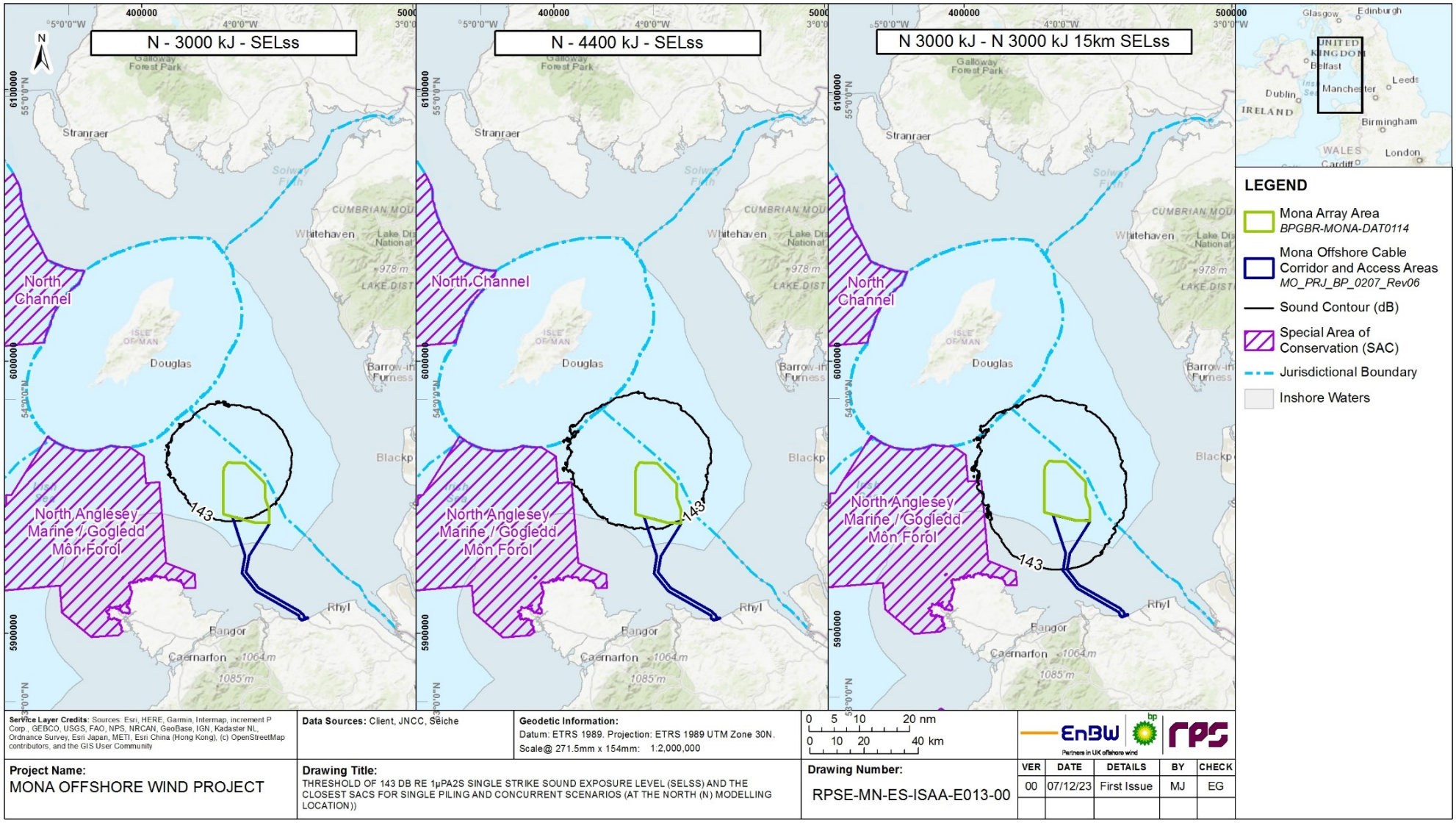

Figure 1.15: Unweighted sound threshold of 143 dB re 1µPa^{2}s single strike sound exposure level (SEL_{ss}) and the closest SACs for harbour porpoise for single piling and concurrent piling scenarios (at the north (N) modelling location).

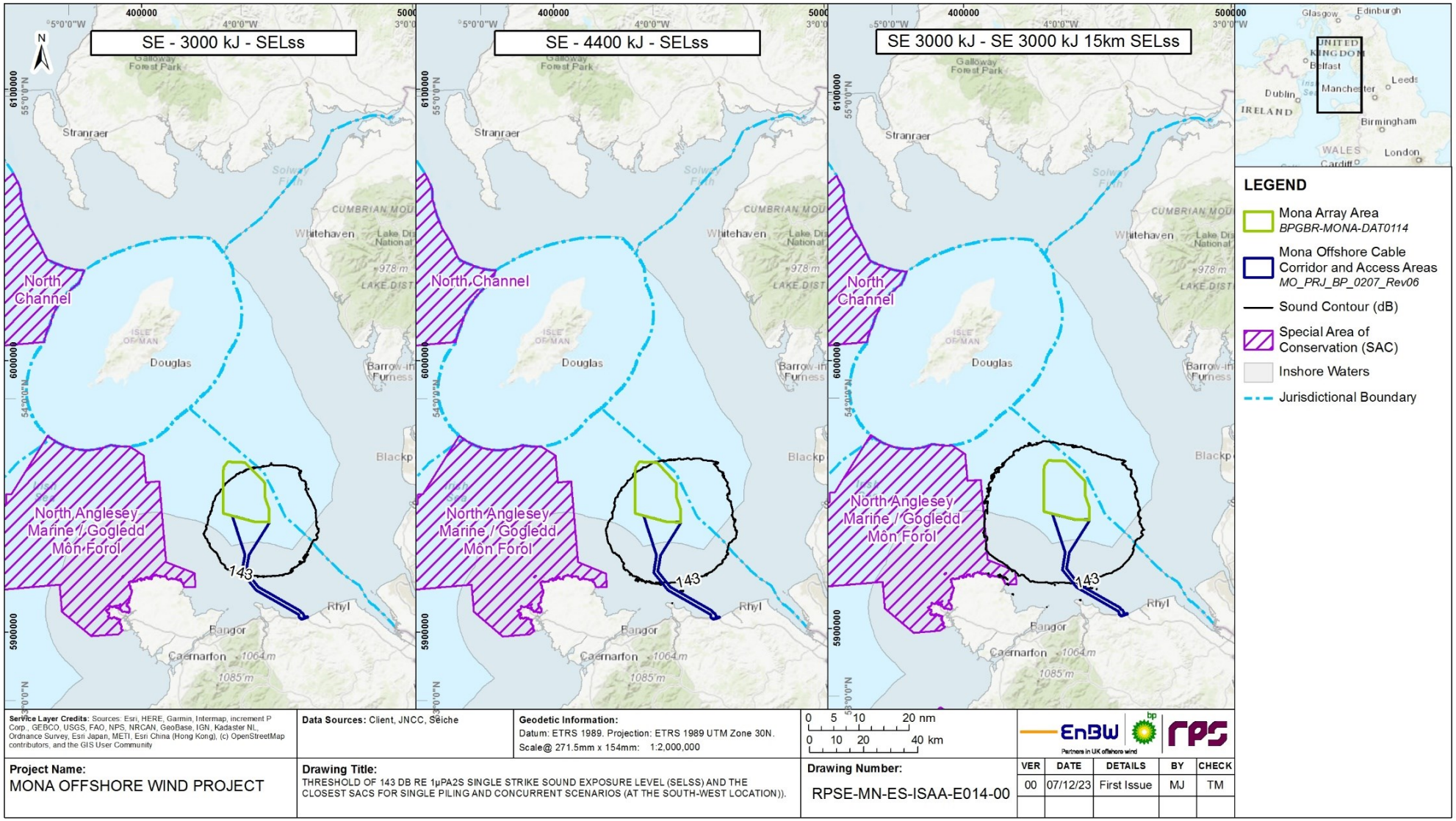

Figure 1.16: Unweighted sound threshold 143 dB re 1µPa^{2}s single strike sound exposure level (SELss) and the closest SACs designated for harbour porpoise for single piling and concurrent piling scenarios (at the south east (SE). location).

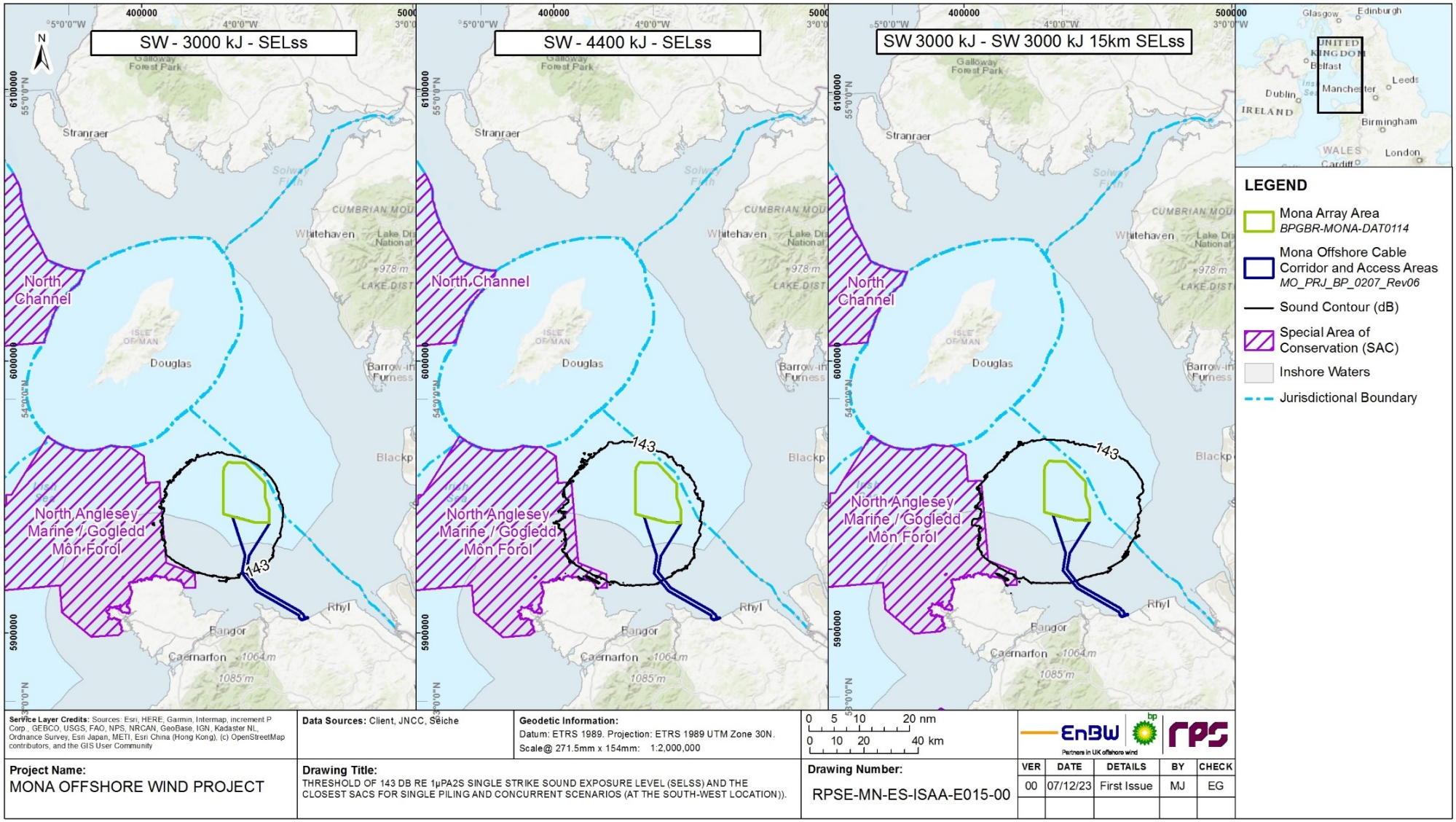

Figure 1.17: Unweighted sound threshold of 143 dB re 1µPa²s single strike sound exposure level (SELss) and the closest SACs designated for harbour porpoise for single piling and concurrent scenarios (at the south-west location).

Harbour porpoise

1.7.3.26 Using the unweighted threshold of 143 dB re 1µPa^{2}s SEL_{ss}, the SW piling location has the greatest overlap with the North Anglesey Marine/Gogledd Môn Forol SAC (4.33% of the total SAC area) during the single piling scenario with hammer energy of 4,400 kJ, due to proximity. Up to 745 animals could potentially be disturbed within the unweighted threshold 143 dB re 1µPa^{2}s SEL_{ss} (1.19% of the CIS MU population), but numbers of animals cannot be apportioned to the SAC directly.

1.7.3.27 As outlined above, the unweighted threshold 143 dB re 1µPa^{2}s SEL_{ss} has been used to assess disturbance associated with piling for the HRA. Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) used the dose response to inform the assessment, and this is also presented for additional context. Using the dose response approach 1,142 animals could potentially be disturbed within weighted SEL_{ss} sound contours, which equates to 1.83% of the CIS MU, but numbers of animals cannot be attributed or allocated to one individual SAC within the marine mammal study area.

Bottlenose dolphin

1.7.3.28 There was no overlap of the 160 dB re 1 µPa SPL_{rms} (strong disturbance) contour with any SAC designated for bottlenose dolphin in the marine mammal study area (Figure 1.18). The potential for barrier effects to bottlenose dolphin resulting from disturbance associated with piling is assessed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4). Considering the locations of the SACs designated for Annex II bottlenose dolphin features (Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC and Cardigan Bay/Bae Ceredigion SAC) the potential for barrier effects to result in adverse impacts on the Annex II bottlenose dolphin features is considered to be low, given the coastal bottlenose dolphin population that is resident in the Irish Sea MU. As shown in Figure 1.18, although the mild disturbance sound contours (which may result in low level disturbance effects) extend from the coast of North Wales to the Isle of Man, this would not impede the movement of bottlenose dolphin within this region, some of which may be Annex II features associated with the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC and Cardigan Bay/Bae Ceredigion SAC. The strong disturbance sound contours (which may result in a strong behavioural reaction), as shown in Figure 1.18, represent a small offshore area and do not extend to these inshore regions which are largely utilised by the coastal bottlenose dolphin ecotype. Although, it is noted that individuals from the SACs could range as far as the ensonified area.

1.7.3.29 The EIA (which used dose response) found that up to seven animals could potentially be disturbed within weighted SEL_{ss} sound contours, which equates to 2.39% of the IS MU, but numbers of animals cannot be attributed or allocated to one individual SAC within the marine mammal study area. Whilst there is no direct overlap with any designated SAC in the marine mammal study area, animals from the IS MU may be disturbed.

1.7.3.30 This is a conservative estimate using a single density derived for the Mona Array Area from the Welsh Marine Mammal Atlas (Evans and Waggitt, 2023) across the Irish Sea and assumes a uniform distribution throughout the area.

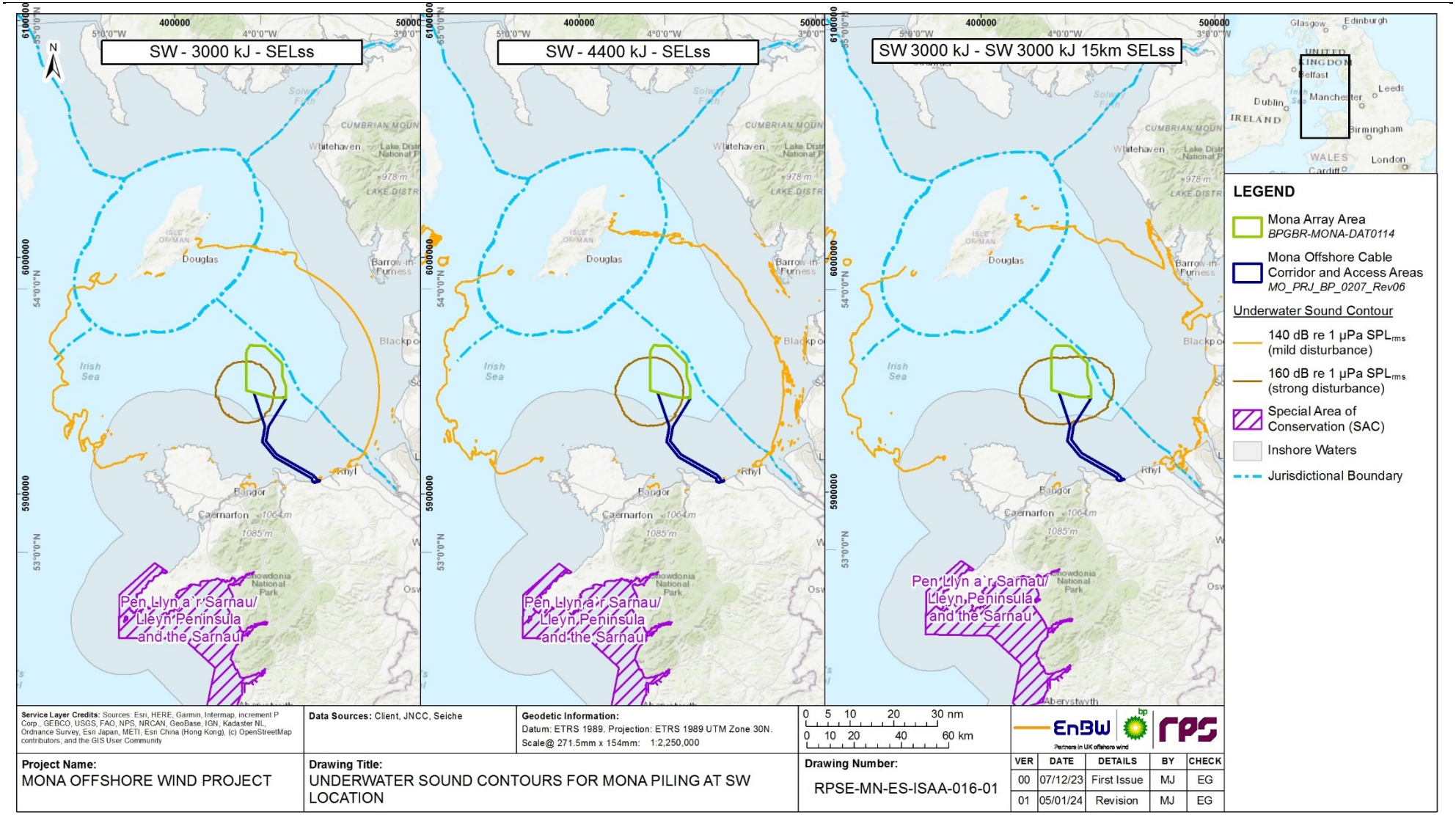

Figure 1.18: Thresholds of 160 dB re 1µPa SPL_{rms} (strong disturbance) and 140 dB re 1µPa SPL_{rms} (mild disturbance) and the closest SACs designated for bottlenose dolphin for single piling and concurrent scenarios (at the south west modelling location).

Grey seal

1.7.3.31 There was no overlap of the (160 dB re 1 µPa SPL_{rms} (strong disturbance)) contour with any SAC designated for grey seal in the marine mammal study area.

1.7.3.32 The EIA (which used dose response) found that 31 animals could potentially be disturbed within weighted SEL_{ss} sound contours, which equates to 0.05% of OSPAR Region III region (or 0.23% of the GSRP), but numbers of animals cannot be attributed or allocated to one individual SAC within the marine mammal study area.

Harbour seal

1.7.3.33 There was no overlap of the (160 dB re 1 µPa SPL_{rms} (strong disturbance)) contour with any SAC designated for harbour seal in the marine mammal study area.

1.7.3.34 The EIA (which used the dose response approach) found that less than one animal was could potentially be disturbed within weighted SEL_{ss} sound contours, which equates to 0.01% of HSRP, but numbers of animals cannot be attributed or allocated to one individual SAC within the marine mammal study area.

Further measures

1.7.3.35 The project alone assessment of injury and disturbance from elevated underwater sound during piling concluded no significant effect in EIA terms (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4). However, recognising the potential contribution to elevated underwater sound in the regional marine mammal study area, the project has committed to the development of an Underwater sound management strategy which is secured in the deemed marine licence (with an Outline underwater sound management strategy included with the application for consent, Document Reference J16) to reduce the magnitude of impact such that any residual significant effects from the project are reduced to a non-significant level (on the basis of a refined project envelope and programme).

1.7.3.36 The Outline Underwater sound management strategy (Document Reference J16) will set out the process for investigation options to manage underwater sound levels (such as NAS, temporal and spatial piling restrictions, piling methods, soft start) in order to reduce the magnitude for the project alone. The Underwater sound management strategy (Document Reference J16) will be developed in consultation with the licensing authority and SNCBs.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

Injury

1.7.3.37 As outlined in paragraph 1.7.3.26 for pin piles, with primary and tertiary mitigation applied, no animals would be affected by peak pressure (SPL_{pk}) as they would move away at first strike and no animals would be injured (SEL_{cum}). Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) concluded that the range of effect is predicted to be localised to within the Mona Array Area and there is no potential for spatial overlap with the North Anglesey Marine/Gogledd Môn Forol SAC.

1.7.3.38 Therefore, no residual animals were required in the iPCoD modelling assessment alongside disturbance to understand the implications at a population level and the model demonstrated that there would be no long-term effect on the population (see

Appendix A of Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)).

Disturbance

1.7.3.39 In line with guidance from stakeholders (JNCC, and Natural England) the EDR approach has been used alongside the unweighted threshold (143 dB re 1μPa^{2}s SEL_{ss}) for the assessment of disturbance associated with pile driving during the construction phase for harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC. The EDR approach, as outlined in JNCC (2020), recommends the use of 15 km deterrence range for pin piles with and without sound mitigation at source, which is informed by studies from Graham *et al.* (2019).

1.7.3.40 The implementation of a 15 km EDR would therefore rule out potential disturbance to harbour porpoise features of all SACs screened into the ISAA. Figure 1.19 shows that there is no potential overlap between the 15 km EDR and the North Anglesey Marine/Gogledd Môn Forol SAC. The assessment considered piling at the closest location within the Mona Array Area to the North Anglesey Marine/Gogledd Môn Forol SAC.

1.7.3.41 In parallel with the EDR approach, an unweighted threshold 143 dB re 1 μPa^{2}s SEL_{ss} (Tougaard, 2021) as set out in NRW's 'Position on assessing behavioural disturbance of harbour porpoise from underwater noise' (NRW, 2023) has also been applied, in line with guidance from stakeholders (JNCC, NRW and Natural England). As shown in Figure 1.17, the use of an unweighted threshold 143 dB re 1 μPa^{2}s SEL_{ss} shows an overlap of 4.33% of the total North Anglesey Marine/Gogledd Môn Forol SAC area for the SW piling location (single piling of 4,400 kJ), which is below the daily 20% guidance threshold from JNCC (2020). In terms of potential disturbance across the site averaged over the season (summer, 183 days) a daily footprint of 140.67 km^2, over 114 days of piling across the construction phase (see Table 1.83) would result in an average of 2.69% of the relevant area of the SAC potentially being affected over the season. This therefore falls well below the threshold of 10% of the relevant area of the site over the season (Table 1.187). This approach is highly precautionary, as not all foundations will be piled at the maximum hammer energy (as per the MDS of 16 foundations at 4,400 kJ, 48 foundations at 3,000 kJ, see Table 1.83), and assumes no concurrent piling of foundations.

1.7.3.42 It is therefore considered that there is no significant disturbance of harbour porpoise within the North Anglesey Marine/Gogledd Môn Forol SAC.

Table 1.87: Disturbance thresholds for piling for the North Anglesey Marine/Gogledd Môn Forol SAC.

Guidance threshold	Justification
20% of the relevant area[40] of the site in any given day.	Using EDRs, there is no overlap between the 15 km EDR and North Anglesey Marine/Gogledd Môn Forol SAC. However, using the unweighted threshold of 143 dB re 1 µPa^{2}s SEL_{ss}, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC would be 140.67 km^2 (for a single piling activity on any given day), which equates to 4.33% of the relevant area of the site.
An average of 10% of the relevant area of the site over the season.	A daily footprint of 140.67 km^2 over 114 days of piling across the construction phase would result in an average of 2.69% of the relevant area of the SAC over the season (summer, 183 days)[41]

[40] The relevant area is defined as that part of the SAC that was designated on the basis of higher persistent densities for that season (the North Anglesey Marine/Gogledd Môn Forol SAC is designated for the summer season which is defined as April to September inclusive). The SAC covers an area of 3,248.03km^2 which is used as the relevant area to inform the calculations.

[41] A daily footprint of 4.33% for 114 days would result in an average of 4.33x114/183 days (summer) = 2.69%

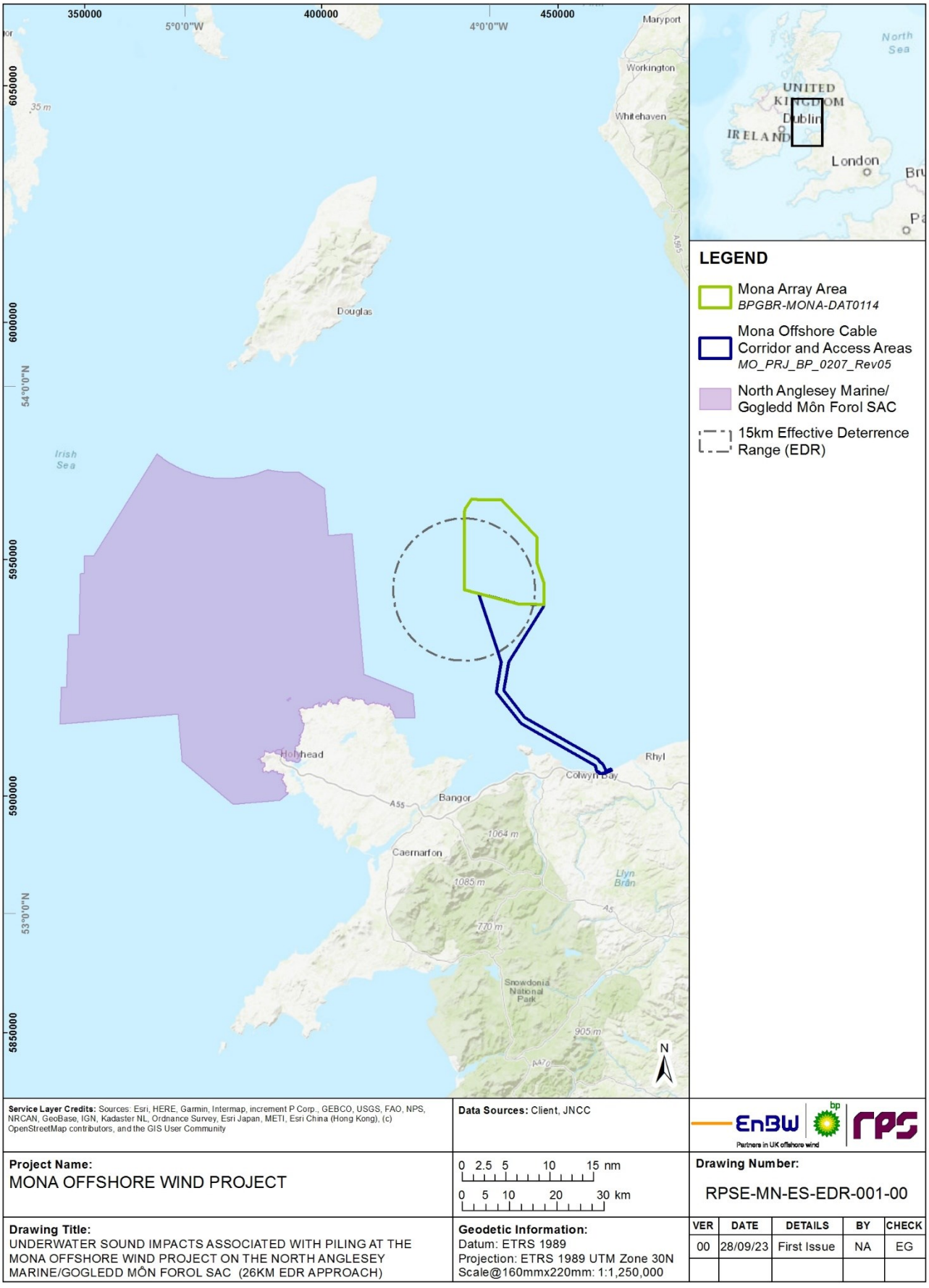

Figure 1.19: Maximum spatial overlap of underwater sound impacts associated with piling at the Mona Offshore Wind Project on the North Anglesey Marine/Gogledd Môn Forol SAC based on the 15 km EDR approach.

Conclusions

1.7.3.43 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.88.

Table 1.88: Conclusions against the conservation objectives of the North West Anglesey Marine/Gogledd Môn Forol SAC for underwater sound generated from piling.

Conservation objective	Conclusion
The species is a viable component of the site.	For harbour porpoise, as outlined in paragraph 1.7.3.26, with primary and tertiary mitigation (as detailed in Table 1.84) applied, there is predicted to be no residual risk of injury during piling activities associated with the construction phase. In addition, tertiary mitigation in the form of a MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36which will reduce the number of individuals affected further as harbour porpoise features will be deterred beyond the predicted injury ranges. As outlined in paragraph 1.7.3.40, the maximum area of disturbance, based on the 15 km EDR for pin piles (JNCC, 2020) does not overlap the North Anglesey Marine/Gogledd Môn Forol SAC. The unweighted threshold of 143 dB re 1 μPa^2s SEL_{ss} demonstrates a daily overlap of 4.33% with the North Anglesey Marine/ /Gogledd Môn Forol SAC, however this does not exceed the disturbance thresholds presented in Table 1.87. Underwater sound associated with piling is therefore not predicted to restrict the objective of the population being able to maintain itself as a viable component of its natural habitat over the long-term.
There is no significant disturbance of the species.	As outlined in paragraph 1.7.3.40, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC would be 140.67 km^2 (for a single piling activity on any given day) which does not surpass either of the thresholds for significant disturbance. Underwater sound associated with piling is therefore not predicted to restrict the objective of no significant disturbance of the species within the site.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	Habitats and processes will not be affected by underwater sound. With respect to prey species, some short-term disturbance is predicted to potential prey fish species, such as herring and cod spawning grounds (see Volume 2, Chapter 9: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). However harbour porpoise are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species, with the ability to exploit other food sources. Effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term.

1.7.3.44 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

North Channel SAC

Harbour porpoise

Injury

1.7.3.45 The North Channel SAC is located at an increased distance to the Mona Offshore Wind Project (81.5 km from the Mona Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, assessed in paragraphs 1.7.3.37 to 1.7.3.44. As the North Channel SAC is located at an increased distance from the Mona Offshore Wind Project than the North Anglesey Marine/Gogledd Môn Forol SAC it is considered that effects would be of similar if not lower magnitude (i.e. no more than one individual affected by PTS).

Disturbance

1.7.3.46 The North Channel SAC is located 81.5 km from the Mona Array Area, which is beyond the 15 km EDR outlined in JNCC (2020) and the unweighted threshold of 143 dB re 1 μPa^2s SEL_{ss}. There is therefore no spatial overlap with the North Channel SAC, and the thresholds for significant disturbance, as outlined in Table 1.187, would not be exceeded.

Conclusions

1.7.3.47 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the SAC will not occur as a result of underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.89.

Table 1.89: Conclusions against the conservation objectives of the North Channel SAC for underwater sound generated from piling.

Conservation objective	Conclusion
The species is a viable component of the site.	For harbour porpoise, as outlined in paragraph 1.7.3.26, with primary and tertiary mitigation (as detailed in Table 1.84) applied, there is predicted to be no residual risk of injury during piling activities associated with the construction phase. In addition, tertiary mitigation in the form of a MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36 which will reduce the number of individuals affected further as harbour porpoise features will be deterred beyond the predicted injury ranges. The North Channel SAC is located 81.5 km from the Mona Array Area, which is beyond the 15 km EDR outlined in JNCC for pin piles (2020) and the unweighted threshold 143 dB re 1 μPa^2s SEL_{ss} There is therefore no spatial overlap with the North Channel SAC, the thresholds for significant disturbance as outlined in Table 1.87 would not be exceeded. Underwater sound associated with piling is therefore not predicted to restrict the objective of the population being able to maintain itself as a viable component of its natural habitat over the long-term.
There is no significant disturbance of the species.	The North Channel SAC is located 81.5 km from the Mona Array Area, which is outside the 15 km EDR for pin piles outlined in JNCC (2020). There is therefore no spatial overlap with the North Channel SAC, the thresholds for significant disturbance as outlined in Table 1.87 would not be exceeded. Underwater sound associated with piling is therefore not predicted to restrict the objective of the population

Conservation objective	Conclusion
	being able to maintain itself as a viable component of its natural habitat over the long-term.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	Habitats and processes will not be affected by underwater sound. With respect to prey species, some short-term disturbance is predicted to potential prey fish species such as herring and cod spawning grounds (see Volume 2, Chapter 9: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). However harbour porpoise are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species, with the ability to exploit other food sources. Effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term.

1.7.3.48 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

Injury

1.7.3.49 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Mona Offshore Wind Project (274.8 km from the Mona Array Area) than the North Channel SAC, assessed in paragraphs 1.7.3.45 to 1.7.3.48. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance from the Mona Offshore Wind Project than the North Channel SAC it is considered that effects would be of similar if not lower magnitude (i.e. no more than one individual affected by PTS).

Disturbance

1.7.3.50 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located 274.8 km from the Mona Array Area, which is beyond the 15 km EDR for pin piles outlined in JNCC (2020). There is therefore no spatial overlap with the Bristol Channel Approaches SAC, the thresholds for significant disturbance as outlined in Table 1.187 would not be exceeded.

Conclusions

1.7.3.51 Significant adverse effects on the qualifying harbour porpoise features of the Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will not occur as a result of underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.90.

Table 1.90: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for underwater sound generated from piling.

Conservation objective	Conclusion
The species is a viable component of the site.	For harbour porpoise, as outlined in paragraph 1.7.3.26, with primary and tertiary mitigation (as detailed in Table 1.84) applied, there is predicted to be no residual risk of injury during piling activities associated with the construction phase. In addition, tertiary mitigation in the form of a MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36 which will reduce the number of individuals affected further as harbour porpoise features will be deterred beyond the predicted injury ranges. The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located 274.8 km from the Mona Array Area, which is beyond the 15 km EDR outlined in JNCC for pin piles (2020) and the unweighted threshold 143 dB re 1 μPa^2s SEL_{ss} . There is therefore no spatial overlap with the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC, the thresholds for significant disturbance as outlined in Table 1.87 would not be exceeded. Underwater sound associated with piling is therefore not predicted to restrict the objective of the population being able to maintain itself as a viable component of the site over the long-term.
There is no significant disturbance of the species.	The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located 274.8 km from the Mona Array Area, which is outside the 15 km EDR for pin piles outlined in JNCC (2020). There is therefore no spatial overlap with the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC, the thresholds for significant disturbance as outlined in Table 1.87, would not be exceeded. Underwater sound associated with piling is therefore not predicted to result in significant disturbance of the species.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	Habitats and processes will not be affected by underwater sound. With respect to prey species, some short-term disturbance is predicted to potential prey fish species such as herring and cod spawning grounds (see Volume 2, Chapter 9: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). Harbour porpoise are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species, with the ability to exploit other food sources. Effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term.

1.7.3.52 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC

Bottlenose dolphin

Injury

1.7.3.53 As outlined in paragraph 1.7.3.16 for bottlenose dolphin, with the primary and tertiary mitigation detailed in Table 1.84 applied there is no residual risk of injury during piling.

Disturbance

1.7.3.54 As outlined in paragraph 1.7.3.28, there was no overlap of the (160 dB re 1 µPa SPL_{rms} (strong disturbance)) contour with any SAC designated for bottlenose dolphin in the marine mammal study area.

1.7.3.55 The EIA found that seven animals were predicted to be disturbed within weighted SEL_{ss} sound contours, which equates to 2.39% of the IS MU, but numbers of animals cannot be attributed or allocated to one individual SAC within the marine mammal study area.

1.7.3.56 Population modelling was carried out to explore the potential of disturbance during piling to affect the population trajectory over time and provide additional certainty in the predictions of the assessment of potential effects. This is presented in full in in Appendix A of Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4), Results of the iPCoD modelling for bottlenose dolphin against the MU population showed that the difference between the impacted and unimpacted populations after 25 years was a maximum of one animal (approximately 0.341% of the IS MU population estimate) for both the maximum temporal and maximum spatial scenarios, for both fertility rates.

1.7.3.57 Small differences (i.e. one to two animals) in the population size over time between the impacted and unimpacted population fall within the natural variance of the population, and would not be expected to change the population trajectory. Therefore, given the scale of differences between impacted and unimpacted populations (i.e. two animals is 0.683% of the IS MU population estimate), it was considered that there is no potential for a long-term effect on this species from elevated underwater sound arising during piling. It is important to highlight that whilst any model is sensitive to input parameters (as evidenced in Appendix A of Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)), the parameters (recommended by NRW through the Evidence Plan Process) used in the iPCoD model represent a conservative assessment of population changes.

Grey seal

Injury

1.7.3.58 As outlined in paragraph 1.7.3.18, for grey seal, with the primary and tertiary mitigation detailed in Table 1.84: applied, no animals would be affected by peak pressure (SPL_{pk}) as they would move away at first strike. Similarly, cumulative exposure (SEL_{cum}) would not result in injury to any individuals.

Disturbance

1.7.3.59 As outlined in paragraph 1.7.3.31, for grey seal, there was no overlap of the unweighted threshold 143 dB re 1 μPa^2s SEL_{ss} contour with any SAC designated for grey seal in the marine mammal study area.

1.7.3.60 The EIA found that 31 animals were predicted to be disturbed within weighted SEL_{ss} sound contours, which equates to 0.07% of the OSPAR Region III region (or 0.23% of the GSRP), but numbers of animals cannot be attributed or allocated to one individual SAC within the marine mammal study area.

1.7.3.61 The potential for barrier effects (i.e. the ability to move between key areas such as haul-out sites and foraging areas offshore) was considered for both concurrent and single piling scenarios. Volume 2, Chapter 4: Marine mammals considered that grey

seal close to the coast could experience mild disturbance but that this would be unlikely to lead to barrier effects, (i.e. preventing animals from using the foraging grounds in waters along the coast) as animals are unlikely to be excluded from the coastal areas. Furthermore, grey seal has a large foraging range (up 448 km reported in Carter *et al*., 2022) and could therefore move to alternative foraging grounds during piling. Animals would, however, be likely to avoid offshore areas where received levels during piling exceed thresholds for strong disturbance. In addition, there may be an energetic cost associated with longer foraging trips and alternative habitat may be sub-optimal in terms of abundance of key prey species.

1.7.3.62 Results of the iPCoD modelling in the EIA for grey seal showed that the median of the ratio of the impacted population to the unimpacted population (when using both the GSRP and OSPAR Region III) was 1 at both six years and 25 years post the start of piling, and simulated grey seal population sizes for both baseline and impacted populations showed no difference. Therefore, it was considered that there is no potential for long-term effects on this species. Further information on the iPCoD modelling is provided in Appendix A of Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4).

Conclusions

1.7.3.63 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC will not occur as a result of underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.91 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.91: Conclusions against the conservation objectives of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC for underwater sound generated from piling.

Conservation objective	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **Important elements are population size, structure, production, and condition of the species within the site.** **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	For both bottlenose dolphin and grey seal, with primary and tertiary mitigation applied there is no residual risk of injury during piling. In addition, tertiary mitigation in the form of an MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36 which will reduce the number of individuals affected further as bottlenose dolphin and grey seal features will be deterred beyond the predicted injury ranges. For bottlenose dolphin and grey seal there was no overlap of the 160 dB_{rms} (strong disturbance) contour with any SAC designated for bottlenose dolphin or grey seal. For bottlenose dolphin the most conservative estimate of disturbance led to up to seven animals predicted to be disturbed within weighted SEL_{ss} sound contours, which equates to 2.39% of the MU. For grey seal the most conservative estimate of disturbance led to up to 31 animals which equates to 0.23 % of the GSRP or 0.05 % of the OSPAR Region III population. Grey seal close to the coast could experience mild disturbance but this would be unlikely to lead to barrier effects and considering the large foraging range of grey seal (up 448 km reported in Carter *et al.*, 2022) seals could move to alternative foraging grounds during piling.

Conservation objective	Conclusion
	The iPCoD modelling suggests that over the duration of the impact, six years post impact and up to 25 years after the start of piling, there would be no long-term effects on the bottlenose dolphin or grey seal reference population. Therefore, underwater sound as a result of piling will not prevent the populations of bottlenose dolphin and grey seal from maintaining themselves on a long-term basis as a viable component of their natural habitats. Similarly, underwater sound as a result of piling will not adversely affect the population size, structure, production, and condition of the species within the site. The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of underwater sound impacts associated with piling.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	Habitats and processes will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species such as cod and herring spawning grounds (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)), effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term. The presence, abundance, condition and diversity of habitats and species required to support this species will not be adversely affected. Underwater sound as a result of piling will not prevent the distribution, abundance and populations dynamics of the species within the site and population beyond the site, from remaining stable or increasing.

1.7.3.64 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.7.3.65 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Mona Offshore Wind Project (162.5 km from the Mona Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.7.3.53 to 1.7.3.64. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude (i.e. with the primary and tertiary mitigation detailed in Table 1.84 applied there is no residual risk of injury during piling).

Conclusions

1.7.3.66 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will not occur as a result of underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.92 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.92: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for underwater sound generated from piling.

Conservation objective	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **Important elements are population size, structure, production, and condition of the species within the site.** **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	For bottlenose dolphin, with the primary and tertiary mitigation detailed in Table 1.84 applied, there is no residual risk of injury during piling. In addition, tertiary mitigation in the form of an MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36 which will reduce the number of individuals affected further as bottlenose dolphin features will be deterred beyond the predicted injury ranges. For bottlenose dolphin the most conservative estimate of disturbance led to up to seven animals using the unweighted sound threshold of 160 dB_{rms} (strong disturbance) predicted to experience potential disturbance, which equates to 2.93% of the MU. The iPCoD modelling presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) predicts that over the duration of the impact, six years post impact and up to 25 years after the start of piling, there would be no long-term effects on the bottlenose dolphin population. Therefore, underwater sound as a result of piling will not prevent the features' population from maintaining itself on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound as a result of piling will not adversely affect the population size, structure, production, and condition of the species within the site. The population of bottlenose dolphin within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of underwater sound impacts associated with piling.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	Habitats and processes will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species such as cod and herring spawning (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. The presence, abundance, condition and diversity of habitats and species required to support this species will not be adversely affected to such extent that would impact the species. Underwater sound as a result of piling will not prevent the distribution, abundance and populations dynamics of the species within the site and population beyond the site from remaining stable or increasing.

1.7.3.67 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.7.3.68 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Mona Offshore Wind Project (211.7 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau, assessed in paragraphs 1.7.3.53 to 1.7.3.64. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r

Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude (i.e. with the primary and tertiary mitigation detailed in Table 1.84 applied there is no residual risk of injury during piling).

Conclusions

1.7.3.69 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will not occur as a result of underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.93. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.93: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for underwater sound generated from piling.

Conservation objective	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **Important elements are population size, structure, production, and condition of the species within the site.** **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	For grey seal, with the primary and tertiary mitigation detailed in Table 1.84 applied, there is no residual risk of injury during piling. In addition, tertiary mitigation in the form of an MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36 which will reduce the number of individuals affected further as grey seal features will be deterred beyond the predicted injury ranges. There was no overlap of the 160 dB_{rms} (strong disturbance) contour with any SAC designated for grey seal in the marine mammal study area. The most conservative estimate of disturbance using the unweighted sound threshold of 160 dB re 1 µPa SPL_{rms} (strong disturbance) led to up to 31 animals which equates to 0.23% of the grey seal reference population or 0.05% of the OSPAR Region III population. Grey seal close to the coast could experience mild disturbance but that this would be unlikely to lead to barrier effects and considering the large foraging range of grey seal (up 448 km reported in Carter et al., 2022) seals could move to alternative foraging grounds during piling. The iPCoD modelling presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) predicts that over the duration of the impact, and up to 25 years after the start of piling, there would be no long-term effects on the grey seal population. Therefore, underwater sound as a result of piling will not prevent the population of grey seal from maintaining itself on a long-term basis as a viable component of its natural habitat. On the basis of the above underwater sound as a result of piling will also not adversely affect the population size, structure, production, and condition of the species within the site. The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced as a result of underwater sound impacts associated with piling.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	Habitats and processes will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species such as cod and herring spawning (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)), effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term. The presence, abundance, condition and diversity of habitats and species required to support this species will not be adversely affected to such an extent that would impact this species. Underwater sound as a result of piling will not prevent the distribution, abundance and populations dynamics of the species within the site and population beyond the site from remaining stable or increasing.

1.7.3.70 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Strangford Lough SAC

Harbour seal

Injury

1.7.3.71 For harbour seal, with primary and tertiary mitigation detailed in Table 1.84 applied, no animals would be affected by peak pressure (SPL_{pk}) as they would move away at first strike. Similarly, cumulative exposure (SEL_{cum}) would not result in injury to any individuals.

Disturbance

1.7.3.72 As outlined in paragraph 1.7.3.33, for harbour seal, there was no overlap of the 160 dBrms (strong disturbance) contour with any SAC designated for harbour seal in the marine mammal study area.

1.7.3.73 The most conservative estimate of disturbance using the 160 dB re 1 µPa SPL_{rms} (strong disturbance) led to up to less than one animal being disturbed which equates to 0.01% of the HSRP (Table 1.82). Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) concluded that the impact could also result in a very small effect on the distribution of harbour seal during piling only and may affect the fecundity of very small numbers in the context of the reference population (up to 0.2% of the combined total of MU population at any one time) over the medium term. However, due to the very small numbers and small proportion of the population affected the magnitude of the impact is unlikely to lead to a population-level effect and this species was not carried forward for further assessment within the iPCoD model framework.

Conclusions

1.7.3.74 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Strangford Lough SAC will not occur as a result of underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed Table 1.94 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.94: Conclusions against the conservation objectives of the Strangford Lough SAC for underwater sound generated from piling.

Conservation objective	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of harbour seal.**	For harbour seal, with primary and tertiary mitigation detailed in Table 1.84 applied, there is no residual risk of injury during piling. In addition, tertiary mitigation in the form of an MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36 which will reduce the number of individuals affected further as harbour seal features will be deterred beyond the predicted injury ranges.

Conservation objective	Conclusion
	There was no overlap of the 160 dB re 1 µPa SPL_{rms} (strong disturbance) contour with any SAC designated for harbour seal in the marine mammal study area. For harbour seal, the most conservative estimate of disturbance using the unweighted sound threshold of 160 dB rms led to less than one animal predicted to experience potential disturbance which equates to 0.01% of the HSRP (Table 1.82). This could result in a very small effect on the distribution of harbour seal during piling only and may affect the fecundity of very small numbers in the context of the reference population (up to 0.01% of the combined total of MU population at any one time) over the medium term. However, due to the very small numbers and small proportion of the population affected the impact is not considered to lead to a population-level effect. Underwater sound from piling associated with the Mona Offshore Wind Project will not prevent the harbour seal feature from being maintained or restored to favourable condition. On the basis of the above, underwater sound from piling associated with the Mona Offshore Wind Project will also not prevent the harbour seal population numbers and distribution from being maintained or enhanced in the long term.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound from piling to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project will prevent physical features used by harbour seal within the site from being maintained or enhanced.

1.7.3.75 Therefore, it can be concluded re 1 µPa SPL_{rms} that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Murlough SAC

Harbour seal

1.7.3.76 The Murlough SAC is located at an increased distance to the Mona Offshore Wind Project (115. km from the Mona Array Area) than the Strangford Lough SAC, assessed in paragraphs 1.7.3.71 to 1.7.3.75. As the Murlough SAC is located at an increased distance from the Mona Offshore Wind Project than the Strangford Lough SAC it is considered that effects would be of similar if not lower magnitude (i.e. with the primary and tertiary mitigation detailed in Table 1.84 applied there is no residual risk of injury during piling).

Conclusions

1.7.3.77 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Murlough SAC will not occur as a result of underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.95. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.95: Conclusions against the conservation objectives of the Murlough SAC for underwater sound generated from piling.

Conservation objective	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of harbour seal.**	For harbour seal, with primary and tertiary mitigation detailed in Table 1.84 applied, there is no residual risk of injury during piling. In addition, tertiary mitigation in the form of an MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36 which will reduce the number of individuals affected further as harbour seal features will be deterred beyond the predicted injury ranges. There was no overlap of the 160 dB rms (strong disturbance) contour with any SAC designated for harbour seal in the marine mammal study area. For harbour seal, the most conservative estimate of disturbance using the unweighted sound threshold of 160 dB re 1 µPa SPL_{rms} (strong disturbance) led to less than one animal predicted to experience potential disturbance which equates to 0.01% of the HSRP (Table 1.82). This could result in a very small effect on the distribution of harbour seal during piling only and may affect the fecundity of very small numbers in the context of the reference population (up to 0.01% of the combined total of MU population at any one time) over the medium term. However, due to the very small numbers and small proportion of the population affected the impact is not considered to lead to a population-level effect. Underwater sound from piling associated with the Mona Offshore Wind Project will not prevent the harbour seal feature from being maintained or restored to favourable condition. On the basis of the above, underwater sound from piling associated with the Mona Offshore Wind Project will also not prevent the harbour seal population numbers and distribution from being maintained or enhanced in the long term.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound from piling to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project will prevent physical features used by harbour seal within the site from being maintained or enhanced.

1.7.3.78 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

The Maidens SAC

Grey seal

1.7.3.79 The Maidens SAC is located at an increased distance to the Mona Offshore Wind Project (166.8 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.3.53 to 1.7.3.64. As The Maidens SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude (i.e. with the primary and tertiary mitigation detailed in Table 1.84 applied there is no residual risk of injury during piling).

Conclusions

1.7.3.80 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of The Maidens SAC will not occur as a result of

underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.96 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.96: Conclusions against the conservation objectives of The Maidens SAC for underwater sound generated from piling.

Conservation objective	Conclusion
To maintain (or restore where appropriate) the grey seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of grey seal.**	For grey seal, with primary and tertiary mitigation detailed in Table 1.84 applied, there is no residual risk of injury during piling. In addition, tertiary mitigation in the form of an MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36 which will reduce the number of individuals affected further as grey seal features will be deterred beyond the predicted injury ranges. There was no overlap of the 160 dB re 1 µPa SPL_{rms} (strong disturbance) contour with any SAC designated for grey seal in the marine mammal study area. The most conservative estimate of disturbance using the unweighted sound threshold of 160 dB re 1 µPa SPL_{rms} (strong disturbance) led to up to 31 animals which equates to 0.23% of the grey seal reference population or 0.05% of the OSPAR Region III population. Grey seal close to the coast could experience mild disturbance but that this would be unlikely to lead to barrier effects and considering the large foraging range of grey seal (up 448 km reported in Carter *et al*., 2022) seals could move to alternative foraging grounds during piling. The iPCoD modelling presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) predicts that over the duration of the impact, and up to 25 years after the start of piling, there would be no long-term effects on the grey seal population. Underwater sound from piling associated with the Mona Offshore Wind Project will therefore not prevent the grey seal feature from being maintained or restored to favourable condition. On the basis of the above, Underwater sound from piling associated with the Mona Offshore Wind Project will also not prevent the grey seal population numbers and distribution from being maintained or enhanced in the long term.
Maintain and enhance, as appropriate, physical features used by grey seal within the site.	There is no pathway for underwater sound from piling to result in adverse effects on the physical features of the qualifying species. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored.

1.7.3.81 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of The Maidens SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Lundy SAC

Grey seal

1.7.3.82 The Lundy SAC is located at an increased distance to the Mona Offshore Wind Project (309.5 km from the Mona Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.7.3.53 to 1.7.3.64. As the Lundy SAC is located at an increased distance from the Mona Offshore Wind Project than the

Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC it is considered that effects would be of similar if not lower magnitude (i.e. with the primary and tertiary mitigation detailed in Table 1.84 applied there is no residual risk of injury during piling).

Conclusions

1.7.3.83 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the SAC will not occur as a result of underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.97 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.97: Conclusions against the conservation objectives of the Lundy SAC for underwater sound generated from piling.

Conservation objective	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound from piling to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats of qualifying species, the structure and function of the habitats of qualifying species or the supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	For grey seal, with primary and tertiary mitigation detailed in Table 1.84 applied there is no residual risk of injury during piling. In addition, tertiary mitigation in the form of an MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36 which will reduce the number of individuals affected further as grey seal features will be deterred beyond the predicted injury ranges. There was no overlap of the 160 dB re 1 µPa SPL_{rms} (strong disturbance) contour with any SAC designated for grey seal in the marine mammal study area. The most conservative estimate of disturbance using the unweighted sound threshold of 160 dB re 1 µPa SPL_{rms} (strong disturbance) led to up to 31 animals which equates to 0.23% of the grey seal reference population or 0.05% of the OSPAR Region III population. Grey seal close to the coast could experience mild disturbance but that this would be unlikely to lead to barrier effects and considering the large foraging range of grey seal (up 448 km reported in Carter et al., 2022) seals could move to alternative foraging grounds during piling. The iPCoD modelling presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) predicts that over the duration of the impact and up to 25 years after the start of piling there would be no long-term effects on the grey seal reference population. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project will not prevent the populations or the distribution of qualifying species within the site of qualifying species from being maintained or restored.

1.7.3.84 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Lundy SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Isles of Scilly Complex SAC

Grey seal

1.7.3.85 The Isles of Scilly Complex SAC is located at an increased distance to the Mona Offshore Wind Project (439.3 km from the Mona Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.7.3.53 to 1.7.3.64. As the Isles of Scilly Complex SAC is located at an increased distance from the Mona Offshore Wind Project than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC it is considered that effects would be of similar if not lower magnitude (i.e. with the primary and tertiary mitigation detailed in Table 1.84 applied there is no residual risk of injury during piling).

Conclusions

1.7.3.86 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will not occur as a result of underwater sound generated from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.98 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.98: Conclusions against the conservation objectives of the Isles of Scilly SAC for underwater sound generated from piling.

Conservation objective	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound from piling to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats of qualifying species, the structure and function of the habitats of qualifying species or the supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	For grey seal, with primary and tertiary mitigation detailed in Table 1.84 applied there is no residual risk of injury during piling. In addition, tertiary mitigation in the form of an MMMP (Document Reference J21) (as an annex of the Underwater Sound Management Strategy), outlined in paragraph 1.7.3.35 and 1.7.3.36 which will reduce the number of individuals affected further as grey seal features will be deterred beyond the predicted injury ranges. There was no overlap of the 160 dB re 1 µPa SPL_{rms} (strong disturbance) contour with any SAC designated for grey seal in the marine mammal study area. The most conservative estimate of disturbance using the unweighted sound threshold of 160 dB re 1 µPa SPL_{rms} (strong disturbance) led to up to 31 animals which equates to 0.23% of the grey seal reference population or 0.05% of the OSPAR Region III population. Grey seal close to the coast could experience mild disturbance but that this would be unlikely to lead to barrier effects and considering the large foraging range of grey seal (up

Conservation objective	Conclusion
	448 km reported in Carter et al., 2022) seals could move to alternative foraging grounds during piling. The iPCoD modelling presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) predicts that over the duration of the impact and up to 25 years after the start of piling there would be no long-term effects on the grey seal reference population. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project will not prevent the populations or the distribution of qualifying species within the site of qualifying species from being maintained or restored.

1.7.3.87 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Isles of Scilly Complex SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Additional sites for which a full assessment has not been conducted in line with the iterative process

1.7.3.88 As outlined in paragraphs 1.7.1.3 to 1.7.1.6, following the iterative approach adopted for this ISAA, the closest European site to the Mona Offshore Wind Project within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this ISAA, are located at a greater distance from the Mona Offshore Wind Project and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.7.3.37 to 1.7.3.87 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.7.3.89 to 1.7.3.111.

West Wales Marine/Gorllewin Cymru Forol SAC

1.7.3.89 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.7.3.90 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llŷn a'r Sarnau/ Lleyn Peninsula and the Sarnau SAC (paragraph 1.7.3.53 to 1.7.3.64), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project alone.

Saltee Islands SAC

1.7.3.91 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llŷn a'r Sarnau/ Lleyn Peninsula and the Sarnau SAC (paragraph 1.7.3.53 to 1.7.3.64), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Saltee Islands SAC as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project alone.

Rockabill to Dalkey Island SAC

1.7.3.92 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Rockabill to Dalkey Island SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Roaringwater Bay and Islands SAC

1.7.3.93 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Roaringwater Bay and Islands SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Blasket Islands SAC

1.7.3.94 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Blasket Islands SAC as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Mers Celtiques – Talus du golfe de Gascogne SCI

1.7.3.95 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Mers Celtiques – Talus du golfe de Gascogne SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Abers – Côte des legends SCI

1.7.3.96 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Abers – Côte des legends SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Ouessant-Molène SCI

1.7.3.97 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Ouessant-Molène SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Côte de Granit rose-Sept-Iles SCI

1.7.3.98 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Anse de Goulven, dunes de Keremma SCI

1.7.3.99 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Tregor Goëlo SCI

1.7.3.100 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Tregor Goëlo SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Côtes de Crozon SCI

1.7.3.101 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Côtes de Crozon SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Chaussée de Sein SCI

1.7.3.102 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Chaussée de Sein SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Cap Sizun SCI

1.7.3.103 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cap Sizun SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Récifs du talus du golfe de Gascogne SCI

1.7.3.104 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Anse de Vauville SCI

1.7.3.105 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Anse de Vauville SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Cap d'Erquy-Cap Fréhel SCI

1.7.3.106 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Baie de Saint-Brieuc – Est SCI

1.7.3.107 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Banc et récifs de Surtainville SCI

1.7.3.108 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.7.3.109 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Estuaire de la Rance SCI

1.7.3.110 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Estuaire de la Rance SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Baie du Mont Saint-Michel SCI

1.7.3.111 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.37 to 1.7.3.48), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Baie du Mont Saint-Michel SCI as a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Injury and disturbance from underwater sound generation from unexploded ordnance (UXO) detonation

1.7.3.112 UXO detonation during the construction phase may result in hearing damage/auditory injury or behavioural disturbance/displacement (including barrier effects) of marine mammals.

1.7.3.113 The assessment of LSE during the HRA screening process identified that during construction and decommissioning, LSE could not be ruled out for the potential impact of Injury and disturbance from underwater sound generated from UXO. This relates to the sites listed in Table 1.77.

1.7.3.114 The following sections explain how this potential impact on Annex II marine mammal features of the SACs outlined above has been quantified and assessed.

1.7.3.115 The MDS considered for the assessment of potential impacts on Annex II marine mammals for underwater sound from UXO detonation is presented in Table 1.99.

Table 1.99: Maximum design scenario considered for the assessment of potential impacts on Annex II marine mammals from injury and disturbance from underwater sound generation from UXO detonation during the construction phase.

Phase	Maximum design scenario	Justification
Contruction phase	• Clearance of up to 22 UXOs within the Mona Array Area or Offshore Cable Corridor and Access Areas • A range of UXO sizes assessed from 25 kg up to 907 kg (absolute maximum) with 130 kg the most likely (common) size	Maximum number and maximum size of UXOs encountered in the Mona Array Area and Mona Offshore Cable Corridor and Access Areas. Due to uncertainties in size of UXOs the assessment presents a range of UXO

Phase	Maximum design scenario	Justification
	• For high order detonation donor charges of 1.2 kg (most common) and 3.5 kg (single barracuda blast charge) • Up to 0.5 kg NEQ clearance shot for neutralisation of residual explosive material at each location • Clearance during daylight hours only • MDS is for high order clearance but assessment also considered: – Low order clearance charge size of 0.08 kg – Low yield clearance configurations of 0.75 kg charges (up to 4x0.75 kg).	sizes assessed (from 25 kg up to an absolute maximum of 907 kg), highlighting 130 kg is the most likely (common) size. Most common (1.2 kg) and maximum donor charges (3.5 kg) assessed for high order detonation. Assumption of a clearance shot of up to 0.5kg at all locations although noting that this may not always be required. For the assessment of low order/low yield clearance, charges are based on the maximum required to initiate clearance event.

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.116 The measures adopted as part of the Mona Offshore Wind Project that are relevant to the effects of underwater sound generation from UXO detonations during the construction phase are outlined in Table 1.84.

Construction phase

Information to support assessment

Injury-PTS

1.7.3.117 Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) presents the impact ranges for low order and low yield UXO clearance activities, donor charges used in high order UXO clearance and high order clearance of UXO. The number of animals predicted to experience PTS due to low order UXO clearance is less than one animal for bottlenose dolphin, grey seal and harbour seal and up to six harbour porpoise. The number of animals predicted to experience PTS due to high order clearance of UXO (907 kg) is less than one bottlenose dolphin and harbour seal, up to six grey seal and up to 206 harbour porpoise. Additional information is provided in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4).

1.7.3.118 As reported in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) an explosive mass of 907 kg (absolute maximum high order explosion) yielded the largest PTS ranges for all species, with the greatest range of effects (15,370 m) predicted for harbour porpoise (SPL_{pk}). However, the most likely (common) 130 kg charge sees this injury range reduce to 8,045 m for harbour porpoise (SPL_{pk}). Conservatively, the number of harbour porpoise that could be potentially injured, based on the Welsh Marine Mammal Atlas density of 0.2773 animals per km^2, was estimated as 206 animals for the absolute maximum 907 kg UXO high order explosion (using the SPL_{pk}) equating to 0.329 % of the Celtic and Irish Seas MU population. Predicted numbers were much smaller for the most likely (common) 130kg with up to 57 animals potentially experiencing PTS, respectively (using the SPL_{pk}). For low order techniques, the largest range of 2,290 m was predicted from the 4x0.75 kg low-yield charges, which could injure up to three harbour porpoise within this range.

1.7.3.119 The underwater sound assessment found that the maximum injury (PTS) range estimated for bottlenose dolphin using the SPL_{pk} metric is 890 m for the absolute maximum detonation of charge size of 907 kg, but this is reduced to 464 m for 130 kg (most likely (common maximum) and 268 m for 25 kg. Therefore conservatively, during high order detonation of any UXO up to the maximum size of 907 kg, the number of individuals that could be potentially injured (based on densities presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)) was estimated to be no more than one. With reference to the wider population, this equated to very small proportions of the relevant Irish Sea MU (0.01%). For low order techniques, the injury ranges were considerably lower with a maximum of 133 m estimated with no more than one animal likely to be present within this range.

1.7.3.120 The underwater sound assessment found that the maximum injury (PTS) range estimated for grey seal using the SPL_{pk} metric was 3,015 m for the detonation of charge size of 907 kg (absolute maximum), but this was reduced to 1,580 m for the most likely (common) maximum 130kg and 910 m for 25 kg. Therefore conservatively, the number of individuals that could potentially be injured, based on the inshore densities, was estimated as less than six animals for the absolute maximum 907 kg UXO high order explosion, which equates to 0.04% of the grey seal reference population or 0.008 % of the OSPAR III population, and less than two animals for 130 kg UXO most likely (common) maximum and less than one animal for 25 kg UXO. For low order techniques, the maximum range predicted was up to 449 m and there would be no more than one animal potentially within this impact range.

1.7.3.121 The underwater sound assessment found that the maximum injury (PTS) range estimated for harbour seal using the SPL_{pk} metric was 3,015 m for the detonation of charge size of 907 kg (absolute maximum), but this was reduced to 1,580 m for 130kg and 910 m for 25 kg. Therefore conservatively, the number of individuals that could be potentially injured, was estimated as less than one animal for 907 kg UXO high order explosion (absolute maximum), 130 kg UXO (most likely (common) maximum and 25 kg UXO, which equates to up to 0.002% of the reference population (Wales, NW England and Northern Ireland SMUs). For low order techniques, the maximum range predicted was up to 449 m and there would be no more than one animal potentially within this impact range.

1.7.3.122 Further details on underwater sound modelling of UXO clearance are provided in Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement and Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4).

Behavioural displacement (TTS as a proxy)

1.7.3.123 Within Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) a second threshold assessed was the onset of TTS where the resulting effect would be a potential temporary loss in hearing. Whilst similar ecological functions would be inhibited in the short term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual. However, the onset of TTS also corresponds to a 'moving away response' as this is the threshold at which animals are likely to move away from the ensonified area. Thus, the onset of TTS also reflects the threshold at which strong disturbance could occur (it represents the boundary between the most severe disturbance levels and the start of physical auditory impacts on animals) TTS thresholds are less conservative than those for PTS thresholds and can aid in counterbalancing the precautionary nature of the underwater sound models.

1.7.3.124 As before, the assessment of strong disturbance considered low order and low yield UXO clearance activities, donor charges for high order UXO disposal and high order explosions. The largest ranges using SPL_{pk} were predicted for clearance of the 907kg UXO (absolute maximum) with potential strong disturbance/moving away response over a distance of up to 28.3 km for harbour porpoise. Ranges predicted for other species using SPL_{pk} were smaller, with potential strong disturbance/moving away response over a distance of up to 1.6 km for bottlenose dolphin and 6.47 km for both grey seal and harbour seal.

1.7.3.125 As seen for PTS the highest number of animals affected, based on high order detonation of a 907kg UXO (absolute maximum), was found for harbour porpoise where up to 699 animals could experience disturbance within the 28.3 km impact range equating to 0.39 % of the Celtic and Irish Seas MU population (based on SPL_{pk}). For bottlenose dolphin less than one animal could experience TTS within the 1.6 km impact range (based on SPL_{pk}). Based on SEL_{cum} the number of grey seal within a predicted 6.47 km disturbance range was estimated as 24 animals (0.18 % of the Grey seal reference population or 0.04 % of the OSPAR region III population) and for harbour seal less than one animal could experience TTS within the 6.47 km impact range.

1.7.3.126 Further detail on sound modelling of UXO clearance are provided in Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement and Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4).

Further mitigation measures

1.7.3.127 The project alone assessment of injury from elevated underwater sound during UXO clearance concludes a significant effect in EIA terms, for harbour porpoise only (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4). The project alone assessment of disturbance from elevated underwater sound during UXO clearance concluded no significant effect in EIA terms, for all marine mammal receptors. The project has committed to the development of an Underwater sound management strategy (Document Reference J16) to manage underwater sound levels associated with significant impacts from the project, to reduce the magnitude of impacts such that there will be no residual significant effect. The Underwater sound management strategy (Document Reference J16) will also reduce impacts resulting from underwater sound on the SACs designated for Annex II marine mammals assessed below.

1.7.3.128 The Underwater sound management strategy will present relevant further mitigation options (such as NAS, temporal and spatial restrictions, low order clearance methods, soft start) in order to manage underwater sound levels so as to reduce the magnitude of impacts for the project alone. The project has prepared an Outline underwater sound management strategy (Document Reference J16) which is secured in the deemed marine licence in Schedule 14 of the draft DCO, which establishes a process of investigating options to manage underwater sound levels, in consultation with the licensing authority and SNCBs and agreeing prior to construction, mitigation measures that will be implemented to reduce the magnitude of impacts such that there will be no residual significant effect from the project (in this case, on harbour porpoise). These further measures would also reduce impacts associated with underwater sound for other marine mammal receptors.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.7.3.129 The conclusions presented onwards are based on the assessment for high order clearance.

1.7.3.130 As outlined in paragraph 1.7.3.118 the number of harbour porpoise that could be potentially injured was estimated as 206 animals for 907kg UXO high order explosion (absolute maximum) which equates to 0.329% of the Celtic and Irish Seas MU. For disturbance, as outlined in paragraph 1.7.3.124 the number of harbour porpoise potentially affected by TTS based on high order detonation of a 907kg UXO, was up to 699 animals which equates to 1.12% of the MU population.

1.7.3.131 With the implementation of primary measures (i.e. development and adherence to a MMMP that requires implementation of a mitigation hierarchy with regard to UXO) in place, (outlined in Table 1.84) Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) identified that there would be a residual risk of injury over a range of 2,290 m (for harbour porpoise using the SPL_{pk} metric) that would require further mitigation. Where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to 15 km for a 907kg UXO (absolute maximum) and 8 km for a 130kg UXO (most likely common maximum). Therefore, adopting standard industry practice (JNCC, 2010), tertiary mitigation will be applied as part of an MMMP (Document Reference J21), as an annex of the Underwater sound management strategy (with an Outline underwater sound management strategy submitted as part of the application (Document Reference J16)). Tertiary mitigation will also include the use of ADDs and scare charges to deter animals from the injury zone (see Table 1.84). With tertiary mitigation applied it is anticipated that for most species, animals would be deterred from the injury zone and therefore the likelihood of PTS would be reduced.

1.7.3.132 For harbour porpoise the ranges of effect are large for high order clearance and there is considered to be a residual risk of PTS to a number of individuals. Whilst it is difficult to quantify this residual risk it is anticipated that there would be some measurable changes at an individual level but that this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected.

1.7.3.133 Disturbance ranges (TTS as a proxy) are up to a maximum of 28.3 km for a 907 kg UXO, which leads to an overlap with 1.79% of the North Anglesey Marine/Gogledd Môn Forol SAC. However, this is a highly precautionary approach which assumes the UXO to be detonated is located at the closest point to the SAC, and the range of 28.3 km is outside of the EDR range of 26 km for UXO presented in JNCC (2020).

1.7.3.134 In line with guidance from stakeholders (JNCC, and Natural England) the EDR approach has also been used for the assessment of disturbance associated with UXO detonation during the construction phase for harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC. The EDR approach, as outlined in JNCC (2020), recommends the use of 26 km deterrence range for UXO detonation. The assessment considered UXO detonation could occur at the closest location within the Mona Array Area to the North Anglesey Marine/Gogledd Môn Forol SAC.

1.7.3.135 As shown in Figure 1.20, the implementation of a 26 km EDR for the Mona Offshore Wind Project could potentially result in a 66.06 km^2 overlap with the North Anglesey Marine/Gogledd Môn Forol SAC. Using the disturbance footprints associated with the Mona Offshore Wind Project this could result in potential disturbance across an area equating to 2.03% of the total area of the North Anglesey Marine/Gogledd Môn Forol

SAC which, as outlined in Table 1.102, is below the daily 20% guidance threshold from JNCC (2020). In terms of disturbance across the site averaged over the season (summer, 183 days) a daily footprint of 66.06 km^2, over up to 22 days of UXO detonation across the construction phase (see Table 1.99) would result in an average of 0.24% of the relevant area of the North Anglesey Marine/Gogledd Môn Forol SAC being affected over the season. This therefore falls well below the threshold of 10% of the relevant area of the site over the season (Table 1.100). As outlined in Table 1.99, the MDS assumes clearance of up to 22 UXOs over the construction phase and, for the purposes of this assessment and to ensure a precautionary approach, it is assumed that one UXO detonation could occur in a single day. This is therefore precautionary in the event that multiple detonations occur in a single day. Therefore, disturbance associated with UXO detonation would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season (Table 1.100).

1.7.3.136 The next closest SAC designated for harbour porpoise, the North Channel SAC, is located 81.5 km away from the Mona Array Area and 94.5 km away from the Mona Offshore Cable Corridor and Access Areas which is outside the 26 km EDR range for UXO. Therefore with the implementation of a 26 km EDR, there will be no overlap with the North Channel SAC or any other SACs designated for harbour porpoise and disturbance associated with UXO detonation will not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.

Table 1.100: Disturbance thresholds for UXO detonation for the North Anglesey Marine/Gogledd Môn Forol SAC.

Guidance threshold	Justification
20% of the relevant area of the site in any given day.	Using the EDR approach, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC would be 66.06 km^2 (for a UXO detonation on any given day), which equates to 2.03 % of the relevant area of the site.
An average of 10% of the relevant area of the site over the season.	A daily footprint of 66.06 km^2 over 22 days of UXO detonation across the construction phase would result in an average of 0.24% of the relevant area of the SAC over the season (summer, 183 days)[42].

[42] A daily footprint of 2.03% for 22 days would result in an average of 2.03x22/183 days (summer) = 0.24%

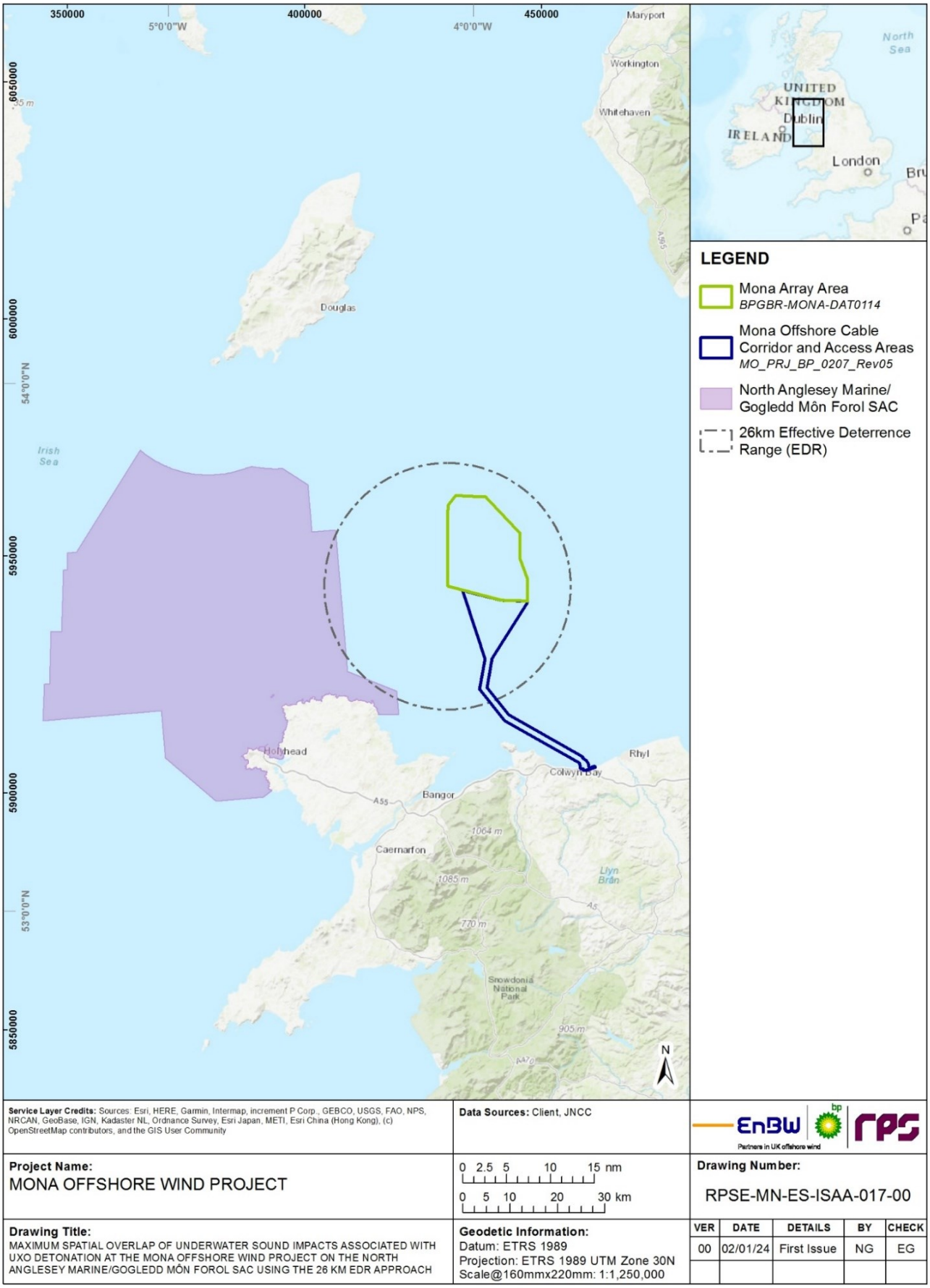

Figure 1.20: Maximum spatial overlap of underwater sound impacts associated with UXO detonation at the Mona Offshore Wind Project on the North Anglesey Marine/Gogledd Môn Forol SAC based on the 26 km EDR approach.

Conclusions

1.7.3.137 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn in Table 1.101 below.

Table 1.101: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
The species is a viable component of the site.	As outlined in paragraph 1.7.3.131, where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to 15 km for a 907 kg UXO (absolute maximum) and 8 km for a 130 kg UXO (most likely (common) maximum. The North Anglesey Marine/Gogledd Môn Forol SAC is located 22.5 km from the Mona Offshore Wind Project therefore there is no overlap between the potential impact zone and the SAC. Due to the mobile nature of harbour porpoise there is potential for harbour porpoise to be present within the impact zone. With tertiary mitigation applied it is anticipated that animals would be deterred from the injury zone and therefore the risk of PTS would be reduced. Whilst it is anticipated that there would be some measurable changes at an individual level, this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected (0.32%). Disturbance (using TTS as a proxy) is very short term and reversible and therefore animals that experience this effect are anticipated to fully recover. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not prevent harbour porpoise from remaining a viable component of the SAC.
There is no significant disturbance of the species.	Disturbance (using TTS as a proxy) is considered very short term and reversible, therefore animals that experience this effect are anticipated to fully recover. It is, however, recognised that where tertiary mitigation applies deterrence measures (i.e. ADD and soft start charges) by their nature would contribute to, rather than reduce, the moving away response (behavioural disturbance). Any disturbance would occur during a short time period during the construction phase and is not anticipated to have long term population effects on the feature (i.e. features are anticipated to fully recover). There is no spatial overlap of the injury ranges associated with UXO detonation with the SAC and the disturbance thresholds outlined in Table 1.87 will not be exceeded (using TTS as a proxy presents a potential overlap of 1.79% with the North Anglesey Marine/Gogledd Môn Forol SAC for 907 kg UXO (absolute maximum), whilst using the EDR approach presents a potential daily overlap of 2.03%, see Table 1.100). Disturbance impacts associated with the Mona Offshore Wind Project will not surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not result in significant disturbance of the species.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	Supporting habitats and processes will not be affected by underwater sound from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be long lasting ensuring that the Mona Offshore Wind Project will not affect prey species populations being maintained in the long term.

1.7.3.138 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol

SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

North Channel SAC

Harbour porpoise

1.7.3.139 The North Channel SAC is located at an increased distance to the Mona Offshore Wind Project (81.5 km from the Mona Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, assessed in paragraphs 1.7.3.137 to 1.7.3.16. As the North Channel SAC is located at an increased distance from the Mona Offshore Wind Project than the North Anglesey Marine/Gogledd Môn Forol SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.3.140 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Channel SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.102 below.

Table 1.102: Conclusions against the conservation objectives of the North Channel SAC for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
The species is a viable component of the site.	As outlined in paragraph 1.7.3.131, where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to 15 km for a 907kg UXO (absolute maximum) and 8 km for a 130kg UXO most likely (common) maximum. The North Channel SAC is located 81.5 km from the Mona Offshore Wind Project therefore there is no overlap between the potential impact zone and the SAC. Due to the mobile nature of harbour porpoise there is still potential for harbour porpoise to be present within the impact zone. With tertiary mitigation applied it is anticipated that for most species animals would be deterred from the injury zone and therefore the risk of PTS would be reduced. It is anticipated that there would be some measurable changes at an individual level but that this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected (0.32%). Disturbance (using TTS as a proxy) is very short term and is reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not prevent harbour porpoise from remaining a viable component of the SAC.
There is no significant disturbance of the species.	Disturbance (using TTS as a proxy) is considered very short term and reversible, therefore animals that experience this effect are anticipated to fully recover. It is, however, recognised that where tertiary mitigation applies deterrence measures (i.e. ADD and soft start charges) these measures would contribute to, rather than reduce, the moving away response (behavioural disturbance). Any disturbance would occur during a short time period during the construction phase and is not anticipated to have long term population effects on the feature (i.e. features are anticipated to fully recover). There is no spatial overlap of the injury or disturbance ranges associated with UXO detonation, or the 26 km EDR, and the North Channel SAC and therefore harbour porpoise will not be excluded from any part of the SAC and the disturbance thresholds outlined in Table 1.87 will not be exceeded. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not result in significant disturbance of the species.

Conservation Objectives	Conclusion
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	Supporting habitats and processes will not be affected by underwater sound from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be long lasting ensuring that the Mona Offshore Wind Project will not affect prey species populations being maintained in the long term.

1.7.3.141 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.7.3.142 The Bristol Channel Approaches SAC is located at an increased distance to the Mona Offshore Wind Project (274.8 km from the Mona Array Area) than the North Channel SAC, assessed in paragraphs 1.7.3.139 to 1.7.3.141. As the Bristol Channel Approaches is located at an increased distance from the Mona Offshore Wind Project than the North Channel SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.3.143 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Bristol Channel Approaches SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.103 below.

Table 1.103: Conclusions against the conservation objectives of the Bristol Channel Approaches SAC for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
The species is a viable component of the site.	As outlined in paragraph 1.7.3.131, where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to 15 km for a 907kg UXO (absolute maximum) and 8 km for a 130kg UXO most likely (common) maximum. The Bristol Channel Approaches SAC is 274.8 km from the Mona Offshore Wind Project therefore there is no overlap between the potential impact zone and the SAC. Due to the mobile nature of harbour porpoise there is still potential for harbour porpoise to be present within the impact zone. With tertiary mitigation applied it is anticipated that for most species animals would be deterred from the injury zone and therefore the risk of PTS would be reduced. It is anticipated that there would be some measurable changes at an individual level but that this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected (0.32%). Disturbance (using TTS as a proxy) is very short term and reversible, therefore animals that experience this effect this are anticipated to fully recover. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not prevent harbour porpoise from remaining a viable component of the SAC.

Conservation Objectives	Conclusion
There is no significant disturbance of the species.	Disturbance (using TTS as a proxy) is considered very short term and reversible, therefore animals that experience this effect this are anticipated to fully recover. It is, however, recognised that where tertiary mitigation applies deterrence measures (i.e. ADD and soft start charges) these measures would contribute to, rather than reduce, the moving away response (behavioural disturbance). Any disturbance would occur during a short time period during the construction phase and is not anticipated to have long term population effects on the feature (i.e. features are anticipated to fully recover). There is no spatial overlap of the injury or disturbance ranges associated with UXO detonation, or the 26 km EDR and the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC and therefore harbour porpoise will not be excluded from any part of the SAC and the disturbance thresholds outlined in Table 1.87 will not be exceeded. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not result in significant disturbance of the species.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	Supporting habitats and processes will not be affected by underwater sound from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be significant or long-term ensuring that the Mona Offshore Wind Project will not affect prey species populations being maintained in the long term.

1.7.3.144 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Bristol Channel Approaches SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

Bottlenose dolphin

1.7.3.145 As outlined in paragraph 1.7.3.119, considering the maximum injury (PTS) range estimated for bottlenose dolphin using the SPL_{pk} metric (890 m) the maximum the number of individuals that could be potentially injured f (based on densities presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)) was estimated to be no more than one. With reference to the wider population, this equated to very small proportions of the relevant MU (0.01%). For low order techniques, the injury ranges were considerably lower. As outlined in paragraph 1.7.3.217, less than one bottlenose dolphin could experience strong disturbance (using TTS as a proxy) within the 1.6 km impact range, which equates to 0.34% of the MU.

1.7.3.146 The Mona Offshore Wind Project will adopt standard industry practice (JNCC, 2010), with tertiary mitigation being applied as part of an MMMP (Document Reference J21), as an annex of the Underwater sound management strategy (with an Outline underwater sound management strategy submitted as part of the application (Document Reference J16)). Tertiary mitigation will also include the use of ADDs and scare charges to deter animals from the injury zone. With tertiary mitigation applied it is anticipated that for most species, animals would be deterred from the injury zone and therefore the risk of PTS would be reduced.

1.7.3.147 As outlined in paragraph 1.7.3.119, the number of animals at risk of potential PTS would be very small, with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects demonstrated by the small proportion of the Irish Sea MU potentially affected.

Grey seal

1.7.3.148 As outlined in paragraph 1.7.3.120, considering the maximum injury (PTS) range estimated for grey seal using the SPL_{pk} metric the number of individuals that could be potentially injured, based on the inshore densities, was estimated as less than six animals for 907kg UXO high order explosion (absolute maximum), which equates to 0.04% of the grey seal reference population or 0.008% of the OSPAR III population. For grey seal the number of animals within a predicted 6.47 km strong disturbance range was estimated as 26 animals (0.19% of the Grey seal reference population or 0.042% of the OSPAR region III population).

1.7.3.149 The Mona Offshore Wind Project will adopt standard industry practice (JNCC, 2010), with tertiary mitigation being applied as part of an MMMP (Document Reference J21), as an annex of the Underwater sound management strategy (with an Outline underwater sound management strategy submitted as part of the application (Document Reference J16)). Tertiary mitigation will also include the use of ADDs and scare charges to deter animals from the injury zone. With tertiary mitigation applied it is anticipated that for most species, animals would be deterred from the injury zone and therefore the risk of PTS would be reduced.

1.7.3.150 As outlined in paragraph 1.7.3.120, the number of animals at risk of potential PTS would be very small, with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects demonstrated by the small proportion of the CIS MU potentially affected.

Conclusions

1.7.3.151 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.104 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.104: Conclusions against the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat.	The number of animals at risk of potential PTS would be very small (less than one bottlenose dolphin and less than six grey seal), with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (<1 bottlenose dolphin and <6 grey seal), but that this would not manifest to population level effects demonstrated by the small proportion of the MUs potentially affected. Potential disturbance impacts are very short term and reversible, therefore animals that experience this effect are anticipated to fully recover. Therefore, injury and disturbance from underwater sound

Conservation Objectives	Conclusion
	generation from UXO detonation will not prevent the bottlenose dolphin or grey seal population from maintaining itself on a long-term basis as a viable component of its natural habitat.
Important elements are population size, structure, production, and condition of the species within the site. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	The number of animals at risk of potential PTS would be very small (less than one bottlenose dolphin and less than six grey seal), with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (less than one bottlenose dolphin and less than six grey seal), but that this would not manifest to population level effects demonstrated by the small proportion of the MUs potentially affected. Potential disturbance impacts are very short term and reversible, therefore animals that experience this effect this are anticipated to fully recover. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not adversely affect the population size, structure, production, and condition of the species within the site. Injury and disturbance from underwater sound generation from UXO detonation will also not lead to the natural range of the bottlenose dolphin or grey seal populations being reduced or likely to be reduced for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	The presence, abundance, condition and diversity of supporting habitats and processes will not be affected by underwater sound from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be long lasting ensuring that the Mona Offshore Wind Project will not affect the distribution, abundance and populations dynamics of the species within the site and population beyond the site from remaining stable or increasing

1.7.3.152 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

1.7.3.153 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Mona Offshore Wind Project (162.5 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.3.145 to 1.7.3.167. As the Cardigan Bay/Bae Ceredigion SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Bottlenose dolphin

1.7.3.154 As outlined in paragraph 1.7.3.119, considering the maximum injury (PTS) range estimated for bottlenose dolphin using the SPL_{pk} metric (890 m) the maximum the number of individuals that could be potentially injured for any of these species (based on densities presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)) was estimated to be no more than one. With reference to the wider population, this equated to very small proportions of the relevant MU (0.01%). For low order techniques, the injury ranges were considerably lower. As

outlined in paragraph 1.7.3.125, <1 bottlenose dolphin could experience disturbance within the 1.6 km impact range, which equates to 0.34% of the MU.

1.7.3.155 The Mona Offshore Wind Project will adopt standard industry practice (JNCC, 2010), with tertiary mitigation being applied as part of a MMMP (Document Reference J21), as an annex of the Underwater sound management strategy (with an Outline underwater sound management strategy submitted as part of the application (Document Reference J16)). Tertiary mitigation will also include the use of ADDs and scare charges to deter animals from the injury zone. With tertiary mitigation applied it is anticipated that for most species, animals would be deterred from the injury zone and therefore the risk of PTS would be reduced.

1.7.3.156 As outlined in paragraph 1.7.3.119, the number of animals at risk of potential PTS would be very small, with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (for <1 animal) but that this would not manifest to population level effects demonstrated by the small proportion of the Irish Sea MU potentially affected.

Conclusions

1.7.3.157 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.105 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.105: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **Important elements are population size, structure, production, and condition of the species within the site.** **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	The number of animals at risk of potential PTS would be very small (<1 bottlenose dolphin), with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (<1 bottlenose dolphin), but that this would not manifest to population level effects demonstrated by the small proportion of the MUs potentially affected. Potential disturbance impacts are very short term and reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not prevent the bottlenose dolphin population from maintaining itself on a long-term basis as a viable component of its natural habitat. On the basis of the above, injury and disturbance from underwater sound generation from UXO detonation will also not adversely affect the population size, structure, production, and condition of the species within the site. The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	The presence, abundance, condition and diversity of supporting habitats and processes will not be affected by underwater sound from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be long lasting ensuring that the Mona Offshore Wind Project will not affect the distribution, abundance and populations dynamics of the species within the site and population beyond the site from remaining stable or increasing.

1.7.3.158 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.7.3.159 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Mona Offshore Wind Project (211.7 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.3.145 to 1.7.3.167. As Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.3.160 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.106

1.7.3.161 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.106: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	The number of animals at risk of potential PTS would be very small (<6 animals), with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (for <6 animals) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. Potential disturbance impacts are reversible and therefore animals that experience this effect this are anticipated to fully recover. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not prevent the grey seal population from maintaining itself on a long-term basis as a viable component of its natural habitat. On this basis, the species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of injury and disturbance from underwater sound generation from UXO detonation.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	The presence, abundance, condition and diversity of supporting habitats and processes will not be affected by underwater sound from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be long lasting ensuring that the Mona Offshore Wind Project will not affect the distribution, abundance and populations dynamics of the species within the site and population beyond the site from remaining stable or increasing.

1.7.3.162 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

Strangford Lough SAC

Harbour seal

1.7.3.163 As outlined in paragraph 1.7.3.121, considering the maximum injury (PTS) range estimated for harbour seal using the SPL_{pk} the number of individuals that could be potentially injured, was estimated as less than one animal for 907 kg UXO high order explosion (absolute maximum), 130 kg UXO most likely (common) maximum and 25 kg UXO, which equates to up to 0.002% of the reference population (Wales, NW England and Northern Ireland SMUs).

1.7.3.164 The Mona Offshore Wind Project will adopt standard industry practice (JNCC, 2010), with tertiary mitigation being applied as part of an MMMP (Document Reference J21), as an annex of the Underwater sound management strategy (with an Outline underwater sound management strategy submitted as part of the application (Document Reference J16)). Tertiary mitigation will also include the use of ADDs and scare charges to deter animals from the injury zone. With tertiary mitigation applied it is anticipated that for most species, animals would be deterred from the injury zone and therefore the risk of PTS would be reduced.

1.7.3.165 As outlined in paragraph 1.7.3.121, the number of animals at risk of potential PTS would be very small, with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects as demonstrated by the small proportion of the SMU potentially affected.

Conclusions

1.7.3.166 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Strangford Lough SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.107 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.107: Conclusions against the conservation objectives of the Strangford Lough SAC for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	The number of animals at risk of potential PTS would be very small (less than one animal), with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. Potential disturbance impacts are very short term and reversible, therefore animals that experience this effect are anticipated to fully recover. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not prevent the harbour seal feature from being maintained or restored to favourable conservation status. It should be noted that no condition assessments are available for this SAC, as outlined in section 1.7.2. On this basis, injury and

Conservation Objectives	Conclusion
	disturbance from underwater sound generation from UXO detonation will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	Physical features used by harbour seal within the site will not be affected by underwater sound from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be long lasting ensuring that the Mona Offshore Wind Project will not prevent physical features from being maintained or enhanced.

1.7.3.167 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

Murlough SAC

Harbour seal

1.7.3.168 Potential underwater sound impacts as a result of UXO detonation on harbour seal features of the Murlough SAC are considered to be similar to those associated with Strangford Loch SAC due to the proximity of the locations. The Murlough SAC however, is located at an increased distance to the Mona Offshore Wind Project (115.9 km from the Mona Array Area) than the Strangford Lough SAC, assessed in paragraphs 1.7.3.163 to 1.7.3.167. As the Murlough SAC is located at an increased distance from the Mona Offshore Wind Project than the Strangford Lough SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.3.169 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.108 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.108: Conclusions against the conservation objectives of the Murlough SAC for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of harbour seal.**	The number of animals at risk of potential PTS would be very small (less than one animal), with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (for less than one animal) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. Potential disturbance impacts are very short term and reversible, therefore animals that experience this effect this are anticipated to fully recover. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not prevent the harbour seal feature from being maintained or restored to favourable conservation status. It should be noted that no condition assessments are available for this SAC, as outlined in section 1.7.2. On this basis, injury and disturbance from underwater sound generation from UXO detonation will not prevent the harbour seal population from being maintained or enhanced.

Conservation Objectives	Conclusion
To maintain (and if feasible enhance) population numbers and distribution. **To maintain and enhance, as appropriate, physical features used by harbour seals within the site.**	Physical features used by harbour seal within the site will not be affected by underwater sound from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be long lasting ensuring that the Mona Offshore Wind Project will not prevent physical features from being maintained or enhanced.

1.7.3.170 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

The Maidens SAC

Grey seal

1.7.3.171 The Maidens SAC is located at an increased distance to the Mona Offshore Wind Project (166.8 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.3.145 to 1.7.3.167. As The Maidens SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.3.172 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of The Maidens SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.109 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.109: Conclusions against the conservation objectives of The Maidens SAC for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the grey seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of grey seal.**	The number of animals at risk of potential PTS would be very small (<6 animals), with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (for <6 animals) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. Potential disturbance impacts are very short term and reversible, therefore animals that experience this effect this are anticipated to fully recover. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not prevent the grey seal feature from being maintained or restored to favourable conservation status. It should be noted that no condition assessments are available for this SAC, as outlined in section 1.7.2. On this basis, injury and disturbance from underwater sound generation from UXO detonation will not prevent the grey seal population from being maintained or enhanced.

Conservation Objectives	Conclusion
To maintain and enhance, as appropriate, physical features used by grey seal within the site.	Physical features used by grey seal within the site will not be affected by underwater sound from UXO detonation, (i.e. there will be no habitat loss/ disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species, effects are not considered to be long lasting ensuring that the Mona Offshore Wind Project will not prevent physical features from being maintained or enhanced.

1.7.3.173 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of The Maidens SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

Lundy SAC

Grey seal

1.7.3.174 The Lundy SAC is located at an increased distance to the Mona Offshore Wind Project (309.5 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.3.145 to 1.7.3.167. As the Lundy SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.3.175 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Lundy SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.110 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.110: Conclusions against the conservation objectives of the Lundy SAC for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound from UXO detonation to result in adverse effects on the habitats of the qualifying species, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). Therefore, underwater sound from pre-construction site investigation surveys pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats, the structure and function or the supporting processes of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	The number of animals at risk of potential PTS would be very small (<6 animals), with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (for <6 animals) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. Potential disturbance impacts are very short term and reversible and

Conservation Objectives	Conclusion
	therefore animals that experience this effect are anticipated to fully recover. Therefore, injury and disturbance from underwater sound generation from UXO detonation will not adversely affect the population of qualifying species within the SAC. Injury and disturbance from underwater sound generation from UXO detonation will also not adversely affect the distribution of qualifying species within the SAC.

1.7.3.176 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Lundy SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

Isles of Scilly Complex

Grey seal

1.7.3.177 The Isles of Scilly Complex SAC is located at an increased distance to the Mona Offshore Wind Project (439.3 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.3.145 to 1.7.3.167. As The Isles of Scilly Complex SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.3.178 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will not occur as a result of underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.111 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.111: Conclusions against the conservation objectives of the Isles of Scilly Complex for underwater sound generated from UXO detonation.

Conservation Objectives	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound from UXO detonation to result in adverse effects on the habitats of the qualifying species, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats, the structure and function or the supporting processes of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	The number of animals at risk of potential PTS would be very small (<6 animals), with the implementation of tertiary mitigation this would be further reduced. There may be some measurable changes at an individual level (for <6 animals) but that this would not manifest to population level effects demonstrated by the small proportion of the SMU potentially affected. Potential disturbance impacts are very short term and reversible, therefore animals that experience this effect this are anticipated to fully recover. Therefore, injury and disturbance from

Conservation Objectives	Conclusion
	underwater sound generation from UXO detonation will not adversely affect the population of qualifying species within the SAC. Injury and disturbance from underwater sound generation from UXO detonation will also not adversely affect the distribution of qualifying species within the Isles of Scilly Complex SAC.

1.7.3.179 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of The Isles of Scilly Complex SAC as a result of underwater sound from UXO detonation from the Mona Offshore Wind Project alone.

Sites assessed in line with the iterative approach

1.7.3.180 As outlined in paragraphs 1.7.1.3 to 1.7.1.8, following the iterative approach adopted for this ISAA, the closest European site to the Mona Offshore Wind Project within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this ISAA, are located at a greater distance from the Mona Offshore Wind Project and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.7.3.129 to 1.7.3.179 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.7.3.181 to 1.7.3.203.

West Wales Marine/Gorllewin Cymru Forol SAC

1.7.3.181 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.7.3.182 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (paragraph 1.7.3.145 to 1.7.3.152), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project alone.

Saltee Islands SAC

1.7.3.183 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (paragraph 1.7.3.145 to 1.7.3.152), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Saltee Islands SAC as a

result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project alone.

Rockabill to Dalkey Island SAC

1.7.3.184 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Rockabill to Dalkey Island SAC as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Roaringwater Bay and Islands SAC

1.7.3.185 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Roaringwater Bay and Islands SAC as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Blasket Islands SAC

1.7.3.186 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Blasket Islands SAC as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.7.3.187 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Abers - Côte des legends SCI

1.7.3.188 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Abers - Côte des legends SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Ouessant-Molène SCI

1.7.3.189 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the

Ouessant-Molène SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Côte de Granit rose-Sept-Iles SCI

1.7.3.190 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Anse de Goulven, dunes de Keremma SCI

1.7.3.191 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Tregor Goëlo SCI

1.7.3.192 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Tregor Goëlo SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Côtes de Crozon SCI

1.7.3.193 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Côtes de Crozon SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Chaussée de Sein SCI

1.7.3.194 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Chaussée de Sein SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Cap Sizun SCI

1.7.3.195 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cap

Sizun SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Récifs du talus du golfe de Gascogne SCI

1.7.3.196 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Anse de Vauville SCI

1.7.3.197 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Anse de Vauville SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Cap d'Erquy-Cap Fréhel SCI

1.7.3.198 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Baie de Saint-Brieuc – Est SCI

1.7.3.199 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Banc et récifs de Surtainville SCI

1.7.3.200 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.7.3.201 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Baie de

Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Estuaire de la Rance SCI

1.7.3.202 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Estuaire de la Rance SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Baie du Mont Saint-Michel SCI

1.7.3.203 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.129 to 1.7.3.141), it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Baie du Mont Saint-Michel SCI as a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Injury and disturbance from underwater sound from pre-construction site investigation surveys

1.7.3.204 Site investigation surveys during the construction phase have the potential to cause direct or indirect effects (including hearing injury or behavioural disturbance) on marine mammals.

1.7.3.205 Several sonar-like survey types will potentially be used for the geophysical surveys, including MBES, SSS, SBES, SBP and sparker (as an example of UHRS) (0.05 – 4 kHz; 182 dB re 1µPa^{2}s SEL). The equipment likely to be used can typically work at a range of signal frequencies, depending on the distance to the seabed and the required resolution. For sonar-like sources the signal is highly directional, acts like a beam and is emitted in pulses. Sonar-based sources are considered as continuous (non-impulsive) because they generally comprise a single (or multiple discrete) frequency as opposed to a broadband signal with high kurtosis, high peak pressures and rapid rise times. Unlike the sonar-like survey sources, the UHRS is likely to utilise a sparker, which produces an impulsive, broadband source signal. A full description of the source sound levels for geophysical survey activities is provided in Volume 5, annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference F5.3.1).

1.7.3.206 The assessment of LSE during the HRA screening process identified that during construction and decommissioning, LSE could not be ruled out for the potential impact of underwater sound from pre-construction site surveys. This relates to the designated sites listed in Table 1.77 and relevant Annex II marine mammal features. The assessment is undertaken as an iterative approach and considers the closest site in the first instance and the sites suggested in NRW (2022).

1.7.3.207 The MDS considered for the assessment of potential impacts on Annex II marine mammals for underwater sound from pre-construction site investigation surveys is presented in Table 1.112.

Table 1.112: Maximum design scenario considered for the assessment of potential impacts on marine mammals from Injury and disturbance from pre-construction site investigation surveys during the construction phase.

Phase	Maximum design scenario	Justification
Construction phase	Geophysical site investigation activities include: • Multi-beam echo-sounder (MBES) - 200-500 kHz; 180-240 dB re 1µPa re 1 m (rms) • Sidescan Sonar (SSS) - 200-700 kHz; 216-228 dB re 1µPa re 1 m (rms) • Single Beam Echosounder (SBES) - 120-400 kHz; 180-240 dB re 1µPa re 1 m (rms) • Sub-Bottom Profilers (SBP) – Chirp 0.2-14 kHz, 200-240 chirp dB re 1µPa re 1 m (rms) – Pinger 2-7 kHz; 200-235 pinger dB re 1µPa re 1 m (rms) • Sparker (as an example of Ultra High Resolution Seismic (UHRS) (0.05 – 4 kHz; 182 dB re 1µPa^{2}s SEL) Geotechnical site investigation activities include: • Boreholes • Cone penetration tests (CPTs) • Vibrocores Pre-construction site investigation surveys will involve the use of several geophysical/geotechnical survey vessels and take place over up to a period of up to eight months.	Range of geophysical and geotechnical activities likely to be undertaken using equipment typically employed for these types of surveys. Parameters chosen resulted in the greatest range of impact (e.g. highest source sound level, fastest pulse rate, longest pulse duration) and as such were those that would lead to the greatest spatial extent for potential injury or disturbance effects.

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.208 The measures adopted as part of the Mona Offshore Wind Project that are relevant to effects from underwater sound from pre-construction site investigation surveys are outlined in Table 1.84.

Construction Phase

Information to support assessment

Auditory injury

1.7.3.209 Potential impacts of site investigation surveys will depend on the characteristic of the source, survey design, frequency bands and water depth. Sonar like sources have very strong directivity which effectively means that there is only potential for injury when a marine mammal is directly underneath the sound source. Once the animal moves outside of the main beam, there is no potential for injury.

1.7.3.210 With respect to the ranges within which there is a potential of PTS occurring to marine mammals as a result of geophysical investigation activities, the maximum PTS is expected to occur out to 254 m for harbour porpoise due to SBP (chirp/pinger) (Table 1.113). For bottlenose dolphin the maximum PTS is expected to occur out to 41 m for MBES, for pinniped species out to 40 m due to SBP.

1.7.3.211 With respect to the ranges within which there is a potential of PTS occurring to marine mammals as a result of geotechnical investigation activities, PTS threshold was not exceeded for most marine mammal species, except harbour porpoise (Table 1.114). PTS is expected to occur during cone penetration tests, out to a maximum of 55 m for harbour porpoise, and for vibro-coring to a maximum of 61 m for harbour porpoise.

1.7.3.212 The number of marine mammals potentially injured within the modelled ranges for PTS presented in Table 1.113 and Table 1.114 were estimated using species-specific density estimates. Due to low injury ranges, for all marine species, there is the potential for no more than one animal to experience PTS (and no animals where the threshold is not exceeded) as a result of geophysical and geotechnical site investigation surveys. The site-investigation surveys are considered to be short term as they will take place over a period of several months. Mitigation for injury during geophysical surveys using a sub-surface sensor from a conventional vessel will involve the use of MMOs and PAM to ensure that the risk of injury over the defined mitigation zone is reduced in line with JNCC guidance (JNCC, 2017). The largest range was predicted as 254 m (for SBP) and it is considered that standard industry measures will be effective at reducing the risk of injury over this distance.

Table 1.113: Potential impact ranges (m) for PTS for marine mammals for geophysical site investigation surveys. Based on comparison to Southall *et al.* (2019) SEL thresholds.

[1] Non-impulsive threshold used from Southall *et al.* (2019)

[2] Impulsive threshold used from Southall *et al.* (2019)

Source	Potential impact range (m) for PTS		
	Bottlenose dolphin (HF)	Harbour porpoise (VHF)	Grey seal and harbour seal (PCW)
MBES[1]	41	68	25
SSS[1]	2	41	6
SBES[1]	12	68	25
SBP (chirp/ pinger)[1]	40	254	40
UHRS (sparker)[2]	N/E	11	N/E

Table 1.114: Potential impact ranges (m) for PTS for marine mammals for geotechnical site investigation surveys. Comparison to Southall *et al.* (2019) SEL thresholds (comparison to ranges for peak SPL where threshold was exceeded shown in brackets). N/E = not exceeded.

[1] Non-impulsive threshold used from Southall *et al.* (2019)

[2] Impulsive threshold used from Southall *et al.* (2019)

Source	Potential impact range (m) for PTS		
	Bottlenose dolphin (HF)	Harbour porpoise (VHF)	Grey seal and harbour seal (PCW)
Borehole drilling[1]	N/E	N/E	N/E
Cone penetration testing[2]	N/E	55 (14)	N/E
Vibro-coring[1]	N/E	61	N/E

Behavioural disturbance

1.7.3.213 The estimated maximum ranges for onset of disturbance are based on sound level being greater than the 120 dB re 1µPa (rms) threshold applicable for all Annex II marine mammal species.

1.7.3.214 The disturbance ranges as a result of geophysical and geotechnical site-investigation surveys (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)) will be higher than those presented for PTS. Most of the predicted ranges are within 100s of meters, however the largest distance over which the disturbance could occur is out to approximately 14.3 km during vibro-coring. This is due to the higher source levels for this piece of equipment compared to other types of survey equipment.

1.7.3.215 For geophysical surveys, the maximum disturbance ranges were predicted for the SBP with mild disturbance potentially up to 17.3 km. For impulsive sound sources (UHRS (sparker) and cone penetration testing), the largest distance over which mild disturbance could occur is out to 1,350 m, and the largest distance over which strong disturbance could occur is out to 158 m. Quantitatively, this would lead to maximum disturbance of less than one animal for all Annex II marine mammal species.

1.7.3.216 For impulsive sound sources, there is an understanding of the difference between strong and mild disturbance, whereas for non-impulsive (continuous) sound sources, there is only a single available threshold (120 dB re 1µPa (rms) for Level B disturbance (NMFS, 2005)), which is classed as a strong behavioural reaction. Ranges for disturbance for non-impulsive sound sources (MBES, SSS, SBES, SBP (chirp/pinger), borehole drilling and vibro-coring), are presented up to the 120 dB re 1µPa (rms) threshold. However, for those animals disturbed, there is likely to be a proportional response (i.e. not all animals will be disturbed to the same extent), although there is no dose-response curve available to apply in the context of non-impulsive sound sources. It is important to note that the life history of an individual and the context will also influence the likelihood of an individual to exhibit an aversive response to sound, and it must be highlighted that these potential impacts will not be continuous over the construction phase, instead carried out over a shorter number of days within the period. Furthermore, this threshold does not take into account ambient sound levels in the area which may be already above the 120 dB re 1 µPa (see Farcas *et al.* (2020)).

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.7.3.217 As outlined in paragraph 1.7.3.210, ranges for harbour porpoise within which there is a risk of PTS are small with a maximum of 61 m for geotechnical surveys and 254 m for geophysical surveys. The number of harbour porpoise potentially experiencing PTS is less than one animal and the risk of injury reduced with tertiary mitigation in place. Since sonar-based systems have strong directivity and that the site investigation surveys will be of short term duration and intermittent, there is no adverse effects leading to auditory injury for harbour porpoise associated with underwater sound from pre-construction site investigation surveys for the Mona Offshore Wind Project.

1.7.3.218 Less than one harbour porpoise during URHS and cone penetration testing are predicted to be potentially disturbed within ranges of 1,350 m (mild disturbance) and 158 m (strong disturbance). Given the distance from the Mona Offshore Wind Project to the North Anglesey Marine/Gogledd Môn Forol SAC (22.58 km to Mona Array Area and 17.5 km to Mona Offshore Cable Corridor and Access Areas), it is expected that

harbour porpoise will avoid the area of the survey. Noting that pre-construction site investigation surveys will not be undertaken nearby or within this SAC and with harbour porpoise recovering quickly after the surveys have ceased, behavioural disturbance is unlikely to be significant (see paragraph 1.7.3.213). Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the SAC.

1.7.3.219 Therefore, the impact is not predicted to result in auditory injury of harbour porpoises and there is negligible risk of behavioural disturbance of harbour porpoises.

Conclusions

1.7.3.220 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.115 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.115: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury within range of the SAC, that underwater sound from vessels is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the SAC. Harbour porpoise will remain a viable component of the site. Similarly, underwater sound as a result of pre-construction site investigation surveys will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not hinder the conditions of supporting habitats and processes or reduce the availability of prey.

1.7.3.221 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

North Channel SAC

Harbour porpoise

1.7.3.222 Underwater sound from pre-construction surveys on harbour porpoise features of the North Channel SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (22.5 km from Mona Array Area and 17.5 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.217 and 1.7.3.218, due to the proximity of the locations. As the North Channel SAC (79 km from Mona Array Area and 96 km from Mona Offshore Cable Corridor and

Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.223 Therefore, the impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.7.3.224 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Channel SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.116 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.116: Conclusions against the conservation objectives of the North Channel SAC for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury within range of the SAC, that underwater sound from vessels is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the SAC. Harbour porpoise will remain a viable component of the site. Similarly, underwater sound as a result of pre-construction site investigation surveys will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not hinder the conditions of supporting habitats and processes or reduce the availability of prey.

1.7.3.225 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

Bottlenose dolphin

1.7.3.226 The range for bottlenose dolphin within which there is a risk of PTS is small with a maximum of 41 m for geophysical surveys (for geotechnical surveys, thresholds are not exceeded). Less than one bottlenose dolphin would be at risk from PTS. Since sonar-based systems have strong directivity and that the site investigation surveys will be of short term duration and intermittent, there is no adverse effects leading to auditory injury for bottlenose dolphin associated with underwater sound from pre-construction site investigation surveys for Mona Offshore Wind Project.

1.7.3.227 Less than one bottlenose dolphin during URHS and cone penetration testing are predicted to be potentially disturbed within ranges of 1,350 m (mild disturbance) and

158 m (strong disturbance). However, considering the distance from the Mona Offshore Wind Project to the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km to Mona Array Area and 93 km to Mona Offshore Cable Corridor and Access Areas), it is expected bottlenose dolphins to avoid the area of the survey. Therefore, animals within the site are unlikely to be disturbed. Noting that pre-construction site investigation surveys will not be undertaken nearby or within this SAC and with bottlenose dolphins recovering quickly after the surveys have ceased, behavioural disturbance is unlikely to be significant (see paragraph 1.7.3.213). Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC.

1.7.3.228 Therefore, the impact is not predicted to result in auditory injury of bottlenose dolphins and there is negligible risk of behavioural disturbance of bottlenose dolphins.

Grey seal

1.7.3.229 The range for grey seal within which there is a risk of PTS is small with a maximum of 40 m for geophysical surveys (for geotechnical surveys, thresholds are not exceeded). The potential for grey seal to experience PTS is less than one animal. Since sonar-based systems have strong directivity and that the site investigation surveys will be of short term duration and intermittent, there is no adverse effects leading to auditory injury for grey seal associated with underwater sound from pre-construction site investigation surveys for Mona Offshore Wind Project.

1.7.3.230 Less than one grey seal during URHS and cone penetration testing are predicted to be potentially disturbed within ranges of 1,350 m (mild disturbance) and 158 m (strong disturbance). However, considering the distance from the Mona Offshore Wind Project to the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km to Mona Array Area and 93 km to Mona Offshore Cable Corridor and Access Areas), animals within the site are unlikely to be disturbed. Noting that site surveys will not be undertaken nearby or within this SAC and with grey seals recovering quickly after the pre-construction surveys have ceased, behavioural disturbance is unlikely to be significant. Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC.

1.7.3.231 Therefore, the impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.7.3.232 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.117 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.117: Conclusions against the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury within range of the SAC, that underwater sound from vessels is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound as a result of pre-construction site investigation surveys will not reduce nor likely reduce the natural range of the populations of the qualifying bottlenose dolphin and grey seal features for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.3.233 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

Strangford Lough SAC

Harbour seal

1.7.3.234 The Range for harbour seal within which there is a risk of PTS is small with a maximum of 40 m for geophysical surveys (for geotechnical surveys, thresholds are not exceeded). The potential for harbour seal to experience PTS is less than one animal. Since sonar-based systems have strong directivity and that the site investigation surveys will be of short term duration and intermittent, there is no adverse effects leading to auditory injury for harbour seal associated with underwater sound from pre-construction site investigation surveys for the Mona Offshore Wind Project.

1.7.3.235 Up to one harbour seal during SBP and up to three harbour seals during vibro-coring are predicted to be potentially disturbed within ranges of 17.3 km and 14.3 km respectively. However, considering the distance from the Proposed Development to the Strangford Lough SAC (112.2 km to Mona Array Area and 125.1 km to Mona Offshore Cable Corridor and Access Areas), animals within the site are unlikely to be disturbed and it is unlikely that all the disturbed animals will originate from this SAC and therefore, this number is likely to be an over-estimation of the number of harbour seals from the Strangford Lough SAC affected. Noting that site surveys will not be undertaken nearby or within this SAC and with harbour seals recovering quickly after the surveys have ceased, behavioural disturbance is unlikely to be significant. Only a small area will be affected when compared to available foraging habitat in the Irish Sea

and it will not affect important areas for foraging and reproduction within the Strangford Lough SAC.

1.7.3.236 Therefore, the impact is not predicted to result in auditory injury of harbour seals and there is negligible risk of behavioural disturbance of harbour seals.

Conclusions

1.7.3.237 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Strangford Lough SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.118 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.118: Conclusions against the conservation objectives of the Strangford Lough for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Given that there is no potential for injury within range of the SAC, that the sound of the survey vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, underwater sound as a result of pre-construction site investigation surveys will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.3.238 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

Murlough SAC

Harbour seal

1.7.3.239 Underwater sound from pre-construction surveys on harbour seal features of the Murlough SAC are predicted to be similar to those associated with the Strangford Lough SAC (112.2 km from Mona Array Area and 125.1 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.234 and 1.7.3.235, due to the proximity of the locations. As the Murlough SAC (115.9 km from Mona Array Area and 127.1 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Strangford Lough SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.240 Therefore, the impact is not predicted to result in auditory injury of harbour seal and there is negligible risk of behavioural disturbance of harbour seal.

Conclusions

1.7.3.241 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Murlough SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.119 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.119: Conclusions against the conservation objectives of Murlough SAC for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of harbour seal**	Given that there is no potential for injury within range of the SAC, that the sound of the survey vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, underwater sound as a result of pre-construction site investigation surveys will not prevent the harbour seal population numbers and distribution from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.3.242 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.7.3.243 Underwater sound from pre-construction surveys on bottlenose dolphin features of the Cardigan Bay/Bae Ceredigion SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.226 and 1.7.3.227, due to the proximity of the locations. As the Cardigan Bay/Bae Ceredigion SAC (162.5 km from Mona Array Area and 161.5 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.244 Therefore, the impact is not predicted to result in auditory injury of bottlenose dolphins and there is negligible risk of behavioural disturbance of bottlenose dolphins.

Conclusions

1.7.3.245 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.120 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.120: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements are population size, structure, production, and condition of the species within the site. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury within range of the SAC, that the sound of the survey vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound as a result of pre-construction site investigation surveys will not adversely affect the population size, structure, production, and condition of the species within the site. The population of bottlenose dolphin within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of underwater sound impacts associated with pre-construction site surveys.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.3.246 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

The Maidens SAC

Grey seal

1.7.3.247 Underwater sound from pre-construction surveys on grey seal features of The Maidens SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 9 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.229 and 1.7.3.230, due to the proximity of the locations. As The Maidens SAC (166.8 km from Mona Array Area and 179.8 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen

Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.248 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

Conclusions

1.7.3.249 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.121 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.121: Conclusions against the conservation objectives of The Maidens SAC for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the grey seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of grey seal**	Given that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, underwater sound as a result of pre-construction site investigation surveys will not prevent the grey seal population numbers and distribution from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by grey seal within the site.	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the physical features used by grey seal within the site. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent physical features used by grey seal within the site from being maintained or enhance.

1.7.3.250 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of The Maidens SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.7.3.251 Underwater sound from pre-construction surveys on grey seal features of the Pembrokeshire Marine/Sir Benfro Forol SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 93km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.229 and 1.7.3.230, due to the proximity of the locations. As the Pembrokeshire Marine/Sir Benfro Forol SAC (211.7 km from Mona Array Area and 210.7 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.252 Therefore, the impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.7.3.253 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.122 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.122: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound as a result of pre-construction site investigation surveys will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying marine mammal species.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.3.254 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.7.3.255 Underwater sound from pre-construction surveys on harbour porpoise features of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (22.5 km from Mona Array Area and 17.5 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.217 and 1.7.3.218, due to the proximity of the locations. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (274.8 km from Mona Array Area and 273.8 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than

the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.256 Therefore, the impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.7.3.257 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.123 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.123: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species**	Given that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound as a result of pre-construction site investigation surveys will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not hinder the conditions of supporting habitats and processes or reduce the availability of prey.

1.7.3.258 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

Lundy SAC

Grey seal

1.7.3.259 Underwater sound from pre-construction surveys on grey seal features of the Lundy SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.229 and 1.7.3.230, due to the proximity of the locations. As the Lundy SAC (309.5 km from Mona Array Area and 308.5 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.260 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

Conclusions

1.7.3.261 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Lundy SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.124 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.124: Conclusions against the conservation objectives of the Lundy SAC for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, underwater sound as a result of pre-construction site investigation surveys will not prevent the structure and function of the habitats of qualifying species from being maintained or restored nor prevent the supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, underwater sound as a result of pre-construction site investigation surveys will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.3.262 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Lundy SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

Isles of Scilly Complex SAC

Grey seal

1.7.3.263 Underwater sound from pre-construction surveys on grey seal features of the Isles of Scilly Complex SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.229 and 1.7.3.230, due to the proximity of the locations. As the Isles of Scilly Complex SAC (439.3 km from Mona Array Area and 438.3 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.264 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

Conclusions

1.7.3.265 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will not occur as a result of underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.125 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.125: Conclusions against the conservation objectives of the Isle of Scilly Complex SAC for underwater sound generated from pre-construction site surveys.

Conservation Objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, underwater sound as a result of pre-construction site investigation surveys will not prevent the structure and function of the habitats of qualifying species from being maintained or restored nor prevent the supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that there is no potential for injury within range of the SAC, that underwater sound from vessels is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, underwater sound as a result of pre-construction site investigation surveys will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.3.266 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Isles of Scilly Complex SAC as a result of underwater sound from pre-construction site investigation surveys from the Mona Offshore Wind Project alone.

Sites assessed in line with the iterative approach

1.7.3.267 As outlined in paragraphs 1.7.1.3 to 1.7.2.8, following the iterative approach adopted for this ISAA, the closest European site to the Mona Offshore Wind Project within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this ISAA, are located at a greater distance from the Mona Offshore Wind Project and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The

conclusions of the assessments presented in paragraphs 1.7.3.217 to 1.7.3.266 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.7.3.268 to 1.7.3.290.

West Wales Marine/Gorllewin Cymru Forol SAC

1.7.3.268 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.7.3.269 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.3.226 to 1.7.3.233), it can be concluded that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Saltee Islands SAC

1.7.3.270 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.3.226 to 1.7.3.233), it can be concluded that there is no risk of an adverse effect on the integrity of the Saltee Islands SAC as a result of underwater sound vessels and other activities with respect to construction of the Mona Offshore Wind Project alone.

Rockabill to Dalkey Island SAC

1.7.3.271 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Rockabill to Dalkey Island SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Roaringwater Bay and Islands SAC

1.7.3.272 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Roaringwater Bay and Islands SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Blasket Islands SAC

1.7.3.273 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Blasket Islands SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.7.3.274 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Abers - Côte des legends SCI

1.7.3.275 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Abers - Côte des legends SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Ouessant-Molène SCI

1.7.3.276 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Ouessant-Molène SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Côte de Granit rose-Sept-Iles SCI

1.7.3.277 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Anse de Goulven, dunes de Keremma SCI

1.7.3.278 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Tregor Goëlo SCI

1.7.3.279 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Tregor Goëlo SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Côtes de Crozon SCI

1.7.3.280 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Côtes de Crozon SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Chaussée de Sein SCI

1.7.3.281 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Chaussée de Sein SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Cap Sizun SCI

1.7.3.282 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap Sizun SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Récifs du talus du golfe de Gascogne SCI

1.7.3.283 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Anse de Vauville SCI

1.7.3.284 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Vauville SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Cap d'Erquy-Cap Fréhel SCI

1.7.3.285 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Baie de Saint-Brieuc – Est SCI

1.7.3.286 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Banc et récifs de Surtainville SCI

1.7.3.287 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.7.3.288 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Estuaire de la Rance SCI

1.7.3.289 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Estuaire de la Rance SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Baie du Mont Saint-Michel SCI

1.7.3.290 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.217 to 1.7.3.224), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie du Mont Saint-Michel SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project alone.

Injury and disturbance to marine mammals from elevated underwater sound due to vessel use and other (non-piling) activities

1.7.3.291 The assessment of LSE during the HRA screening process identified that during construction, operations and maintenance and decommissioning phase of the Mona Offshore Wind Project, LSE could not be ruled out for the potential impact of injury and disturbance to marine mammals from elevated underwater sound due to vessel use and other activities. This relates to the European sites listed in paragraph 1.7.1.7 and relevant Annex II marine mammal features. The assessment is undertaken as an iterative approach and considers the closest site in the first instance and the sites suggested in NRW (2022).

1.7.3.292 Non-piling, sound producing activities and increased vessel movements during the construction phase have the potential to result in a range of impacts on marine mammals such as avoidance behaviour or displacement and masking of vocalisations or changes in vocalisation rate. During the construction phase of the Mona Offshore Wind Project, the increased levels of vessel activity will contribute to the total underwater sound levels, but the movements will be limited to within the Mona Array Area and Mona Offshore Cable Corridor and Access Areas and will likely follow existing shipping routes to/from the ports.

1.7.3.293 Vessel use during the operations and maintenance phase of the Mona Offshore Wind Project may lead to injury and/or disturbance to Annex II marine mammals species. A variety of vessel types will be used during routine operations and maintenance activities, including crew transfer vessels/workboats, jack-up vessels, cable repair vessels, Service Operation Vessels (SOV) or similar vessels and excavators/backhoe dredgers.

1.7.3.294 The assessment of potential impacts from elevated underwater sound due to vessel use and other (non-piling) activities is based on vessel and/or activity basis, considering the maximum injury/disturbance range as assessed in Volume 5, annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference F5.3.1). However, several activities could be potentially occurring at the same time and therefore ranges of effects may extend from several vessels/locations where the activity is carried out and potentially overlap.

1.7.3.295 The MDS considered for the assessment of potential impacts on Annex II marine mammal features from underwater sound from vessels and other non-pilling sound producing activities is presented in Table 1.126.

Table 1.126: Maximum design scenario considered for the assessment of potential impacts on marine mammals from underwater sound from vessels and other (non-piling) sound producing activities during the construction and decommissioning phase.

Phase	Maximum design scenario	Justification
Construction phase	***Vessels*** • Up to a total of **96** construction vessels on site at any one time (**24** main installation and support vessels, **10** tug/anchor handlers, **14** cable lay installation and support vessels, **three** guard vessels, **nine** survey vessels, **12** seabed preparation vessels, **15** Crew Transfer Vessels (CTVs), **three** scour protection installation vessels, **four** cable protection installation	The maximum design scenario considers the maximum number of vessels on site at any one time and greatest number of round trips during each phase of the Mona Offshore Wind Project. This represents the broadest range of vessel types and therefore sound signatures within the marine environment to affect marine mammal receptors.

Phase	Maximum design scenario	Justification
	vessels), **one** jack-up operations vessel, **one** cable barge grounding vessel. • Up to **2,199** installation vessel movements (return trips) during construction (**553** main installation and support vessels, **106** tug/anchor handlers, **112** cable lay installation and support vessels, **84** guard vessel, **51** survey vessels, **43** seabed preparation vessels, **1,171** CTVs, **41** scour protection installation vessels, **22** cable protection installation vessels, **16** jack up operations, and **16** cable barge groundings) **Other activities:** • Up to 100% of overall piles may require drilling (64 4-legged wind turbine jacket foundations with a diameter of 3.8 m and four four-legged OSP jacket foundations with a diameter of 3.5 m), up to two concurrent drilling vessels. • Burial of up to **325 km** of inter-array cables, **50 km** of interconnector cables and **360 km** of offshore export cable via ploughing, trenching and jetting. Protection of up to 32.5 km of inter-array cables via rock dumping and mattressing. Maximum offshore construction duration of up to 4 years.	The maximum design scenario considers the maximum durations which activities could be conducted for.
Operations and maintenance phase	• Up to a total of **21** operations and maintenance vessels on site at any one time (**six** CTVs/workboats, **three** jack-up vessels, **four** cable repair vessels, **four** Service Operation Vessels (SOV) or similar and **four** excavators/backhoe dredgers) Up to **849** operations and maintenance vessel movements (return trips) each year (**730** CTVs/workboats, **25** jack-up vessels, **8** cable repair vessels, **78** SOV or similar and **8** excavators/backhoe dredgers)	The maximum design scenario considers the maximum number of vessels on site at any one time and greatest number of round trips during each phase of the Mona Offshore Wind Project. This represents the broadest range of vessel types and therefore sound signatures within the marine environment to affect marine mammal receptors. The maximum design scenario considers the maximum durations which activities could be conducted for.
Decommissioning phase	Vessels used for a range of decommissioning activities such as removal of foundations (e.g. using cutting tools). Sound from vessels assumed to be as per vessel activity described for construction phase above.	The maximum design scenario considers the maximum number of vessels on site at any one time and greatest number of round trips during each phase of the Mona Offshore Wind Project. This represents the broadest range of vessel types and therefore sound signatures within the marine environment to affect marine mammal receptors. The maximum design scenario considers the maximum durations which activities could be conducted for.

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.296 The measures adopted as part of the Mona Offshore Wind Project that are relevant to effects from elevated underwater sound due to vessel use and other activities are outlined in Table 1.84.

Construction and decommissioning phase

Information to support assessment

1.7.3.297 The MDS for construction activities associated with the Mona Array Area, is up to a total of 69 vessels on site at any one time. This includes maximum of 22 main installation and support vessels, carrying out 521 trips. Eight tug/anchor handlers will carry out 74 return trips. Seven cable lay installation and support vessels will carry out 56 return trips across the total construction period. One guard vessel will carry out 50 return trips. Six survey vessels will carry out 31 return trips. Maximum of eight seabed preparation vessels for boulder removal, grapnel, pre-sweep and levelling will carry out 19 return trips. Twelve crew transfer vessels will carry out 1,135 return trips. Three scour protection installation vessels will carry out 41 return trips, and two cable protection vessels will carry out two return trips.

1.7.3.298 The MDS for construction activities associated with the Mona Offshore Cable Corridor and Access Areas is up to a total of 17 construction vessels on site at any one time . This includes six cable lay installation and support vessels will carry out up to 40 return trips. A maximum of one guard vessel will carry out 18 return trips. Two survey vessels will carry out up to four return trips. A maximum of four seabed preparation vessels for boulder removal, grapnel, pre-sweep and levelling will carry out 24 return trips. Two crew transfer vessels will carry out 20 return trips. Two cable protection vessels will carry out 20 return trips.

1.7.3.299 The MDS for construction activities associated with the landfall cable installation, is up to a total of ten vessels on site at any one time. This includes a maximum of one cable barge grounding vessel carrying out 16 return trips, one jack-up operations vessel carrying out 16 return trips, two installation and support vessels carrying out 32 return trips, two tug/anchor handlers carrying out 32 return trips, one cable installation & support vessels carrying out 16 return trips, one guard vessel carrying out 16 return trips, one survey vessel carrying out 16 return trips, one CTV carrying out 16 return trips.

1.7.3.300 Whilst this will lead to an uplift in vessel activity, the movements will be limited to within the Mona Array Area and Mona Offshore Cable Corridor and Access Areas and are likely to follow existing shipping routes to and from the ports. Approximately 3,166 vessels in total pass through the Mona Array Area per year (from Navigational Risk Assessment (NRA) in volume 6, annex 7.1: Navigational Risk Assessment of the Environmental Statement (Document reference F6.7.1).

1.7.3.301 Vessel traffic activity shows a seasonal trend that peaks over the summer months (May to Aug) and decreases in the winter months (Nov-Feb) (Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)). This is primarily due to an increase in ferry service operations and recreational activity. The NRA demonstrated much of the marine mammal study area experienced over 640 vessel trips per year (Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)). The majority of vessels crossing the Mona Offshore Cable Corridor and Access Areas are commercial cargo, tanker and passenger vessels and commercial traffic is largely concentrated where the route crosses the approaches to Liverpool and the associated ferry routes. The vessel movements will be contained within the Mona Array Area and Mona Offshore Cable Corridor and Access Areas and are likely to follow existing shipping routes to and from the ports.

Auditory injury

1.7.3.302 A detailed underwater sound modelling assessment has been carried out to investigate the potential for injurious and behavioural effects on marine mammals resulting from elevated underwater sound (non-impulsive sound), using the latest criteria (see Volume 5, annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference F5.3.1)). A conservative assumption has been made that all individual marine mammals will respond aversively to increases in vessel sound (i.e. that there is no intra or inter-specific variation or context-dependent differences). The distance over which effects may occur will, however, vary according to the species, the ambient sound levels, hearing ability, vertical space use and behavioural response differences.

1.7.3.303 SELs have been estimated for each vessel type based on 24 hours continuous operation, although it is important to note that it is highly unlikely that any marine mammal would stay at a stationary location or within a fixed radius of a vessel for 24 hours. Therefore, the acoustic modelling has been undertaken based on an animal swimming away from the source (or the source moving away from an animal).

1.7.3.304 The sound modelling results indicate that the threshold for PTS was not exceeded for any species for all vessels, drilled piling and all cable burial activities. Therefore, there is a negligible risk of PTS occurring to marine mammals as a result of elevated underwater sound due to vessel use, drilled piling or cable burial activities. Acoustic modelling was also conducted for TTS for completeness (see Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1)), however ranges indicated are likely to be overestimates as for continuous sources such as vessel sound the thresholds do not take into account any ambient sound levels in the region (which is already has high levels of shipping activity, see paragraph 1.7.3.262).

1.7.3.305 Ranges for TTS were between <10 m and 162 m for vessels (based on harbour porpoise), and between <10 m and 162 m for drilled piling and cable burial activities. Whist the likelihood of auditory injury is extremely low, the maximum duration of the construction phase is up to four years (48 months).

1.7.3.306 Whist the likelihood of auditory injury is extremely low, the maximum duration of the construction phase is up to four years (48 months).

Behavioural disturbance

1.7.3.307 Disturbance from vessel sound is likely to occur only where vessel sound associated with the construction of the Mona Offshore Wind Project exceeds the background ambient sound level. The Mona Offshore Wind Project is located in a relatively busy shipping area and therefore background sound levels are likely to be relatively high.

1.7.3.308 A detailed underwater sound modelling assessment has been carried out to investigate the potential for behavioural effects on marine mammals resulting from increased vessel sound and other activities. The estimated ranges within which there is a potential for disturbance to marine mammals are presented in Table 1.127.

1.7.3.309 Survey vessel and support vessels, crew transfer vessel, scour/cable protection and seabed preparation/installation vessels resulted in the greatest modelled disturbance out to 4.082 km for all marine mammal species (Table 1.127). The greatest disturbance range for other non-vessel continuous sound behavioural effects was predicted to be 3.412 km due to underwater sound from cable trenching activities. In comparison, installation vessels and construction vessels, rock placement vessels and

cable installation vessels all resulted in a predicted disturbance range of 2.195 km; vessels for boulder clearance had a disturbance range of 191 m (0.191 km); tug/anchor handlers had a disturbance range of 1.169 km; and jack up rigs had a disturbance range of 10 m (0.01 km).

Table 1.127: Estimated disturbance ranges for marine mammals as a result of vessels and other activities.

Threshold	Disturbance Range (m)
Vessels	
Sandwave clearance, installation vessel, construction vessel (using Dynamic Positioning), rock placement vessel and cable installation vessels	2,195
Boulder clearance	191
Jack-up rig	<10
Tug/anchor handlers, guard vessels	1,169
Survey vessel and support vessels, crew transfer vessel, scour/cable protection/seabed preparation/installation vessels	4,082
Other activities	
Cable trenching	3,412
Cable laying	2,195
Jack-up rig	<10
Drilled piling	251

1.7.3.310 Ranges for disturbance for vessels are presented up to the 120 dB re 1µPa (rms) threshold, and there is no differentiation between mild and strong disturbance for continuous sound (just one single fixed threshold for Level B harassment), this assumes 100% of animals above this threshold are disturbed (single step-function criterion used in the NMFS thresholds assume a “all-or-none” threshold). However, in reality, for those animals disturbed there is likely to be a proportional no dose-response curve available to apply in context of non-impulsive sound sources for key species in the Irish Sea. Dose-response curves for vessels have been created for killer whales (Joy *et al.*, 2019), thus indicating there is evidence of proportional response to vessel sound.

1.7.3.311 Moreover, for those animals disturbed, there is likely to be a proportional response (i.e. not all animals will be disturbed to the same extent), although there is no dose-response curve available to apply in the context of non-impulsive sound sources. It is important to note that the life history of an individual and the context will also influence the likelihood of an individual to exhibit an aversive response to sound, and it must be highlighted that these potential impacts will not be continuous over the construction phase, instead carried out over a shorter number of days within the period. Therefore, given the limited quantitative information available, as described above, any simplified calculation would likely lead to an unrealistic overestimation of the number of animals likely to be disturbed. Multiplying the area of ensonification by each species’ specific density would lead to unrealistic estimates, as serious disturbance would not occur over ranges such as 2.195 km. As such, this value has not been quantified.

1.7.3.312 However, empirical evidence suggests that for similar areas with existing vessel traffic responses to disturbance are reduced. Benhemma-Le Gall *et al.* (2021) suggested increased vessel activity (and other construction activities) led to a decrease in porpoise acoustic detections and activity at distances of up to 4 km. Porpoise responses decreased as the mean vessel distance increased (−24% at 3 km) until no apparent response was observed at 4 km. Similarly McQueen *et al.* (2020) used a distance threshold of 5 km as a point of comparison for screening potential marine mammal habitat displacement (behavioural avoidance), based upon the relative size of the dredging area and habitat range of receptors. Verboom *et al.* (2014) also suggested a porpoise never approached the study dredging ship in full operation at less than 5 km. Wisniewska *et al.* (2018) used sound and movement recording tags to detect fine-scale responses in harbour porpoise to vessel sound, and determined that foraging may be temporarily disrupted up to 7 km. Graham *et al.* (2019) indicated higher vessel activity within 1 KM was significantly associated with an increased probability of response in harbour porpoise.

1.7.3.313 Therefore, to give quantitative indication of impact, a range of distances from empirical studies (1 to 7 km) have been used as an effective impact range and the numbers of animals predicted to be disturbed is presented in Table 1.128 (noting this distance is based upon VHF species and does not account for different hearing groups, but is likely to be precautionary). The numbers disturbed presented are more likely to be the case for fast moving vessels such as a CTV (of which there are a max of 15 on site at one time) and not for slow-moving vessels such as boulder clearance or jack up rigs that show much smaller modelled disturbance ranges (Table 1.127).

1.7.3.314 It is important to highlight that multiplying these animals by the numbers of vessels in the Mona Array Area would lead to unrealistic estimates as it does not allow for any overlap between vessels and assumes if animals experience vessel sound they would remain in the area (which is unlikely if serious enough disturbance is experienced).

Table 1.128: Potential number of animals predicted to be disturbed per vessel for a range between 1 km (minimum) and 7 km (maximum).

Species	Number of animals disturbed (1 km)	% MU	Number of animals disturbed (7 km)	%MU
Harbour porpoise	<1	0.001%	43	0.07%
Bottlenose dolphin	<1	0.002%	<1	0.09%
Grey seal	<1	0.004%	28	0.21%
Harbour seal	<1	0.000%	<1	0.01%

1.7.3.315 The impact, for injury and disturbance, is predicted to be of local spatial extent, medium term duration and intermittent. Given the existing levels of vessel activity in the area, it is expected that marine mammals could tolerate the effects of disturbance without any impact on reproduction and survival rates and would return to previous activities once the impact had ceased.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.7.3.316 As outlined in paragraph 1.7.3.304, the sound modelling results indicate that the threshold for PTS was not exceeded for any species for all vessels, drilled piling and all cable burial activities Since other activities and vessel traffic will be short term duration and intermittent, there is no adverse effects leading to auditory injury for harbour porpoise associated with elevated underwater sound due to vessel use and other activities for Mona Offshore Wind Project. Ranges for TTS were between <1 m and 162 m for vessels (based on harbour porpoise), and between <10 m and 162 m for drilled piling and cable burial activities. Whist the likelihood of auditory injury is extremely low, the maximum duration of the construction phase is up to four years (48 months).

1.7.3.317 For disturbance impacts a range of distances from empirical studies (1 to 7 km) were used. For harbour porpoise less than one animal was predicted to be disturbed (using a 1 km impact range) and 43 animals (using a 7 km impact range).

1.7.3.318 Activities and vessel movements will be restricted to the Mona Array Area and Mona Offshore Cable Corridor and Access Areas, and large vessels, producing low frequency sound, will likely follow existing shipping routes. Therefore, a slight increase from the existing levels of traffic in the vicinity of the Mona Offshore Wind Project may not result in high levels of disturbance and thus, behavioural disturbance is unlikely to be significant (see paragraph 1.7.3.315). Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the North Anglesey Marine/Gogledd Môn Forol SAC.

1.7.3.319 Therefore, the impact is not predicted to result in auditory injury of harbour porpoises and there is negligible risk of behavioural disturbance of harbour porpoises (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)).

Conclusions

1.7.3.320 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.129 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.129: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for elevated underwater sound generated from vessel use and other activities during the construction and decommissioning phase.

Conservation Objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the supporting habitats and processes from being maintained or reduce the availability of prey.

1.7.3.321 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

North Channel SAC

Harbour porpoise

1.7.3.322 Elevated underwater sound due to vessel use and other activities on harbour porpoise features of the North Channel SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (22.58 km from Mona Array Area and 17.5 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.316 to 1.7.3.318, due to the proximity of the locations. As the North Channel SAC (81.5 km from Mona Array Area and 94.5 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.323 Therefore, the impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.7.3.324 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Channel SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.130 below. Where the justifications and supporting evidence

are the same for more than one conservation objective, the assessments have been grouped.

Table 1.130: Conclusions against the conservation objectives of the North Channel SAC for elevated underwater sound generated from vessels and other non-piling activities during the construction and decommissioning phase.

Conservation Objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the supporting habitats and processes from being maintained or reduce the availability of prey.

1.7.3.325 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result of elevated underwater sound due to vessels and other activities from the Mona Offshore Wind Project alone.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

Bottlenose dolphin

1.7.3.326 Maximum range for bottlenose dolphin within which there is a risk of PTS do not exceed the thresholds. The potential for bottlenose dolphin to experience PTS is less than one animal. Since other activities and vessel traffic will be short term duration and intermittent, there is no adverse effects leading to auditory injury for bottlenose dolphin associated with elevated underwater sound due to vessel use and other activities for the Mona Offshore Wind Project.

1.7.3.327 For disturbance impacts a range of distances from empirical studies (1 to 7 km) were used. For bottlenose dolphin less than one animal was predicted to be disturbed (using both a 1 km and 7 km impact range).

1.7.3.328 Activities with the largest disturbance ranges, including sandwave clearance installation, construction, rock placement and cable laying vessels will be operating at distances from the coastline of Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC and are unlikely to affect coastal bottlenose dolphin populations. Considering the distance from the Mona Offshore Wind Project to the SAC (94 km to Mona Array Area and 93 km to Mona Offshore Cable Corridor and Access Areas), it is unlikely that all the disturbed animals will originate from this SAC. Activities and vessel movements will be restricted to the Mona Array Area and Mona Offshore Cable Corridor and Access Areas, and large vessels, producing low frequency sound, will follow existing

shipping routes. Therefore, a slight increase from the existing levels of traffic in the vicinity of the Mona Offshore Wind Project may not result in high levels of disturbance and thus, behavioural disturbance is unlikely to be consequential (see paragraph 1.7.3.315). Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the SAC.

1.7.3.329 Therefore, the impact is not predicted to result in auditory injury of bottlenose dolphins and there is negligible risk of behavioural disturbance of bottlenose dolphins.

Grey seal

1.7.3.330 Maximum range for grey seal within which there is a risk of PTS do not exceed the thresholds. Since other activities and vessel traffic will be short term duration and intermittent, there is no adverse effects leading to auditory injury for bottlenose dolphin associated with elevated underwater sound due to vessel use and other activities for the Mona Offshore Wind Project.

1.7.3.331 For disturbance impacts a range of distances from empirical studies (1 to 7 km) were used. For grey seal less than one animal was predicted to be disturbed (using a 1 km impact range) and 28 animals (using a 7 km impact range).

1.7.3.332 Considering the distance from the Mona Offshore Wind Project to the SAC (94 km to Mona Array Area and 93.1 km to Mona Offshore Cable Corridor and Access Areas), animals within the site are unlikely to be disturbed and it is unlikely that all the disturbed animals will originate from this SAC. Activities and vessel movements will be restricted to the Mona Array Area and Mona Offshore Cable Corridor and Access Areas, and large vessels, producing low frequency sound, will likely follow existing shipping routes. Therefore, a slight increase from the existing levels of traffic in the vicinity of the Mona Offshore Wind Project may not result in high levels of disturbance and thus, behavioural disturbance is unlikely to be significant (see paragraph 1.7.3.315). Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the SAC.

1.7.3.333 Therefore, the impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.7.3.334 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.131 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.131: Conclusions against the conservation objectives of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC for underwater sound generated from vessels and other non-piling activities during the construction and decommissioning phase.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying marine mammal species.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.3.335 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Strangford Lough SAC

Harbour seal

1.7.3.336 Maximum range for harbour seal within which there is a risk of PTS do not exceed the thresholds. The potential for harbour seal to experience PTS is less than one animal. Since other activities and vessel traffic will be short term duration and intermittent, there is no adverse effects leading to auditory injury for harbour seal associated with elevated underwater sound due to vessel use and other activities for Mona Offshore Wind Project.

1.7.3.337 For disturbance impacts a range of distances from empirical studies (1 to 7 km) were used. For harbour seal less than one animal was predicted to be disturbed (using a 1 km and 7 km impact range).

1.7.3.338 Considering the distance from the Mona Offshore Wind Project to the Strangford Lough SAC (112 km to Mona Array Area and 125 km to Mona Offshore Cable Corridor and Access Areas), it is unlikely that the disturbed animals will originate from this SAC. Activities and vessel movements will be restricted to the Mona Array Area and Mona Offshore Cable Corridor and Access Areas, and large vessels, producing low frequency sound, will follow existing shipping routes. Therefore, a slight increase from the existing levels of traffic in the vicinity of the Mona Offshore Wind Project may not

result in high levels of disturbance and thus, behavioural disturbance is unlikely to be significant (see paragraph 1.7.3.315). Only a small area will be affected when compared to available foraging habitat in the Irish Sea and it will not affect important areas for foraging and reproduction within the SAC.

1.7.3.339 Therefore, the impact is not predicted to result in auditory injury of harbour seals and there is negligible risk of behavioural disturbance of harbour seals.

Conclusions

1.7.3.340 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Strangford Lough SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.132. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.132: Conclusions against the conservation objectives of the Strangford Lough SAC for underwater sound generated from vessels and other non-piling activities during the construction and decommissioning phase.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.3.341 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Murlough SAC

Harbour seal

1.7.3.342 Elevated underwater sound due to vessel use and other activities on harbour seal features of the Murlough SAC are predicted to be similar to those associated with the Strangford Lough SAC (110 km from Mona Array Area and 126 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.336 to 1.7.3.338, due to the proximity of the locations. As the Murlough SAC (115.9 km from Mona Array Area and 127.1 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the

Strangford Lough SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.343 Therefore, the impact is not predicted to result in auditory injury of harbour seal and there is negligible risk of behavioural disturbance of harbour seal.

Conclusions

1.7.3.344 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Murlough SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.133. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.133: Conclusions against the conservation objectives of the Murlough SAC for underwater sound generated from vessels and other non-piling activities during the construction and decommissioning phase.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.3.345 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.7.3.346 Elevated underwater sound due to vessel use and other activities on bottlenose dolphin features of the Cardigan Bay/Bae Ceredigion SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.326 to 1.7.3.329, due to the proximity of the locations. As the Cardigan Bay/Bae Ceredigion SAC (162.5 km from Mona Array Area and 161.5 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r

Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.347 Therefore, the impact is not predicted to result in auditory injury of bottlenose dolphins and there is negligible risk of behavioural disturbance of bottlenose dolphins.

Conclusions

1.7.3.348 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.134. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.134: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for underwater sound generated from vessels and other non-piling activities during the construction and decommissioning phase.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying marine mammal species.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.3.349 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

The Maidens SAC

Grey seal

1.7.3.350 Elevated underwater sound due to vessel use and other activities on grey seal features of the Maidens SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and

93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.330 to 1.7.3.333, due to the proximity of the locations. As The Maidens SAC (166.8 km from Mona Array Area and 189.8 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.351 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

Conclusions

1.7.3.352 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of The Maidens SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.135. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.135: Conclusions against the conservation objectives of The Maidens SAC for elevated underwater sound due to vessel use and other activities during the construction and decommissioning phase.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the grey seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of harbour seal.**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the grey seal population numbers and distribution from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by grey seal within the site.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the physical features used by grey seal within the site. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.3.353 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Maidens SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.7.3.354 Elevated underwater sound due to vessel use and other activities on grey seal features of the Pembrokeshire Marine/Sir Benfro Forol SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access

Areas) outlined in paragraphs 1.7.3.330 to 1.7.3.333, due to the proximity of the locations. As the Pembrokeshire Marine/Sir Benfro Forol SAC (211.7 km from Mona Array Area and 210.7 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.355 Therefore, the impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.7.3.356 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.136. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.136: Conclusions against the conservation objectives of Pembrokeshire Marine/Sir Benfro Forol SAC for elevated underwater sound due to vessel use and other activities during the construction and decommissioning phase.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying grey seal feature.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying grey seal feature.

1.7.3.357 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.7.3.358 Elevated underwater sound due to vessel use and other activities on harbour porpoise features of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (22.6 km from Mona Array Area and 17.5 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.316 to 1.7.3.318, due to the proximity of the locations. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (274.8 km from Mona Array Area and 273.8 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.359 Therefore, the impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.7.3.360 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.137. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.137: Conclusions against the conservation objectives of Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for elevated underwater sound due to vessel use and other activities during the construction and decommissioning phase.

Conservation Objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the supporting habitats and processes from being maintained or reduce the availability of prey.

1.7.3.361 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Lundy SAC

Grey seal

1.7.3.362 Elevated underwater sound due to vessel use and other activities on grey seal features of the Lundy SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.330 to 1.7.3.333, due to the proximity of the locations. As the Lundy SAC (309.5 km from Mona Array Area and 308.5 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.363 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

Conclusions

1.7.3.364 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Lundy SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.138. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.138: Conclusions against the conservation objectives of Lundy SAC for elevated underwater sound due to vessel use and other activities during the construction and decommissioning phase.

Conservation Objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other activities will not prevent the structure and function of the habitats of qualifying species from being maintained or restored nor prevent the supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.3.365 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Lundy SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Isles of Scilly Complex SAC

Grey seal

1.7.3.366 Elevated underwater sound due to vessel use and other activities on grey seal features of the Isles of Scilly Complex SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.330 to 1.7.3.333, due to the proximity of the locations. As the Isles of Scilly Complex SAC (439.3 km from Mona Array Area and 438.3 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.367 Therefore, the impact is not predicted to result in auditory injury of grey seal and there is negligible risk of behavioural disturbance of grey seal.

Conclusions

1.7.3.368 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.139. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.139: Conclusions against the conservation objectives of Isles of Scilly Complex SAC for elevated underwater sound due to vessel use and other activities during the during the construction and decommissioning phase.

Conservation Objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other activities will not prevent the structure and function of the habitats of qualifying species from being maintained or restored nor prevent the supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, elevated underwater sound due to vessel use and other activities

Conservation Objectives	Conclusion
	associated with the Mona Offshore Wind Project will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.3.369 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Isles of Scilly Complex SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Sites assessed in line with the iterative approach

1.7.3.370 As outlined in paragraphs 1.7.1.3 to 1.7.1.8, following the iterative approach adopted for this ISAA, the closest European site to the Mona Offshore Wind Project within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this ISAA, are located at a greater distance from the Mona Offshore Wind Project and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.7.3.316 to 1.7.3.369 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.7.3.371 to 1.7.3.393.

West Wales Marine/Gorllewin Cymru Forol SAC

1.7.3.371 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

1.7.3.372 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.3.330 to 1.7.3.335), it can be concluded that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Saltee Islands SAC

1.7.3.373 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.3.330 to 1.7.3.335), it can be concluded that there is no risk of an adverse effect on the integrity of the Saltee Islands SAC as a result of underwater sound vessels and other activities with respect to construction of the Mona Offshore Wind Project alone.

Rockabill to Dalkey Island SAC

1.7.3.374 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Rockabill to Dalkey Island SAC as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Roaringwater Bay and Islands SAC

1.7.3.375 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Roaringwater Bay and Islands SAC as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Blasket Islands SAC

1.7.3.376 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Blasket Islands SAC as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.7.3.377 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Abers - Côte des legends SCI

1.7.3.378 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Abers - Côte des legends SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Ouessant-Molène SCI

1.7.3.379 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Ouessant-Molène SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Côte de Granit rose-Sept-Iles SCI

1.7.3.380 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Anse de Goulven, dunes de Keremma SCI

1.7.3.381 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Tregor Goëlo SCI

1.7.3.382 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Tregor Goëlo SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Côtes de Crozon SCI

1.7.3.383 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Côtes de Crozon SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Chaussée de Sein SCI

1.7.3.384 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Chaussée de Sein SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Cap Sizun SCI

1.7.3.385 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap Sizun SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Récifs du talus du golfe de Gascogne SCI

1.7.3.386 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Anse de Vauville SCI

1.7.3.387 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC(paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Vauville SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Cap d'Erquy-Cap Fréhel SCI

1.7.3.388 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Baie de Saint-Brieuc – Est SCI

1.7.3.389 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Banc et récifs de Surtainville SCI

1.7.3.390 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.7.3.391 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Estuaire de la Rance SCI

1.7.3.392 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Estuaire de la Rance SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Baie du Mont Saint-Michel SCI

1.7.3.393 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.316 to 1.7.3.325), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie du Mont Saint-Michel SCI as a result of elevated underwater sound due to vessel use and other activities with respect to construction of the Mona Offshore Wind Project alone.

Operations and maintenance phase

Information to support assessment

1.7.3.394 Vessel use during the operations and maintenance phase of the Mona Offshore Wind Project may lead to injury and/or disturbance to marine mammals. Vessel types which will be required during the operations and maintenance phase include those used during routine inspections, geophysical surveys, repairs and replacements of navigational equipment, removal of marine growth, replacement of corrosion protection anodes, painting, replacement of access ladders and boat landings, modifications to/replacement of J-tubes, replacement of consumables, minor repairs and replacements to wind turbines or OSPs, major component replacement to wind turbines or OSPs, inter-array/interconnector cable repair or reburial, export cable repair or reburial (subtidal or intertidal. This will involve crew transfer vessels/workboats, jack up vessels, cable repair vessels, service operation vessels (SOVs) or similar vessels, excavators/backhoe dredgers. Up to a maximum of 21 vessels will be on site at any one time, with 849 operations and maintenance vessel movements (return trips) will be carried out each year (730 CTVs/workboats, 25 jack-up vessels, eight cable repair vessels, 78 SOV or similar and eight excavators/backhoe dredgers).

1.7.3.395 The uplift in vessel activity during the operations and maintenance is considered to be relatively small in the context of the baseline levels of vessel traffic in the Mona marine mammal study area. Presence of the operational Mona Offshore Wind Project may divert some of the shipping routes and therefore, current traffic within the Mona array area, which is not associated with Mona Offshore Wind Project, is likely to be reduced. It is likely that this reduction will be ultimately counterbalanced by presence of maintenance vessels. Vessel movements will be within the Mona Array Area and Mona Offshore Cable Corridor and Access Areas and will follow the provisions for vessels and vessel movements within the EMP (which includes measures to minimise disturbance to marine mammals from transiting vessels (Document reference J17); see Table 1.84.

1.7.3.396 The size and sound outputs from vessels during the operations and maintenance phase will be similar to those used in the construction phase and therefore will result in a similar spatial MDS. However, the number of vessel round trips and their frequency

is much lower for the operations and maintenance phase compared to the construction phase.

1.7.3.397 An overview of potential impacts for auditory injury and behavioural disturbance to marine mammals from elevated underwater sound due to vessel use and other activities is described in paragraphs 1.7.3.302 to 1.7.3.315 for the construction phase with similar impact ranges and have not been reiterated here for the operations and maintenance phase. The impacts are predicted to be of local spatial extent, long term duration and intermittent.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.7.3.398 On the basis of the rationale outlined in paragraphs 1.7.3.316 and 1.7.3.318 for the construction phase impact, and the lower number of vessels and other activities associated with the operations and maintenance phase compared to the construction phase, it is considered that effects would be of similar if not of a lower magnitude than during construction phase.

1.7.3.399 Therefore, the impact is not predicted to result in auditory injury of harbour porpoises and there is negligible risk of behavioural disturbance of harbour porpoises.

Conclusions

1.7.3.400 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.140. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.140: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for elevated underwater sound due to vessel use and other activities during the during the operations and maintenance phase.

Conservation Objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the

Conservation Objectives	Conclusion
	condition of the habitats and their processes and the availability of prey from being maintained.

1.7.3.401 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

North Channel SAC

Harbour porpoise

1.7.3.402 Elevated underwater sound due to vessel use and other activities on harbour porpoise features of the North Channel SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (22.5 km from Mona Array Area and 17.5 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraph 1.7.3.398, due to the proximity of the locations. As the North Channel SAC (81.5 km from Mona Array Area and 94.5 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.403 Therefore, the impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.7.3.404 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Channel SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.141. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.141: Conclusions against the conservation objectives of the North Channel SAC for elevated underwater sound due to vessel use and other activities during the during the operations and maintenance phase.

Conservation Objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not significantly disturb the species.
The condition of supporting habitats and processes, and the	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) also did not conclude any significant adverse effects

Conservation Objectives	Conclusion
availability of prey is maintained.	on fish receptors as a result of underwater sound associated with vessels. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the condition of the habitats and their processes and the availability of prey from being maintained.

1.7.3.405 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

Bottlenose dolphin

1.7.3.406 On the basis of the rationale outlined in paragraphs 1.7.3.326 and 1.7.3.328 for the construction phase impact, and the lower number of vessels and other activities associated with the operations and maintenance phase compared to the construction phase, it is considered that effects would be of similar if not of a lower magnitude than during construction phase.

1.7.3.407 Therefore, the impact is not predicted to result in auditory injury of bottlenose dolphins and there is negligible risk of behavioural disturbance of bottlenose dolphins.

Grey seal

1.7.3.408 On the basis of the rationale outlined in paragraphs 1.7.3.330 and1.7.3.332 for the construction phase impact, and the lower number of vessels and other activities associated with the operations and maintenance phase compared to the construction phase, it is considered that effects would be of similar if not of a lower magnitude than during construction phase.

1.7.3.409 Therefore, the impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.7.3.410 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.142. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.142: Conclusions against the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC for underwater sound generated from elevated underwater sound due to vessel use and other activities during the operations and maintenance phase.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat.	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance elevated

Conservation Objectives	Conclusion
The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.	underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying marine mammal species.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.3.411 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Strangford Lough SAC

Harbour seal

1.7.3.412 On the basis of the rationale outlined in paragraphs 1.7.3.336 and 1.7.3.338 for the construction phase impact and the lower number of vessels and other activities associated with the operations and maintenance phase compared to the construction phase, it is considered that effects would be of similar if not of a lower magnitude than during construction phase.

1.7.3.413 Therefore, the impact is not predicted to result in auditory injury of harbour seals and there is negligible risk of behavioural disturbance of harbour seals.

Conclusions

1.7.3.414 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Strangford Lough SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.143. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.143: Conclusions against the conservation objectives of the Strangford Lough SAC for elevated underwater sound due to vessel use and other activities during the during the operations and maintenance phase.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.3.415 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Murlough SAC

Harbour seal

1.7.3.416 Elevated underwater sound due to vessel use and other activities on harbour seal features of the Murlough SAC are predicted to be similar to those associated with the Strangford Lough SAC (112.2 km from Mona Array Area and 125.1 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraph 1.7.4.409 due to the proximity of the locations. As the Murlough SAC (115.9 km from Mona Array Area and 127.1 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Strangford Lough SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.417 Therefore, the impact is not predicted to result in auditory injury of harbour seals and there is negligible risk of behavioural disturbance of harbour seals.

Conclusions

1.7.3.418 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Murlough SAC will not occur as a result of underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.143. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.144: Conclusions against the conservation objectives of the Murlough SAC for elevated underwater sound due to vessel use and other activities during the during the operations and maintenance phase.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound from elevated underwater sound due to vessel use and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.3.419 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.7.3.420 Elevated underwater sound due to vessel use and other activities on bottlenose dolphin features of the Cardigan Bay/Bae Ceredigion SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.406 to 1.7.3.407, due to the proximity of the locations. As the Cardigan Bay/Bae Ceredigion SAC (162.5 km from Mona Array Area and 161.5 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.421 Therefore, the impact is not predicted to result in auditory injury of bottlenose dolphins and there is negligible risk of behavioural disturbance of bottlenose dolphins.

Conclusions

1.7.3.422 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.145. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.145: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for elevated underwater sound due to vessel use and other activities during the during the operations and maintenance phase.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future**.	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying marine mammal species.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.3.423 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

The Maidens SAC

Grey seal

1.7.3.424 Elevated underwater sound due to vessel use and other activities on grey seal features of the Maidens SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.408 to 1.7.3.409, due to the proximity of the locations. As the Maidens SAC (166.8 km from Mona Array Area and 179.8 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.425 Therefore, the impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.7.3.426 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of The Maidens SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is

discussed in turn below in Table 1.146. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.146: Conclusions against the conservation objectives of The Maidens SAC for elevated underwater sound due to vessel use and other activities during the during the operations and maintenance phase.

Conservation Objectives	Conclusion
To maintain (or restore where appropriate) the grey seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of grey seal.**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the grey seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by grey seal within the site.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will prevent physical features used by grey seal within the site from being maintained or enhance.

1.7.3.427 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Maidens SAC as a result of underwater sound from vessels and other activities from the Mona Offshore Wind Project alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.7.3.428 Elevated underwater sound due to vessel use and other activities on grey seal features of the Pembrokeshire Marine/Sir Benfro Forol SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.408 to 1.7.3.409 due to the proximity of the locations. As the Pembrokeshire Marine/Sir Benfro Forol SAC (211 km from Mona Array Area and 219 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.429 Therefore, the impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.7.3.430 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will not occur as a result of elevated underwater sound due to vessel use and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.147. Where the

justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.147: Conclusions against the conservation objectives of Pembrokeshire Marine/Sir Benfro Forol SAC for elevated underwater sound due to vessel use and other activities during the operations and maintenance phase.

Conservation Objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future**.	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying marine mammal species.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for elevated underwater sound due to vessel use and other activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, elevated underwater sound due to vessel use and other activities associated with the Mona Offshore Wind Project will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.3.431 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of elevated underwater sound due to vessel use and other activities from the Mona Offshore Wind Project alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.7.3.432 Elevated underwater sound due to vessel use and other activities on harbour porpoise features of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC are predicted to be similar to those associated with the North Anglesey Marine/Gogledd Môn Forol SAC (22.5 km from Mona Array Area and 17.5 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.398 to 1.7.3.399, due to the proximity of the locations. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (274.8 km from Mona Array Area and 273.8 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the North Anglesey Marine/Gogledd Môn Forol SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.433 Therefore, the impact is not predicted to result in auditory injury of harbour porpoise and there is negligible risk of behavioural disturbance of harbour porpoise.

Conclusions

1.7.3.434 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will not occur as a result of underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.148. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.148: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for elevated underwater sound due to vessel use and other activities during the operations and maintenance phase.

Conservation Objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury and disturbance within range of the SAC, that harbour porpoise are likely to avoid vessels, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3) also did not conclude any significant adverse effects on fish receptors as a result of underwater sound associated with vessels. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the condition of the habitats and their processes and the availability of prey from being maintained.

1.7.3.435 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of underwater sound from vessels and other activities from the Mona Offshore Wind Project alone.

Lundy SAC

Grey seal

1.7.3.436 Underwater sound from vessels and other activities on grey seal features of the Lundy SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.408 to 1.7.3.409, due to the proximity of the locations. As the Lundy SAC (309.5 km from Mona Array Area and 308.5 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.437 Therefore, the impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.7.3.438 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Lundy SAC will not occur as a result of underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.149. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.149: Conclusions against the conservation objectives of the Lundy SAC for underwater sound generated from vessels and other non-piling activities during the during the operations and maintenance phase.

Conservation Objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound from vessels and other activities to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, underwater sound as a result of vessels and other activities will not prevent the structure and function of the habitats of qualifying species from being maintained or restored nor prevent the supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.3.439 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Lundy SAC as a result of underwater sound from vessels and other activities from the Mona Offshore Wind Project alone.

Isles of Scilly Complex SAC

Grey seal

1.7.3.440 Underwater sound from vessels and other activities on grey seal features of the Isles of Scilly Complex SAC are predicted to be similar to those associated with the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km from Mona Array Area and 93 km from Mona Offshore Cable Corridor and Access Areas) outlined in paragraphs 1.7.3.408 to 1.7.3.409, due to the proximity of the locations. As the Isles of Scilly Complex SAC (439.3 km from Mona Array Area and 438.3 km from Mona Offshore Cable Corridor and Access Areas) is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, it is considered that effects would be of similar if not of a lower magnitude.

1.7.3.441 Therefore, the impact is not predicted to result in auditory injury of grey seals and there is negligible risk of behavioural disturbance of grey seals.

Conclusions

1.7.3.442 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will not occur as a result of underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.150. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.150: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC for underwater sound generated from vessels and other non-piling activities during the during the operations and maintenance phase.

Conservation Objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound from vessels and other activities to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, underwater sound as a result of vessels and other activities will not prevent the structure and function of the habitats of qualifying species from being maintained or restored nor prevent the supporting processes on which the habitats of qualifying species rely from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that there is no potential for injury and disturbance within range of the SAC, the existing level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.3.443 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Isles of Scilly Complex SAC as a result of underwater sound from vessels and other activities from the Mona Offshore Wind Project alone.

Sites assessed in line with the iterative approach

1.7.3.444 As outlined in paragraphs 1.7.1.3 to 1.7.1.8, following the iterative approach adopted for this ISAA, the closest European site to the Mona Offshore Wind Project within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this ISAA, are located at a greater distance from the Mona Offshore Wind Project and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.7.3.398 to 1.7.3.443 are,

therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.7.3.445 to 1.7.3.467.

West Wales Marine/Gorllewin Cymru Forol SAC

1.7.3.445 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

1.7.3.446 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Saltee Islands SAC

1.7.3.447 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Saltee Islands SAC as a result of underwater sound vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Rockabill to Dalkey Island SAC

1.7.3.448 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Rockabill to Dalkey Island SAC as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Roaringwater Bay and Islands SAC

1.7.3.449 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Roaringwater Bay and Islands SAC as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Blasket Islands SAC

1.7.3.450 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Blasket Islands SAC as a result of underwater

sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.7.3.451 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Abers - Côte des legends SCI

1.7.3.452 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Abers - Côte des legends SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Ouessant-Molène SCI

1.7.3.453 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Ouessant-Molène SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Côte de Granit rose-Sept-Iles SCI

1.7.3.454 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Anse de Goulven, dunes de Keremma SCI

1.7.3.455 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Tregor Goëlo SCI

1.7.3.456 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Tregor Goëlo SCI as a result of underwater sound

from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Côtes de Crozon SCI

1.7.3.457 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Côtes de Crozon SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Chaussée de Sein SCI

1.7.3.458 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Chaussée de Sein SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Cap Sizun SCI

1.7.3.459 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap Sizun SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Récifs du talus du golfe de Gascogne SCI

1.7.3.460 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Anse de Vauville SCI

1.7.3.461 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Vauville SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Cap d'Erquy-Cap Fréhel SCI

1.7.3.462 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of

underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Baie de Saint-Brieuc – Est SCI

1.7.3.463 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Banc et récifs de Surtainville SCI

1.7.3.464 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.7.3.465 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Estuaire de la Rance SCI

1.7.3.466 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Estuaire de la Rance SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Baie du Mont Saint-Michel SCI

1.7.3.467 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.3.398 to 1.7.3.405), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie du Mont Saint-Michel SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Changes in fish and shellfish communities affecting prey availability

1.7.3.468 There is the potential for changes in marine mammal prey (e.g. fish species) abundance and distribution to arise as a result of construction and decommissioning activities which physically disturb the seabed, result in increased SSC or which

generate underwater sound. Potential impacts to prey species may result in changes in the ability/success of marine mammals to forage in the area of the Mona Offshore Wind Project. The risk of effects on prey species is expected to be greatest during the construction phase (e.g. due to seabed disturbance and/or underwater sound during construction).

1.7.3.469 The HRA Stage 1 Screening Report (Document Reference E1.4) concluded that any potential temporary changes to the fish community in the vicinity of the Mona Array Area as a result of construction and decommissioning impacts such as underwater sound, are unlikely to result in significant effects to Annex II marine mammal features given that the majority of potential impacts on prey species will be spatially limited to the Mona Offshore Wind Project Boundary (for habitat disturbance) and surrounding area (e.g. behavioural effects from underwater sound), particularly in the context of the foraging opportunities within the extensive ranges for marine mammal species and the highly mobile nature of these species. As such, no LSEs were anticipated to occur as a result of changes in fish and shellfish communities affecting prey availability for Annex II marine mammal features with the exception of the North Anglesey Marine/Gogledd Môn Forol SAC which was screened in on a precautionary basis.

1.7.3.470 The potential for any adverse effects on prey were screened out for the operations and maintenance phase as effects are considered to be significantly reduced compared to the construction phase as underwater sound will be substantially lower (i.e. no piling will be required).

1.7.3.471 The MDS considered for the assessment of potential impacts on Annex II marine mammal features from changes in fish and shellfish communities affecting prey availability is presented in Table 1.151.

Table 1.151: MDS considered for the assessment of potential impacts on marine mammals from changes in fish and shellfish communities affecting prey availability during the construction phase.

Potential impact	MDS	Justification
Construction phase	As described in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) for: • Temporary habitat loss/disturbance • Long term habitat loss • Increased SSC and associated sediment deposition. • Disturbance/remobilisation of sediment-bound contaminants • Underwater sound during the construction phase impacting fish and shellfish receptors.	As described in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3).

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.472 The measures adopted as part of the Mona Offshore Wind Project that are relevant to effects from changes in fish and shellfish communities affecting prey availability are outlined in Table 1.152. The measures adopted as part of the Mona Offshore Wind Project outlined in Table 1.30 for effects of underwater sound on fish are also relevant

to the impact pathway of changes in fish and shellfish communities affecting prey availability.

Table 1.152: Measures adopted as part of the project relevant to the assessment of adverse effect on European sites designated for Annex II marine mammal features from changes in fish and shellfish communities affecting prey availability.

Measure	Justification	How the measure is secured
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Development of, and adherence to an Offshore EMP that will include a MPCP which will include planning for accidental spills, address all potential contaminant releases and include key emergency details.	To ensure that the potential for release of pollutants during construction, operations and maintenance, and decommissioning phases are minimised. These will likely include designated areas for refuelling where spillages can be easily contained, storage of chemicals in secure designated areas in line with appropriate regulations and guidelines, double skinning of pipes and takes containing hazardous substances, and storage of these substances in impenetrable bunds. The MPCP will ensure that in the unlikely event that a pollution event occurs, that plans are in place to respond quickly and effectively to ensure any spillage is minimised and potential effects on the environment are ideally avoided or minimised. Implementation of these measures will ensure that accidental release of contaminants from vessels will be avoided or minimised, thus providing protection for marine life across all phases of the Mona Offshore Wind Project.	Offshore EMP secured within the deemed marine licence in Schedule 14 of the draft DCO and expected to be secured within the standalone NRW marine licence.
Development of, and adherence to, a Decommissioning Programme in accordance with the Energy Act 2004. A Decommissioning Programme is required under the provisions of the Energy Act 2004 and this must be approved by the Secretary of State before works commence.	The aim of this plan is to adhere to the existing UK legislation and guidance. Overall, this will ensure the legacy of the Mona Offshore Wind Project will result in the minimum amount of long-term disturbance to the environment. While this measure has been committed to as part of the Mona Offshore Wind Project, the MDS for the decommissioning phase has been considered in each of the impact assessments presented in section 1.7.3.	Decommissioning Programme secured as a requirement in Schedule 2 of the DCO and is a requirement of the Energy Act 2004.

Construction phase

Information to support assessment

1.7.3.473 As outlined in the Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) the key prey species for Annex II marine mammals include small shoaling fish from demersal or pelagic habitats, particularly gadoids (e.g. cod *Gadus morhua*, haddock *Melanogrammus aeglefinus*, whiting *Merlangius merlangus*), whiting *Trispoterus* spp, clupeids (herring), European sprat *Sprattus sprattus,* sandeels, mackerel (*Scomber scombrus*), flatfish (plaice *Pleuronectes platessa*, sole, flounder, dab) and cephalopods.

1.7.3.474 Marine mammals exploit a range of different prey items and can forage widely and change prey sources, sometimes covering extensive distances. Given that the potential impacts of construction to prey resources will be localised and largely restricted to the boundaries of the Mona Offshore Wind Project, only a small area will be affected when compared to available foraging habitat in the Irish and Celtic Seas. The fish and shellfish communities found within the Mona fish and shellfish ecology study area are characteristic of the fish and shellfish assemblages in the wider Irish Sea and it is therefore reasonable to assume that, due to the highly mobile nature of marine mammals, there will be similar prey resources available in the wider area. There may be an energetic cost associated with increased travelling and two species, harbour porpoise and harbour seal, may be particularly vulnerable to this effect. Harbour porpoise has a high metabolic rate and only a limited energy storage capacity, which limits their ability to buffer against diminished food (Rojano-Doñate *et al*., 2018). Conversely, harbour seal typically forage close to haul out sites, i.e. within nearest 50 km. Despite this, if animals do have to travel further to alternative foraging grounds, the impacts are expected to be short term in nature and reversible. It is expected that all marine mammal receptors would be resilient to the effect without any impact on reproduction and survival rates and would be able to return to previous activities once the impact had ceased.

1.7.3.475 Potential impacts on the marine mammal prey species outlined above during the construction and decommissioning phase have been assessed in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) using the appropriate MDSs for these receptors. Impacts which may have indirect effects on marine mammals include temporary and long-term habitat loss/disturbance, underwater sound imp fish and shellfish receptors, increased SSCs and associated sediment deposition, EMFs from subsea electrical cabling, colonisation of hard structures, and disturbance/remobilisation of sediment-bound contaminants.

1.7.3.476 The installation and removal of infrastructure within the Mona Offshore Wind Project may lead to temporary subtidal habitat loss/disturbance. There is the potential for temporary habitat loss/disturbance to affect up to 60,512,833 m^2 of seabed during the construction phase, although only a small proportion of this will be impacted at any one time. For long term habitat loss, up to 2,192,412 m^2 may be lost.

1.7.3.477 Habitat loss/disturbance could potentially affect spawning, nursery or feeding grounds of fish and shellfish receptors, which will impact those feeding higher up the food chain. However, as suggested in Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3), only a small proportion of the maximum footprint of habitat loss/disturbance may be affected at any one time during the construction phase and areas will start to recover immediately after cessation of construction activities in the vicinity. Additionally, habitat disturbance during the construction phase will also expose benthic infaunal species from the sediment, potentially offering foraging opportunities to some fish and shellfish species (e.g. opportunistic scavenging species) immediately after completion of works.

1.7.3.478 With respect to underwater sound, marine mammals occurring within the predicted impact areas for fish and shellfish also have the potential to be directly affected as a result of impacts such as injury and disturbance from elevated underwater sound during piling and it is likely that the effects to prey resources (e.g. behavioural displacement) will occur over a similar, or lesser, extent and duration as those for marine mammals. There would, therefore, be no additional displacement of marine mammals as a result of any changes in prey resources during construction, as they

would already be potentially disturbed as a result of underwater sound during piling. In addition, as prey resources are displaced from the areas of potential impact, marine mammals are likely to follow in order to exploit these resources.

1.7.3.479 There is also the potential for underwater sound during construction pile-driving to result in injury and/or disturbance to fish and shellfish communities. However for auditory injury for most fish, the impact was predicted to be of regional spatial extent, medium term duration, intermittent and high reversibility, and is unlikely to lead to significant mortality due to primary mitigation.

1.7.3.480 Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) determined the impact of underwater sound on most fish and shellfish receptors during the construction phase to predicted to be of regional spatial extent, relatively short term duration, intermittent and of high reversibility, with the soundscape returning to near-baseline conditions upon completion of construction activities, with a magnitude of low for most species. However, discrete high and low intensity mapped herring spawning grounds are located off the east coast of the IoM at Douglas Bank, with spawning occurring over an approximate six-week period in September and October, and therefore Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3) conservatively assessed the magnitude as medium for herring. This, combined with high sensitivity for herring, led to potential moderate adverse significance for this key prey species from underwater sound associated with piling.

1.7.3.481 As discussed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4), whilst certain prey species may comprise the main part of their diet, all marine mammals in this assessment are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species. Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.4) concluded that most prey species would not be exposed to significant adverse effects as a result of Mona Offshore Wind Project. Given that marine mammals are wide-ranging in nature with the ability to exploit numerous food sources, there would be a variety of prey species available for marine mammal foraging. Furthermore, the Underwater sound management strategy (with an Outline underwater sound management strategy submitted as part of the application (Document Reference J16)), will present a review of relevant mitigation options in order to reduce the magnitude of impacts leading to significant effects (for the project alone) on fish and shellfish (such herring spawning) to a non-significant effect, which would benefit marine mammal predators who may feed on these fish.

1.7.3.482 Other potential impacts included increased SSCs and associated sediment deposition which may result in short-term avoidance of affected areas by fish and shellfish. Adult fish have high mobility and may show avoidance behaviour in areas of high sedimentation (EMU, 2004), however, there may be potential impacts on the hatching success of fish and shellfish larvae and consequential effects on the viability of spawning stocks due to limited mobility (Bisson and Bilby, 1982; Berli *et al.*, 2014). However, most fish juveniles expected to occur in the Mona Fish and Shellfish Ecology study area will be largely unaffected by the relatively low-level temporary increases in SSC and impacts will be short in duration, returning to background levels relatively quickly, and the effect is predicted to be minor which will not impact marine mammals.

1.7.3.483 A moderate adverse effect, which is significant in EIA terms was predicted for herring as a result of underwater noise during the construction phase of the Mona Offshore Wind Project (Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document reference F2.4)). No other significant adverse effects were

predicted to occur to fish and shellfish species (marine mammal prey) as a result of the construction of the Mona Offshore Wind Project (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)). Therefore, changes in fish and shellfish communities affecting prey availability for marine mammals were predicted to be of local spatial extent, medium-term duration, intermittent and high reversibility.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.7.3.484 The potential impacts of construction and decommissioning will be highly localised and largely restricted to the boundaries of the Mona Offshore Wind Project, only a small area will be affected when compared to available foraging habitat in the Irish Sea. Harbour porpoise feed on a variety of prey including gobies, sandeel, whiting, herring and sprat (Santos and Pierce, 2003; Aarfjord, 1995). There may be an energetic cost associated with increased travelling and due to harbour porpoise high metabolic rate (see paragraph 1.7.3.474), this species may be particularly vulnerable to this effect. However, harbour porpoises have a widespread distribution and individuals have been documented either switching to different prey species depending on the prey availability (Santos and Pierce, 2003) or moving relatively large distances on a daily basis (Nielsen *et al*., 2013). Based on findings of Benhemma-Le Gall *et al*. (2021), it can be anticipated that harbour porpoise can compensate for any resulting loss in energy intake by increasing foraging activities beyond impact zone. The availability of wider suitable habitat across the CIS MU suggest that individuals may move to alternative foraging grounds without affecting animals health.

1.7.3.485 As outlined in paragraph 1.7.3.480 to 1.7.3.315, no significant adverse effects were predicted to occur to most fish and shellfish species (marine mammal prey) as a result of the construction of the Mona Offshore Wind Project (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)) but there may be an adverse significant effect on herring (spawning grounds). However, as stated in paragraphs 1.7.3.480 and 1.7.3.484 harbour porpoise are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species.

1.7.3.486 Therefore, the impact is not predicted to result in adverse effects (i.e. disruption to foraging) for harbour porpoises.

Conclusions

1.7.3.487 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of changes in fish and shellfish communities affecting prey availability. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.153. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.153: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for changes in fish and shellfish communities affecting prey availability during the during construction phase.

Conservation Objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Harbour porpoise may be affected in response to changes in fish and shellfish communities affecting prey availability in the vicinity of the Mona Offshore Wind Project boundaries, however impacts to prey species are predicted to be localised, short term and intermittent, and harbour porpoise are expected to adapt (they are considered to be opportunistic feeders and are thus not reliant on a single prey species) and recover quickly. As such there is a negligible risk of disruption of foraging activities of harbour porpoise. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, changes in fish and shellfish communities affecting prey availability associated with the Mona Offshore Wind Project will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for changes in fish and shellfish communities affecting prey availability to result in adverse effects on the habitats of the qualifying species and there are no adverse effects expected for fish and shellfish species. No significant adverse effects were predicted to occur to most fish and shellfish species (marine mammal prey) as a result of the construction of the Mona Offshore Wind Project (see Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)) but there may be an adverse significant effect on herring (spawning grounds). However, this adverse significant effect is only concluded during the spawning periods for herring and cod and harbour porpoise are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Mona Offshore Wind Project will not prevent the condition of habitats and their processes and the availability of prey from being maintained.

1.7.3.488 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of changes in fish and shellfish communities affecting prey availability from the Mona Offshore Wind Project alone.

1.7.4 Assessment of adverse effects in-combination

1.7.4.1 The other developments (projects/plans) that could result in in-combination effects associated with the Mona Offshore Wind Project on Annex II marine mammal features of the designated sites identified have been summarised in Table 1.154 and shown in Figure 1.21.

1.7.4.2 As outlined in the HRA Stage 1 Screening Report (Document Reference E1.4), where the potential for LSE has been concluded with respect to the Mona Offshore Wind Project alone, the potential for LSE has also been concluded in-combination. For impacts where LSE has been ruled out with respect to the Mona Offshore Wind Project alone, there is either no pathway to effect, or the Mona Offshore Wind Project would result in only negligible or inconsequential effects that would not contribute (even collectively) or materially to in-combination effects and therefore, no additional in-combination issues are identified.

1.7.4.3 On this basis, the potential impacts identified for assessment as part of the Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4), and which have been brought forward for consideration in the in-combination assessment of the ISAA are:

- In-combination underwater sound from piling
- In-combination underwater sound from the clearance of UXO
- In-combination underwater sound from pre-construction site survey
- In-combination underwater sound from vessels and other vessel activities
- In-combination changes in fish and shellfish communities affecting prey availability.

1.7.4.4 The following assessments of the effects of the Mona Offshore Wind Project, acting in-combination with other relevant plans and projects, on Annex II marine mammals have been informed by the detailed project-specific underwater sound modelling presented in Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1) and the technical assessments presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4). The Applicant has also made all reasonable efforts to ensure that the information included in the assessment relating to other projects is correct and sufficiently detailed, with any limitations on the information available acknowledged. The assessments have also drawn upon the sensitivity assessments of the relevant marine mammals detailed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) which reference the best available literature and evidence with regards to sensitivity. In this regard, the Applicant is confident that the conclusions made on whether an adverse effect on integrity on a European site(s) and qualifying features can or cannot be ruled out as a result of the Mona Offshore Wind Project in-combination with other plans and projects have been identified in light of the best scientific knowledge in the field and all reasonable scientific doubt can be ruled out.

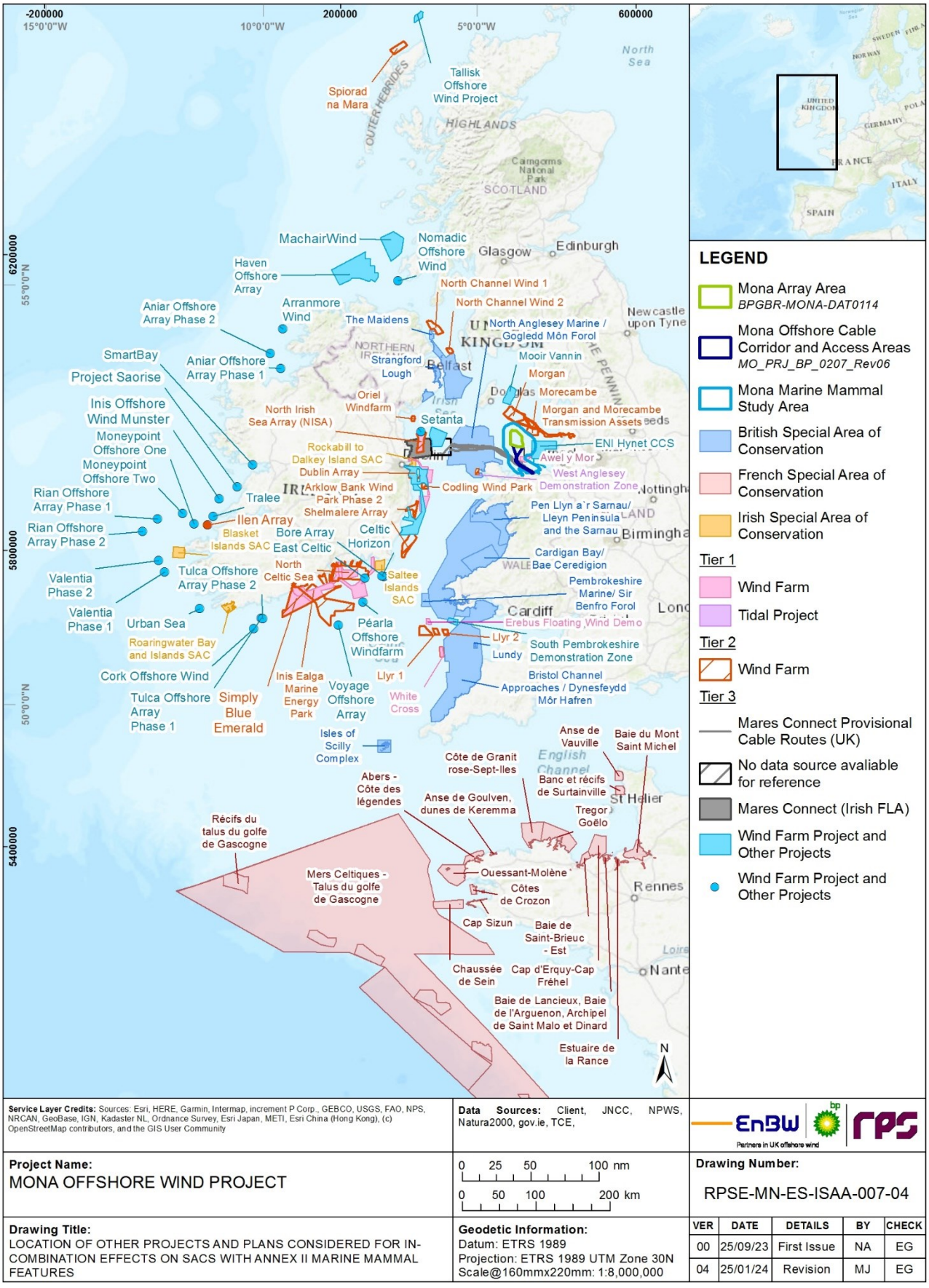

Figure 1.21: Location of other projects and plans considered for in-combination effects on SACs with Annex II marine mammal features

Table 1.154: List of other projects and plans with potential for in-combination effects on Annex II marine mammal features.

*These offshore wind projects are only included in the grey seal extended screening area (OSPAR region III) and lie outside of the CIS MU screening area

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Tier 1							
Awel y Môr	Consented	13.52	3.60	Offshore Wind Farm	2026 to 2029	2030 to 2055	Construction and operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at Awel y Môr Offshore Wind Farm.
West Anglesey Demonstration Zone tidal site	Permitted but not yet implemented	53.78	50.57	Tidal Demonstration Zone	2021 to 2023	2024 to 2061	Operational activities at the Mona Offshore Wind Project may overlap with operational activities of West Anglesey Tidal Demonstration Zone.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Mainstream, Renewable Power Ltd- Site Investigations off Co, Dublin	Submitted but not yet determined	106.56	110.3	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for Mainstream Dublin Northeast Wind.
Statkraft North Irish Sea Array (NISA) Site Investigations	Operational	114.25	119.47	Offshore Wind Farm: site investigations	n/a	2021 to 2026	Construction activities at the Mona Offshore Wind Project may overlap with site investigation activities for the Statkraft NISA.
Site Investigations for the proposed Sunrise Offshore Wind Farm, off Counties Dublin and Wicklow	Submitted but not yet determined	115.61	118.56	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for Sunrise Offshore Wind Farm.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
ESB Wind Development Limited Site Investigations at Sea Stacks Offshore Wind off Dublin and Wicklow	Submitted but not yet determined	117.42	119.82	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for ESB Sea Stacks Offshore Wind.
Site Investigations for proposed Offshore Wind Farm, off Counties Wicklow and Dublin	Submitted but not yet determined	124.69	125.24	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for Banba Offshore Wind Farm.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
RWE Renewables Ireland Site Investigations for Dublin Array Offshore Wind Farm	Submitted but not yet determined	126.12	129.03	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for RWE Renewables Dublin Array Offshore Wind Farm.
Site Investigations for the proposed Wicklow Project offshore wind farm, off County Wicklow	Submitted but not yet determined	129.91	125.75	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for Wicklow Project Offshore Wind Farm.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Shelmalere Offshore Wind Farm - Site Investigations off Counties Wexford and Wicklow	Submitted but not yet determined	164.62	160.44	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for Shelmalere Offshore Wind Farm.
SSE Renewables Celtic Sea surveys	Submitted but not yet determined	239.08	231.44	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for SSE Renewables Celtic Sea Offshore Wind Farm.
Project Erebus	Under Construction	259.9	240.23	Floating Demonstration Projects	2024 to 2025	2026 to 2051	Construction activities at the Mona Offshore Wind Project may overlap with operational activities at Project Erebus.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
ESB Wind Development Limited Site Investigations off Waterford and Cork Coasts - Helvick Head Offshore Wind	Submitted but not yet determined	267.83	260.12	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for ESB Helvick Head Offshore Wind.
White Cross	Submitted but not yet determined	287.7	264.1	Demonstration Floating Wind Farm	2025 to 2027	2027 to Unknown	Construction and operational activities at Mona Offshore Wind Project may overlap with construction and operational activities of White Cross.
ESB Celtic Offshore Wind - Site Investigations off Waterford and Cork	Submitted but not yet determined	305.21	298	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for ESB Celtic Offshore Wind.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Simply Blue Energy (Kinsale) Limited surveys	Submitted but not yet determined	338.83	331.26	Floating Offshore Wind Farm: site investigations	n/a	unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for Simply Blue Energy (Kinsale) Limited surveys.
Site Investigations for the proposed Kinsale Project offshore wind farm, off County Cork	Submitted but not yet determined	363.92	356.95	Offshore Wind Farm: site investigations	n/a	Unknown	There is potential for construction activities at the Mona Offshore Wind Project to overlap with site investigation activities for Kinsale Project Offshore Wind Farm.
Twin Hub	Permitted but not yet implemented	377.1	350.9	Floating offshore wind platforms (32 MW)	2024-2026	2026 to Unknown	Construction and operational activities at Mona Offshore Wind Project may overlap with operational activities of Twin Hub.

Tier 2

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Morgan Offshore Wind Project Generation Assets	Pre-application	5.52	32.93	Offshore Wind Farm	2026 to 2029	2030 to 2065	Construction and operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at Morgan Generation Assets.
Morecambe Offshore Windfarm Generation Assets	Pre-application	8.9	21.53	Morgan and Morecambe Offshore Wind Farms: Transmission Assets	2026 to 2029	2030 to 2089	Construction and operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at Morecambe Generation Assets.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Morgan and Morecambe Offshore Windfarms Transmission Assets	Pre-application	8.92	21.53	Transmission Assets	2026 to 2029	2030 to 2065	Construction and operational activities for the Mona Offshore Wind Project may overlap with construction and operational activities of the Morgan and Morecambe Offshore Wind Farms: Transmission Assets.
Mooir Vannin	Pre-application	34.53	59.9	Orsted have signed an agreement for lease to develop a 700 MW (annual output 3000 GWh) wind farm on the east coast and have undertaken initial surveys since 2016.	2030 to 2032	Unknown	There is potential at the operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Mooir Vannin wind farm lease area.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
North Irish Sea Array Offshore Wind Farm	Pre-application	112.7	118.6	Offshore Wind Farm	2025 to 2027	2027 to 2059	Construction and operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at North Irish Sea Array.
Codling Wind Park Offshore Wind Farm	Pre-application	125.1	123.6	Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and/or operational activities at Codling Wind Park Offshore Wind Farm.
Dublin Array Offshore Wind Farm	Pre-application	126.1	129	Offshore Wind Farm	2026 to 2028	2029 to 2062	Construction and operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at Dublin Array.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
North Channel Wind 2	Pre-application	128.5	151.52	Floating Offshore Wind Farm	2027-2030	unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at North Channel Wind 2.
Oriel Windfarm Offshore Wind Farm	Pre-application	130.4	138.1	Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and/or operational activities at Oriel Windfarm Offshore Wind Farm.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Arklow Bank Wind Park Phase 2	Pre-application	146.7	142.8	Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and/or operational activities at Arklow Bank Wind Park Phase 2.
North Channel Wind 1	Pre-application	157.25	180.93	Floating Offshore Wind Farm	2027-2030	unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at North Channel Wind 1.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Shelmalere Offshore Wind Farm	Pre-application	164.6	160.4	Offshore Wind Farm	2028 to 2029	2030 to 2055	Construction and operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at Shelmalere Offshore Wind Farm.
North Celtic Sea Offshore Wind Farm	Pre-application	256.4	248.84	Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and/or operational activities at North Celtic Sea Offshore Wind Farm.
Llŷr 2	Pre-application	263	240	Floating Demonstration Project	2025 to 2026	2026 to 2051	Construction and operational activities at the Mona Offshore Wind Project may overlap with operational activities at Llŷr 2.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Llŷr 1	Pre-application	267	245	Floating Demonstration Project	2025 to 2026	2026 to 2051	Construction and operational activities at the Mona Offshore Wind Project may overlap with operational activities at Llŷr 1.
Project Valorous	Pre-application	271.7	252.4	Early commercial Floating Offshore Wind Farm	2028 to 2029	2029 to 2054	Construction and operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at Project Valorous.
Inis Ealga Marine Energy Park	Pre-application	288.3	282.7	Floating Offshore Wind Farm	2028 to 2030	2030 to Unknown	Construction and operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at Inis Ealga Marine Energy Park.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Simply Blue Emerald	Pre-application	338.83	331.26	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with site investigation activities at Simply Blue Energy (Kinsale) Limited surveys.
Project Ilen	Pre-application	392.52	395.4	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Project Ilen.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
*Spiorad na Mara – Offshore Wind Project	Pre-application	560.74	552.54	Offshore wind farm	2028 to unknown	2030 to unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Spiorad na Mara – Offshore Wind Project.
Tier 3							
Eni Hynet CCS	Pre-application	12.1	9.52	CCS project in the east Irish Sea. Works will include installation of a new Douglas CCS platform and work on the existing Hamilton, Hamilton North and Lennox wellhead platforms.	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Eni Hynet CCS.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
MaresConnect - Wales-Ireland Interconnector Cable	Pre-application	16.4	0	A proposed subsea and underground electricity interconnector system linking the existing electricity grids in Ireland and Great Britain.	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at MaresConnect.
Lir Offshore Array*	Pre-application	85.87	90.43	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Lir Offshore Array.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Braymore Point	Pre-application	114.15	119.31	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Braymore Point.
Realt na Mara	Pre-application	117.25	119.7	Offshore wind farm	2028 to 2029	2030 to unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Realt na Mara.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Cooley Point Offshore Wind Farm	Pre-application	117.98	124.39	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Cooley Point Offshore Wind Farm.
Setanta Offshore Wind Park	Pre-application	120.67	125.07	Offshore wind farm	2027 to 2029	2030 to Unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Setanta Offshore Wind Park.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Clogher Head Offshore Wind Farm	Pre-application	122.99	129.34	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Clogher Head Offshore Wind Farm.
Codling Wind Park Extension Offshore Wind Farm	Pre-application	127.15	124.89	Offshore wind farm	Unknown	Unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Codling Wind Park Extension Offshore Wind Farm.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Mac Lir	Pre-application	135.08	133.2	Offshore wind farm	2028 to 2029	2030 to unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Mac Lir.
Celtic Sea Array Offshore Wind Farm	Submitted but not yet determined	239.08	231.44	Offshore Wind Farm (1.2GW Capacity)	2027 to 2029	2030 to unknown	Construction and operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at Celtic Sea Array Offshore Wind Farm.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Blackwater Offshore Wind Farm	Pre-application	239.42	228.19	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Blackwater Offshore Wind Farm.
Malin Sea Wind*	Pre-application	246.77	262.37	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Malin Sea Wind.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
South Pembrokeshire Demonstration Zone	Submitted but not yet determined	247.59	221.75	Wave energy demonstration project	Unknown	Unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at South Pembrokeshire Demonstration Zone.
Bore Array	Pre-application	247.65	237.23	Offshore wind farm	2027 to 2029	2030 to unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Bore Array.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Celtic Horizon	Pre-application	248.63	238.53	Offshore wind farm	2027 to 2029	2030 to unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Celtic Horizon.
Nomadic Offshore Wind*	Pre-application	253.95	270.98	Floating Offshore Wind Farm	Unknown	2030 to unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Nomadic Offshore Wind.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
East Celtic	Pre-application	267.35	258.44	Offshore wind farm	Unknown	2030 to unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at East Celtic.
Haven Offshore Array Wind Farm*	Pre-application	268.9	290.5	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Haven Offshore Array Wind Farm.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Machair Wind – Hybrid Energy Project*	Pre-application	276.8	300.2	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Machair Wind – Hybrid Energy Project.
Péarla Offshore Wind Farm	Pre-application	292.21	281.22	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Péarla Offshore Wind Farm.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Aniar Offshore Array (Fixed)*	Pre-application	322.52	330.52	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Aniar Offshore Array (Fixed).
Voyage Offshore Array	Pre-application	337.89	326.93	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Voyage Offshore Array.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Arranmore*	Pre-application	338.27	348.66	Offshore wind farm	Unknown	Unknown	There is potential for construction and operational activities for the Mona Offshore Wind Project to overlap with construction and operational activities at Arranmore.
Aniar Offshore Array (Floating)*	Pre-application	341.64	350.36	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Aniar Offshore Array (Floating).

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Inis Offshore Wind Munster	Pre-application	383.96	387.09	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities for Inis Offshore Wind Munster.
Project Saoirse	Pre-application	394.19	396.73	Wave energy demonstration project	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Project Saoirse.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Tulca Offshore Array Phase 2	Pre-application	409.48	403.12	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Tulca Offshore Array Phase 2.
Tralee	Pre-application	413.98	416.05	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Tralee.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Cork offshore wind project	Pre-application	427.4	420.7	Offshore Wind Farm (1 GW Capacity)	2028 to 2029	2030 to unknown	Construction and operational activities at the Mona Offshore Wind Project may overlap with construction and operational activities at Cork offshore wind project.
Cork Offshore Wind project	Pre-application	427.4	420.7	Offshore wind farm	2028 to 2029	2030 to unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Cork Offshore Wind project.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Moneypoint Offshore One	Pre-application	441.18	443.03	Offshore wind farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities for Moneypoint Offshore One.
Urban Sea	Pre-application	475.79	472.15	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Urban Sea.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Valentia Phase 1	Pre-application	498.76	498.1	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Valentia Phase 1.
Valentia Phase 2	Pre-application	501.25	501.37	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Valentia Phase 2.

Project/Plan name	Status	Distance from the Mona Array Area (km)	Distance from the Mona Offshore Cable Corridor and Access Areas (km)	Description of project/plan	Dates of construction (if applicable)	Dates of operation (if applicable)	Overlap with the Mona Offshore Wind Project
Rian Offshore Array Phase 2	Pre-application	511.5	513.58	Floating Offshore Wind Farm	Unknown	Unknown	There is potential for construction and/or operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Rian Offshore Array Phase 2.
Talisk*	Pre-application	560.74	580.73	Floating Offshore Wind Farm	2028 to 2029	2030 to unknown	There is potential for construction and operational activities at the Mona Offshore Wind Project to overlap with construction and operational activities at Talisk.

In-combination injury and disturbance from underwater sound generated during piling

1.7.4.5 There is potential for injury and/or disturbance from underwater sound as a result of activities associated with the Mona Offshore Wind Project during construction, in-combination with activities associated with the projects outlined in Table 1.154 and shown in Figure 1.21.

1.7.4.6 As for the assessment of the Mona Offshore Wind Project alone, the risk of injury in terms of PTS to most of the marine mammal receptors, as a result of underwater sound due to piling, would be expected to be localised to within the boundaries of the respective projects. It is also anticipated that standard offshore wind industry construction methods (which include soft starts and visual and acoustic monitoring of marine mammals as standard) will be applied for all projects, thereby reducing the magnitude of impact with respect to auditory injury occurring in marine mammals. The Mona Offshore Wind Project has developed an Outline underwater sound management strategy (Document Reference J16) which sets out the process for investigating options to manage underwater sound levels (such as NAS, temporal and spatial piling restrictions, piling methods, soft start) in order to reduce the magnitude for the project alone. Although it cannot be assumed that other projects will implement sound reduction/NAS measures there is still a very low potential for significant in-combination effects for injury from elevated underwater sound during pilling and the in-combination assessment presented below focuses on disturbance only.

1.7.4.7 As outlined in paragraph 1.7.3.23 and 1.7.3.24, the Mona Offshore Wind Project alone assessment used both the unweighted threshold 143 dB re 1 µPa SEL_{ss} and EDR approach for harbour porpoise and the unweighted sound threshold of 160 dB re 1 µPa SPL_{rms} (strong disturbance) for all other species. These are area-based approaches using a fixed threshold below which there is considered to be no significant disturbance. This approach has not been universally adopted across all tier 1 projects considered within this in-combination assessment as some projects present results based on application of the dose-response approach within their Report to Inform Appropriate Assessment (RIAA). Therefore, in these cases the Mona Offshore Wind Project in-combination assessment presents the dose response numbers to allow a comparable approach. For example, whilst Awel y Môr Offshore Wind Farm applied the EDR approach for harbour porpoise this project presented an assessment using the dose-response approach for bottlenose dolphin and grey seal in the RIAA. Similarly, Project Erebus applied the dose-response approach for all species and presented the 5 dB SEL_{ss} sound contours together with the number of animals disturbed. The SACs with marine mammal features considered within the Project Erebus RIAA include the West Wales SAC, the Cardigan Bay SAC and the Pembrokeshire Marine SAC. As outlined, above for the Mona Offshore Wind Project alone assessment, using the relevant area based assessments (the unweighted threshold 143 dB re 1 µPa SEL_{ss} and EDR approach for harbour porpoise and the unweighted sound threshold of 160 dB re 1 µPa SPL_{rms} (strong disturbance) for bottlenose dolphin and grey seal)) there is no spatial overlap with the SACs assessed for Project Erebus above. For additional context, the dose response numbers associated with Project Erebus are also presented for the relevant receptors in section 1.7.4.

1.7.4.8 The White Cross HRA is not in the public domain and therefore the dose response approach presented in the White Cross EIA has been used in this in-combination assessment. In terms of tier 2 projects, the Morgan Generation Assets and Morgan

and Morecambe Offshore Wind Farm: Transmission Assets PEIR used the dose response numbers from the relevant EIA for all species, with the addition of EDRs for harbour porpoise to assess disturbance within the HRA. At PEIR, the Morecambe Generation Assets used the EDR and dose response for harbour porpoise, EDR and TTS ranges (as a moving away response) for bottlenose dolphin and TTS ranges/dose response for grey seal. These approaches have therefore been presented below in the in-combination assessment.

Construction phase

Tier 1

1.7.4.9 The construction of Mona Offshore Wind Project, together with construction of tier 1 projects identified in Figure 1.21 and Table 1.154 may lead to disturbance to marine mammals during piling. Tier 1 projects screened into the in-combination assessment include Awel y Môr Offshore Wind Farm, Project Erebus and White Cross.

1.7.4.10 The assessments provided in the Environmental Statements for Awel y Môr Offshore Wind Farm, Project Erebus and White Cross did not consider effects on harbour seal, as this species was scoped out. Given that the cumulative assessment for piling is provided on species-by-species basis, harbour seal will not be considered further for tier 1 projects.

1.7.4.11 There is potential for an in-combination effect of piling at Awel y Môr Offshore Wind Farm with piling at the Mona Offshore Wind Project. The maximum duration of piling at Mona Offshore Wind Project is 114 days over the piling phase between 2027 and 2028 (based on the maximum temporal scenario). For Awel y Môr, there will be up to 201 days of piling over the piling phase of 12 months in 2028, within the four year construction phase (RWE, 2022). The potential for temporal overlap of piling activities between Mona Offshore Wind Project and Awel y Môr is considered likely. Subsequently, simultaneous piling may take place, generating high levels of underwater sound.

1.7.4.12 Project Erebus is a demonstration scale floating offshore wind farm, comprising six to ten wind turbines and a range of foundation options, including pile driven anchors. The construction is planned to take place in 2025 with only 18 days over which piling may occur. The number of harbour porpoise predicted to be affected by disturbance is based on densities from site-specific surveys (Blue Gem Wind, 2020). Since the construction phase at Mona Offshore Wind Project and Awel y Môr commences in 2026, there is no potential for piling activity at Project Erebus to coincide with piling at Mona Offshore Wind Project and therefore, spatially, there would be no larger in-combination area of disturbance. It is, however, important to note that Project Erebus is located in close proximity to the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC designated for harbour porpoise. The construction of Project Erebus is planned to take place in 2025 with only 18 days over which piling may occur and therefore there is no potential for piling activity to coincide with piling at Mona Offshore Wind Project or Awel y Môr. Temporally, Project Erebus would make a slight contribution to the overall duration of piling.

1.7.4.13 Based on the White Cross MDS, as presented in the White Cross marine mammal and marine turtle ecology chapter, there will be up to six days of piling (five days for WTG mooring pin piles and one day for OSP pin piles) over the piling phase of six months between 2025 and 2027 (onshore and offshore construction phase) (Offshore Wind Limited, 2023). The maximum number of animals predicted to be disturbed, at White Cross is up to 1,652 (2.6% of CIS MU) for wind turbines (800 kJ, mooring pin piles)

and 2,754 (4.4% of CIS MU) for OSPs (2,500 kJ) (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4), based on TTS/moving away response as a proxy for disturbance. As such, numbers are likely to be overestimated, as this approach assumes 100% avoidance of all individuals exposed, as opposed to a dose response approach, which assumes a proportional decrease in avoidance at greater distances from the pile driving source (Brandt *et al.*, 2011). This was the most precautionary estimate based on the APEM summer density estimate density (0.918 animals per km2), rather than the lower APEM annual density estimate (0.594 animals per km^2) (see Offshore Wind Ltd. (2023) for more details about both density estimates and associated caveats). The assessment concluded a magnitude of negligible for the OSP and a magnitude of low for wind turbines.

1.7.4.14 In-combination (based on the MDS for each project) in 2025, there would be piling at Project Erebus potentially affecting 1,967 harbour porpoise and piling at White Cross potentially affecting up to 2,754 harbour porpoise over days of piling or 1,652 harbour porpoise on a single day of piling of OSPs. This could be followed by piling at Mona Offshore Wind Project in 2027 affecting 1,142 (spatial MDS) harbour porpoise and piling at White Cross potentially affecting up to 2,754 harbour porpoise. In 2028 there may be piling at Awel y Môr and Mona Offshore Wind Project in 2028 which may coincide and affect up to 3,254 (if using maximum SWF density for Awel y Môr) harbour porpoise. It is important to note that piling schedule information available for White Cross is limited; whilst piling may occur at any point in the construction phase between 2025 and 2027, piling will take place over a maximum of six days, within a six month piling phase. In addition, the higher hammer energy of 2,500 kJ will only occur on a single day and estimates of number of animals disturbed are based on TTS/moving away response as a proxy for disturbance, and as such numbers are likely to be overestimated and therefore an in-combination total presented is highly precautionary.

Harbour porpoise

1.7.4.15 The potential for temporal overlap of piling activities between the Mona Offshore Wind Project and Awel y Môr is considered likely. Subsequently, simultaneous piling may take place, generating significant levels of underwater sound. It is predicted that during piling at the Mona Offshore Wind Project, harbour porpoise may experience disturbance over the proportion of Irish Sea between the Solway Firth and Caernarfon Bay, albeit only mild disturbance (<130 dB) where the disturbance contours extend towards the coastal area.

1.7.4.16 In-combination, up to 3,254 harbour porpoise (5.20% of the Celtic and Irish Seas MU) could be disturbed at any one time during piling at the Mona Offshore Wind Project (using the spatial MDS) and Awel y Môr. This is likely to be an overestimate given highly precautionary SWF densities (1.0 animals per km^2) used for the assessment at Awel y Môr. If more realistic densities (0.13 animals per km^2, based on JCP Phase III Tool estimate) are taken into account, the in-combination number of harbour porpoise potentially disturbed would be up to 1,417 individuals (2.27% of the CIS MU). In addition, it is expected that animals would be disturbed over a similar area and disturbance contours are likely to overlap to a large extent due to the proximity of the projects. However, the area of strong disturbance may be larger compared to the Mona Offshore Wind Project alone and in-combination piling will result in longer duration of the impact and subsequently affect animals over longer timescales.

1.7.4.17 Project Erebus is a demonstration scale floating offshore wind farm, comprising six to ten wind turbines and a range of foundation options, including pile driven anchors. The construction is planned to take place in 2025 with only 18 days over which piling may

occur. The number of harbour porpoise predicted to be affected by disturbance is based on densities from site-specific surveys (Blue Gem Wind, 2020;Table 1.55). Since the construction phase at the Mona Offshore Wind Project and Awel y Môr commences in 2026, there is no potential for piling activity at Project Erebus to coincide with piling at Mona Offshore Wind Project and therefore, spatially, there would be no larger in-combination area of disturbance. It is, however, important to note that Project Erebus is located in close proximity to the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC designated for protection or harbour porpoise. Temporally, Project Erebus would contribute to a slightly longer duration of piling within the cumulative marine mammal study area.

1.7.4.18 Based on the White Cross MDS, as presented in the White Cross marine mammal and marine turtle ecology chapter, there will be up to six days of piling (five days for WTG mooring pin piles and one day for OSP pin piles) over the piling phase of six months between 2025 and 2027 (onshore and offshore construction phase) (Offshore Wind Limited, 2023). The maximum number of animals predicted to be disturbed, at White Cross is up to 1,652 (2.6% of CIS MU) for wind turbines (800 kJ, mooring pin piles) and 2,754 (4.4% of CIS MU) for OSPs (2,500 kJ) (Table 1.55), based on TTS/moving away response as a proxy for disturbance. As such, numbers are likely to be overestimated, as this approach assumes 100% avoidance of all individuals exposed, as opposed to a dose response approach, which assumes a proportional decrease in avoidance at greater distances from the pile driving source (Brandt et al., 2011). This was the most precautionary estimate based on the APEM summer density estimate density (0.918 animals per km^2), rather than the lower APEM annual density estimate (0.594 animals per km^2) (see Offshore Wind Ltd. (2023) for more details about both density estimates and associated caveats). The assessment concluded a magnitude of negligible for the OSP and a magnitude of low for wind turbines.

1.7.4.19 In-combination (based on each projects MDS) in 2025, there would be piling at Project Erebus potentially affecting 1,967 harbour porpoise and piling at White Cross potentially affecting up to 2,754 harbour porpoise over 5 days of piling or 1,652 harbour porpoise on a single day of piling of OSPs. This could be followed by piling at Mona Offshore Wind Project in 2027 affecting 1,142 (spatial MDS) harbour porpoise and piling at White Cross potentially affecting up to 2,754 harbour porpoise. In 2028 there may be piling at Awel y Môr and Mona Offshore Wind Project in 2028 which may coincide and affect up to 3,254 (if using maximum SWF density for Awel y Môr) harbour porpoise. It is important to note that piling schedule information available for White Cross is limited; whilst piling may occur at any point in the construction phase between 2025 and 2027, piling will take place over a maximum of six days, within a six month piling phase. In addition, the higher hammer energy of 2,500 kJ will only occur on a single day and estimates of number of animals disturbed are based on TTS/moving away response as a proxy for disturbance, and as such numbers are likely to be overestimated and therefore an in-combination total presented is highly precautionary.

Table 1.155: Harbour porpoise cumulative assessment – numbers predicted to be disturbed as a result of underwater sound during piling for Tier 1 Projects.

[1] Based on realistic density of 0.13 animals/km^2

[2] Number based on TTS as a proxy for disturbance (White Cross Offshore Wind (2023)).

Project	Reference	Max number of piles	Scenario	Piling duration	Piling phase	Max number of animals disturbed	Density (animal per km^2)	% of reference population
Mona Offshore Wind Project	Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)	454	MDS Spatial (Concurrent piling)	90	24 months	1,142	0.2773	1.83% CIS MU
		454	MDS Temporal	114 days		971 (4,400 kJ)		1.55% CIS MU
Awel y Môr Offshore Wind Farm	RWE (2022)	50	Monopile, 5,000 kJ	201 days	12 months	2,112 (275[1])	1.0 (SWF) (0.13 animals per km^2 (JCP))	3.38% CIS MU
Project Erebus	Blue Gem Wind (2020)	35	Pin-pile, 800 kJ	18 days	8 months	1,967	0.4	3.15% CIS MU
White Cross	White Cross Offshore Wind (2023)	48	WTG: pin pile 800 kJ Single piling	5 days	6 months	1,652	0.918	2.6%
		4	OSP: pin pile 2,500 kJ Single piling	1 day		2,754	0.918	4.4%

1.7.4.20 As outlined in paragraph 1.7.3.39, the EDR approach has also been used for the assessment of disturbance associated with pile driving during the construction phase for harbour porpoise features in-combination with other plans and projects. Figure 1.22 shows the EDRs for the relevant projects considered in the in-combination assessment (i.e. 15 km for the Mona Offshore Wind Project and 26 km for all other projects). As outlined in section 1.7.3 the 15 km EDR for the Mona Offshore Wind Project does not overlap with the North Anglesey Marine/Gogledd Môn Forol SAC. This therefore rules out potential disturbance from in-combination effects to harbour porpoise features of all SACs screened into the ISAA. All SACs are located in excess of 15 km from the Mona Offshore Wind Project and therefore it can be concluded that the Mona Offshore Wind Project will not contribute to an in-combination effect on these SACs if using the EDR approach.

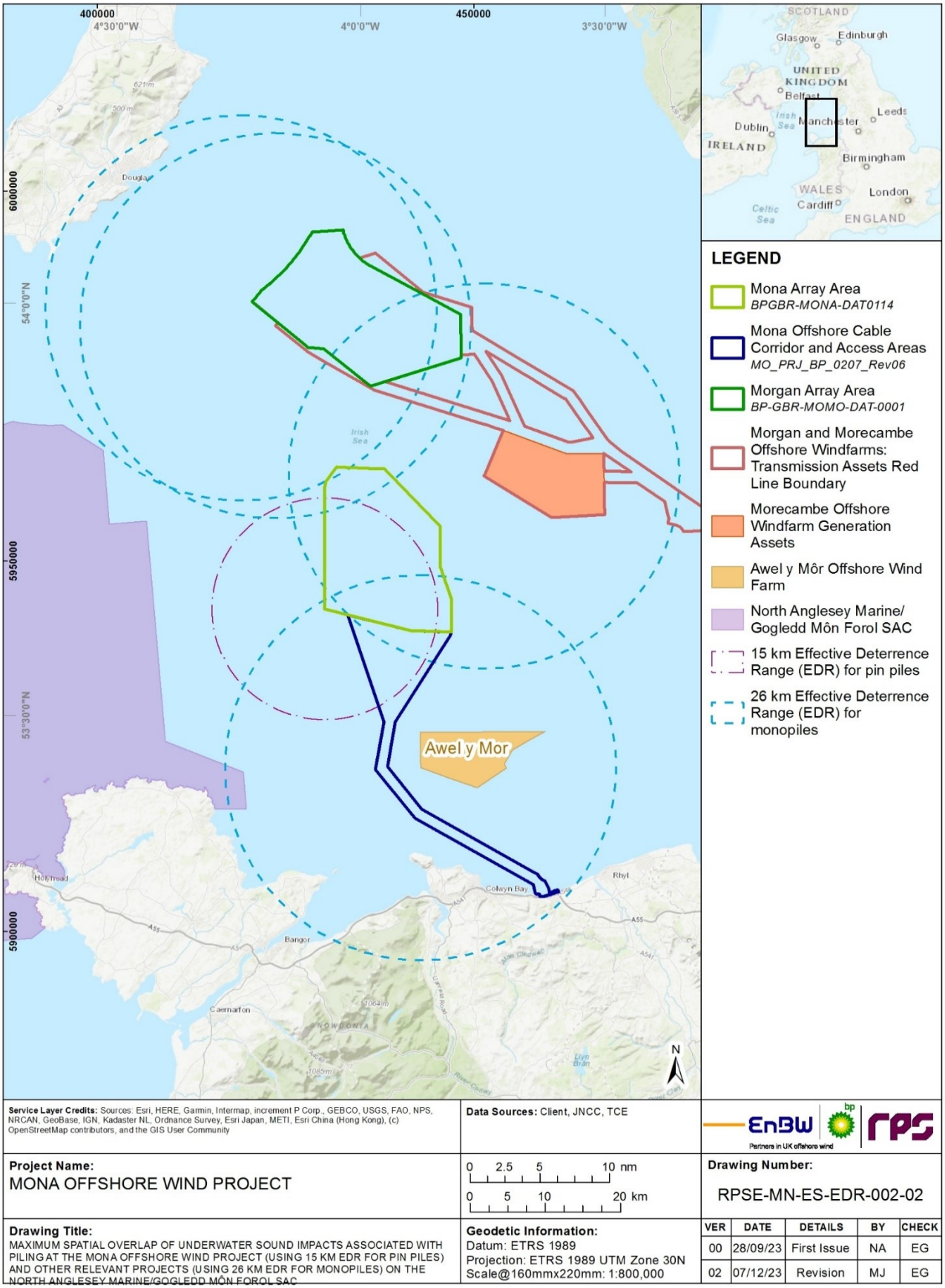

Figure 1.22: Maximum spatial overlap of underwater sound impacts associated with piling at the Mona Offshore Wind Project (using 15 km EDR for pin piles) and other relevant projects (using 26 km EDR for monopiles) on the North Anglesey Marine/Gogledd Môn Forol SAC.

1.7.4.21 As outlined in paragraph 1.7.3.41, in parallel with the EDR approach, an unweighted threshold 143 dB re 1 µPa SEL_{ss} (Tougaard, 2021) as set out in NRW's 'Position on assessing behavioural disturbance of harbour porpoise from underwater noise' (NRW, 2023) has also been applied. It demonstrated an overlap of 4.33% of the total North Anglesey Marine/Gogledd Môn Forol SAC area for the SW piling location (single piling of 4,400 kJ). In terms of disturbance across the site averaged over the season (summer, 183 days) a daily footprint of 140.67 km^2, over 114 days of piling across the construction phase (see

1.7.4.22 Table 1.87) would result in an average of 2.69% of the relevant area of the SAC being affected over the season. This therefore falls well within the threshold of 20% of the relevant area of the site in any given day and 10% of the relevant area of the site over the season. As this is the closest piling location, disturbance associated with all other piling locations within the Mona Array Area would be reduced. However, the unweighted threshold 143 dB re 1 μPa^2s SEL_{ss} approach has not been applied to the assessment of disturbance for harbour porpoise features in-combination with other plans and projects, as this would require the generation of project-specific unweighted threshold 143 dB re 1 μPa^2s SEL_{ss} contours for tier 1 Projects, which are not publicly available.

1.7.4.23 At the Awel y Môr Offshore Wind Farm (which was recently granted consent in September 2023), the Report to Inform Appropriate Assessment (RIAA), concluded that the footprint of disturbance (based on an EDR of 26 km and a single piling activity at the worst-case location) would at most be 0.84% of the total area (based on a footprint of disturbance of 27.3 km^2 within the total North Anglesey Marine/Gogledd Môn Forol SAC area of 3,249 km^2 of the SAC and therefore well within the daily 20% threshold (other piling locations within the array would have a reduced level of impact) (RWE, 2022). Should such activity occur every day of the season in sufficient proximity to the site (which would not be possible, as only a limited proportion of the array area falls within 26 km), the contribution to the 10% seasonal threshold would be at most 0.84% and therefore well within the 10% threshold (see Table 1.187).

1.7.4.24 Considering there is a potential for temporal overlap of piling activities between Mona Offshore Wind Project and Awel y Môr, the footprints of disturbance from the Mona Offshore Wind Project and the Awel y Môr Offshore Wind Farm have been added together to assess the potential for in-combination effects.

1.7.4.25 Using the EDR approaches available in both Mona Offshore Wind Project and Awel y Môr, as outlined in paragraph 1.7.4.20 and 1.7.4.23 the disturbance footprints associated with both projects in-combination would result in potential disturbance across an area equating to 0.84% of the total area of the SAC. This, therefore, would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.

1.7.4.26 It is acknowledged that a number of methods are available to determine the potential for significant disturbance to marine mammals, which means individual project assessments are not directly comparable. However, as a highly precautionary approach which uses the unweighted threshold 143 dB re 1 μPa^2s SEL_{ss} approach for Mona Offshore Wind Project in combination with the EDR ranges from Awel y Môr, the disturbance footprints associated with both projects would result in potential disturbance across an area equating to 5.17% of the total area of the SAC per day, which is well below the daily 20% disturbance threshold (see Table 1.187).

Bottlenose dolphin

1.7.4.27 It is anticipated that there will be a temporal overlap with piling at Awel y Môr Offshore Wind Farm and the Mona Offshore Wind Project. The consequences of potential simultaneous piling in 2028, i.e. larger area of strong disturbance compared to the Mona Offshore Wind Project alone and longer duration of the effect, are described in more detail in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4).

1.7.4.28 Only projects within the Irish Sea bottlenose dolphin MU will be used for the in-combination effects assessment for bottlenose dolphin, as this MU largely represents

the coastal bottlenose dolphin ecotype (of which there are only a few hundred). Therefore Project Erebus and White Cross, which lie in the Offshore Channel and Southwest England MU (offshore ecotype), are not considered for this species. This approach was agreed with the marine mammal EWG 5 (June 2023; see Table 1.1).

1.7.4.29 As outlined in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4), the in-combination assessment therefore assumes piling at Mona Offshore Wind Project in 2027 affecting up to seven bottlenose dolphin (as presented as the MDS in the EIA), and subsequently piling at Awel y Môr and Mona Offshore Wind Project in 2028 (affecting seven and 23 bottlenose dolphin respectively) which may coincide and affect up to 30 bottlenose dolphin (10.24% of the Irish Sea MU in total), see Table 1.156. However, this is likely to be an overestimate given highly precautionary densities were used for the respective assessments and that, due to the proximity of the sites, the sound contours are likely to overlap.

1.7.4.30 Population modelling for tier 1 projects presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) (i.e. Mona Offshore Wind Project and Awel y Môr) demonstrated these changes are not enough to significantly affect the population trajectory over a generational scale (i.e. the trajectory falls within natural variation). There may, however, be a small reduction in population size for the impacted population with seven fewer animals at six years (2.3% of the IS MU) and five fewer animals at the time point of 25 years (1.7% of the IS MU). It should, however, be highlighted that these small differences are predicted against a background of a modelled declining population (based on precautionary demographic parameters recommended by NRW, which uses a 0.22 fertility rate from Arso Civil et al., 2017) (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document Reference F2.4)). As discussed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4, it is important to highlight that whilst any model is sensitive to input parameters, the model chosen represents a conservative assessment of population changes. The trend for the IS MU is stable (though Cardigan Bay appears to have a declining population), and therefore the interpretation is with respect to the difference between impacted and unimpacted population.

1.7.4.31 As outlined above, it should be noted that this assessment is highly precautionary and does not take into account the measures adopted as part of the Mona Offshore Wind Project that are outlined in Table 1.84.

Table 1.156: Number of bottlenose dolphin predicted to be disturbed as a result of underwater sound during piling for Tier 1 projects.

Project	Max number of piles	Scenario	Piling Duration	Piling phase	Max number of animals disturbed	Density (animals per km^2)	% of Reference Population
Mona Offshore Wind Project	454	MDS Spatial (Concurrent piling)	90	24 months	7	0.0017	2.39 (Irish Sea MU)
		MDS Temporal	114		6 (4,400 kJ)		2.03 IS MU

Project	Max number of piles	Scenario	Piling Duration	Piling phase	Max number of animals disturbed	Density (animals per km^2)	% of Reference Population
Awel y Môr Offshore Wind Farm	50	Monopile, 5,000kJ	201 days	12 months	23	0.035 for the 20 m depth contour 0.008 offshore	7.9 (Irish Sea MU)

Grey seal

1.7.4.32 Table 1.157 provides information detailing the duration of piling associated with tier 1 projects considered in the in-combination assessment for grey seal.

1.7.4.33 As outlined in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4), the in-combination assessment therefore assumes there would be piling at Project Erebus in 2025 affecting 18 grey seal, piling at White Cross affecting up to 10 grey seal, followed by piling at Mona Offshore Wind Project in 2027 affecting 31 grey seal (as presented in the EIA using dose response). In 2028, there would be piling at Awel y Môr and Mona Offshore Wind Project which may coincide and affect up to 112 grey seal (0.87% of the GSRP or 0.18% of OSPAR Region III).

1.7.4.34 Population modelling of tier 1 projects presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) considered that there is no potential for long-term effects on this species.

Table 1.157: Numbers of grey seal numbers predicted to be disturbed as a result of underwater sound during piling for Tier 1 projects.

* From the maximum spatial scenario presented in the EIA.

Project	Max number of piles	Scenario	Piling duration	Piling phase	Max number of animals disturbed	Density (animal per km^2)	% of reference population
Mona Offshore Wind Project	454	MDS Spatial	90	24 months	31*	N/A – Grid cell specific	0.24% of the GSRP
		MDS temporal	114		26 (4,400 kJ)		0.24% of the GSRP
Awel y Môr Offshore Wind Farm	50	Monopile, 5,000kJ	201 days	12 months	81	0.43	1.6 (Wales and NW England MUs)
Project Erebus	35	Pin-pile 800kJ	18 days	8 months	18	N/A – Grid cell specific	0.3 (Wales and SW England MUs)

Project	Max number of piles	Scenario	Piling duration	Piling phase	Max number of animals disturbed	Density (animal per km^2)	% of reference population
White Cross	48	WTG: pin pile 800 kJ Single piling	5 days	6 months	10	Based on 25 km known disturbance range	0.48% (of the SW MU)
	4	OSP: pin pile 2,500 kJ Single piling	1 day				0.30% (CGNS MU)

Tier 2

1.7.4.35 There may be a temporal overlap between the construction of the Mona Offshore Wind Project and the construction of tier 1 projects and the following tier 2 projects: Arklow Bank Wind Park Phase 2, Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, Inis Ealga Marine Energy Park , Llŷr 1, Llŷr 2, Morecambe Offshore Windfarm Generation Assets, Morgan and Morecambe Offshore Windfarms: Transmission Assets (hereafter known as 'Transmission Assets'), Morgan Offshore Wind Project Generation Assets, North Celtic Sea Offshore Wind Farm, North Channel Wind 1, North Channel Wind 2, North Irish Sea Array Offshore Wind Farm, Oriel Windfarm Offshore Wind Farm, Project Ilen, Project Valorous, Shelmalere Offshore Wind Farm and Simply Blue Emerald. This may lead to in-combination disturbance to Annex II marine mammal features from piling.

1.7.4.36 The indicative timelines suggest that there will be a temporal overlap of construction phase of Mona Offshore Wind Project with the construction phases of all listed tier 2 projects. The construction phase of the Llŷr projects finishes in 2025 but both projects are screened into cumulative assessment due to the potential for sequential piling. The construction dates are unknown for Arklow Bank Wind Park Phase 2, Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, Morecambe Offshore Windfarm Generation Assets, North Celtic Sea Offshore Wind Farm, Oriel Windfarm Offshore Wind Farm and Project Ilen, however, conservatively these projects were screened into the cumulative assessment in the event that a temporal overlap occurs. It is noted that the description of the projects provided in the respective EIA Scoping Reports is indicative and may be further refined.

1.7.4.37 The EIA Scoping Reports do not provide detailed information about impacts of underwater sound as a result of piling and therefore it is not possible to undertake a full, quantitative assessment for this impact. As such, a qualitative assessment is provided below. However, for the Morgan Offshore Wind Project Generation Assets, Morecambe Offshore Windfarm Generation Assets and Morgan and Morecambe Wind Farms Transmission Assets, PEIRs are available and more detailed information is included.

1.7.4.38 The number of animals potentially disturbed during piling at Morgan Offshore Wind Project Generation Assets is presented in Table 1.158. Cumulatively, during piling at Mona Offshore Wind Project and Morgan Offshore Wind Project Generation assets, up to 2,512 harbour porpoise (4.02% of the MU population), 23 bottlenose dolphin

(7.85% of the MU population), 79 grey seal (0.61% of the Grey Seal Reference Population, 0.13% of the OSPAR III region) and up to two harbour seal (0.14% of the reference population) may be disturbed. (see paragraph 1.7.3.22 to 1.7.3.33 for numbers of animals disturbed during piling at the Mona Offshore Wind Project).

Table 1.158: The maximum number of animals predicted to be disturbed during concurrent piling of monopiles at Morgan Offshore Wind Project Offshore Wind Project Generation Assets.

Species	Number of Animals	% Reference Population (MU)
Harbour porpoise	1,370	2.19
Bottlenose dolphin	16	5.28
Grey seal	48	0.35 (GSRP)/0.08 (OSPAR Region iii)
Harbour seal	<1	0.009

1.7.4.39 The maximum number of animals predicted to be disturbed at the Morecambe Offshore Windfarm Generation Assets, is presented in Table 1.57 (Morecambe Offshore Windfarm Ltd, 2023). Cumulatively, during piling at Mona Offshore Wind Project and Morecambe Generation assets, up to 4,103 harbour porpoise (6.56% of the MU population), eight bottlenose dolphin (2.73% of the MU population), 74 grey seal (0.57% of the Grey Seal Reference Population, 0.11% of the OSPAR III region) and up to four harbour seal (0.28% of the reference population) may be disturbed.

Table 1.159: The maximum number of animals predicted to be disturbed during concurrent piling of monopiles at the Morecambe Offshore Windfarm Generation Assets.

[1]Based upon EDR approach, rather than TTS as for other species.Species	Number of Animals	% Reference Population
Harbour porpoise	2,961[1]	4.74%
Bottlenose dolphin	1	0.34%
Grey seal	11	0.99%

1.7.4.40 Cumulatively, during piling at Mona Offshore Wind Project and Morgan and Morecambe Offshore Windfarms: Transmission Assets up to 3,607 harbour porpoise (5.77% of the MU population), 18 bottlenose dolphin (6.14% of the MU population),, 119 grey seal (0.92% of the Grey Seal Reference Population, 0.2% of the OSPAR III region) and up to two harbour seal (0.14% of the reference population) may be disturbed.

Table 1.160: The maximum number of animals predicted to be disturbed during concurrent piling of monopiles at the Morgan and Morecambe Wind Farms Transmission Assets.

Species	Number of Animals	% Reference Population
Harbour porpoise	2,465	3.94%
Bottlenose dolphin	11	3.7%
Grey seal	88	0.65% / 0.14%

1.7.4.41 In temporal terms, the first construction phases are anticipated to start in 2025, for North Irish Sea Array and Llŷr Projects. The construction of some of the cumulative projects will last until 2029, including Inis Ealga Marine Energy Park, Transmission Assets, Morgan Offshore Wind Project Generation Assets, North Channel Wind 1 and 2, and Shelmalere Offshore Wind Farm. This timescale constitutes a total of five years where construction activities, including piling, may occur across the Irish and Celtic Seas. Piling activities will occur intermittently over the construction phase of respective projects, therefore, whilst this will not result in a continuous risk of disturbance to marine mammals, it may affect multiple breeding seasons for marine mammal species. In the context of the life cycle of respective species (see Volume 6, Annex 4.1: Marine mammal technical report of the Environmental Statement (Document Reference: F.6.4.1) for more details), the duration of the impact is classified as medium term, as the exposure to elevated sound levels could occur over a meaningful proportion of their lifespan.

1.7.4.42 Additionally, in spatial terms depending on the type of foundation installation technique, piling at each wind farm is likely to affect marine mammals behaviourally over different spatial scales. Due to the proximity of Morgan Generation Assets, Morecambe Offshore Wind Farm Generation Assets, Morgan and Morecambe Wind Farms Transmission Assets, North Irish Sea Array and Oriel Wind Farm to the Mona Offshore Wind Project, there is a potential for overlap of sound disturbance contours during piling. Animals may be displaced from an area comparable to piling contours at the Mona Offshore Wind Project alone (see Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)). However, where there is a potential for simultaneous piling to take place, it may potentially result in a larger area of strong disturbance (160 dB re 1 µPa SPL_{rms} (strong disturbance)) compared to piling at the Mona Offshore Wind Project alone.

1.7.4.43 In the context of the wider habitat available within the Irish Sea and wider Celtic Sea regional marine mammal study area, it is not anticipated that in-combination impacts will result in a long-term population-level effect on harbour porpoise, grey seal or harbour seal. There was also no noticeable difference in the iPCoD models with the addition of the tier 2 Morgan Offshore Wind Project Generation Assets, Morecambe Offshore Wind Farm Generation Assets, and Morgan and Morecambe Wind Farms Transmission Assets.

1.7.4.44 However, cumulative piling of tier 1 and tier 2 projects could contribute to the reduction in Irish Sea MU population size for bottlenose dolphin, although it must be noted there was a difference of only one animal in the iPCoD model with the addition of the tier 2 projects (Morgan Offshore Wind Project Generation Assets, Morecambe Offshore Wind Farm Generation Assets, and Morgan and Morecambe Offshore Windfarms Transmission Assets) to the tier 1 cumulative scenario for Mona Offshore Wind Project (i.e. a difference of eight animals or 2.7% of the IS MU population between the impacted and unimpacted populations).

Tier 3

1.7.4.45 The construction of the Mona Offshore Wind Project, together with construction phase of tier 1, tier 2 and tier 3 projects may lead to in-combination injury and disturbance to marine mammals from underwater sound generated during piling. Tier 3 projects screened into the assessment within the regional marine mammal study area include: Celtic Sea Array Offshore Wind Farm, Cork Offshore Wind Project, Bore Array, Celtic Horizon, Mac Lir, Realt na Mara, Setanta Offshore Wind Park, Blackwater Offshore Wind Farm, Braymore Point, Clogher Head Offshore Wind Farm, Codling Wind Park

Extension Offshore Wind Farm, Cooley Point Offshore Wind Farm, Inis Offshore Wind Munster, MaresConnect, Project Saoirse, South Pembrokeshire Demonstration Zone, Aniar Offshore Array (Fixed), East Celtic, Lir Offshore Array, Moneypoint Offshore One, Péarla Offshore Wind Farm, Rian Offshore Array Phase 2, Tralee, Tulca Offshore Array Phase 2, Urban Sea, Valentia Phase 1 and Valentia Phase 2.

1.7.4.46 The extended CEA area (this area is also deemed suitable for the in-combination assessment) for grey seal (OSPAR Region III) was used to screen in projects and therefore additional Tier 3 projects are included (Talisk, Aniar Offshore Array (Floating), Arranmore, Nomadic Offshore Wind, Machair Wind – Hybrid Energy Project, Malin Sea Wind, Haven Offshore Array Wind Farm, and Voyage Offshore Array). However telemetry data presented in Volume 6, Annex 4.1: Marine mammal technical report of the Environmental Statement (Document Reference: F.6.4.1) suggests connectivity to projects outside of the GSRP is unlikely and there is no receptor impact pathway.

1.7.4.47 The data available in relation to the Tier 3 projects available at the time of writing is limited. Tier 3 projects were screened in precautionarily based on their location within the regional marine mammal study area, though there is limited/no information on the construction/operation dates or project design with regards to piling. It should be acknowledged that there is a potential for piling activities to be taking place intermittently across the Irish Sea and wider Celtic Sea. As such, although temporal and/or spatial overlap with Tier 3 projects cannot be discounted, at current time it is not possible to undertake any kind of meaningful assessment for in-combination impacts as a result of elevated underwater sound due to piling with Tier 3 projects.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

Conclusions

1.7.4.48 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.161. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.161: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for in-combination underwater sound from piling.

Conservation Objectives	Conclusion
The species is a viable component of the site. **There is no significant disturbance of the species.**	As outlined in paragraph 1.7.4.25, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC resulting from projects considered within the in-combination assessment would be 0.84% (on any given day) which does not exceed either the daily or seasonal thresholds for significant disturbance. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. On the basis of the above, underwater

Conservation Objectives	Conclusion
	sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will also not cause significant disturbance of the species.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	Habitats and processes will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project (see section Volume 2, Chapter 9: Fish and shellfish ecology of the Environmental Statement (Document Reference F2.3)), effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term.

1.7.4.49 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result underwater sound from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

North Channel SAC

Harbour porpoise

Conclusions

1.7.4.50 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Channel SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.162. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.162: Conclusions against the conservation objectives of the North Channel SAC for in-combination underwater sound from piling.

Conservation Objectives	Conclusion
The species is a viable component of the site. **There is no significant disturbance of the species.**	As outlined in paragraph 1.7.3.40 the 15 km EDR for the Mona Offshore Wind Project does not overlap with the North Channel SAC (located 81.5 km from the Mona Array Area). Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. Underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not cause significant disturbance of the species.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	Habitats and processes will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project (see section Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)), effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term.

1.7.4.51 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result underwater sound from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

Bottlenose dolphin

1.7.4.52 Given that bottlenose dolphin can travel over large distances, there is a possibility that a small number of individuals from the SAC may be occasionally present within the disturbance contours.

1.7.4.53 As outlined in paragraph 1.7.4.27 to 1.7.4.29, although likely to be an over estimate given the highly precautionary densities used, piling at Mona Offshore Wind Project in 2027 could affect seven bottlenose dolphin, with subsequent piling at Awel y Môr and the Mona Offshore Wind Project in 2028 which may coincide and affect up to 30 bottlenose dolphin from both projects combined (10.24% of the Irish Sea MU in total). During piling at the Mona Offshore Wind Project and Morgan Generation assets, up to 23 bottlenose dolphin (7.85% of the MU population) could potentially be disturbed as a result of both projects. During piling at the Mona Offshore Wind Project and Morecambe Generation assets, up to eight bottlenose dolphin (2.73% of the MU population) could potentially be disturbed as a result of both projects. During piling at the Mona Offshore Wind Project and Transmission Assets, up to 18 bottlenose dolphin (6.14% of the MU population) could potentially be disturbed as a result of both projects.

1.7.4.54 Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) states that piling at projects in the Liverpool Bay area (the Mona Offshore Wind Project and Awel y Môr) could result in potential reductions to lifetime reproductive success to some individuals in the Irish Sea MU population as disturbance in offshore areas during piling could lead to a longer duration over which individuals may be displaced from key areas (in offshore areas between the mainland coast and the Isle of Man including MNRs). It should however be noted that recovery is anticipated to occur between piling events, which will be intermittent for in-combination projects. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects.

1.7.4.55 Based on the iPCoD modelling, these changes are not sufficient to significantly affect the population trajectory over a generational scale (i.e. the trajectory falls within natural variation), however, there may be a small reduction in population size for the impacted population.

1.7.4.56 As reported in Lohrengel *et al.* (2018) there has been an overall increase in the population size between 2001 to 2007 and a decline since then to 2001 levels but there is considerable variability between years and low confidence in some estimates (and the apparent trends are not significant). The decline in recent years may be related to animals moving away from the study area and spending the majority of their time in other parts of Wales or beyond. The population is said to be declining in the short term (10 years), but stable in the medium term (since 2001).

1.7.4.57 It should also be highlighted that the number of bottlenose dolphin predicted to be exposed to sound levels that could result in behavioural disturbance during piling at Awel y Môr Offshore Wind Farm was 23 animals (7.9% of the Irish Sea MU). The iPCoD modelling carried out for Awel y Môr Offshore Wind Farm, as presented in the project's Environmental Statement, demonstrated that, whilst there were likely to be some measurable changes in the population during piling, the trajectory of the population is expected to be stable in the long term. As outlined in paragraph 1.7.4.11, the Awel y Môr assessment considers 201 days of piling across the 12 month piling phase, in comparison with 35 days across a 24 month piling phase for the Mona Offshore Wind Project. The numbers of animals potentially disturbed during piling at

Awel y Môr Offshore Wind Farm was 23 whilst piling at the Mona Offshore Wind Project could potentially disturb 17 animals, over a maximum of 114 days. It should be noted that this assessment is highly precautionary and, in reality, numbers of animals potentially disturbed are likely to be significantly lower.

1.7.4.58 As outlined in paragraph, 1.7.4.53, the Mona Offshore Wind Project may contribute to an in combination impact in the context of the Irish Sea MU and therefore the Mona Offshore Wind Project has committed to the development of an Underwater sound management strategy which is secured in the deemed marine licence (with an Outline Underwater sound management strategy included with the application for consent, Document Reference J16) to reduce the magnitude of impact such that any potential residual significant effects from the project are reduced to a non-significant level (on the basis of a refined project envelope and programme, for both the Mona Offshore Wind Project and other projects that may have potential in-combination impacts).

1.7.4.59 The Outline underwater sound management strategy (Document Reference J16) will set out the process for investigating options to manage underwater sound levels (such as NAS, temporal and spatial piling restrictions, piling methods, soft start) in order to reduce the magnitude for the project alone. The Underwater sound management strategy (Document Reference J16) will be developed in consultation with the licensing authority and SNCBs.

Grey seal

1.7.4.60 The in-combination assessment considers that there would be piling at Project Erebus in 2025 affecting 18 grey seal, followed by piling at the Mona Offshore Wind Project in 2027 affecting 31 grey seal, and subsequently piling at Awel y Môr and Mona Offshore Wind Project in 2028 which may coincide and affect up to 130 grey seal in total from the three projects. During piling at the Mona Offshore Wind Project and the Morgan Generation Assets, up to 79 grey seal (0.13% of the OSPAR III region) could potentially be disturbed as a result of both projects. During piling at the Mona Offshore Wind Project and the Morecambe Generation Assets, up to 42 grey seal (0.07% of the OSPAR III region) could potentially be disturbed as a result of both projects. During piling at the Mona Offshore Wind Project and the Transmission Assets, up to 119 grey seal (0.20% of the OSPAR III region) could potentially be disturbed as a result of both projects.

1.7.4.61 Recovery is anticipated to occur between piling events, which will be intermittent for in-combination projects. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects, such as between the end of piling at Project Erebus in 2025 and commencement of piling phase at the Mona Offshore Wind Project and Awel y Môr in 2028.

1.7.4.62 Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) presents population modelling which was carried out to explore the potential of disturbance during piling to affect the population trajectory over time and provide additional certainty in the predictions of the impact assessment. Results of the cumulative iPCoD modelling for grey seal showed that the median of the ratio of the impacted population to the unimpacted population (when using both the grey seal reference population and OSPAR region III) was 1 at six and 25 years, and simulated grey seal population sizes for both baseline and impacted populations showed no difference. Therefore, it was considered that there is no potential for a long-term effect on this species.

Conclusions

1.7.4.63 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.163. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.163: Conclusions against the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC for in-combination underwater sound from piling during the during construction phase.

Conservation objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat.	As outlined in paragraph 1.7.4.60 to 1.7.4.62, piling at other projects may result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above are inconsequential in the context of the grey seal reference population and OSPAR III region. Furthermore, grey seal has a large foraging range (up to 448 km reported in Carter *et al*., 2022) and could therefore move to alternative foraging grounds during piling associated with the Mona Offshore Wind Project and other projects considered in the in-combination assessment. The iPCoD modelling for grey seal also concluded that there is no potential for a long-term effects on this species when all tier 1 and tier 2 projects (whom had quantitative information) was included. The Outline underwater sound management strategy (Document Reference J16) will set out the process for investigating options to manage underwater sound levels (such as NAS, temporal and spatial piling restrictions, piling methods, soft start) in order to reduce the magnitude for the project alone. Therefore, potential impacts on the SAC from the Mona Offshore Wind Project alone will be reduced thus reducing the potential for the Mona Offshore Wind Project to contribute to any in combination effect. Piling at other projects may result in disturbance of Annex II bottlenose dolphin features of the SAC, however although the population is said to be declining in the short term (10 years), it is deemed stable in the medium term. The decline in recent years is also likely to be related to animals moving away from the study area and spending the majority of their time in other parts of Wales or beyond. On this basis, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population from maintaining itself on a long-term basis as a viable component of its natural habitat.
The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.	As outlined in paragraph 1.7.4.60 to 1.7.4.62, piling at other projects will result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above are inconsequential in the context of the grey seal reference population and OSPAR III region. Piling at other projects will also result in disturbance of Annex II bottlenose dolphin features of the SAC, however, recovery is also anticipated to occur between piling events, which will be intermittent for in-combination projects. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects, such as between the end of piling at Project Erebus in 2025 and commencement of piling phase at the Mona Offshore Wind Project and Awel y Môr in 2028. The Outline underwater sound management strategy (Document Reference J16) will set out the process for investigating options to manage underwater sound levels (such as NAS, temporal and spatial piling restrictions, piling methods, soft start) in order to reduce the magnitude for the project alone. Therefore, potential impacts on the SAC from the Mona Offshore Wind Project alone will be reduced thus

Conservation objectives	Conclusion
	reducing the potential for the Mona Offshore Wind Project to contribute to any in combination effect. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not result in species population within the site and the natural range of the population from being reduced or likely reduced for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	The presence, abundance, condition and diversity of habitats will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project (see section Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)), effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term. The distribution, abundance and populations dynamics of the species within the site and population beyond the site will not be prevented from remaining stable or increasing.

1.7.4.64 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC as a result of underwater sound from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Strangford Lough SAC

Harbour seal

1.7.4.65 The assessments provided in the Environmental Statements for Awel y Môr Offshore Wind Farm and Project Erebus did not consider effects on harbour seal, as this species was scoped out due to a lack of presence within the site specific digital aerial surveys. There is therefore no quantitative information for which to base an in-combination assessment on for tier 1 projects.

1.7.4.66 For tier 2 projects, during piling at Mona Offshore Wind Project and Morgan Generation assets, up to two harbour seal may be disturbed which equates to 0.14% of the reference population. Harbour seal also have a large foraging range (up 273 km reported in Carter *et al*., 2022) and could therefore move to alternative foraging grounds during piling associated with the Mona Offshore Wind Project and other projects considered in the in-combination assessment. Recovery is also anticipated to occur between piling events, which will be intermittent for in-combination projects. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects, such as between the end of piling at Project Erebus in 2025 and commencement of piling phase at Mona Offshore Wind Project and Awel y Môr in 2028.

Conclusions

1.7.4.67 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Strangford Lough SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.164. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.164: Conclusions against the conservation objectives of the Strangford Lough SAC for in-combination underwater sound from piling during the during construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Piling at other projects may result in disturbance of Annex II harbour seal features of the SAC, however the numbers presented above are inconsequential in the context of the harbour seal reference population. Harbour seal also have a large foraging range (up 273 km reported in Carter *et al*., 2022) and could therefore move to alternative foraging grounds during piling associated with the Mona Offshore Wind Project and other projects considered in the in-combination assessment. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal population from being maintained at or restored to favourable condition. Similarly, it will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound in-combination effects from piling to result in adverse effects on the physical features used by the harbour seal features within the site.

1.7.4.68 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of Strangford Lough SAC as a result of underwater sound from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Murlough SAC

Harbour seal

1.7.4.69 The Murlough SAC is located at an increased distance to the Mona Offshore Wind Project (115.9 km from the Mona Array Area) than the Strangford Lough SAC, assessed in paragraphs 1.7.4.65 to 1.7.4.68. As the Murlough SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.4.70 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Murlough SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.165. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.165: Conclusions against the conservation objectives of the Murlough SAC for in-combination underwater sound from piling during the during construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Piling at other projects may result in disturbance of Annex II harbour seal features of the SAC, however the numbers presented above are inconsequential in the context of the harbour seal reference population. Harbour seal also have a large foraging range (up 273 km reported in Carter *et al*., 2022) and could therefore move to alternative foraging grounds during piling associated with the Mona Offshore Wind Project and other projects considered in the in-combination assessment. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal population from being maintained at or restored to favourable condition. Similarly, it will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound in-combination effects from piling to result in adverse effects on the physical features used by the harbour seal features within the site.

1.7.4.71 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of Murlough SAC as a result of underwater sound from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

Conclusions

1.7.4.72 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.166 below.

Table 1.166: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for in-combination underwater sound from piling during the during construction phase.

Conservation objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat.	Piling at other projects may result in disturbance of Annex II bottlenose dolphin features of the SAC. Whilst the population may be declining in the short term (10 years), it is deemed stable in the medium term. The decline in recent years is also likely to be related to animals moving away from the study area and spending the majority of their time in other parts of Wales or beyond. The Outline underwater sound management strategy (Document Reference J16) will set out the process for investigating options to manage underwater sound levels (such as NAS, temporal and spatial piling restrictions, piling methods, soft start) in order to reduce the magnitude for the project alone. Therefore, potential impacts on the SAC from the Mona Offshore Wind Project alone will be reduced thus reducing

Conservation objectives	Conclusion
	the potential for the Mona Offshore Wind Project to contribute to any in combination effect. On this basis, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population from maintaining itself on a long-term basis as a viable component of its natural habitat.
The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future	Piling at other projects will also result in disturbance of Annex II bottlenose dolphin features of the SAC, however, recovery is also anticipated to occur between piling events, which will be intermittent for in-combination projects. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects. The Outline underwater sound management strategy (Document Reference J16) will set out the process for investigating options to manage underwater sound levels (such as NAS, temporal and spatial piling restrictions, piling methods, soft start) in order to reduce the magnitude for the project alone. Therefore, potential impacts on the SAC from the Mona Offshore Wind Project alone will be reduced thus reducing the potential for the Mona Offshore Wind Project to contribute to any in combination effect. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the species population within the site and the natural range of the population from being reduced or likely reduced for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	The presence, abundance, condition and diversity of habitats will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project (see section Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)), effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. The distribution, abundance and populations dynamics of the species within the site and population beyond the site will not be prevented from remaining stable or increasing.

1.7.4.73 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

The Maidens SAC

Grey seal

1.7.4.74 The Maidens SAC is located at an increased distance to the Mona Offshore Wind Project (166.8 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.4.60 to 1.7.4.64. As The Maidens SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.4.75 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of The Maidens SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.167.

Table 1.167: Conclusions against the conservation objectives of The Maidens SAC for in-combination underwater sound from piling during the during construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the grey seal feature to favourable condition.	As outlined in paragraph 1.7.4.60 to 1.7.4.62, piling at other projects will result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above are inconsequential in the context of the grey seal reference population and OSPAR III region. Furthermore, grey seal has a large foraging range (up 448 km reported in Carter *et al.*, 2022) and could therefore move to alternative foraging grounds during piling associated with the Mona Offshore Wind Project and other projects considered in the in-combination assessment. The iPCoD modelling for grey seal also concluded that there is no potential for a long-term effects on this species. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the grey seal feature from being maintained at or restored to favourable condition.
To maintain (and if feasible enhance) population numbers and distribution of grey seal.	As outlined in paragraph 1.7.4.60 to 1.7.4.62, piling at other projects will result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above are inconsequential in the context of the grey seal reference population and OSPAR III region. Recovery is also anticipated to occur between piling events, which will be intermittent for in-combination projects. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects, such as between the end of piling at Project Erebus in 2025 and commencement of piling phase at Mona Offshore Wind Project and Awel y Môr. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent population numbers and distribution of grey seal from being maintained.
Maintain and enhance, as appropriate, physical features used by grey seal within the site.	There is no pathway for underwater sound in-combination effects from piling to result in adverse effects on the physical features used by the grey seal features within the site.

1.7.4.76 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of The Maidens SAC as a result of underwater sound from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.7.4.77 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Mona Offshore Wind Project (211.7 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.4.60 to 1.7.4.64. As the Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llyn a`r

Sarnau/Llŷn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.4.78 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.168.

Table 1.168: Conclusions against the conservation objectives of Pembrokeshire Marine/Sir Benfro Forol SAC for in-combination underwater sound from piling during the during construction phase.

Conservation objectives	Conclusion
The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.	As outlined in paragraph 1.7.4.60 to 1.7.4.62, piling at other projects will result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above are inconsequential in the context of the GSRP and OSPAR III region. Recovery is also anticipated to occur between piling events, which will be intermittent for in-combination projects. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects, such as between the end of piling at Project Erebus in 2025 and commencement of piling phase at Mona Offshore Wind Project and Awel y Môr in 2028. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the species population within the site and the natural range of the population from being reduced or likely reduced for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	The presence, abundance, condition and diversity of habitats will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project (see section Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)), effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term. The distribution, abundance and populations dynamics of the species within the site and population beyond the site will not be prevented from remaining stable or increasing.

1.7.4.79 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC as a result of underwater sound from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

Conclusions

1.7.4.80 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as

presented in section 1.7.2) is discussed in turn below Table 1.169. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.169: Conclusions against the conservation objectives of Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for in-combination underwater sound from piling during the during construction phase.

Conservation objectives	Conclusion
The species is a viable component of the site. **There is no significant disturbance of the species.**	As outlined in paragraph 1.7.4.20 to 1.7.4.24 the 15 km EDR for the Mona Offshore Wind Project does not overlap with the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (located 274.8 km from the Mona Array Area). Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site. On this basis, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will also not cause significant disturbance of the species.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	Habitats and processes will not be affected by underwater sound. With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project (see section Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)), effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term.

1.7.4.81 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of underwater sound from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Lundy SAC

Grey seal

1.7.4.82 The Lundy SAC is located at an increased distance to the Mona Offshore Wind Project (309.5 km from the Mona Array Area) than the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.4.60 to 1.7.4.64. As Lundy SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.4.83 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Lundy SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below Table 1.170. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.170: Conclusions against the conservation objectives of Lundy SAC for in-combination underwater sound from piling during the during construction phase.

Conservation objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects from piling to result in adverse effects on the habitats of grey seal. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects and will not prevent the extent and distribution, the structure and function or supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored]	As outlined in paragraph 1.7.4.60 to 1.7.4.62, piling at other projects will result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above are inconsequential in the context of the grey seal reference population and OSPAR III region. Furthermore, grey seal has a large foraging range (up 448 km reported in Carter *et al*., 2022) and could therefore move to alternative foraging grounds during piling associated with the Mona Offshore Wind Project and other projects considered in the in-combination assessment. The iPCoD modelling for grey seal also concluded that there is no potential for a long-term effects on this species. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population of qualifying species from being maintained or restored.
The distribution of qualifying species within the site [are maintained or restored]	As outlined in paragraph 1.7.4.60 to 1.7.4.62, piling at other projects will result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above are inconsequential in the context of the grey seal reference population and OSPAR III region. Recovery is also anticipated to occur between piling events, which will be intermittent for in-combination projects. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects, such as between the end of piling at Project Erebus in 2025 and commencement of piling phase at Mona Offshore Wind Project and Awel y Môr in 2028. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the distribution of qualifying species from being maintained or restored.

1.7.4.84 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of Lundy SAC as a result of underwater sound from piling impacts with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Isles of Scilly Complex SAC

Grey seal

1.7.4.85 The Isles of Scilly Complex SAC is located at an increased distance to the Mona Offshore Wind Project (439.3 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.4.60 to1.7.4.64. As Isles of Scilly Complex SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.4.86 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will not occur as a result of in-combination underwater sound from piling. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.171. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.171: Conclusions against the conservation objectives of Isles of Scilly Complex SAC for in-combination underwater sound from piling during the during construction phase.

Conservation objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects from piling to result in adverse effects on the habitats of grey seal. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects and will not prevent the extent and distribution, the structure and function or supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored].	As outlined in paragraph 1.7.4.60 to 1.7.4.62, piling at other projects will result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above are inconsequential in the context of the grey seal reference population and OSPAR III region. Furthermore, grey seal has a large foraging range (up 448 km reported in Carter *et al.,* 2022) and could therefore move to alternative foraging grounds during piling associated with the Mona Offshore Wind Project and other projects considered in the in-combination assessment. The iPCoD modelling for grey seal also concluded that there is no potential for a long-term effects on this species. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population of qualifying species from being maintained or restored.
The distribution of qualifying species within the site [are maintained or restored].	As outlined in paragraph 1.7.4.60 to 1.7.4.62, piling at other projects will result in disturbance of Annex II grey seal features of the SAC, however the numbers presented above are inconsequential in the context of the grey seal reference population and OSPAR III region. Recovery is also anticipated to occur between piling events, which will be intermittent for in-combination projects. In particular, baseline levels of activity are anticipated to resume where there are long gaps between piling of respective projects, such as between the end of piling at Project Erebus in 2025 and commencement of piling phase at Mona Offshore Wind Project and Awel y Môr in 2028. Therefore, underwater sound from piling associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the distribution of qualifying species from being maintained or restored.

1.7.4.87 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of Isles of Scilly Complex SAC as a result underwater sound from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Sites assessed in line with the iterative approach

1.7.4.88 As outlined in paragraphs 1.7.1.3 to 1.7.1.6, following the iterative approach adopted for this ISAA, the closest European site to the Mona Offshore Wind Project within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this ISAA, are located at a greater distance from the Mona Offshore Wind Project and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.7.4.48 to 1.7.4.87 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.7.4.89 to 1.7.4.111.

West Wales Marine/Gorllewin Cymru Forol SAC

1.7.4.89 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

1.7.4.90 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.4.60 to1.7.4.64), it can be concluded that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Saltee Islands SAC

1.7.4.91 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.4.60 to 1.7.4.64), it can be concluded that there is no risk of an adverse effect on the integrity of the Saltee Islands SAC as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

1.7.4.92 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Rockabill to Dalkey Island SAC as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

1.7.4.93 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Roaringwater Bay and Islands SAC as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Blasket Islands SAC

1.7.4.94 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Blasket Islands SAC as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.7.4.95 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Abers - Côte des legends SCI

1.7.4.96 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Abers - Côte des legends SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Ouessant-Molène SCI

1.7.4.97 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Ouessant-Molène SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

1.7.4.98 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

1.7.4.99 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Tregor Goëlo SCI

1.7.4.100 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Tregor Goëlo SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côtes de Crozon SCI

1.7.4.101 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Côtes de Crozon SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Chaussée de Sein SCI

1.7.4.102 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Chaussée de Sein SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap Sizun SCI

1.7.4.103 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap Sizun SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Récifs du talus du golfe de Gascogne SCI

1.7.4.104 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Vauville SCI

1.7.4.105 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Vauville SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

1.7.4.106 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Saint-Brieuc – Est SCI

1.7.4.107 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Banc et récifs de Surtainville SCI

1.7.4.108 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.7.4.109 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Estuaire de la Rance SCI

1.7.4.110 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Estuaire de la Rance SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

1.7.4.111 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.48 to 1.7.4.51), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie du Mont Saint-Michel SCI as a result of underwater sound from piling with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination injury and disturbance from underwater sound generation from UXO detonation

1.7.4.112 There is potential for injury and/or disturbance (TTS-onset considered as a proxy for disturbance) from underwater sound from UXO clearance as a result of activities associated with the Mona Offshore Wind Project during construction, in-combination with activities associated with the projects/plans outlined in Table 1.84.

1.7.4.113 As presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4), the duration of effect for each UXO detonation is less than one second. Behavioural effects are therefore considered to be negligible in this context. TTS is presented as a temporary auditory injury but also represents a threshold for the onset of strong behavioural disturbance or a moving away response in line with recommendations from Southall *et al.* (2007).

1.7.4.114 The assessments provided in the Environmental Statements for Awel y Môr Offshore Wind Farm, Project Erebus and White Cross did not consider effects on harbour seal, as this was not included as a key species in these assessments. Therefore, quantitative assessments for harbour seal have not been included for these projects.

Construction phase

Tier 1

1.7.4.115 Awel y Môr is located 3.6 km from the Mona Offshore Cable Corridor and Access Areas and is located 13.52 km from the Mona Array Area. The MDS for Awel y Môr anticipated 10 expected UXOs requiring clearance, with two clearance events every 24 hours but up to 10 detonations in 10 days. The assessed clearance method was high-order detonation, though low-order is more likely. The Environmental Statement assessed both PTS, disturbance as well as TTS as a result of UXO clearance, additional information on the assessment method is detailed in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4).

1.7.4.116 Maximum impact ranges from UXO and numbers of animals predicted to be injured as a result of underwater sound from UXO clearance for Tier 1 projects including Awel y Môr is presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) and Table 1.172. The exact mitigation measures contained with the UXO MMMP for Awel y Môr are yet to be determined and agreed with NRW. Residual impacts for PTS from UXO were therefore considered unlikely for harbour porpoise, grey seal and minor adverse significance for bottlenose dolphin (RWE, 2022).

1.7.4.117 In the absence of agreed thresholds to assess the potential for behavioural disturbance in marine mammals from UXO detonations, the Awel y Môr assessment presented results for various disturbance thresholds, including a 26 km EDR for high order

detonations, 5 km EDR for low order and TTS-onset thresholds for high-order detonations.

1.7.4.118 Awel y Môr used TTS-onset as a proxy for disturbance but caveated this is likely to over-estimate true behavioural response due to UXO comprising a single pulse source sound and not lasting a full diel cycle. Large TTS-onset impact ranges were predicted for harbour porpoise (16 km using SPL_{pk}). As highlighted in the Awel y Môr Environmental Statement, these ranges may be highly over-precautionary as these do not account for the impulsive sound losing harmful impulsive characteristics and becoming non-impulsive as it propagates from the source (RWE, 2022). Based on the predicted impact ranges and numbers of animals affected Awel y Môr concluded that the magnitude of the effects of TTS would be low for all species. In the Awel y Môr RIAA, it is reported that the impact range of 16 km would not extend far enough to overlap with the North Anglesey Marine/Gogledd Môn Forol SAC (which is a minimum distance of 21 km from the array area).

1.7.4.119 White Cross is located 287.7 km from the Mona Offshore Wind Project. The number of UXO requiring clearance and duration of UXO clearance operations at White Cross was unknown at the time of publication of the Environmental Statement. A UXO Risk Assessment identified different types of UX that may pose a threat to the study site, with a range NEQs (ranging from 0.06 kg to 309.4 kg). The assessed clearance method modelled was high-order detonation (up to 309 kg NEQ) and low-order clearance (2 kg). The Environmental Statement for White Cross assessed PTS and TTS/moving away response as a proxy for behavioural disturbance, as well as applying a 26 km EDR for harbour porpoise, based on current SNCB guidance.

1.7.4.120 The charge sizes modelled for the White Cross assessment are lower than the maximum modelled for Mona Offshore Wind Project, and injury ranges are smaller. With the implementation of an MMMP the significance of effect for all species was considered to be minor adverse for all species for PTS from high-order and low-order detonation. For TTS (and behavioural disturbance), from high-order detonation the significance of effect for harbour porpoise and grey seal was considered to be minor adverse, and for HF species was considered to be negligible. For TTS (and behavioural disturbance) from low-order detonation the significance of effect for harbour porpoise was considered to be minor adverse, and for all other species was considered to be negligible. Maximum PTS ranges from UXO and numbers of animals predicted to be injured as a result of underwater sound from UXO clearance for tier 1 projects including White Cross is presented in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4). The numbers presented for harbour porpoise are based on the higher APEM summer density estimate.

1.7.4.121 The number of animals predicted to experience PTS as a result of high-order detonation is 349 harbour porpoise, less than one bottlenose dolphin and up to two individuals for grey seal. For low-order detonation up to 11 harbour porpoise, and less than one individual for all other species, were predicted to experience PTS. For TTS, large impact ranges were predicted for grey seal at 16 km, with the potential to affect up to 96 individuals, respectively. For harbour porpoise, for a 20 km disturbance range, up to 1,154 individuals were predicted to be disturbed. is based on high-order detonation of the largest UXO size of 309 kg NEQ, whereas the White Cross Environmental Statement identified that UXO likely to be found in the site would range from 0.06 kg to 309.4 kg. Proposed mitigation measures for UXO clearance at White Cross include the use of low-order clearance techniques, such as deflagration; high order clearance would only be undertaken in the event that all other options are not

possible, following the identified hierarchy. As such, the numbers presented are expected to be highly precautionary.

1.7.4.122 Project Erebus anticipated one UXO detonation via low-order deflagration but included assessment for high-order detonations for completeness, highlighting this is not realistic. Additional information on the method of assessment and densities used is provided in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4).

1.7.4.123 The number of marine mammals expected to experience PTS-onset as a result of UXO detonation for project Erebus is less than one for all species and charge sizes, apart from 0.5 kg and 2 kg NEQ, which could result in PTS in up to two and five harbour porpoise respectively. For high-order detonation, which is not in the project design for Project Erebus, up to 212 harbour porpoise could be affected by PTS (Blue Gem Wind, 2020), see Table 1.172. The Environmental Statement for Project Erebus used a EDR of 5 km for low order clearance and 26 km for high-order clearance. Project Erebus used TTS-onset as a proxy for disturbance, and maximum predicted TTS-onset impact range was 20 km for grey seal. The Erebus Environmental Statement highlighted that TTS-onset as a proxy for disturbance is expected to over-estimate the actual biological consequences (Blue Gem Wind, 2020). For disturbance from both low-order or high-order UXO detonation, Project Erebus concluded that the impact was unlikely to significantly affect marine mammal receptors (Blue Gem Wind, 2020).

1.7.4.124 UXO clearance activities coinciding at the respective projects is considered highly unlikely, as due to safety reasons the UXO clearance activities takes place before other construction activities commence. Temporally, sequential UXO clearance at respective projects could lead to a longer duration of impact on marine mammals. Awel y Môr construction dates are from 2026 therefore there may be some overlap in pre-construction activities with Mona Offshore Wind Project. These timelines are, however, indicative and subject to change. UXO clearance at each of these projects will occur as a discrete stage within the overall construction phase and therefore will not coincide continuously over the duration of temporal overlap. Furthermore, each clearance event results in very short duration of sound emission (seconds) (as outlined in Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)) event so the impact will be short in temporal duration and therefore the overlap is unlikely. Construction of Project Erebus is likely to be completed a year before the commencement of construction activities at Mona Offshore Wind Project and therefore will not overlap with Mona Offshore Wind Project UXO clearance. Given the project design for use of low-order UXO clearance techniques only for Project Erebus, in-combination effects are considered unlikely.

1.7.4.125 The maximum number of animals potentially affected by PTS (harbour porpoise) resulting from the tier 1 projects is 650 animals (Table 1.172). However, as outlined in paragraph 1.7.4.123 this is using modelled high-order UXO clearance for Project Erebus which is very unlikely to occur in practice (the maximum UXO charge weight expected in the area is 331 kg, and the project is seeking consent for one low-order detonation with a maximum of 2 kg NEQ) and is based upon high-order clearance for Mona Offshore Wind Project. Therefore, with the implementation of mitigation measures applied at other projects (i.e. use of low order clearance only for Project Erebus and MMMPs for Awel y Môr) the residual risk of injury is likely to be very small.

Table 1.172: Number of animals with the potential to experience PTS during UXO clearance at Tier 1 projects.

Project	Species	Maximum charge size leading to highest impact (kg)	Metric	Maximum impact range (m)	Estimated number of animals in impact area	Mitigation included (per specific project)
Mona Offshore Wind Project	Harbour porpoise	907 (absolute maximum)	SPL_{pk}	15,370	206	Measures adopted (Table 1.84) and Underwater sound management strategy
	Bottlenose dolphin			890	<1	
	Grey seal			3,015	6	
Awel y Môr	Harbour porpoise	164	SPL_{pk}	8,600	232	UXO-specific MMMP
	Bottlenose dolphin			500	<1	
	Grey seal			1,600	3	
Project Erebus	Harbour porpoise	525	SPL_{pk}	13,000	212	Low-order deflagration
	Bottlenose dolphin			730	<1	
	Grey seal			2,500	1	
White Cross	Harbour porpoise	309	SPL_{pk}	11,000	349	MMMP (including low-order detonation and ADD)
	Bottlenose dolphin			610	< 1	
	Grey seal			2,000	2	

1.7.4.126 Production of underwater sound during detonation of UXOs from the tier 1 projects have the potential to cause behavioural disturbance (using TTS-onset as a proxy) in marine mammal receptors in-combination with the Mona Offshore Wind Project, however, this effect will be short-lived and reversible. The maximum impact ranges and estimated number of Annex II marine mammals estimated in the impact area associated with tier 1 projects are listed in Table 1.173. Since behavioural disturbance is recoverable and the duration of impact will be very short, the potential for in-combination impact is considered to be very limited, even for multiple tier 1 projects within the regional marine mammal study area. It is assumed whilst some ecological functions could be inhibited in the short-term due to behavioural disturbance (e.g. cessation of feeding), these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual.

Table 1.173: Number of animals with the potential to experience behavioural disturbance (using TTS-onset as a proxy) during UXO clearance at Tier 1 projects.

Project	Species	Maximum charge size (kg)	Metric	Maximum impact range (m)	Estimated number in impact area
Mona Offshore Wind Project	Harbour porpoise	907	SPL_{pk}	28,230	245
	Bottlenose dolphin			1,635	<1
	Grey seal			6,470	26
Awel y Môr	Harbour porpoise	164	SPL_{pk}	16,000	804
	Bottlenose dolphin			920	<1
	Grey seal			310	13
Project Erebus	Harbour porpoise	525	SPL_{pk}	23,000	665
	Bottlenose dolphin			1,300	<1 bottlenose dolphin
	Grey seal			20,000	52
White Cross	Harbour porpoise	309	SPL_{pk}	20,000	1,154
	Bottlenose dolphin			1,100	<1
	Grey seal			16,000	96

Tier 2

1.7.4.127 For tier 2 projects, with the exception of Morgan Generation Assets, Morecambe Generation Assets and Morgan and Morecambe Offshore Wind Farm: Transmission Assets, beyond the EIA Scoping Reports there was not enough information to do a quantitative assessment. The EIA Scoping Reports do not provide detailed information about the impact of sound from UXO clearance. These projects are likely to have effects similar to the Mona Offshore Wind Project and will likely have similar measures (e.g. MMMPs or separate marine licences) to avoid injury; but at this stage a more detailed assessment cannot be presented.

1.7.4.128 The Morgan and Morecambe Offshore Windfarms: Transmission Assets PEIR assumed there may be up to 51 UXOs requiring clearance. Although the PEIR presents a range of potential impacts for low order clearance as well as low-yield donor charges, the assessment is based on the high order clearance of the maximum UXO size of 907 kg. An explosive mass of 907 kg (high order explosion) yielded the largest PTS ranges for all species, with the greatest injury range (15,370 m) seen for harbour porpoise (Table 1.174). With primary measures in place the assessment found that there would be a residual risk of injury over a range of 2,290 m that would require additional tertiary measures and therefore the Morgan and Morecambe Offshore Windfarms: Transmission Assets will be adopting standard industry practice (JNCC, 2010b) tertiary measures as part of a MMMP, discussed and agreed with consultees post-consent. Behavioural disturbance (using TTS-onset as a proxy) could affect harbour porpoise across largest range of up to 28 km (Table 1.174). Construction is

expected to be from 2026 to 2029 and therefore may have three years of overlap with Mona Offshore Wind Project, though the exact dates are uncertain at this stage. Potential impacts including PTS and disturbance ranges are similar to those from Mona Offshore Wind Project and given the local proximity there is potential for in-combination effects to occur with Morgan and Morecambe Offshore Wind Farms: Transmission Assets.

1.7.4.129 It should be noted that the PEIR for the Morgan and Morecambe Offshore Wind Farms: Transmission Assets considered all UXO anticipated to require clearing within the 'Transmission Assets Red Line Boundary', which includes any UXO likely to be found within the Morgan Offshore Wind Project: Generation Assets and the Morecambe Offshore Windfarm: Generation Assets. As such, the in-combination assessment has not considered the Morgan Offshore Wind Project: Generation Assets and Morecambe Offshore Windfarm: Generation Assets in addition to results presented in this paragraph, on the basis that this would represent duplication.

Table 1.174: Number of animals with the potential to experience onset PTS and disturbance (using TTS-onset as a proxy) during UXO clearance at the Morgan and Morecambe Offshore Wind Farms: Transmission Assets.

Species	Maximum charge size leading to highest impact (kg)	Metric	Maximum range (m)	Estimated number of animals within impact area
PTS				
Harbour porpoise	907	SPL_{pk}	15,370	416
Bottlenose dolphin			890	<1
Grey seal			3,015	4
Harbour seal				<1
Behavioural disturbance				
Harbour porpoise	907	SPL_{pk}	28,230	1,411
Bottlenose dolphin			1,635	<1
Grey seal		SEL	6,470	11
Harbour seal				<1

1.7.4.130 The EIA Scoping Report for Shelmalere Offshore Wind Farm (Shelmalere Offshore Wind Farm Ltd., 2022) concluded that a detailed UXO survey would be undertaken post-consent. No further information on UXO clearance method was given. Construction activities are planned from 2028, therefore it is unlikely there will be overlap in UXO clearance with the Mona Offshore Wind Project. This, in addition to the distance from the Mona Offshore Wind Project (approximately 160 km) means minimal spatial overlap in UXO PTS and TTS ranges and limited potential for in-combination effects.

1.7.4.131 The Llŷr Projects (Llŷr 1/Llŷr 2) EIA Scoping Report confirms UXO surveys will be undertaken before construction and suggested the potential for UXO clearance will be high due to proximity of the inshore part of the Study Area to Castlemartin Range (Floventis Energy Ltd., 2022). Llŷr 1 and Llŷr 2 construction period is planned from 2024 to 2025 and therefore it is unlikely there will be overlap in UXO clearance with the Mona Offshore Wind Project. This, in addition to the distance from the Mona

Offshore Wind Project (approximately 240 to 260 km) mean minimal spatial overlap in UXO PTS and disturbance ranges, and limited potential for in-combination effects.

1.7.4.132 The EIA Scoping Report for Inis Ealga Marine Energy Park proposed that UXO is scoped into the EIA (Inis Ealga Marine Energy Park Ltd., 2022). Construction is planned in 2028, therefore it is unlikely there will be overlap in UXO clearance with the Mona Offshore Wind Project as it will be carried out after the Mona Offshore Wind Project construction period. This, in addition to the distance from the Mona Offshore Wind Project (approximately 280 km) means likely minimal spatial overlap in UXO PTS and disturbance ranges and limited potential for in-combination effects.

1.7.4.133 Codling Wind Park does not explicitly scope in or out sound from UXO clearance but does mention it will consider a MMMP for any potential UXO work (Codling Wind Park Limited, 2020). The construction phase is planned to be complete by 2027 and therefore some temporal overlap with Mona Offshore Wind Project construction is possible. Despite the lack of information, the smaller proposed extent (less UXOs within the area) and location to the east of Ireland (approximately 123 km from Mona Offshore Wind Project) means there is limited potential for in-combination effects with Codling Wind Park.

1.7.4.134 The Project Valorous EIA Scoping Report assumes that given the proximity to the Castlemartin firing range, there is potential for UXOs to be present in the area and that their controlled detonation can cause injury to marine mammals (Blue Gem Wind, 2020). Though it is not certain that UXOs will be discovered at the scoping stage, the impact has been scoped in due to its potential severity (Blue Gen Wind, 2020). It has been acknowledged that Project Valorous would follow best practice measures to limit the potential impacts of sound on sensitive receptors, such as adhering to the JNCC's guidelines on mitigation measures for UXO detonation (JNCC, 2010b). The construction of Project Valorous is planned to take place in 2029 and since the UXO clearance usually takes place at the beginning of its construction phase (commencing in 2026 at Mona Offshore Wind Project), the temporal overlap and therefore potential in-combination impacts are unlikely.

1.7.4.135 The Simply Blue Emerald EIA Scoping Report assumes that if UXO clearance will be required, disposal could be a significant sound source depending on the selected disposal methods and this impact has been scoped in for further consideration in the EIA process (Emerald Floating Wind, 2023). The EIA Scoping Reports anticipated that a number of mitigation measures could possibly be used, including methods to reduce underwater sound from the project, such as the use of low order detonation methods for UXO disposal. Nevertheless, the timeline for the construction phase of the Simply Blue Emerald project is unknown and therefore the temporal overlap with the Mona Offshore Wind Project UXO clearance is not possible to assess. However, considering that the Simply Blue Emerald will be located approximately 330 km from the Mona Offshore Wind Project, the spatial overlap of sound contours and therefore potential in-combination impacts are unlikely.

1.7.4.136 The Project Ilen EIA Scoping Report identified that underwater sound due to clearance of UXO detonation may have detrimental effects on marine mammals, including physical or auditory injury as well as short-term behavioural effects (Western Star Wind Ltd, 2023). The use of low order clearance techniques (deflagration) was acknowledged as preferred approach and the project committed to appropriate mitigation measures, e.g., ADDs and soft starts. However, as for Simply Blue Emerald, the timeline for the construction phase of the Project Ilen is unknown and therefore the temporal overlap with the Mona Offshore Wind Project UXO clearance is not possible to assess. However, considering that the Project Ilen will be located to the west of

Ireland and approximately 390 km from the Mona Offshore Wind Project, the spatial overlap of sound contours and therefore in-combination impacts are unlikely.

1.7.4.137 The North Celtic Sea Offshore Wind Farm EIA Scoping Report assumes that UXO clearance may result in injury and/or disturbance to marine mammals from underwater sound (North Celtic Sea Wind Limited, 2023). However, the timeline for the construction phase of the North Celtic Sea Offshore Wind Farm is unknown and therefore the temporal overlap with the Mona Offshore Wind Project UXO clearance is not possible to assess. However, given that the North Celtic Sea Offshore Wind Farm will be located approximately 250 km from the Mona Offshore Wind Project, the spatial overlap of sound contours and therefore in-combination impacts are unlikely.

1.7.4.138 Injury and disturbance due to UXO clearance has also been scoped in for further consideration as a potential impact to marine mammals in North Channel Wind 1 and 2 Projects EIA Scoping Report (North Channel Wind Limited, 2023). The use of low order clearance techniques (deflagration) was acknowledged as preferred approach and the project committed to appropriate mitigation measures, (e.g. ADDs and soft starts) (North Channel Wind Limited, 2023). The construction of North Channel Wind 1 and 2 Projects is planned to take place in 2029 and since the UXO clearance usually takes place at the beginning of its construction phase (commencing in 2026 at Mona Offshore Wind Project), the temporal overlap and therefore in-combination impacts are unlikely.

1.7.4.139 On the basis of information available at the time of writing, projects most likely to contribute to an in-combination effect on marine mammals due to UXO clearance included: Morgan Generation Assets, Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Wind Farm Generation Assets. Adopting a precautionary approach, and assuming application of standard industry measures (such as MMOs, PAM and ADDs) measures, the assessment considered the magnitude of impact for a high order detonation.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.7.4.140 Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4) identified the magnitude of the impact from all projects in terms of PTS is predicted to be of local to regional spatial extent, very short-term duration and intermittent. In line with UXO guidance, assuming standard industry measures applied for each project, it is anticipated that for most species animals would be deterred from the injury zone and therefore the risk of PTS would be reduced. TTS was predicted to be of regional spatial extent, very short-term duration, intermittent and both the impact itself (i.e. risk of injury during the detonation event) and effect of TTS is reversible. In addition, injury ranges identified are also likely to be highly over-precautionary and in the case of Project Erebus the assessment used modelled high-order UXO clearance which is very unlikely to occur in practice, therefore impact ranges and number of animals within the impact range in reality is likely to be much lower.

1.7.4.141 In-combination disturbance has been assessed for the Mona Offshore Wind Project together with the tier 1 projects Awel y Môr Offshore Wind Farm, Project Erebus and White Cross Offshore Wind Farm. The Awel y Môr RIAA, reported that the TTS range of 16 km would not extend far enough to overlap with the North Anglesey Marine/Gogledd Môn Forol SAC (which is a minimum distance of 21 km from the array area). As outlined in paragraph 1.7.3.133, disturbance ranges (using TTS as a proxy) for the Mona Offshore Wind Project are up to a maximum of 28.3 km for a 907 kg UXO,

which leads to an overlap with 1.79% of the North Anglesey Marine/Gogledd Môn Forol SAC (noting that this is a highly precautionary approach).

1.7.4.142 White Cross is located approximately 149 km from the North Anglesey Marine/Gogledd Môn Forol SAC and Project Erebus is located approximately 200 km from the North Anglesey Marine/Gogledd Môn Forol SAC. Considering these distances, the 20 km disturbance range for harbour porpoise predicted for White Cross (see Table 1.173) would not overlap with the SAC. Similarly for Project Erebus the TTS-onset range used as a proxy for disturbance of 23 km (see Table 1.173) would not overlap with the SAC. In this way, in-combination underwater sound resulting from UXO detonation at all tier 1 projects together with the Mona Offshore Wind Project will not surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season.

1.7.4.143 For tier 2 projects Morgan Generation Assets, Morecambe Generation Assets and Morgan and Morecambe Offshore Wind Farm: Transmission Assets have been considered for in-combination disturbance. The Morgan and Morecambe Offshore Wind Farm: Transmission Assets red line boundary incorporates both the Morgan Generation Assets, Morecambe Generation Assets, therefore the Morgan and Morecambe Offshore Wind Farm: Transmission Assets red line boundary is used for the basis of the assessment. The North Anglesey Marine/Gogledd Môn Forol SAC is located more than 28 km from the closest point of the Transmission Assets Red Line Boundary. The maximum predicted range for disturbance (using TTS as a proxy) was estimated at approximately 28 km and therefore there is no overlap between the impact zone and the North Anglesey Marine/Gogledd Môn Forol SAC. In this way, in-combination underwater sound resulting from UXO detonation at tier 2 projects Morgan Generation Assets, Morecambe Generation Assets and Morgan, Morecambe Offshore Wind Farm: Transmission Assets and the Mona Offshore Wind Project will not surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season.

1.7.4.144 As outlined in paragraph 1.7.3.134, in line with guidance from stakeholders (JNCC, and Natural England) the EDR approach has also been used for the assessment of disturbance associated with UXO detonation during the construction phase for harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC. The EDR approach, as outlined in JNCC (2020), recommends the use of 26 km deterrence range for UXO detonation. The assessment considered UXO detonation could occur at the closest location within the Mona Array Area and other relevant projects to the North Anglesey Marine/Gogledd Môn Forol SAC.

1.7.4.145 As shown in Figure 1.23, the implementation of a 26 km EDR for the Mona Offshore Wind Project alone could result in a 66.06 km^2 overlap with the North Anglesey Marine/Gogledd Môn Forol SAC, which corresponds to 2.03 % of the SAC. Using the EDR approach for the tier 1 project Awel y Môr Offshore Wind Farm, would result in an overlap of potential disturbance within 0.24% (based on a footprint of disturbance of 7.69 km^2) of the total North Anglesey Marine/Gogledd Môn Forol SAC area of 3,249 km^2 (Awel y Môr Offshore Wind Farm Limited, 2022). The disturbance footprints associated with both projects in-combination would result in potential disturbance across an area equating to 2.27% of the total area of the North Anglesey Marine/Gogledd Môn Forol SAC. This, therefore, would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.

1.7.4.146 The implementation of a 26 km EDR for the tier 2 projects Morgan Generation Assets, Morgan and Morecambe Offshore Windfarms: Transmission Assets and Morecambe

Offshore Windfarm Generation Assets, would not result in an overlap with the North Anglesey Marine/Gogledd Môn Forol SAC (see Figure 1.23). This, therefore, would not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.

1.7.4.147 The next closest SAC designated for harbour porpoise is located 81.5 km away from the Mona Array Area and 94.5 km away from the Mona Offshore Cable Corridor and Access Areas which is outside the 26 km EDR range. Therefore with the implementation of a 26 km EDR, there will be no overlap with the North Channel SAC or any other SACs designated for harbour porpoise and disturbance associated with UXO detonation will not exceed the daily 20% disturbance threshold or the 10% threshold of the relevant area of the site over the season.

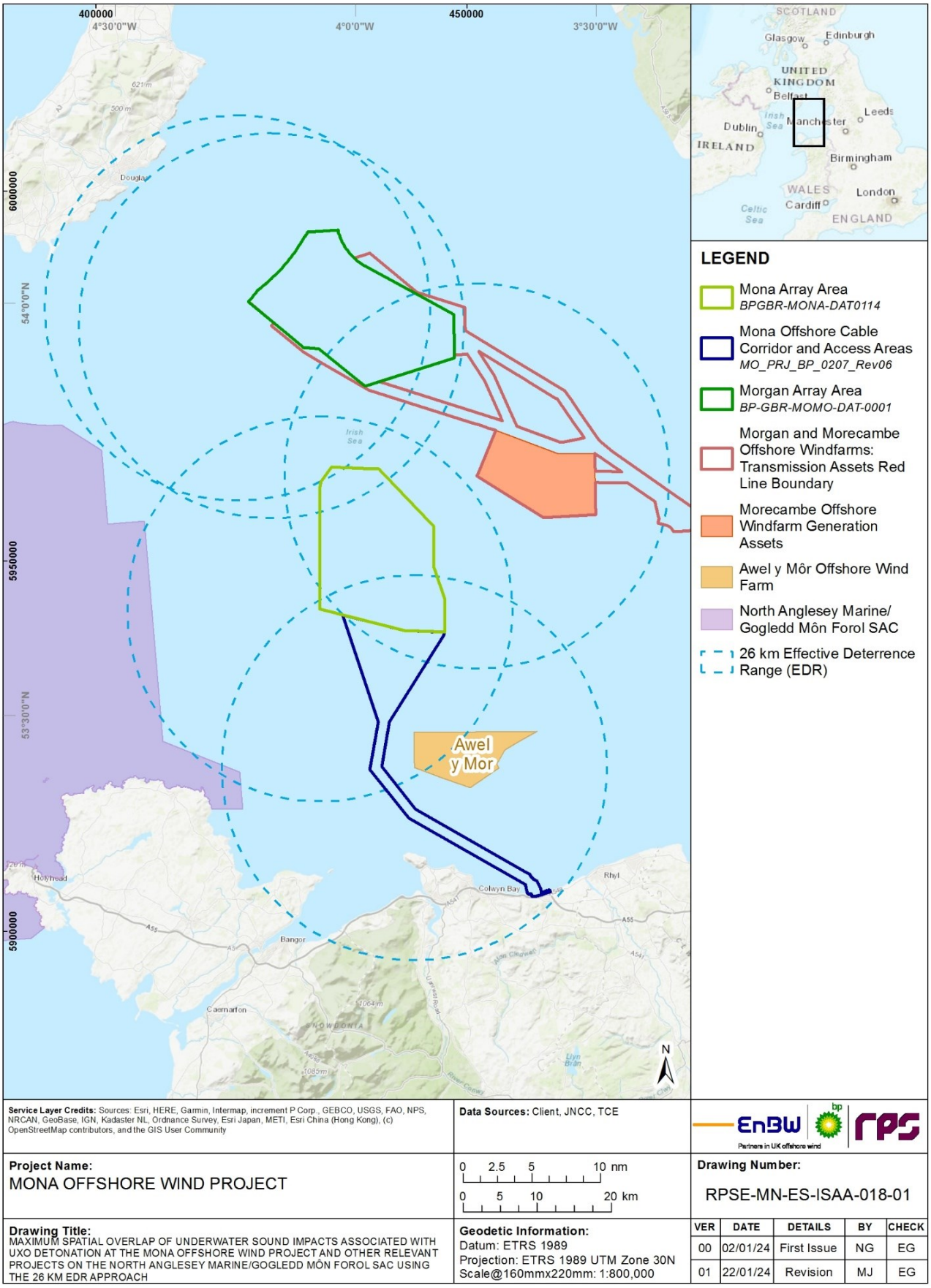

Figure 1.23: Maximum spatial overlap of underwater sound impacts associated with UXO detonation at the Mona Offshore Wind Project and other relevant projects (using 26 km EDR) on the North Anglesey Marine/Gogledd Môn Forol SAC.

Conclusions

1.7.4.148 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below Table 1.175. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.175: Conclusions against the conservation objectives of North Anglesey Marine/Gogledd Môn Forol SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
The species is a viable component of the site.	Assuming standard industry measures (e.g. the measures adopted a part of the Mona Offshore Wind Project, as outlined in Table 1.84:) are applied for each project, it is anticipated that harbour porpoise would be deterred from the injury zone and therefore the risk of PTS would be low. Where low order/low yield measures are not possible, the maximum impact range of harbour porpoise for the high order UXO clearance was 15,370 m, and therefore will not extend to the North Anglesey Marine/Gogledd Môn Forol SAC (which lies 22.58 km from the Mona array area and 17.5 km from the offshore cable corridor) and therefore there will be no overlap between the potential impact zone and the SAC. Due to the mobile nature of harbour porpoise there is potential for harbour porpoise to be present within the impact zone. Disturbance (using TTS as a proxy) is very short term and reversible and therefore not considered likely to lead to any long-term effects on the individual. Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site.
There is no significant disturbance of the species.	There is no spatial overlap of the injury ranges (PTS) associated with UXO detonation and the SAC, and therefore harbour porpoise will not be excluded from any part of the SAC. The disturbance (TTS used as a proxy) range of impact and the 26 km EDR associated with the Mona Offshore Wind Project and relevant tier 1 projects will not surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season with projects located in closer vicinity to the SAC and therefore disturbance as a result of UXO clearance in-combination with other projects is unlikely to be significant (particularly as the closest projects Awel y Môr and Morgan and Morecambe Offshore Wind Farms: Transmission Assets concluded no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC in their RIAA assessments). Underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the species.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	There is no pathway for underwater sound in-combination effects from UXO detonation to result in adverse effects on the habitats of the qualifying species, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project in-combination with other plans and projects, effects are not considered to be r long-term

Conservation objectives	Conclusion
	ensuring that the project will not affect prey species populations being maintained in the long term (see paragraphs 1.7.3.468 to 1.7.3.488). Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.149 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of underwater sound from UXO detonations with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

North Channel SAC

Harbour porpoise

Conclusions

1.7.4.150 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Channel SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below Table 1.176. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.176: Conclusions against the conservation objectives of North Channel SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
The species is a viable component of the site.	Assuming standard industry measures (e.g. the measures adopted a part of the Mona Offshore Wind Project, as outlined in Table 1.84:) are applied for each project, it is anticipated that harbour porpoise would be deterred from the injury zone and therefore the risk of PTS would be low. Where low order/low yield measures are not possible, the maximum impact range from higher order UXO clearance will not overlap the SAC. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual. Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site.

Conservation objectives	Conclusion
There is no significant disturbance of the species.	Given the distance from the North Channel SAC (80 km), the PTS range of impact, the disturbance range of impact (TTS used as a proxy at 28.3 km) and 26 km EDR associated with the Mona Offshore Wind Project will not overlap with the SAC. As disturbance impacts resulting from the Mona Offshore Wind Project will not overlap with the SAC, the Mona Offshore Wind Project will not contribute to an in-combination impact on the SAC with other projects. Therefore, the Mona Offshore Wind Project together with the relevant plans and projects will not surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season. Therefore underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the species.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	There is no pathway for underwater sound in-combination effects from UXO detonation to result in adverse effects on the habitats of harbour porpoise, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project in-combination with other plans and projects, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term. (see section 1.6.4). Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.151 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result underwater sound from UXO detonation with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

Bottlenose dolphin and grey seal

Conclusions

1.7.4.152 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.177. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.177: Conclusions against the conservation objectives of Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat.	The number of animals at risk of potential PTS would be very small (less than one bottlenose dolphin and less than six grey seal), with the implementation of tertiary mitigation this would be further reduced as most animals would be deterred from the injury zone and therefore the risk of PTS would be low. Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC lies 94.1 km from the Mona Offshore Wind Project and therefore even the maximum PTS range from high order UXO will not overlap with the SAC. Disturbance impacts (TTS as a proxy) are very short term and reversible, therefore animals that experience this effect are anticipated to fully recover. Whilst some ecological functions could be inhibited in the short-term due to disturbance, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual. Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of bottlenose dolphin or grey seal using the SAC and bottlenose dolphin and grey seal will remain a viable component of its natural habitat.
The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.	Given the distance of the Mona Offshore Wind Project from the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC (94.1 km), the PTS and/or disturbance (TTS as a proxy) range of impact associated with the Mona Offshore Wind Project is unlikely to extend to the SAC. The Mona Offshore Wind Project will, therefore, not contribute to an in-combination impact. Therefore, the species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of the Mona Offshore Wind Project in combination with other projects
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for underwater sound in-combination effects from UXO detonation to result in adverse effects on the habitats of bottlenose dolphin and grey seal (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project in-combination with other plans and projects, effects are not considered to be long-term ensuring that the project will not affect prey species populations being maintained in the long term (see paragraphs 1.7.3.468 to 1.7.3.488). Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.153 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC as a result underwater sound from UXO detonation with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Strangford Lough SAC

Harbour seal

1.7.4.154 For the tier 1 projects Awel y Môr and Project Erebus, harbour seal were scoped out of the EIA on the basis that this species was not reported in digital aerial surveys within the respective study areas. Therefore, a quantitative assessment cannot be undertaken however, due to a lack of presence of harbour seal within the tier 1 project study areas it is concluded that any in-combination impact would be of such a low magnitude that it would not change the conclusion of the project-alone assessment for the harbour seal features of the SAC. There may be the potential for in-combination effects on harbour seal with the Morgan Offshore Wind: Generation Assets, Morecambe Offshore Wind Generation Assets and Transmission Assets, however assuming standard industry measures applied for each project, it is anticipated that for most species animals would be deterred from the injury zone and therefore the risk of PTS would be low. Whilst the implementation of mitigation such as ADDs may exacerbate the number of animals at risk of TTS, this impact is considered to be short-term and full recovery of the animal's hearing is anticipated therefore long-term effects on the individual are not expected to occur.

1.7.4.155 As outlined in paragraphs 1.7.4.115 to 1.7.4.125, UXO clearance associated with all other projects is considered either unlikely to overlap with UXO clearance at the Mona Offshore Wind Project or is located at a sufficient distance for in-combination effects to be highly unlikely. The only exception is for Morgan Offshore Wind: Generation Assets, Morecambe Offshore Wind Generation Assets and Transmission Assets. Although information was not available for this project to inform a quantitative assessment, it is considered that standard industry measures (such as MMO/PAM and ADDs) measures will also be employed for this project which will reduce the risk of injury to harbour seal.

Conclusions

1.7.4.156 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Strangford Lough SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.178. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.178: Conclusions against the conservation objectives of Strangford Lough SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	The other projects and plans which are considered to have the potential to contribute to an in-combination effect with the Mona Offshore Wind Project are the Morgan Generation Assets, Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Wind Farm Generation Assets. However, it is assumed that standard industry mitigation measures such as those outlined for the Mona Offshore Wind Project will also be applied for each project outlined above. It is anticipated that mitigation such as ADDs will deter animals from the injury zone and therefore the risk of PTS would be low for the projects considered. Whilst the implementation of mitigation such as ADDs may exacerbate the

Conservation objectives	Conclusion
	number of animals at risk of TTS, this impact is considered to be short-term and full recovery of the animal's hearing is anticipated therefore no long-term effects on the individual are expected to occur. Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal feature from being maintained or restored at favourable condition. On this basis, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will also not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound in-combination effects from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). Therefore, there will be no adverse effects on the physical features used by the harbour seal features within the site.

1.7.4.157 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Murlough SAC

Harbour seal

1.7.4.158 The Murlough SAC is located at an increased distance to the Mona Offshore Wind Project (115.9 km from the Mona Array Area) than the Strangford Lough SAC, assessed in paragraphs 1.7.4.154 to 1.7.4.157. As the Murlough SAC is located at an increased distance from the Mona Offshore Wind Project than the Strangford Lough SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.4.159 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Murlough SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.179. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.179: Conclusions against the conservation objectives of Murlough SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	The other projects and plans which are considered to have the potential to contribute to an in-combination effect with the Mona Offshore Wind Project are the Morgan Generation Assets, Morgan and Morecambe Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morecambe Offshore Wind Farm Generation Assets. However, it is assumed that standard industry mitigation measures such as those outlined for the Mona Offshore Wind Project will also be applied for each project outlined above. It is anticipated that mitigation such as ADDs will deter animals from the

Conservation objectives	Conclusion
	injury zone and therefore the risk of PTS would be low for the projects considered. Whilst the implementation of mitigation such as ADDs may exacerbate the number of animals at risk of TTS, this impact is considered to be short-term with and full recovery of the animal's hearing is anticipated therefore no long-term effects on the individual are expected to occur. Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal feature from being maintained or restored at favourable condition. On this basis, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will also not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound in-combination effects from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). Therefore, there will be no adverse effects on the physical features used by the harbour seal features within the site.

1.7.4.160 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

Conclusions

1.7.4.161 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.180.

Table 1.180: Conclusions against the conservation objectives of Cardigan Bay/Bae Ceredigion SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat.	The number of animals at risk of potential PTS would be very small for bottlenose dolphin, with the implementation of standard tertiary mitigation this would be further reduced. Cardigan Bay/Bae Ceredigion SAC lies 162.5 km from the Mona Offshore Wind Project and therefore even the maximum PTS range from high order UXO will not overlap with the SAC. Disturbance impacts (TTS as a proxy) are very short term and reversible, therefore animals that experience this effect are anticipated to fully recover. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual. Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability

Conservation objectives	Conclusion
	and reproductive potential of bottlenose dolphin using the SAC and bottlenose dolphin will remain a viable component of its natural habitat.
The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.	Given the distance from the Cardigan Bay/Bae Ceredigion SAC (162.5 km), the PTS and/or TTS range of impact associated with the Mona Offshore Wind Project is unlikely to extend to the SAC. Therefore, the species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of the Mona Offshore Wind Project.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for underwater sound in-combination effects from UXO detonation to result in adverse effects on the habitats of bottlenose dolphin and grey seal (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project in-combination with other plans and projects, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term (see section 1.6.4). Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.162 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from UXO detonation with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

The Maidens SAC

Grey seal

1.7.4.163 The Maidens SAC is located at an increased distance to the Mona Offshore Wind Project (165 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.4.152 to 1.7.4.157. As the Maidens SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.4.164 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of The Maidens SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.181. Where the justifications and supporting

evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.181: Conclusions against the conservation objectives of The Maidens SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the grey seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of grey seal.**	The number of animals at risk of potential PTS would be very small (less than six grey seal), with the implementation of tertiary mitigation this would be further reduced as most animals would be deterred from the injury zone and therefore the risk of PTS would be low. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual. Underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other plans/projects will not prevent the grey seal population from being maintained or restored at/to favourable condition. On this basis, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will also not prevent the population numbers and distribution of grey seal from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by grey seal within the site.	There is no pathway for underwater sound in-combination effects from UXO detonation, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). Therefore, there will be no adverse effects on the physical features used by the grey seal features within the site.

1.7.4.165 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of The Maidens SAC as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

Conclusions

1.7.4.166 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.182.

Table 1.182: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat.	The number of animals at risk of potential PTS would be very small (less than six grey seal), with the implementation of tertiary mitigation this would be further reduced as most animals would be deterred from the injury zone and therefore the risk of PTS would be low. Disturbance impacts (TTS as a proxy) are very short term and reversible, therefore animals that experience this effect are anticipated to fully recover. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual. Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the SAC and grey seal will remain a viable component of its natural habitat.
The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.	Given the distance from the Pembrokeshire Marine/Sir Benfro Forol SAC (211.7 km), the PTS and/or TTS range of impact associated with the Mona Offshore Wind Project is unlikely to extend to the SAC. Therefore, the species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future as a result of the Mona Offshore Wind Project in combination with other projects.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound in-combination effects from UXO detonation to result in adverse effects on the habitats of the qualifying species (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project in-combination with other plans and projects, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term (see section 1.6.4). Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.167 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result underwater sound from UXO detonation with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

Conclusions

1.7.4.168 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below Table 1.183.

Table 1.183: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
The species is a viable component of the site.	Assuming standard industry measures (e.g. the measures adopted a part of the Mona Offshore Wind Project, as outlined in Table 1.84) are applied for each project, it is anticipated that harbour porpoise would be deterred from the injury zone and therefore the risk of PTS would be low. Where low order/low yield measures are not possible, the maximum impact range of harbour porpoise for the high order UXO clearance was 15,370 m, and therefore will not extend to the North Anglesey Marine/Gogledd Môn Forol SAC (which lies 22.58 km from the Mona array area and 17.5 km from the offshore cable corridor) and therefore no overlap between the potential impact zone and the SAC. Due to the mobile nature of harbour porpoise there is potential for harbour porpoise to be present within the impact zone. Disturbance (using TTS as a proxy) is very short term and reversible and therefore not considered likely to lead to any long-term effects on the individual. Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the SAC and harbour porpoise will remain a viable component of the site.
There is no significant disturbance of the species.	There is no spatial overlap of the injury ranges associated with UXO detonation and the SAC and therefore harbour porpoise will not be excluded from any part of the SAC. The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located beyond the disturbance (using TTS as a proxy) and 26 km EDR ranges from the Mona Offshore Wind Project. As disturbance impacts resulting from the Mona Offshore Wind Project will not overlap with the SAC, the Mona Offshore Wind Project will not contribute to an in-combination impact on the SAC Therefore, Mona Offshore Wind Project together with the relevant plans and projects will not surpass 20% of relevant area disturbed in any given day or 10% of the relevant area of the site over a season. Underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the species.
The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.	There is no pathway for underwater sound in-combination effects from UXO detonation to result in adverse effects on the habitats of the qualifying species, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). With respect to prey species, although some short-term disturbance is predicted to potential prey fish species as a result of the Mona Offshore Wind Project in-combination with other plans and projects, effects are not considered to be significant or long-term ensuring that the project will not affect prey species populations being maintained in the long term.(see section 1.6.4). Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.169 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result underwater sound from UXO detonation with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Lundy SAC

Grey seal

1.7.4.170 The Lundy SAC is located at an increased distance to the Mona Offshore Wind Project (309.5 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.4.152 to 1.7.4.157. As the Lundy SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.4.171 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Lundy SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.184. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.184: Conclusions against the conservation objectives of the Lundy SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects from UXO detonation to result in adverse effects on the habitats of grey seal, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored].	Assuming standard industry measures applied for each project, it is anticipated that grey seal would be deterred from the injury zone and therefore the risk of PTS would be low. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual. Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population of grey seal from being maintained or restored.
The distribution of qualifying species within the site [are maintained or restored].	Given the distance from the Lundy SAC (309.5 km), the PTS and/or TTS range of impact associated with the Mona Offshore Wind Project will not overlap with the SAC and therefore the distribution of grey seal within the site will not be adversely affected.

1.7.4.172 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Lundy SAC as a result underwater sound from UXO detonation with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Isles of Scilly Complex SAC

Grey seal

1.7.4.173 The Isles of Scilly Complex SAC is located at an increased distance to the Mona Offshore Wind Project (439.3 km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.7.4.152 to 1.7.4.157. As the Isles of Scilly Complex SAC is located at an increased distance from the Mona Offshore Wind Project than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC it is considered that effects would be of similar if not lower magnitude.

Conclusions

1.7.4.174 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.185. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.185: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC for in-combination underwater sound from UXO detonation during the during construction phase.

Conservation objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species.** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects from UXO detonation to result in adverse effects on the habitats of grey seal, (i.e. there will be no habitat loss/disturbance from underwater sound associated with UXO detonation). Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored].	The number of animals at risk of potential PTS would be very small (less than six grey seal for high order UXO), with the implementation of tertiary mitigation this would be further reduced as most animals would be deterred from the injury zone and therefore the risk of PTS would be low. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animal's hearing and therefore not considered likely to lead to any long-term effects on the individual. Therefore, underwater sound from UXO detonation associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population of grey seal from being maintained or restored.
The distribution of qualifying species within the site [are maintained or restored].	Given the distance from the Isles of Scilly Complex SAC (309 km), the PTS and/or TTS range of impact associated with the Mona Offshore Wind Project will not overlap with the SAC and therefore the distribution of grey seal within the site will not be adversely affected.

1.7.4.175 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Isles of Scilly Complex SAC as a result underwater sound from UXO detonation with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Sites assessed in line with the iterative approach

1.7.4.176 As outlined in paragraphs 1.7.1.3 to 1.7.1.6, following the iterative approach adopted for this ISAA, the closest European site to the Mona Offshore Wind Project within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this ISAA, are located at a greater distance from the Mona Offshore Wind Project and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.7.4.140 to 1.7.4.175 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.7.4.177 to 1.7.4.199.

West Wales Marine/Gorllewin Cymru Forol SAC

1.7.4.177 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

1.7.4.178 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraphs 1.7.4.152 to 1.7.4.157), it can be concluded that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Saltee Islands SAC

1.7.4.179 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraphs 1.7.4.152 to 1.7.4.157), it can be concluded that there is no risk of an adverse effect on the integrity of the Saltee Islands SAC as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

1.7.4.180 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Rockabill to Dalkey Island SAC as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

1.7.4.181 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Roaringwater Bay and Islands SAC as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Blasket Islands SAC

1.7.4.182 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Blasket Islands SAC as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.7.4.183 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Abers - Côte des legends SCI

1.7.4.184 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Abers - Côte des legends SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Ouessant-Molène SCI

1.7.4.185 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Ouessant-Molène SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

1.7.4.186 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

1.7.4.187 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Tregor Goëlo SCI

1.7.4.188 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Tregor Goëlo SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côtes de Crozon SCI

1.7.4.189 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Côtes de Crozon SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Chaussée de Sein SCI

1.7.4.190 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Chaussée de Sein SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap Sizun SCI

1.7.4.191 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap Sizun SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Récifs du talus du golfe de Gascogne SCI

1.7.4.192 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Vauville SCI

1.7.4.193 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Vauville SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

1.7.4.194 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Saint-Brieuc – Est SCI

1.7.4.195 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Banc et récifs de Surtainville SCI

1.7.4.196 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.7.4.197 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Estuaire de la Rance SCI

1.7.4.198 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Estuaire de la Rance SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

1.7.4.199 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.140 to 0), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie du Mont Saint-Michel SCI as a result of underwater sound from UXO detonation with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination injury and disturbance from underwater sound from pre-construction site investigation surveys

1.7.4.200 There is potential for injury and disturbance from underwater sound from pre-construction site investigation surveys as a result of activities associated with the Mona Offshore Wind Project during construction, in-combination with activities associated with the following projects/plans: tier 2 projects (i.e. Morecambe Offshore Wind Farm, Morgan Offshore Wind Project). No tier 1 or tier 3 projects in Table 1.21 have assessed pre-construction site investigation surveys as an effect pathway and are therefore scoped out of the in-combination effects assessment.

1.7.4.201 The risk of injury to marine mammal receptors in terms of PTS as a result of underwater sound due to site investigation surveys would be expected to be localised to within the boundaries of the respective projects. The assessment for the Mona Offshore Wind Project found that the ranges of effect are expected to be relatively small and the magnitude of the impact with respect to auditory injury occurring in marine mammals has been conservatively assessed to be low (see paragraphs 1.7.3.204 to 1.7.3.216 and Volume 2, Chapter 4: Marine mammals of the Environmental Statement (Document reference F2.4)). Therefore, there is very low potential for in-combination effects for injury from elevated underwater sound due to site investigation surveys and the in-combination assessment provided here focuses on disturbance only.

Construction phase

Tier 1

1.7.4.202 For tier 1 projects with temporal overlap with the construction phase of Mona Offshore Wind Project, effects as a result of underwater sound from site investigation surveys were not included in the respective Environmental Statements. Therefore, all tier 1 projects were scoped out of the cumulative assessment at PEIR, which provides the basis of the in combination assessments. However to allow a quantitative approach to assessment, there are up to 14 tier 1 site investigation surveys identified in the in combination screening area for marine mammals. Surveys typically occur over short durations (typically up to 2 months) (based on expert judgment and agreed with the EWG) and therefore as a conservative approach it is assumed as a worst case scenario that up to two surveys (in addition) could overlap with the Mona site-investigation surveys at any one point.

1.7.4.203 The project alone for Mona Offshore Wind Project predicted most of the disturbance ranges within 100s of meters with the greatest distance over which the disturbance can occur out to approximately 72 km during vibro-coring.

1.7.4.204 Based on the distance from the Mona Offshore Wind Project to 14 site investigation surveys, if pre-construction site investigation surveys were to temporally overlap with the construction phase of the Mona Offshore Wind Project (dates are currently

unknown), there is potential for a small spatial overlap of disturbance ranges to occur. However, this is a highly precautionary approach which assumes the same disturbance ranges as Mona Offshore Wind Project and does not take into account differences in water column depth, pressure, temperature gradients, salinity as well as water surface and seabed conditions at the different site-investigation survey locations (see Volume 5, Annex 3.1: Underwater sound technical report of the Environmental Statement (Document reference: F5.3.1) for detail)).

1.7.4.205 The duration of site-investigation surveys is considered to be short term and localised for each project. It should be noted that these will occur intermittently over a number of years with isolated surveys occurring at different points in time throughout the in-combination screening area, though up to two is assumed to be occurring in addition to Mona Offshore Wind Project.

1.7.4.206 The impact of site investigation surveys leading to behavioural effects is predicted to be of local to regional spatial extent, medium term duration, intermittent and high reversibility (elevated underwater sound occurs only during surveys). The effect of behavioural disturbance is reversible (with animals returning to baseline levels soon after surveys have ceased).

Tier 2

1.7.4.207 The potential impacts considered within the Mona Offshore Wind Project alone assessment are specific to a particular phase of development. As such, where there is no spatial or temporal overlap with the site investigation surveys during the construction phase of the Mona Offshore Wind Project, survey activities associated with tier 2 projects listed in Table 1.154, have been excluded from further consideration. Impacts scoped out from individual assessments of respective projects or from the Mona Offshore Wind Project alone assessment are not considered further.

1.7.4.208 Given that EIA Scoping Reports do not provide detailed information about site investigation surveys involved, it is not possible to undertake full, quantitative assessment for this impact and therefore a qualitative assessment is provided below. However, for Morgan Offshore Wind Project Generation Assets, and Morgan and Morecambe Offshore Wind Farms: Transmission Assets both the EIA Scoping and PEIR are available (Morgan Offshore Wind Project Ltd., 2023; Mona Offshore Wind Project Ltd, 2022b). Morecambe Offshore Windfarm Generation Assets did not include pre-construction site surveys in their project alone assessment in the PEIR chapter (Royal HaskoningDHV, 2022b) and therefore is not considered further.

1.7.4.209 For Morgan Offshore Wind Project Generation Assets most of the disturbance ranges were within 100s of meters with maximum disturbance ranges predicted out to 55 km for vibro-coring for all species. For Morgan and Morecambe Offshore Windfarms: Transmission Assets disturbance ranges most of the disturbance ranges were within 100s of meters with maximum disturbance ranges predicted out to 17.3 km for vibro-coring for all species.

1.7.4.210 Based on the distance from the Mona Offshore Wind Project to the Morgan Generation Assets and Morecambe Offshore Wind Farm, if pre-construction site investigation surveys were to temporally overlap with the construction phase of the Mona Offshore Wind Project, it is likely that spatial overlap of disturbance ranges would occur, especially for site investigation surveys taking place in the south part of the Morgan Array Area and west part of the Morecambe Array Area, nearest to the Mona Array Area. Due to the small distance between projects, animals are likely to be displaced from an area comparable to piling contours at the Mona Offshore Wind Project alone.

1.7.4.211 Although the duration of site-investigation surveys is considered to be short term and localised for each project, it should be noted that these will occur intermittently over a number of years with isolated surveys occurring at different points in time throughout the Irish Sea.

1.7.4.212 Therefore, the in-combination impact of site investigation surveys leading to behavioural effects is predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased.

Tier 3

1.7.4.213 The potential impacts considered within the Mona Offshore Wind Project alone assessment are specific to a particular phase of development. As such, where there is no spatial or temporal overlap with the site investigation surveys during the construction phase of the Mona Offshore Wind Project, survey activities associated with Tier 3 projects listed in Table 1.154, have been excluded from further consideration. Impacts scoped out from individual assessments of respective projects or from the Mona Offshore Wind Project alone assessment are not considered further.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.7.4.214 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to also have measures including the development and adherence to an MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.215 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of in-combination underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.186. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.186: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that the sound of vessels is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the harbour porpoise designated feature.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.216 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

North Channel SAC

Harbour porpoise

1.7.4.217 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.218 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Channel SAC will not occur as a result of in-combination underwater sound from pre-construction site investigation surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.187. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.187: Conclusions against the conservation objectives of the North Channel SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the harbour porpoise designated feature.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.219 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

Bottlenose dolphin and grey seal

1.7.4.220 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.221 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC will not occur as a result of in-combination underwater sound from UXO detonation. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.188. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.188: Conclusions against the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying marine mammal species for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.222 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Strangford Lough SAC

Harbour seal

1.7.4.223 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.224 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Strangford Lough SAC will not occur as a result of in-combination underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.189. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.189: Conclusions against the conservation objectives of the Strangford Lough SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.4.225 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Murlough SAC

Harbour seal

1.7.4.226 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.227 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Murlough SAC will not occur as a result of in-combination underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.190. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.190: Conclusions against the conservation objectives of the Murlough SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.4.228 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.7.4.229 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.230 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will not occur as a result of in-combination underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.191. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.191: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not reduce nor likely reduce the natural range of the populations of the qualifying marine mammal species for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.231 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

The Maidens SAC

Grey seal

1.7.4.232 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.233 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of The Maidens SAC will not occur as a result of in-combination underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.192. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.192: Conclusions against the conservation objectives of The Maidens SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the grey seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of grey seal.**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that the sound of vessels is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the grey seal population numbers and distribution from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by grey seal within the site.	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent physical features used by grey seal within the site from being maintained or enhance.

1.7.4.234 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of The Maidens SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.7.4.235 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.236 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will not occur as a result of in-combination underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.193. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.193: Conclusions against the conservation objectives of Pembrokeshire Marine/Sir Benfro Forol SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not reduce nor likely reduce of the populations of the qualifying grey seal feature for the foreseeable future the natural range.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing.	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.237 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.7.4.238 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.239 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will not occur as a result of in-combination underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.194. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.194: Conclusions against the conservation objectives of Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.240 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Lundy SAC

Grey seal

1.7.4.241 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project will also have mitigation measures including Codes of Conduct and MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.242 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Lundy SAC will not occur as a result of in-combination underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.195. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.195: Conclusions against the conservation objectives of Lundy SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, underwater sound in-combination effects as a result of pre-construction site investigation surveys will not prevent the structure and function of the habitats of grey seal from being maintained or restored nor prevent the supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site. [are maintained or restored].**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.4.243 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Lundy SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Isles of Scilly Complex SAC

Grey seal

1.7.4.244 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after surveys have ceased. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.7.4.245 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will not occur as a result of in-combination underwater sound from pre-construction site surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.196. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.196: Conclusions against the conservation objectives of Isles of Scilly Complex SAC for in-combination underwater sound from pre-construction site investigation surveys during the during construction phase.

Conservation objectives	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects from pre-construction site investigation surveys to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, underwater sound in-combination effects as a result of pre-construction site investigation surveys will not prevent the structure and function of the habitats of grey seal from being maintained or restored nor prevent the supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that underwater sound from pre-construction site investigation surveys will be intermittent, that there is no potential for injury within range of the SAC, that sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, underwater sound from pre-construction site investigation surveys associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.4.246 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Isles of Scilly Complex SAC as a result of underwater sound impacts from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Sites assessed in line with the iterative approach

1.7.4.247 As outlined in paragraphs 1.7.1.3 to1.7.1.8, following the iterative approach adopted for this ISAA, the closest European site to the Mona Offshore Wind Project within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this ISAA, are located at a greater distance from the Mona Offshore Wind Project and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.7.4.140 to 1.7.4.246 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.7.4.248 to 1.7.4.270.

West Wales Marine/Gorllewin Cymru Forol SAC

1.7.4.248 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.7.4.249 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.4.220 to1.7.4.222), it can be concluded that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Saltee Islands SAC

1.7.4.250 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.4.220 to1.7.4.222), it can be concluded that there is no risk of an adverse effect on the integrity of the Saltee Islands SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

1.7.4.251 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Rockabill to Dalkey Island SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

1.7.4.252 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Roaringwater Bay and Islands SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Blasket Islands SAC

1.7.4.253 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Blasket Islands SAC as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Mers Celtiques – Talus du golfe de Gascogne SCI

1.7.4.254 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Mers Celtiques – Talus du golfe de Gascogne SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Abers – Côte des legends SCI

1.7.4.255 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Abers – Côte des legends SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Ouessant-Molène SCI

1.7.4.256 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Ouessant-Molène SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

1.7.4.257 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

1.7.4.258 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Tregor Goëlo SCI

1.7.4.259 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an

adverse effect on the integrity of the Tregor Goëlo SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côtes de Crozon SCI

1.7.4.260 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Côtes de Crozon SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Chaussée de Sein SCI

1.7.4.261 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Chaussée de Sein SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap Sizun SCI

1.7.4.262 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap Sizun SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Récifs du talus du golfe de Gascogne SCI

1.7.4.263 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Vauville SCI

1.7.4.264 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Vauville SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

1.7.4.265 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Saint-Brieuc – Est SCI

1.7.4.266 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Banc et récifs de Surtainville SCI

1.7.4.267 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.7.4.268 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Estuaire de la Rance SCI

1.7.4.269 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Estuaire de la Rance SCI as a result of underwater sound from pre-construction site investigation surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

1.7.4.270 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.214 to 1.7.4.219), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie du Mont Saint-Michel SCI as a result of underwater sound from pre-construction site investigation surveys with respect to

construction of the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination Injury and disturbance to marine mammals from elevated underwater sound due to vessel use and other activities

1.7.4.271 There is potential for injury and disturbance from underwater sound from vessels and other (non-piling) sound producing activities associated with the Mona Offshore Wind Project during construction, to act in-combination with activities associated with all the projects/plans in Table 1.154.

1.7.4.272 As for the assessment of the Mona Offshore Wind Project alone, the risk of injury in terms of PTS to marine mammal receptors as a result of underwater sound due to vessel use and other non-piling sound producing activities would be expected to be very low. PTS thresholds would not be exceeded or would be very localised (<10 m) from the source. The assessment for Mona Offshore Wind Project alone (paragraphs 1.7.3.291 to 1.7.3.315) found relatively small ranges of effects and low impact with respect to auditory injury occurring in marine mammal qualifying features. Given the above, there is very low potential for in-combination effects for injury from elevated underwater sound due to vessel use and other (non-piling) sound producing activities. Instead, the in-combination assessment provided below focuses on disturbance only for this impact.

Construction phase

Tier 1

1.7.4.273 Awel y Môr Offshore Wind Farm is located approximately 3.6 km from the Mona Offshore Cable Corridor and Access Areas. The MDS for Awel y Môr anticipated up to 101 construction vessels in total, of which 35 may be on site during peak period (RWE, 2022). The assessment of potential impacts associated with underwater sound due to vessel traffic and other construction activities (such as cable laying, dredging, trenching and rock placement) presented in the Environmental Statement is based on a desktop study. The Environmental Statement assumed that based on Benhemma-Le Gall *et al.* (2021), harbour porpoise and other cetaceans may be displaced up to 4 km from construction vessels. The assessment also identified localised behavioural disturbance ranges for harbour porpoise and grey seal with avoidance reported up to 5 km from the site during dredging activities. For bottlenose dolphin dredging was predicted to cause a reduction in presence and avoidance of the area for five weeks.

1.7.4.274 The Environmental Statement for the West Anglesey Demonstration Zone tidal site (Morlais, 2019), which is located 50.57 km from the Mona Array Area, provided a quantitative assessment of impacts based on a MDS of up to 16 vessels on site at any one time during the operations and maintenance phase of the project.

1.7.4.275 The Project Erebus site is located 240.23 km from the Mona Array Area and comprises up to 10 floating wind turbines over a maximum area of 32 km^2. The MDS project anticipated a maximum of two crew transfer vessels on site per day during the operations and maintenance phase of the project (Blue Gem Wind, 2020). These vessels would be expected to be stationary or slow moving and would not be a novel impact pathway for marine mammals in the area (Blue Gem Wind, 2020).

1.7.4.276 White Cross is located up 264.1 km the Mona Offshore Cable Corridor and Access Areas, and the MDS for White Cross identified up to five vessels on site at any one time during the construction phase. The assessment concluded that the number of

vessels would not exceed the Heinänen and Skov (2015) threshold (five vessels within 49.4 km^2 would equate to approximately 0.1 vessels per km^2). The Environmental Statement assumed that based on Benhemma-Le Gall et al. (2021), disturbance ranges for non-piling activities (other than vessels) would be up to 4 km from construction vessels.

1.7.4.277 Twin Hub is located 350.9 km from the Mona Offshore Cable Corridor and Access Areas, and details vessels may include anchor handling tugs, cable lay vessels but no quantification of vessel movement is included in the marine licence. Given the greatest disturbance ranges for Mona Offshore Wind Project are for survey vessel, support vessels, crew transfer vessel, scour/cable protection/seabed preparation and installation vessels, as a precautionary approach disturbance ranges are assumed to be comparable to the Mona Offshore Wind Project however the number of vessels are expected to be much lower given the project design and extent (two floating platforms hosting leaning wind turbines with potential capacity of up to 32 MW).

1.7.4.278 It is a standard practice that estimated ranges over which behavioural disturbance may occur are presented for different vessel types in isolation. For Mona Offshore Wind Project, disturbance ranges of up to 23 km were predicted for survey vessel, support vessels, crew transfer vessel, scour/cable protection/seabed preparation and installation vessels. It is likely that several activities could be potentially occurring at the same time across several offshore wind projects and therefore disturbance ranges may extend from several vessels/locations where the activity is carried out. However, Benhemma-Le Gall *et al.* (2021) suggested increased vessel activity (and other construction activities) led to a decrease in porpoise acoustic detections and activity at distances of up to 4 km and therefore this is likely to be an overestimate of disturbance responses.

1.7.4.279 Therefore, cumulatively across the sites there may be a noticeable uplift in vessel activity within the Celtic and Irish Seas regional study area from the baseline, although noting that the assessments are based on the maximum design scenario, the number of vessels present at respective projects at any given time may in reality be lower. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and are likely to follow existing shipping routes to/from port. As such, it would not be realistic to present simply the sum of all vessels anticipated within each offshore wind farm as per respective maximum design scenarios. Introduction of vessels during construction and operations and maintenance phases of the projects will not be a novel impact for marine mammals present in the area and therefore marine mammals are anticipated to demonstrate some degree of tolerance to sound from vessels.

1.7.4.280 Although the duration of vessel activity is considered to be medium term (throughout the construction phase of Mona Offshore Wind Farm) and localised for each project, it should be noted that vessel movements will occur intermittently over a number of years. Vessels such as boulder clearance, jack-up rigs, tug/anchor handlers and guard vessels will have smaller disturbance ranges (between 1 to 6.5 km) and therefore the extent of effect will be local. However, where vessels may disturb animals over ranges of 22 km, it represents larger proportion of the Irish and Celtic Seas and may potentially affect animals over regional scales. Nevertheless, most of the vessels will be associated with construction phases of Awel y Môr and Mona Offshore Wind Project and both projects are located within the area of relatively low marine mammals densities (except bottlenose dolphins, see Volume 6, Annex 9.1: Marine mammal technical report of the Environmental Statement (Document Reference: F.6.4.1)).

1.7.4.281 The in-combination impact is predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

Tier 2

1.7.4.282 The construction of the Mona Offshore Wind Project, together with construction and/or operations and maintenance phases of tier 1 projects and the construction phase of the Inis Ealga Marine Energy Park, Transmission Assets, Morgan Offshore Wind Project Generation Assets, Energy Park, North Channel Wind 1 and 2, Shelmalere Offshore Wind Farm and White Cross, and both the construction and operations and maintenance phases of the Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, Llŷr Projects (Llŷr 1 and Llŷr 2), North Irish Sea Array Offshore Wind Farm, Project Valorous may lead to disturbance to marine mammals from vessel use and other (non-piling) sound producing activities. Timelines of the construction (as well as operations and maintenance phases) of Arklow Bank Wind Park Phase 2, Morecambe Offshore Windfarm Generation Assets, North Celtic Sea Offshore Wind Farm, Oriel Windfarm Offshore Wind Farm, Project Ilen and Simply Blue Emerald are unknown. However, it has been conservatively assumed that there will be a temporal overlap with the construction phase of the Mona Offshore Wind Project. Potential impacts as a result of vessel use and other (non-piling) sound producing activities were screened into the assessments for all projects during the construction phase of the Mona Offshore Wind Project.

1.7.4.283 Given that EIA Scoping Reports do not provide detailed information on vessel numbers, it is not possible to undertake full, quantitative assessment for this impact and therefore a qualitative assessment is provided below.

1.7.4.284 However, for Morgan Offshore Wind Project Generation Assets, Morecambe Offshore Windfarm Generation Assets and Transmission Assets, PEIR is available and vessel information is included. Behavioural disturbance ranges depend on the type of vessels used during construction and type of other (non-piling) sound producing activities. Although these ranges may extend beyond the boundaries of the projects screened into cumulative assessment, the extent to which this occurs will depend on the design parameters. The maximum range over which potential disturbance may occur as a result of underwater sound due to vessel use for the Mona Offshore Wind Project alone as a result of survey vessel, support vessels, crew transfer vessels, scour/cable protection/seabed preparation and installation vessels and is predicted out to 4.08 km (noting this is not for all vessel types).

1.7.4.285 The PEIR for the Morgan Generation Assets (Morgan Offshore Wind Project Ltd, 2023b) identified underwater sound from vessels and other vessel activities as a potential impact during the construction phase of the project. As presented in the PEIR for this project, cable laying activities assessed for the Morgan Generation Assets alone have the potential to disturb marine mammals out to 18 km. The maximum range over which potential disturbance may occur for the Morgan Generation Assets alone was predicted out to 21 km for Survey vessel and support vessels, Crew transfer vessel, Scour/Cable Protection/Seabed Preparation/Installation Vessels. The Morgan Generation Assets PEIR predicted up to 63 vessels to be present on site at any given time during the construction phase, with up to 1878 return trips during construction.

1.7.4.286 The MDS presented in PEIR for Morecambe Offshore Windfarm: Generation Assets (Morecambe Offshore Windfarm Ltd, 2023) anticipated up to 30 vessels on site at any one time, with 150 return trips for delivery of main components and installation over the construction phase, and 2,778 return trips per year for support vessels.

Disturbance ranges were not modelled, but assessment for all species was based on a disturbance impact range of 2 km (based upon studies by Brandt *et al*. 2018 and Benhemma-Le Gall *et al*. (2021).

1.7.4.287 For the Transmission Assets, disturbance ranges of up to 20 km were predicted for survey and support vessels, crew transfer vessels, scour/cable protection/seabed preparation/installation vessels. The Morgan and Morecambe Offshore Wind Farms: Transmission Assets PEIR predicted up to 70 vessels to be present on site at any given time during the construction phase, with up to 740 return trips during the construction phase.

1.7.4.288 The impact for the remaining tier 2 projects is predicted to be localised to within the close vicinity of the respective projects. For the majority of the tier 2 projects (Arklow Bank Wind Park Phase 2, Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, Inis Ealga Marine Energy Park ,Llŷr 1, Llŷr 2, North Celtic Sea Offshore Wind Farm, North Channel Wind 1,- North Channel Wind 2, North Irish Sea Array Offshore Wind Farm, Oriel Windfarm Offshore Wind Farm, Project Ilen, Project Valorous, Shelmalere Offshore Wind Farm and Simply Blue Emerald) the distances from the Mona Offshore Wind Project are greater than 100 km and there is no potential for overlap in the behavioural ZoI.

1.7.4.289 Other projects, including Morecambe Offshore Windfarm Generation Assets, Morgan and Morecambe Offshore Wind Farms: Transmission Assets and Morgan Offshore Wind Project Generation Assets are located in close proximity to the Mona Offshore Wind Project and therefore this could lead to higher levels of traffic within the Liverpool Bay region. Vessel movements and other activities will be largely confined to the array areas and/or offshore cable corridor and vessel routes are likely to follow existing shipping routes to and from port.

1.7.4.290 The duration of vessel activity is considered to be medium term, however, it should be noted that vessel movements will occur intermittently over a number of years. The in-combination number of vessels for tier 1 projects represents an increase compared to the average vessel traffic (see paragraph 1.7.4.279). Although the exact number of vessels associated with most tier 2 projects is unknown, if construction phase at all tier 2 projects will occur simultaneously, vessels associated with each project will contribute further to the increase over a number of years.

Tier 3

1.7.4.291 The construction of the Mona Offshore Wind Project, together with construction and/or operations and maintenance phases of tier 1 and tier 2 projects as well as the construction and/or operations and maintenance phase of Blackwater Offshore Wind Farm, Braymore Point, Celtic Sea Array Offshore Wind Farm, Cork offshore wind project, Clogher Head Offshore Wind Farm, Codling Wind Park Extension Offshore Wind Farm, Cooley Point Offshore Wind Farm, Eni Hynet CCS, Inis Offshore Wind Munster, Isle of Man wind farm lease area, MaresConnect, Project Saoirse and South Pembrokeshire Demonstration Zone may lead to in-combination disturbance to marine mammals from underwater sound generated during vessel use and other (non-piling) sound producing activities. However, there are no scoping reports to give detailed information on the timescales of these projects and therefore a qualitative assessment is provided below.

1.7.4.292 Eni Hynet CCS, Inis Offshore Wind Munster, Isle of Man wind farm lease area and MaresConnect are located within 50 KM of the Mona Offshore Wind Project. Other Tier 3 Projects (Blackwater Offshore Wind Farm, Braymore Point, Celtic Sea Array

Offshore Wind Farm, Cork offshore wind project, Clogher Head Offshore Wind Farm, Codling Wind Park Extension Offshore Wind Farm, Cooley Point Offshore Wind Farm, Project Saoirse and South Pembrokeshire Demonstration Zone) are all located over 100 km away from the Mona Offshore Wind Project.

1.7.4.293 The construction timeline of the Mooir Vannin offshore windfarm is not yet available. However, given that it is in the pre-application stage, its construction phase may overlap temporally towards the end of the construction phase of the Morgan and Morecambe Offshore Windfarms: Transmission Assets (2026-2029). There is no information in the public domain on potential vessel use and other (non-piling) sound producing activities for Mooir Vannin. The construction phase of MaresConnect is anticipated to begin in 2025 (MaresConnect, 2023), with the operations phase commencing in 2026. As such, it is likely that the construction of the MaresConnect will be completed prior to the commencement of construction activities at the Mona Offshore Wind Project. Maintenance of the cable during the operations and maintenance typically involves considerably fewer vessels and round trips compared to construction. Therefore, it is anticipated that these will not add substantially to the number of vessels present during the construction of the Mona Offshore Wind Project and that the potential for in-combination effects is unlikely.

1.7.4.294 Therefore, the in-combination impact of underwater sound from vessel use and other activities leading to behavioural effects is predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.7.4.295 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Despite the known sensitivity of harbour porpoise to vessel sound, Culloch *et al*. (2016) found no detectable decrease in the numbers of harbour porpoise associated with an increase in vessel activity during pipeline construction. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.296 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.197. Where the

justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.197: Conclusions against the conservation objectives of North Anglesey Marine/Gogledd Môn Forol SAC for in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury within range of the SAC, limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.297 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

North Channel SAC

Harbour porpoise

1.7.4.298 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Despite the known sensitivity of harbour porpoise to vessel sound, Culloch *et al*. (2016) found no detectable decrease in the numbers of harbour porpoise associated with an increase in vessel activity during pipeline construction. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project will also have mitigation measures including an MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.299 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Channel SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.198. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.198: Conclusions against the conservation objectives of North Channel SAC for in-combination underwater sound from vessels and other (non-piling) sound producing activities during the during the construction phase.

Conservation objectives	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.300 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau *SAC*

Bottlenose dolphin and grey seal

1.7.4.301 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.302 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.199. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.199: Conclusions against the conservation objectives of Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC for in-combination underwater sound from vessels and other (non-piling) sound producing activities during the construction phase.

Conservation objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not reduce nor likely reduce the natural range of the populations of the qualifying bottlenose dolphin and grey seal features for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.303 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Strangford Lough SAC

Harbour seal

1.7.4.304 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to

available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.305 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Strangford Lough SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.200. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.200: Conclusions against the conservation objectives of Strangford Lough SAC for in-combination underwater sound from vessels and other (non-piling) sound producing activities during the construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.4.306 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Murlough SAC

Harbour seal

1.7.4.307 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing

shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.308 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Murlough SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.201. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.201: Conclusions against the conservation objectives of Murlough SAC for in-combination underwater sound from vessels and other (non-piling) sound producing activities during the construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.4.309 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.7.4.310 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing

shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.311 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.202. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.202: Conclusions against the conservation objectives of Cardigan Bay/Bae Ceredigion SAC for in-combination underwater sound from vessels and other (non-piling) sound producing activities during the during construction phase.

Conservation objectives	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying bottlenose dolphin feature for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.312 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

The Maidens SAC

Grey seal

1.7.4.313 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other

activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.314 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of The Maidens SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.203. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.203: Conclusions against the conservation objectives of The Maidens SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities during the during the construction phase.

Conservation objectives	Conclusion
To maintain (or restore where appropriate) the grey seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of grey seal.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the grey seal population numbers and distribution from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by grey seal within the site.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent physical features used by grey seal within the site from being maintained or enhance.

1.7.4.315 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of The Maidens SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.7.4.316 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other

activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.317 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.204. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.204: Conclusions against the conservation objectives of Pembrokeshire Marine/Sir Benfro Forol SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities during the during the construction phase.

Conservation objective	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not reduce nor likely reduce the natural range of the populations of the qualifying grey seal feature for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species

1.7.4.318 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.7.4.319 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Despite the known sensitivity of harbour porpoise to vessel sound, Culloch *et al*. (2016) found no detectable decrease in the numbers of harbour porpoise associated with an increase in vessel activity during pipeline construction. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.320 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.205 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.205: Conclusions against the conservation objectives of Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities during the construction phase.

Conservation objective	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey

1.7.4.321 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Lundy SAC

Grey seal

1.7.4.322 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.323 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Lundy SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.206 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.206: Conclusions against the conservation objectives of Lundy SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities during the construction phase.

Conservation objective	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, underwater sound in-combination effects as a result of vessels and other activities will not prevent the structure and function of the habitats of qualifying species from being maintained or restored nor prevent the supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored].	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination

Conservation objective	Conclusion
The distribution of qualifying species within the site [are maintained or restored].	with other projects will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.4.324 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Lundy SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Isles of Scilly Complex SAC

Grey seal

1.7.4.325 Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.326 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.207 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.207: Conclusions against the conservation objectives of Isles of Scilly Complex SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities during the construction phase.

Conservation objective	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].**	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, underwater sound in-combination effects as a result of vessels

Conservation objective	Conclusion
The supporting processes on which the habitats of qualifying species rely [are maintained or restored].	and other activities will not prevent the structure and function of the habitats of qualifying species from being maintained or restored nor prevent the supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.4.327 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Isles of Scilly Complex SAC as a result of underwater sound impacts from vessel use and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Sites assessed in line with the iterative approach

1.7.4.328 As outlined in paragraphs 1.7.1.3 to 1.7.1.8, following the iterative approach adopted for this ISAA, the closest European site to the Mona Offshore Wind Project within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this ISAA, are located at a greater distance from the Mona Offshore Wind Project and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.7.4.295 to 0 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.7.4.329 to 1.7.4.351.

West Wales Marine/Gorllewin Cymru Forol SAC

1.7.4.329 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.7.4.330 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph

1.7.4.301 to 1.7.4.303), it can be concluded that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Saltee Islands SAC

1.7.4.331 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.4.301 to 1.7.4.303), it can be concluded that there is no risk of an adverse effect on the integrity of the Saltee Islands SAC as a result of underwater sound vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

1.7.4.332 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Rockabill to Dalkey Island SAC as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

1.7.4.333 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Roaringwater Bay and Islands SAC as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Blasket Islands SAC

1.7.4.334 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Blasket Islands SAC as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.7.4.335 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Abers - Côte des legends SCI

1.7.4.336 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Abers - Côte des legends SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Ouessant-Molène SCI

1.7.4.337 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Ouessant-Molène SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

1.7.4.338 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

1.7.4.339 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Tregor Goëlo SCI

1.7.4.340 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Tregor Goëlo SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côtes de Crozon SCI

1.7.4.341 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Côtes de Crozon SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Chaussée de Sein SCI

1.7.4.342 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Chaussée de Sein SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap Sizun SCI

1.7.4.343 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap Sizun SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Récifs du talus du golfe de Gascogne SCI

1.7.4.344 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Vauville SCI

1.7.4.345 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Vauville SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

1.7.4.346 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Saint-Brieuc – Est SCI

1.7.4.347 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Banc et récifs de Surtainville SCI

1.7.4.348 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.7.4.349 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Estuaire de la Rance SCI

1.7.4.350 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Estuaire de la Rance SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

1.7.4.351 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.296 to 1.7.4.299), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie du Mont Saint-Michel SCI as a result of underwater sound from vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Operations and maintenance phase

1.7.4.352 There is potential for injury and disturbance from underwater sound from vessels and other (non-piling) sound producing activities associated with the Mona Offshore Wind Project during the operations and maintenance phase, to act in-combination with activities associated with other projects/plans listed in Table 1.154.

1.7.4.353 As for the assessment of the Mona Offshore Wind Project alone, the risk of injury in terms of PTS to marine mammal receptors as a result of underwater due to vessel use and other non-piling sound producing activities would be expected to be very low. PTS thresholds would not be exceeded or would be very localised (<10 m) from the source. The assessment for Mona Offshore Wind Project alone (paragraphs 1.7.3.291 to 1.7.3.315 and 1.7.3.394 to 1.7.3.467) found relatively small ranges of effects and therefore the magnitude of the impact with respect to auditory injury occurring in marine mammals has been assessed as low. Given the above, there is very low potential for in-combination impacts for injury from elevated underwater sound due to

vessel use and other (non-piling) sound producing activities. Instead, the in-combination assessment provided below focuses on disturbance only for this impact.

Tier 1

1.7.4.354 Given the temporal overlap of the operations and maintenance of the Mona Offshore Wind Project, together with operations and maintenance phase of Awel y Môr Offshore Wind Farm, West Anglesey Demonstration Zone tidal site and Project Erebus and Twin Hub may lead to in-combination disturbance to marine mammals from vessel use and other (non-piling) sound producing activities.

1.7.4.355 The range of vessel used in operations and maintenance activities will be similar to those employed during the construction phases of in-combination projects although fewer vessels are likely to be involved but over a longer duration. During the operation of Awel y Môr Offshore Wind Farm, it was anticipated that numerous different vessel types would be conducting round trips to and from port and the array area, but only two jack-up vessels and two SOVs would be present at any one time.

1.7.4.356 West Anglesey Demonstration Zone tidal site is located 53.7 km from the Mona Array Area. The MDS for the project anticipated up to two drilling activities, two cable installation activities, two cable protection activities and 16 vessels on site (Morlais, 2019). The maximum predicated impact range for behavioural response across all species was predicted in harbour porpoise for two percussive drilling rigs and cutter-suction dredging as up to 530 m and 580 m, respectively.

1.7.4.357 The MDS for Project Erebus anticipated a maximum of two CTVs on site per day, which would be expected to be stationary or slow moving and were not expected to be a novel impact pathway for marine mammals in the area (Blue Gem Wind, 2020).

1.7.4.358 The White Cross MDS stated vessel movement during the operations and maintenance stage will be to a lesser extent than the construction stage and used a precautionary approach based the potential for effect during the operation and maintenance phase on the construction phase assessment (up to five vessels at any one time).

1.7.4.359 Similarly, Twin Hub does not give a quantification of vessel movement for operations and maintenance stage, however as a precautionary approach disturbance ranges are assumed to be comparable to the Mona Offshore Wind Project however the number of vessels are expected to be much lower given the project design and extent (two floating platforms hosting leaning wind turbines with potential capacity of up to 32 MW).

1.7.4.360 The MDS for the operations and maintenance phase of the Mona Offshore Wind Project is presented in Table 9.15 and assumes up to 21 operations and maintenance vessels on site at any one time. Vessels involved in the operations and maintenance of Awel y Môr Offshore Wind Farm and West Anglesey Demonstration Zone tidal site will include a similar suite of vessels as those described for the Mona Offshore Wind project alone, such as CTVs/workboats, jack-up vessels, cable repair vessels, SOVs and excavators/backhoe dredgers.

1.7.4.361 Therefore, in-combination across the projects there will be an increase in vessel activity within the Celtic and Irish Seas regional area. This represents an uplift from the current baseline, although noting that the assessments are based on the MDS, the number of vessels present at respective projects at any given time will in reality be lower. Additionally, vessel movements will be confined to the array areas and/or offshore cable corridor routes and are likely to follow existing shipping routes to/from port. As such, it would not be realistic to present a simplistic sum of all vessels

anticipated within each offshore wind farm as per respective maximum design scenarios. Introduction of vessels during construction and operational and maintenance phases of the projects will not be a novel impact for marine mammals present in the area and therefore marine mammals are anticipated to demonstrate some degree of tolerance to vessel sounds.

1.7.4.362 The duration of vessel activity is considered to be long term (throughout the operations and maintenance phase of Mona Offshore Wind Project) and localised for each project with vessel movements occurring intermittently over the life time of the Mona Offshore Wind Project. The in-combination number of vessels presented in paragraphs 1.7.4.355 to 1.7.4.360 will be lower for the operations and maintenance phase compared to construction phase (see paragraphs 1.7.4.271 to 1.7.4.294) of Mona Offshore Wind Project. Therefore, the magnitude of the impact for disturbance as a result of elevated underwater sound due to vessel use and other activities, for all marine mammal receptors, is expected to be less than that assessed for the construction phase. However, considering that the duration of the effect will be longer, over the decadal operating lifetime of the project, a precautionary approach has been taken to include the operations and maintenance phase in the assessment.

Tier 2

1.7.4.363 Given the temporal overlap of the operations and maintenance phase of the Mona Offshore Wind Project, together with operations and maintenance phases of tier 1 projects and maintenance phases of the tier 2 projects (i.e. Codling Wind Park Offshore Wind Farm, Dublin Array Offshore Wind Farm, Inis Ealga Marine Energy Park, Llŷr 1, Llŷr 2, Morecambe Offshore Windfarm Generation Assets, Morgan and Morecambe Offshore Windfarms Transmission Assets, Morgan Offshore Wind Project Generation Assets, North Celtic Sea Offshore Wind Farm, North Channel Wind 1, North Channel Wind 2, North Irish Sea Array Offshore Wind Farm, Oriel Windfarm Offshore Wind Farm, Project Ilen, Project Valorous, Shelmalere Offshore Wind Farm and Simply Blue Emerald) may lead to in-combination disturbance to marine mammals from vessel use and other (non-piling) sound producing activities. Timelines of the construction as well as operations and maintenance phases of Oriel Offshore Wind Farm, Morecambe Offshore Wind Farm Generation Assets, Arklow Bank Wind Park Phase 2 and Morgan and Morecambe Offshore Wind Farms: Transmission Assets are unknown. However, it has been conservatively assumed that there will be a temporal overlap with the operations and maintenance phase of the Mona Offshore Wind Project and therefore there is a potential for in-combination effects.

1.7.4.364 Given that EIA Scoping Reports for the projects outlined in paragraph 1.7.4.363 do not provide detailed information about numbers of vessels involved, it is not possible to undertake full, quantitative assessment for this impact. For Morgan Generation Assets, the PEIR is available, and it predicted up to 21 vessels to be present on site at any given time during the operations and maintenance phase.

1.7.4.365 Morgan Generation Assets predicted up to 21 vessels to be present on site at any given time during the operations and maintenance phase. Morecambe Offshore Windfarm Generation Assets predicted the maximum number of vessels at any one time on site is up to 10 vessels during the operations and maintenance phase. Morgan and Morecambe Offshore Wind Farms: Transmission Assets PEIR predicted up to 19 operation and maintenance vessels on site at any one time during the operations and maintenance phase.

1.7.4.366 The range of vessels used in operations and maintenance activities will be similar to those employed during the construction phases of in-combination projects. The

duration of vessel activity is considered to be long term (throughout the operations and maintenance phase of Mona Offshore Wind Project) and localised for each project; however, it should be noted that vessel movements will occur intermittently over the life time of the Mona Offshore Wind Project. The number of vessels present during the operations and maintenance phases of respective projects in isolation is considered to be smaller than for construction phase. Nevertheless, in-combination it could be expected that the total number of vessel movements will exceed the average traffic levels.

1.7.4.367 Qualitatively, the impact would lead to a larger area of disturbance within the regional marine mammals study area (see paragraph 1.7.4.361) compared to Mona Offshore Wind Project alone. Although animals may be disturbed from isolated project areas at different points in time, in the context of the wider habitat available within the Celtic and Irish Seas regional area, the scale of the disturbance effects (which would be localised) is considered to be small.

1.7.4.368 Therefore, the in-combination impact of underwater sound from vessel use and other activities leading to behavioural effects during the operations and maintenance phase is predicted to be of local to regional spatial extent, long term duration, intermittent and the effect of behavioural disturbance is of high reversibility.

Tier 3

1.7.4.369 Tier 3 projects are in a pre-application phase and no Environmental Statement or HRA are available to inform a quantitative assessment. Therefore, a qualitative assessment is provided below.

1.7.4.370 Operation and maintenance activities for cables or offshore wind farms typically involves considerably smaller numbers of vessels and round trips compared to construction. Considering the vessel activity within the Irish Sea, it is anticipated that these will not add substantially to the number of vessels present during the operations and maintenance phases of the Mona Offshore Wind Project, tier 1 and tier 2 projects and that the potential for in-combination effects is unlikely.

1.7.4.371 The in-combination impact is predicted to be of local to regional spatial extent, long term duration, intermittent and both the impact itself (elevated underwater sound due to vessel use and other (non-piling) sound producing activities) and effect of behavioural disturbance is reversible.

North Anglesey Marine/Gogledd Môn Forol SAC

1.7.4.372 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that harbour porpoise could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.373 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.208 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.208: Conclusions against the conservation objectives of North Anglesey Marine/Gogledd Môn Forol SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury within range of the SAC and limited disturbance within the SAC when compared with available foraging habitat, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.374 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

North Channel SAC

1.7.4.375 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that harbour porpoise could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.376 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North Channel SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.209 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.209: Conclusions against the conservation objectives of North Channel SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.377 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

1.7.4.378 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that marine mammals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.379 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.210 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.210: Conclusions against the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not reduce nor likely reduce the natural range of the populations of the qualifying marine mammal species for the foreseeable future.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.380 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Strangford Lough SAC

1.7.4.381 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that harbour seal could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures

including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.382 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Strangford Lough SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in turn below in Table 1.211. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.211: Conclusions against the conservation objectives of the Conclusions against the conservation objectives of the Strangford Lough SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **Maintain and enhance, as appropriate, the harbour seal population.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal population from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.4.383 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Murlough SAC

1.7.4.384 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that harbour seals could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may

act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.385 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Murlough SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.212 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.212: Conclusions against the conservation objectives of the Murlough SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
To maintain (or restore where appropriate) the harbour seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of harbour seal**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal feature from being maintained or restored to favourable condition. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the harbour seal population numbers and distribution from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by harbour seal within the site.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent physical features used by harbour seal within the site from being maintained or enhance.

1.7.4.386 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

1.7.4.387 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that bottlenose dolphin could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may

act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.388 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.213 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.213: Conclusions against the conservation objectives of the Cardigan Bay/Bae Ceredigion SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying marine mammal species.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.389 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

The Maidens SAC

1.7.4.390 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that grey seal could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes

to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.391 Adverse effects on the qualifying Annex II marine mammal species which undermine the conservation objectives of The Maidens SAC will not occur as a result of underwater sound from vessels and other (non-piling) sound producing activities in-combination with other plans/projects. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) are discussed in Table 1.214 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.214: Conclusions against the conservation objectives of The Maidens SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
To maintain (or restore where appropriate) the grey seal feature to favourable condition. **To maintain (and if feasible enhance) population numbers and distribution of grey seal**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the grey seal feature from being maintained or restored to favourable condition. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the grey seal population numbers and distribution from being maintained or enhanced.
Maintain and enhance, as appropriate, physical features used by grey seal within the site.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent physical features used by grey seal within the site from being maintained or enhance.

1.7.4.392 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of The Maidens SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Pembrokeshire Marine/Sir Benfro Forol SAC

1.7.4.393 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that grey seal could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes

to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.394 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.215 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.215: Conclusions against the conservation objectives of the Pembrokeshire Marine/Sir Benfro Forol SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
The population is maintaining itself on a long-term basis as a viable component of its natural habitat. **The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations of the qualifying marine mammal species from being maintained on a long-term basis as a viable component of its natural habitat. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not reduce nor likely reduce for the foreseeable future the natural range of the populations of the qualifying marine mammal species.
The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the presence, abundance, condition and diversity of habitats and species required to support the distribution, abundance and populations dynamics of the populations of the qualifying marine mammal species.

1.7.4.395 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

1.7.4.396 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected

that harbour porpoise could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.397 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.216 turn below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.216: Conclusions against the conservation objectives of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
Harbour porpoise is a viable component of the site. **There is no significant disturbance of the species.**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not hinder the condition of supporting habitats and processes or reduce the availability of prey.

1.7.4.398 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Lundy SAC

1.7.4.399 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that grey seal could tolerate the effects of vessel presence to some extent. The

potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.400 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Lundy SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.217 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.217: Conclusions against the conservation objectives of the Lundy SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, underwater sound as a result of vessels and other activities will not prevent the structure and function of the habitats of qualifying species from being maintained or restored nor prevent the supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.4.401 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Lundy SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Isles of Scilly Complex SAC

1.7.4.402 Any in-combination effects are predicted to be of local to regional spatial extent, intermittent and the effect of behavioural disturbance is of high reversibility with

animals returning to baseline levels soon after vessel use and other activities have ceased. Given the existing levels of vessel activity within the Irish Sea, it is expected that grey seal could tolerate the effects of vessel presence to some extent. The potential impacts of construction will be highly localised, largely restricted to the boundaries of the respective projects, vessels will follow existing shipping routes to/from port and only a small area will be affected when compared to available foraging habitat. Therefore, it is anticipated that the connectivity with suitable foraging grounds and supporting habitats will not be impaired. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project are likely to have measures including a MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.7.4.403 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the Isles of Scilly Complex SAC will not occur as a result of in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.218 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.218: Conclusions against the conservation objectives of the Isles of Scilly Complex SAC from in-combination underwater sound from vessels and other (non-piling) sound producing activities.

Conservation objective	Conclusion
The extent and distribution of habitats of qualifying species [are maintained or restored]. **The structure and function of the habitats of qualifying species [are maintained or restored].** **The supporting processes on which the habitats of qualifying species rely [are maintained or restored].**	There is no pathway for underwater sound in-combination effects from vessels and other activities to result in adverse effects on the habitats of the qualifying species neither on the habitats structure, function and supporting processes. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the extent and distribution of the habitats of qualifying species from being maintained or restored. Similarly, underwater sound as a result of vessels and other activities will not prevent the structure and function of the habitats of qualifying species from being maintained or restored nor prevent the supporting processes of the habitats of qualifying species from being maintained or restored.
The populations of qualifying species [are maintained or restored]. **The distribution of qualifying species within the site [are maintained or restored].**	Given that there is no potential for injury or disturbance within range of the SAC, the existing high level of vessel traffic and that there is likely recovery from disturbance, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the population of the marine mammal qualifying species from being maintained or restored. Similarly, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.7.4.404 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the Isles of Scilly Complex SAC as a result of underwater sound impacts from vessel use and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Sites assessed in line with the iterative approach

1.7.4.405 As outlined in paragraphs 1.7.1.3 to 1.7.1.8, following the iterative approach adopted for this ISAA, the closest European site to the Mona Offshore Wind Project within the relevant MU for each Annex II marine mammal feature has been subject to a full assessment in the sections above. A full assessment has also been undertaken for the SACs located in English and Northern Irish waters. All remaining sites for Annex II marine mammal features, which were screened into this ISAA, are located at a greater distance from the Mona Offshore Wind Project and, on this basis, it is considered that effects on the marine mammal features of these sites would be of similar if not lower magnitude than those concluded for the sites subject to a full assessment. The conclusions of the assessments presented in paragraphs 1.7.4.352 to 1.7.4.404 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.7.4.406 to 1.7.4.428.

West Wales Marine/Gorllewin Cymru Forol SAC

1.7.4.406 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

1.7.4.407 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.4.378 to 1.7.4.380), it can be concluded that there is no risk of an adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Saltee Islands SAC

1.7.4.408 On the basis of the conclusions of the assessments presented for the grey seal features of the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC (paragraph 1.7.4.378 to 1.7.4.380), it can be concluded that there is no risk of an adverse effect on the integrity of the Saltee Islands SAC as a result of underwater sound vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

1.7.4.409 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Rockabill to Dalkey Island SAC as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

1.7.4.410 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Roaringwater Bay and Islands SAC as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Blasket Islands SAC

1.7.4.411 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Blasket Islands SAC as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.7.4.412 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Abers - Côte des legends SCI

1.7.4.413 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Abers - Côte des legends SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Ouessant-Molène SCI

1.7.4.414 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Ouessant-Molène SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

1.7.4.415 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of

underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

1.7.4.416 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Tregor Goëlo SCI

1.7.4.417 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Tregor Goëlo SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Côtes de Crozon SCI

1.7.4.418 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Côtes de Crozon SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Chaussée de Sein SCI

1.7.4.419 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Chaussée de Sein SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap Sizun SCI

1.7.4.420 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap Sizun SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Récifs du talus du golfe de Gascogne SCI

1.7.4.421 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel

SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Vauville SCI

1.7.4.422 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Anse de Vauville SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

1.7.4.423 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Saint-Brieuc – Est SCI

1.7.4.424 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Banc et récifs de Surtainville SCI

1.7.4.425 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.7.4.426 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI as a result of underwater sound from vessels and other

activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Estuaire de la Rance SCI

1.7.4.427 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Estuaire de la Rance SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

1.7.4.428 On the basis of the conclusions of the assessments presented for the harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC and the North Channel SAC (paragraph 1.7.4.372 to 1.7.4.377), it can be concluded that there is no risk of an adverse effect on the integrity of the Baie du Mont Saint-Michel SCI as a result of underwater sound from vessels and other activities with respect to the operations and maintenance of the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination changes in fish and shellfish communities affecting prey availability

1.7.4.429 There is the potential for changes in Annex II marine mammal prey (e.g. fish species) abundance and distribution to arise as a result of construction activities of the Mona Offshore Wind Project in association with the activities of the projects/plans in Table 1.154. Only the North Anglesey Marine/Gogledd Môn Forol SAC has been assessed within this section, as LSE from changes in fish and shellfish communities affecting prey availability was ruled out for all other European sites with Annex II marine mammal features.

1.7.4.430 These activities may physically disturb the seabed, result in increased SSC or generate underwater sound. Potential impacts to prey species may result in changes in the ability/success of marine mammals to forage in the area of the Mona Offshore Wind Project and other project areas. The risk of effects on prey species is expected to be greatest during the construction phase (e.g. due to seabed disturbance and/or underwater sound during construction). Impacts on fish species has been assessed in Volume 2, Chapter 8: Fish and shellfish of the Environmental Statement (Document Reference: F2.3).

1.7.4.431 Information regarding foraging behaviour of Annex II marine mammal species and their responses to changes of prey availabilities is discussed in paragraphs 1.7.3.468 to 1.7.3.483. Whilst there may be some potential for in-combination effects to fish and shellfish communities, these effects will be highly localised and short term and therefore marine mammals are likely to be able to compensate and move to alternative foraging grounds.

Construction phase

Tier 1

1.7.4.432 Given the temporal overlap of the construction of the Mona Offshore Wind Project, together with tier 1 projects (i.e. activities at other offshore wind farms, dredging activities, aggregate extraction activities and cables and pipelines) may lead to in-combination impacts on marine mammals from changes in fish and shellfish communities affecting prey availability as a result of changes to the fish and shellfish communities. The only tier 1 project considered is Awel y Môr Offshore Wind Farm due to the temporal and spatial overlap with the Mona Offshore Wind Project.

1.7.4.433 Potential in-combination impacts from tier 1 projects on marine mammal prey species during the construction phase of the Mona Offshore Wind Project include temporary subtidal habitat loss, long term subtidal habitat loss, injury and disturbance from underwater sound, increased SSC and associated sediment deposition and colonisation of hard structures.

1.7.4.434 The combined temporary habitat loss and disturbance across all tier 1 plans, projects, and activities assessed in the fish and shellfish study area (for more details see Volume 2, Chapter 8: Fish and shellfish of the Environmental Statement (Document Reference: F2.3)) including the Mona Offshore Wind Project, was estimated at a maximum of 166.15 km^2. The temporary habitat loss on fish and shellfish has been assessed to be unlikely to result in changes in fish and shellfish communities affecting prey availability in marine mammals.

1.7.4.435 The planned construction of the tier 1 projects alongside Mona Offshore Wind Project will introduce up to 3.43 km^2 of hard structures which will act to represent a combined long term habitat loss impact. This will act alongside the 2.36 km^2 of hard structures introduced by the Mona Offshore Wind Project to represent a potential in-combination long term habitat loss of up to approximately 4 km^2. Given that the construction phase will take place over four years, colonisation of hard structures may commence within that period and continue throughout the operations and maintenance phase. The long-term habitat loss for fish and shellfish has been assessed as minimal for impacts to prey availability on marine mammals.

1.7.4.436 The construction phase of the Awel y Môr Offshore Wind Farm will have temporal and spatial overlap with the Mona Offshore Wind Project in terms of construction sound and may impact fish and shellfish. During piling at the Awel y Môr Offshore Wind Farm injury and mortality for Group 2 (salmonids and some Scombridae) and 3 (gadoids and eels) fish may occur out to 1,300 m and 8,600 m (if modelled as static receptors), from the Mona Array Area respectively. However, sound modelling with inclusion of moving away response, significantly reduced mortality distances to less than 100 m for all groups. The Awel y Môr Offshore Wind Farm indicated behavioural effects to similar ranges as those predicted for the Mona Offshore Wind Project, at a range of approximately up to tens of kilometres from the piling location at the maximum hammer energies. For fish and shellfish ecology IEFs the cumulative effect was minor adverse significance. For herring, there was no overlap between sound contours from Awel y Môr and key spawning habitats for this species in the Irish Sea, and a minor adverse significance was given in Volume 2, Chapter 3: Fish and shellfish ecology of Environmental Statement for this species. However, Awel y Môr and the Mona Offshore Wind Project sit across areas of mapped high and low intensity cod spawning grounds. As detailed in Volume 2, Chapter 3: Fish and shellfish ecology of Environmental Statement, if piling were to occur concurrently at the two projects, a magnitude of medium was given for cod, leading to a moderate adverse significance.

Since in-combination effects of underwater sound from piling may also lead to changes in the distribution of marine mammals, it is likely that marine mammals will be displaced from the same or greater area as for their prey species.

1.7.4.437 Seabed preparation and installation of foundations and cables for the Mona Offshore Wind Project alongside tier 1 projects may increase SSC and associated sediment deposition. As discussed in detail Volume 2, Chapter 8: Fish and shellfish of the Environmental Statement (Document Reference: F2.3), resultant plumes from aggregate extraction or dredging would be advected on the tidal currents, travel in parallel, and not towards one another, and are unlikely to interact. Given that the Mona Offshore Cable Corridor and Access Areas runs adjacent to Awel y Môr array area, interaction of SSC plumes on spring tide events may occur should trenching activities be undertaken simultaneously, although this is unlikely. The in-combination effect on fish and shellfish receptors as a result of SSC was assessed as unlikely to impact marine mammals.

1.7.4.438 The temporal overlap between tier 1 projects will result in a combined increase in the introduction of similar new hard structures. Potential adverse/beneficial effects on fish and shellfish would be localised due to the relatively small area of new hard structures introduced during this phase. Marine mammals are likely to benefit from locally increased food availability and/or shelter and therefore have the potential to be attracted to forage within tier 1 offshore wind project array areas. Some increased foraging activities could benefit prey availability for marine mammals although this is unlikely to be at a scale that is measurable in terms of the populations within the wider region.

1.7.4.439 No significant adverse cumulative effects were predicted to occur to most fish and shellfish species (marine mammal prey) as a result of the construction of the Mona Offshore Wind Project in combination with tier 1 projects (Volume 2, Chapter 3: Fish and shellfish ecology of the Environmental Statement (Document Reference: F2.3)). For cod, there was a moderate adverse cumulative effect from underwater sound, noting it is proposed to manage and reduce the effect of this impact through establishment of an Underwater sound management strategy post-consent. For the project alone, all marine mammals in this assessment are considered to be generalist opportunistic feeders and are thus not reliant on a single prey species. Therefore, changes in prey availability on marine mammals were predicted to be of local spatial extent, medium-term duration, intermittent/continuous and high reversibility.

Tier 2

1.7.4.440 Given the temporal overlap of the construction of the Mona Offshore Wind Project, together with tier 1 and tier 2 projects (i.e. activities at Morgan Generation Assets, Morecombe Offshore Wind Farm Generation Assets and Transmission Assets) may lead to in-combination impacts on marine mammals from changes in fish and shellfish communities affecting prey availability as a result of changes to the fish and shellfish communities.

1.7.4.441 Potential in-combination effects from tier 2 projects on marine mammal prey species during the construction phase of the Mona Offshore Wind Project include temporary subtidal habitat loss, long term subtidal habitat loss, injury and disturbance from underwater sound, increased SSC and associated sediment deposition and colonisation of hard structures.

1.7.4.442 The temporary habitat disturbance and long term habitat loss predicted to result from the Morgan Generation Assets during construction phase is up to 85.54 km^2 and

1.52 km^2, respectively (Morgan Offshore Wind Project Ltd, 2023). The area available for colonisation for Morgan Generation Assets was estimated at up to 1.99 km^2 (Morgan Offshore Wind Project Ltd, 2023). The increases in SSC and sediment deposition predicted to result from the Morgan Generation Assets similar to those reported for Mona Offshore Wind Project.

1.7.4.443 For Morecambe Offshore Windfarm Generation Assets and Morgan and Morecambe Offshore Wind Farms: Transmission Assets projects, temporary habitat loss is likely to result from site preparation activities in advance of installation activities, cable installation activities and placement of spud-can legs from jack-up operations. Installation of foundation structures, associated scour protection and cable protection is likely to result in long term habitat loss and provide a hard substrate for colonisation. The temporary habitat disturbance/loss predicted to result from the Morecambe Offshore Windfarm Generation Assets is up to 3.46 km^2 (Morecambe Offshore Windfarm Ltd., 2023). Increased SSC and sediment deposition is likely to occur from site preparation activities including sandwave clearance, drilling for foundation installation, and cable installation and burial activities.

1.7.4.444 As assessed for tier 1 projects in paragraph 1.7.4.432 to 1.7.4.438, with respect to indirect effects on marine mammals, no additional in-combination effects other than those assessed for injury and disturbance to marine mammals as a result of elevated underwater sound during piling are predicted. This is because if prey are disturbed from an area as a result of underwater sound, it is assumed that marine mammals are likely to be disturbed from the same or greater area, and so any changes to the distribution of prey resources would not affect marine mammals as they would already be disturbed from the same (or larger) area.

Tier 3

1.7.4.445 Given the temporal overlap of the construction of the Mona Offshore Wind Project, together with tier 1 and tier 2 projects as well as the tier 3 project, MaresConnect Wales-Ireland Interconnector Cable, activities may lead to in-combination impacts on marine mammals from changes in fish and shellfish communities affecting prey availability as a result of changes to the fish and shellfish communities.

1.7.4.446 Potential in-combination effects from tier 3 project on marine mammal prey species during the construction phase of the Mona Offshore Wind Project include temporary subtidal habitat loss, long term subtidal habitat loss, increased SSC and associated sediment deposition and colonisation of hard structures.

1.7.4.447 The laying and burying of the MaresConnect Interconnector cable may involve introduction of cable protection (assumed as maximum design scenario) which will represent long term habitat loss and will likely follow standard jet trenching and cable protection installation, causing temporary habitat disturbance, although technical specifications will only be released at later development stages. Although no exact specifications are publicly available for the area for potential colonisation, it is expected that the cable protection will only represent a small increase of introduced hard structures and so will have only a minor cumulative impact. The likely jet trenching activities for the laying and burying of the cables for both projects will run concurrently and interaction of SSC plumes on spring tide events may occur. However, given the project is predicted to be operational in 2026, there is unlikely to be any overlap with Mona Offshore Wind Project construction phase and therefore there is a no potential for in-combination effects on marine mammal prey species.

1.7.4.448 These localised and temporary changes in fish and shellfish communities affecting prey availability are considered in the context of the wider foraging habitat available for marine mammals. Therefore, the in-combination impact of changes in prey availabilities on marine mammals is predicted to be of local spatial extent, medium term duration, intermittent and the effect on marine mammals is of high reversibility.

North Anglesey Marine/Gogledd Môn Forol SAC

Conclusions

1.7.4.449 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the SAC will not occur as a result of in-combination changes in fish and shellfish communities affecting prey availability. An assessment of the impact against each relevant conservation objective (as presented in section 1.7.2) is discussed in Table 1.219 below.

Table 1.219: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for in-combination changes in fish and shellfish communities affecting prey availability.

Conservation objective	Conclusion
Harbour porpoise is a viable component of the site.	Any in-combination effects are predicted to be of local to regional spatial extent, medium term duration, intermittent and the effect of behavioural disturbance is of high reversibility. The Annex II marine mammal features of the SAC prey on a wide variety of fish species and therefore are likely to be able to adapt to a minor shift in availability of some prey items and are known to forage over wide areas and exploit a range of prey species. Therefore, whilst there may be some potential in-combination effects to fish and shellfish communities, these effects will be highly localised and short term and therefore marine mammals are likely to be able to compensate and move to alternative foraging grounds. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project will also have mitigation measures which will further reduce the potential for in-combination effects on prey availability. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Mona Offshore Wind Project in-combination with other projects will not affect the survivability and reproductive potential of harbour porpoise using the designated site and harbour porpoise will remain a viable component of the site.
There is no significant disturbance of the species.	Harbour porpoise may experience behavioural effects in response to change in prey availability in the vicinity of the Mona Offshore Wind Project boundaries, however impacts to prey species are predicted to be localised, short term and intermittent, and harbour porpoise are expected to adapt and recover quickly. As such there is a negligible risk of disruption of foraging activities of harbour porpoise. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Mona Offshore Wind Project will not significantly disturb the species.
The condition of supporting habitats and processes, and the availability of prey is maintained.	There is no pathway for changes in fish and shellfish communities affecting prey availability to result in adverse effects on the habitats of the qualifying species and there are no adverse effects expected for fish and shellfish species. Therefore, changes in fish and shellfish communities affecting prey availability associated with the Mona Offshore Wind Project will not prevent the condition of habitats and their processes and the availability of prey from being maintained.

1.7.4.450 Therefore, it can be concluded beyond reasonable scientific doubt that there is no risk of an adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of changes in fish and shellfish communities affecting prey availability from the Mona Offshore Wind Project in-combination with other plans/projects.

1.8 Summary

1.8.1 Effects on site integrity

1.8.1.1 Table 1.220 presents the conclusions of Adverse Effects on Integrity in relation to the Mona Offshore Wind Project alone and in-combination with other plans and projects.

Table 1.220: Summary of conclusions.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC	Reefs Sandbanks which are slightly covered by seawater all the time	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor and Access Areas only) • Increased risk of introduction and spread of invasive non-native species • Accidental pollution • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor and Access Areas only) • Increased risk of introduction and spread of invasive non-native species • Changes in physical processes • EMF • Accidental pollution • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Decommissioning phase	• Changes in physical processes • Removal of hard substrates	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
Dee Estuary/Aber Dyfrdwy SAC	Sea lamprey River lamprey	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• EMF • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC	Atlantic salmon *Salmo salar* Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• EMF • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
River Ehen SAC	Atlantic salmon *Salmo salar* Freshwater pearl mussel *Margaritifera margaritifera*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• EMF • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
River Eden SAC	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
	Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis*	Operations and maintenance	• EMF • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• EMF • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
River Derwent and Bassenthwaite SAC	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis*	Operations and maintenance	• EMF • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Solway Firth SAC	Sea lamprey *Petromyzon marinus*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
	River lamprey *Lampetra fluviatilis*	Operations and maintenance	• EMF • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
River Kent SAC	Freshwater pearl mussel *Margaritifera margaritifera*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• EMF • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
River Bladnoch SAC	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• EMF • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Afon Gywrfai a Llyn Cwellyn SAC	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound impacting fish and shellfish receptors • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• EMF • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
North Anglesey Marine/Gogledd Môn Forol SAC	Harbour Porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
			• Changes in fish and shellfish communities affecting prey availability (construction only) • In-combination effects.		
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
North Channel SAC	Harbour Porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC	Bottlenose dolphin *Tursiops truncatus* Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
West Wales Marine/Gorllewin Cymru Forol SAC	Harbour Porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Cardigan Bay/Bae Ceredigion SAC	Bottlenose Dolphin *Tursiops truncatus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Pembrokeshire Marine/Sir Benfro Forol SAC	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Bristol Channel Approaches SAC	Harbour Porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
			• Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.		
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Isles of Scilly Complex SAC	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Lundy SAC	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
			• In-combination effects.		
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
The Maidens SAC	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Strangford Lough SAC	Harbour seal *Phoca vitulina*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
			• In-combination effects.		
Murlough SAC	Harbour seal *Phoca vitulina*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Rockabill to Dalkey Island SAC	Harbour Porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Roaringwater Bay and Islands SAC	Harbour Porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
			• Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.		
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Blasket Islands SAC	Harbour Porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
Saltee Islands SAC	Grey seal *Halichoerus grypus*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

European Site	Relevant qualifying features	Project phase	Impact	Conclusion – Mona Offshore Wind Project alone	Conclusion – Mona Offshore Wind Project in-combination with other plans and projects
			• Underwater sound from vessels and other vessel activities • In-combination effects.		
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
17 French Sites	Harbour Porpoise *Phocoena phocoena*	Construction/decommissioning	• Underwater sound from piling • Underwater sound from clearance of UXO • Underwater sound from pre-construction site surveys • Underwater sound from vessels and other vessel activities • In-combination effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

1.9 References

Aarfjord, H., Bjørge, A., Kinze, C.C. and Lindstedt, I. (1995) Diet of the harbour porpoise *Phocena phocoena* in Scandinavian waters. Report of the International Whaling Commission, Special Issue Series 16, 211-222.

ABPmer (2014). Habitats Regulations Appraisal for the Wave and Tidal Further Leasing. Reports for The Crown Estate, ABP Marine Environmental Research Ltd, Report No: R.2160a-c. April 2014.

Aberkali, H.B. and Trueman, E.R. (1985) Effects of environmental stress on marine bivalve molluscs. Advances in Marine Biology, 22, pp. 101-198.

Andersen, S.M., Teilmann, J., Dietz, R., Schmidt, N.M., Miller, L.A. (2012) Behavioural responses of harbour seals to human-induced disturbances. Aquat. Conserv. Mar. Freshwat. Ecosyst. 22, 113–121.

Anderwald, P., Brandecker, A., Coleman, M., Collins, C., Denniston, H., Haberlin, M. D., O'Donovan, M., Pinfield, R., Visser, F., and Walshe, L. (2013). Displacement responses of a mysticete, an odontocete, and a phocid seal to construction related vessel traffic. Endangered Species Research, 21(3). Available: https://doi.org/10.3354/esr00523. Accessed: November 2023.

Bagocius, D. (2015) Piling underwater noise impact on migrating salmon fishing during Lithuanian LNG terminal construction (Curonian Lagoon, Eastern Baltic Sea Coast). Marine Pollution Bulletin, 92(1-2), 45-51, https://doi.org/10.1016/j.marpolbul.2015.01.002. Accessed: November 2023.

Bailey, H., Hammond, P. and Thompson, P. (2014). Modelling harbour seal habitat by combining data from multiple tracking. Journal of Experimental Marine Biology and Ecology, 450, 30–39.

Baines, M.E., Earl, S.J., Pierpoint, C.J.L. and Poole, J. (1995). The west Wales grey seal census. CCW Contract Science Report No. 131. Countryside Council for Wales, Bangor.

Baines, M.E. and Evans, P.G.H (2012) Atlas of the Marine Mammals of Wales. CCW Monitoring Report No. 68. 2nd edition. 139pp.

Bell, J.J., McGrath, E., Biggerstaff, A., Bates, T., Bennett, H., Marlow, J. and Shaffer, M. (2015) Sediment impacts on marine sponges. Marine Pollution Bulletin, 94 (1), pp. 5-13.

Benhemma-Le Gall, A., Graham, I.M., Merchant, N.D., Thompson, P. M. (2021). Broad-Scale Responses of Harbour Porpoises to Pile-Driving and Vessel Activities During Offshore Windfarm Construction. Frontiers in Marine Science, 8.

Berghahn, R. and Offermann, U. (1999) Laboratory investigations on larval development, motility Associated British Ports (2017) Record of Likely Significant Effect, Available: View application and documents - MCMS (marinemanagement.org.uk), Accessed: September 2023.

Berli, B.I., Gilbert, M.J.H., Ralph, A.L., Tierney, K.B., and Burkhardt-Holm, P. (2014) Acute exposure to a common suspended sediment affects the swimming performance and physiology of juvenile salmonids. Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology, 176, pp. 1-10. Available: https://doi.org/10.1016/j.cbpa.2014.03.013. Accessed: November 2023.

Bisson, P.A., and Bilby, R.E. (1982) Avoidance of Suspended Sediment by Juvenile Coho Salmon. North American Journal of Fisheries Management, 2(4), pp. 371-4, Available: https://doi.org/10.1577/1548-8659(1982)2<371:AOSSBJ>2.0.CO;2. Accessed: November 2023.

Blue Gem Wind (2020) Project Erebus Environmental Statement, Chapter 12: Marine Mammals. Available: https://www.bluegemwind.com/wp-content/uploads/2020/07/Erebus-ES-Vol-1-Chapter-12-Marine-Mammals_final.pdf Accessed: November 2023.

Blundell, G. M., and Pendleton, G. W. (2015). Factors Affecting Haul-Out Behavior of Harbor Seals (*Phoca vitulina*) in Tidewater Glacier Inlets in Alaska: Can Tourism Vessels and Seals Coexist? Available: https://doi.org/10.1371/journal.pone.0125486. Accessed: November 2023.

Bodznick, D. and Northcutt, R.G. (1981) Electroreception in Lampreys: Evidence that the Earliest Vertebrates were Electroreceptive. Science, 212, 465-67.

Bodznick, D. and Preston, D.G. (1983) Physiological Characterization of Electroreceptors in the Lampreys. Ichthyomyzon uniscuspis and Petromyzon marinus. Journal of Comparative Physiology 152, 209-17.

Boström, K. and Valdes, S. (1969). Arsenic in ocean floors. Lithos, 2(2), pp.351–360.

Boubee, J.A.T., Dean, T.L., West, D.W., and Barrier, R.F.G. (1996) Avoidance of suspended sediment by the juvenile migratory stage of six New Zealand native fish species. New Zealand Journal of Marine and Freshwater Research, 31(1), pp. 61-9, https://doi.org/10.1080/00288330.1997.9516745. Accessed: November 2023.

Brandt, M. J., Dragon, A. C., Diederichs, A., Bellmann, M. A., Wahl, V., Piper, W., & Nehls, G. (2018) Disturbance of harbour porpoises during construction of the first seven offshore wind farms in Germany. Marine Ecology Progress Series, 596, 213–232. https://doi.org/10.3354/ meps12560.

Bryan, G.W. (1984) Pollution due to heavy metals and their compounds. In Marine Ecology: A Comprehensive, Integrated Treatise on Life in the Oceans and Coastal Waters, vol. 5. Ocean Management, part 3, (ed. O. Kinne), pp.1289-1431. New York: John Wiley & Sons.

Bryan, G.W. (1984) Pollution due to heavy metals and their compounds. In Marine Ecology: A Comprehensive, Integrated Treatise on Life in the Oceans and Coastal Waters, vol. 5. Ocean Management, part 3, (ed. O. Kinne), pp.1289-1431. New York: John Wiley & Sons.

Burd, F.(1989). The Saltmarsh survey of Great Britain: an inventory of British saltmarshes. Research and Survey in Nature Conservation Report No. 17. Peterborough: Joint Nature Conservation Committee.

Carter M. I. D., Boehme L., Cronin M. A., Duck C. D., Grecian W. J., Hastie G. D., Jessopp M., Matthiopoulos J., McConnell B. J., Miller D. L., Morris C. D., Moss S. E. W., Thompson D., Thompson P. M., Russell D. J. F. (2022) Sympatric Seals, Satellite Tracking and Protected Areas: Habitat-Based Distribution Estimates for Conservation and Management. Frontiers in Marine Science, 9:875869.

Chapman, C. and Tyldesley, D. (2016). Functional linkage: How areas that are functionally linked to European sites have been considered when they may be affected by plans and projects - a review of authoritative decisions: Natural England Commissioned Report.

Chiasson, A.G. (2011) The effects of suspended sediment on rainbow smelt (Osmerus mordax): A laboratory investigation. Canadian Journal of Zoology, 71(12), pp. 2419-24, DOI:10.1139/z93-337. Accessed: November 2023.

Chung-Davidson., Y., Bryan, M.B., Teeter, J., Bedore, C.N., and Li, W. (2008) Neuroendocrine and Behavioural Responses to Weak Electric Fields in Adult Sea Lampreys (Petromyzon marinus). Hormones and Behaviour, 54(1), 34-40.

Codling Wind Park Limited. (2020) Codling Wind Park, CWP-CWP-02-REP-00023-Offshore Scoping Report. Available at https://www.wexfordcoco.ie/sites/default/files/content/CWP-Offshore-EIA-Scoping-Report_0.pdf. Accessed: November 2023.

Coleman, R.A., Hoskin, M.G., von Carlshausen, E. and Davis, C.M. (2013) Using a no-take zone to assess the impacts of fishing: Sessile epifauna appear insensitive to environmental disturbances from commercial potting. Journal of Experimental Marine Biology and Ecology, 440, pp. 100-107.

Countryside Council for Wales (2006) Phase 1 Intertidal Dataset (unpublished).

Countryside Council for Wales (2008) Core management plan including conservation objectives for the Afon Gwyrfai a Llyn Cwellyn SAC. Available at: https://naturalresources.wales/media/670697/Afon%20Gwyrfai%20a%20Llyn%20Cwellyn%20management%20%20Plan%20_English_.pdf Accessed: November 2023.

Countryside Council Wales (CCW) (2012) Y Fenai a Bae Conwy/Menai Strait and Conwy Bay European Marine Site, Available at: https://naturalresources.wales/media/673892/Y%20Fenai%20a%20Bay%20Conwy%20R33%20Advice%20Feb%202009%20English.pdf, Accessed: November 2023.

Cramp, S. and Simmons, K.E.L. (1977) The Birds of the Western Palearctic, Vol. 1. Oxford: Oxford University Press

CSA Ocean Sciences Inc. and Exponent. 2019. Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Headquarters, Sterling, VA. OCS Study BOEM 2019-049. 59 pp.

Culloch, R.M., Anderwald, P., Brandecker, A. and Haberlin, D. (2016). Effect of construction-related activities and vessel traffic on marine mammals. Mar Ecol Prog Ser 549:231-242.

Culloch, R, Horne, N. and Kregting, L. (2018). A review of Northern Ireland seal count data 1992-2017: Investigating population trends and recommendations for future monitoring. School of Natural and Built Environment, Queen's University Belfast Marine Laboratory. A report prepared for NIEA.

DAERA (2017) THE MAIDENS SAC UK0030384 CONSERVATION OBJECTIVES. Available at: Maidens SAC conservation objectives 2017 (daera-ni.gov.uk). Accessed: 30 November 2022.

DAERA (2018a) STRANGFORD LOUGH SAC UK0016618 CONSERVATION OBJECTIVES Available: https://www.daera-ni.gov.uk/sites/default/files/publications/doe/Strangford%20Lough%20sAC%20Conservation%20Objectives%202018_.pdf Accessed: November 2023.

DAERA (2018b) MURLOUGH SAC UK0016612 CONSERVATION OBJECTIVES. Available at: Murlough SAC Conservation Objectives 2015 (daera-ni.gov.uk) Accessed: 29 November 2022

DAERA (2019) Condition Assessment 2019. Strangford Lough Subtidal Special Area if Conservation (SAC) Available at: DAERA report - Strangford Lough subtidal Special Area of Conservation (SAC) Condition Assessment 2019 - V2.0 January 2022 - Web.pdf (daera-ni.gov.uk) Accessed: November 2023.

Dahne M. Tougaard, J., Carstensen, J., Rose, A. and Nabe-Nielsen, J. (2017) Bubble curtains attenuate noise from offshore wind farm construction and reduce temporary habitat loss for harbour porpoises. Marine Ecology Progress Series 580:221-237

Damseaux, F., Siebert, U., Pomeroy, P., Lepoint, G. and Das, K. (2021). Habitat and resource segregation of two sympatric seals in the North Sea. Science of The Total Environment, Volume 764, 142842, ISSN 0048-9697.

Dargie, T. (2001). NVC survey of the saltmarsh and other habitats in the Dee & Clwyd Estuaries 2000. CCW Science Report No. 450. Bangor: Countryside Council for Wales.

Department for Environment, Food and Rural Affairs (DEFRA) (2021). Policy Paper - Changes to the Habitats Regulations 2017. Available: https://www.gov.uk/government/publications/changes-to-the-habitats-regulations-2017/changes-to-the-habitats-regulations-2017. Accessed: November 2023.

Desprez, M. (2000) Physical and biological impact of marine aggregate extraction along the French coast of the Eastern English Channel: short- and long-term post-dredging restoration. ICES Journal of Marine Science, 57 (5), 1428-1438.

Dierschke, V., Furness, R.W., Gray, C.E., Petersen, I.K., Schmutz, J., Zydelis, R. and Daunt, F. (2017) Possible Behavioural, Energetic and Demographic Effects of Displacement of Red-throated Divers. JNCC Report No. 605. JNCC, Peterborough.

Duck, C.D. 1996. Chapter 5.14 Seals. In: Coasts and seas of the United Kingdom. Region 11 The Western Approaches: Falmouth Bay to Kenfig, ed. By J.H. Barne, C.F. Robson, S.S. Kaznowska, J.P. Doody, N.C. Davidson & A.L. Buck, 146-148. Peterborough, Joint Nature Conservation Committee. (Coastal Directory Series).Dyndo, M., Wiśniewska, D. M., Rojano-Doñate, L. and

Duck, C., and C. Morris. (2019) Aerial thermal-imaging surveys of Harbour and Grey Seals in Northern Ireland, August 2018. Report for the Department of Agriculture, Environment and Rural Affairs, Northern Ireland.

EC (2021) Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission Notice Brussels C(2021) 6913 final.

Eirgrid Group (2015) North-South 400 kV Interconnection Development Environmental Impact Statement Volume 3B, Available at: https://www.eirgridgroup.com/app-sites/nsip/docs/en/environmental-documents/volume-3b/main-doc/Volume %203B %20Chapter %208 %20Electric %20and %20Magnetic %20Fields %20(EMF).pdf, Accessed: November 2023.

Emerald Floating Wind. (2023). Emerald Floating Windfarm EIA Scoping Report Reference: 284926-00. Available at: Emerald-EIA-Scoping-Report.pdf (emeraldfloatingwind.com) . Accessed on: September 2023.

EMU (2004) Subsea Cable Decommissioning – A Limited Environmental Appraisal. Report commissioned by British Telecommunications plc, Cable and Wireless and AT&T, Report no. 04/J/01/06/0648/0415

Evans, P.G.H. and Waggitt, J.J. (2023) Modelled Distribution and Abundance of Cetaceans and Seabirds in Wales and Surrounding Waters. NRW Evidence Report, Report No: 646, 354 pp. Natural Resources Wales, Bangor

Feingold D, Evans P (2014) Bottlenose Dolphin and Harbour Porpoise Monitoring in Cardigan Bay and Pen Llŷn a'r Sarnau Special Areas of Conservation 2011 - 2013. NRW Evidence Report Series No 5. Natural Resources Wales, Bangor. Available at: https://naturalresources.wales/evidence-and-data/research-and-reports/marine-reports/marine-and-coastal-evidence-reports/?lang=en Accessed: November 2023.

Ferns, P.N. (1984) Birds of the British Channel and Severn Estuary. Mar. Pollution Bull. 15: 76–81.

Floventis Energy Ltd. (2022) Llyr Floating Offshore Wind Project Scoping Report Volume 1 – The Proposed Project

Fouda, L., Wingfield, J. E., Fandel, A. D., Garrod, A., Hodge, K. B., Rice, A. N., and Bailey, H. (2018). Dolphins simplify their vocal calls in response to increased ambient noise. Biology Letters, 14(10). Available: https://doi.org/10.1098/RSBL.2018.0484. Accessed: November 2023.

Garthe, S. and Hüppop, O. (2004) Scaling possible adverse effects of marine wind farms on seabirds: developing and applying a vulnerability index. Journal of Applied Ecology 41: 724-734.

GEIST, J. and Auerswald, K. (2007) Physicochemical stream bed characteristics and recruitment of the freshwater pearl mussel (margaritifera margaritifera)', Freshwater Biology.

Gerrodette, T. and Flechsig, A. (1979) Sediment-induced reduction in the pumping rate of the tropical sponge Verongia lacunosa. Marine Biology, 55 (2), pp. 103-110.

Gill, A. B., Gloyne-Phillips, I., Neal, K. J. and Kimber, J. A. (2005) The Potential Effects of Electromagnetic Fields Generated by Sub-Sea Power Cables Associated with Offshore Wind Farm

Developments on Electrically and Magnetically Sensitive Marine Organisms – A Review. COWRIE 1.5 Electromagnetic Fields Review.

Gill, A.B., Huang, Y., Gloyne-Philips, I., Metcalfe, J., Quayle, V., Spencer, J. and Wearmouth, V. (2009) COWRIE 2.0 Electromagnetic Fields (EMF) Phase 2: EMF-Sensitive Fish Response to EM Emissions from Sub-Sea Electricity Cables of the Type used by the Offshore Renewable Energy Industry. COWRIE-EMF-1-06.

Gill, A.B., and Bartlett, M. (2010) Literature review on the potential effects of electromagnetic fields and subsea noise from marine renewable energy developments on Atlantic salmon, sea trout and European eel. Scottish Natural Heritage Commissioned Report No.401.

Gill, A.B., Bartlett, M., and Thomsen, F. (2012) Potential interactions between diadromous fishes of UK conservation importance and the electromagnetic fields and subsea noise from marine renewable energy developments. Journal of Fish Biology, 81, pp. 664-695.

GoBe (2022) Awel y Môr offshore wind farm. Report 5.2: Report to Inform Appropriate Assessment. Accessed: November 2023.

Gosch, M. (2017). The diet of the grey seal [*Halichoerus grypus* (Fabricius, 1791)] in Ireland and potential interactions with commercial fisheries. PhD Thesis, University College Cork.

Guse, N., Garthe, S. and Schirmeister, B. (2009) Diet of red-throated divers Gavia stellata reflects the seasonal availability of Atlantic herring *Clupea harengus* in the southwestern Baltic Sea. Journal of Sea Research, 62, 268-275.

Graham, I. M., Merchant, N. D., Farcas, A., Barton, T. R., Cheney, B., Bono, S., & Thompson, P. M. (2019). Harbour porpoise responses to pile-driving diminish over time. Royal Society Open Science, 6(6), 190335.

Hammond, P.S., Gordon, J.D.D., Grellier, K., Hall, A.J., Northrridge, S.P., Thompson, D., and Harwood, J. (2001). Strategic Environmental Assessment (SEA2) – Technical Report 006 – Marine Mammals. Produced by the Scottish Marine Research Unit (SMRU) on behalf of the Department for Trade and Industry (Dti), August 2001.

Harding, H., Bruintjes, R., Radford, A. N., and Simpson, S. D., (2016). Measurement of Hearing in the Atlantic salmon (Salmo salar) using Auditory Evoked Potentials, and effects of Pile Driving Playback on salmon Behaviour and Physiology. Marine Scotland Science; Scottish Marine and Freshwater Science, 7: 46–47.

Harding, H., Bruintjes, R., Radford, A. N., and Simpson, S. D., (2016). Measurement of Hearing in the Atlantic salmon (*Salmo salar*) using Auditory Evoked Potentials, and effects of Pile Driving Playback on salmon Behaviour and Physiology. Marine Scotland Science; Scottish Marine and Freshwater Science, 7, 46–47.

Hastie, G. D., Lepper, P., Mcknight, | J Chris, Milne, R., Russell, D. J. F., and Thompson, D. (2021). Acoustic risk balancing by marine mammals: anthropogenic noise can influence the foraging decisions by seals. J Appl Ecol, 58, 1854–1863. Available: https://doi.org/10.1111/1365-2664.13931. Accessed: November 2023.

Hastie, G.D., Donovan, C., Götz, T. and Janik, V.M. (2014). Behavioral responses by grey seals (Halichoerus grypus) to high frequency sonar. Marine pollution bulletin, 79(1-2), 205-210.

Hayes, M. P. and Gough, P. T. (1992). Broad-band synthetic aperture sonar. IEEE Journal of Oceanic engineering, 17(1), 80-94.

Heiler, J., Elwen, S. H., Kriesell, H. J., and Gridley, T. (2016). Changes in bottlenose dolphin whistle parameters related to vessel presence, surface behaviour and group composition. Animal Behaviour, 117, 167–177. Available: https://doi.org/10.1016/j.anbehav.2016.04.014. Accessed: November 2023.

Heinänen, S. and Skov, H. (2015) The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area. Joint Nature Conservation Committee.

Henderson, P. 2003. Background information on species of shad and lamprey. London: Pisces Conservation Ltd.

Henry, E., and Hammill, M. O. (2001). Impact of small boats on the haul out activity of harbour seals (*Phoca vitulina*) in Métis Bay, Saint Lawrence Estuary, Québec, Canada. Aquatic Mammals, 27(2), 140–148.

Heinis, F., C. de Jong, S. von Benda-Beckmann, and B. Binnerts (2019) Framework for Assessing Ecological and Cumulative Effects–2018 Cumulative effects of offshore wind farm construction on harbour porpoises. Rijkwaterstaat Sea and Delta.

Holt, R.H.F. and Cordingley, A. (2011) Eradication of the non-native carpet ascidian (Sea squirt) Didemnum vexillum in Holyhead Harbour: Progress, methods and results to spring 2011. CCW Marine Monitoring Report. 90.

Huang, Y. (2005) Electromagnetic Simulations of 135- kV Three phase Submarine Power Cables. Centre for Marine and Coastal Studies, Ltd. Prepared for Sweden Offshore.

Humphreys, E.M., Cook, A.S.C.P. and Burton, N.H.K. (2015). Collision, Displacement and Barrier Effect Concept Note. BTO Research Report No.669.

Hutchison, Z.L., P. Sigray, H. He, A.B. Gill, J. King, and C. Gibson. (2018) Electromagnetic Field (EMF) Impacts on Elasmobranch (shark, rays, and skates) and American Lobster Movement and Migration from Direct Current Cables. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. OCS Study BOEM 2018-003.

Hvidt, C. B., Bech, M., and Klaustrup, M. (2003) Monitoring programme-status report 2003. Fish at the cable trace. Nysted offshore wind farm at Rødsand. Bioconsult.

IAMMWG (2021) Updated abundance estimates for cetacean Management Units in UK waters (Revised March 2022) Available at: https://hub.jncc.gov.uk/assets/3a401204-aa46-43c8-85b8-5ae42cdd7ff3 Accessed: November 2023.

IAMMWG. (2015). Management Units for cetaceans in UK waters. JNCC Report 547, ISSN 0963-8091. Available at: https://hub.jncc.gov.uk/assets/f07fe770-e9a3-418d-af2c-44002a3f2872 Accessed: November 2023.

Inis Ealga Marine Energy Park Ltd. (2022) EIAR Scoping Report

Institute of Environmental Management and Assessment (IEMA) (2016) Environmental Impact Assessment Guide to: Delivering Quality Development. IEMA, St Nicholas House, 70 Newport, Lincoln.

Irving, R, Haynes, T, Bell, G, Saunders, R and Williams J (2014) arine Strategy Framework Directive Shallow Sublittoral Rock Indicators for Fragile Sponge and Anthozoan Assemblages Part 1: Developing Proposals for Potential Indicators. JNCC Report No. 524, Nature Bureau and Environment Systems Ltd. for JNCC, JNCC Peterborough.

IWC (2006). 58th Annual Meeting of the International Whaling Commission. Ship strikes working group. First progress report to the conservation committee. Report No. IWC/58CC3.

Jensen, S. K., Aars, J., Lydersen, · C, Kovacs, · K M, and Åsbakk, · K. (2010). The prevalence of Toxoplasma gondii in polar bears and their marine mammal prey: evidence for a marine transmission pathway? Polar Biol, 33, 599–606. Available: https://doi.org/10.1007/s00300-009-0735-x. Accessed: November 2023.

JNCC (2010a) Statutory nature conservation agency protocol for minimising the risk of injury to marine mammals from piling noise. August 2010. Available: Statutory nature conservation agency

protocol for minimising the risk of injury to marine mammals from piling noise (jncc.gov.uk). Available: https://data.jncc.gov.uk/data/31662b6a-19ed-4918-9fab-8fbcff752046/JNCC-CNCB-Piling-protocol-August2010-Web.pdf Accessed: November 2023.

JNCC (2010b). JNCC guidelines for minimising the risk of injury to marine mammals from using explosives. Joint Nature Conservation Committee, Aberdeen, UK

JNCC (2015a) NATURA 2000 STANDARD DATA FORM: Lundy SAC UK0013114. Available at: UK0013114.pdf (jncc.gov.uk). Accessed: November 2023.

JNCC (2015b) NATURA 2000 STANDARD DATA FORM: Isles of Scilly Complex UK0013694. Available at: UK0013694.pdf (jncc.gov.uk). Accessed: November 2023.

JNCC (2016) Irish Sea Front Potential Special Protection Area Draft Conservation Objectives and Advice on Operations Available: https://data.jncc.gov.uk/data/0032da71-db02-44b5-b4e1-022d77ef7ee3/irish-sea-front-sas-conservation-objectives.pdf Accessed: November 2023.

JNCC (2020) Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England Wales and Northern Ireland) Available at: https://data.jncc.gov.uk/data/2e60a9a0-4366-4971-9327-2bc409e09784/JNCC-Report-654-FINAL-WEB.pdf Accessed: November 2023.

JNCC (2022a) River Ehen. Available at: https://sac.jncc.gov.uk/site/UK0030057#:~:text=The%20River%20Ehen%20supports%20the,the%20entire%20river%20exceeding%20100%2C000. Accessed November 2022.

JNCC (2022b) River Derwent and Bassenthwaite. Available at: https://sac.jncc.gov.uk/site/UK0030032 Accessed: November 2023.

JNCC (2022c) Solway Firth SAC. Available at: https://sac.jncc.gov.uk/site/UK0013025 Accessed: November 2023.

JNCC (2022d) River Kent SAC Available at: https://sac.jncc.gov.uk/site/UK0030256

JNCC (2022e) Dee Estuary/Aber Dyfrdwy special area of conservation. Available at: https://sac.jncc.gov.uk/site/UK0030131 Accessed: November 2023.

JNCC (2022e) River Bladnoch SAC. Available at: https://sac.jncc.gov.uk/site/UK0030249 Accessed: November 2023.

JNCC (2022f) Afon Gwyrfai a Llyn Cwellyn SAC. Available at: https://sac.jncc.gov.uk/site/UK0030046 Accessed Accessed: November 2023.

(JNCC, 2022e) Y Fenai a Bae Conwy/ Menai Strait and Conwy Bay SAC. Available t:https://sac.jncc.gov.uk/site/UK0030202. Accessed: November 2023.

JNCC and DAERA (2017) Inshore and Offshore Special Area of Conservation (SAC):North Channel. SAC Selection Assessment Document. Available at: North Channel MPA: SAC Selection Assessment Document (jncc.gov.uk). Accessed: November 2023.

JNCC and DAERA (2019) Harbour Porpoise (Phocoena phocoena) Special Area of Conservation: North Channel. Conservation Objectives and Advice on Operations. Available at: North Channel MPA: Conservation Objectives And Advice On Operations (jncc.gov.uk). Accessed: November 2023.

JNCC, Natural England and NRW (2016) Inshore and Offshore Special Area of Conservation: Bristol Channel Approaches /Dynesfeydd Môr Hafren SAC Selection Assessment Document. Available at: SAC Selection Assessment Document (cyfoethnaturiol.cymru). Accessed: November 2023.

JNCC, Natural England and NRW (2019) Harbour Porpoise (Phocoena phocoena) Special Area of Conservation: Bristol Channel Approaches /Dynesfeydd Môr Hafren Conservation Objectives and

Advice on Operations. Available at: Bristol Channel Approaches MPA: Conservation Objectives and Advice on Operations (jncc.gov.uk). Accessed: November 2023.

JNCC, NRW, DAERA (2019) Harbour Porpoise (Phocoena phocoena) Special Area of Conservation: North Anglesey Marine/Gogledd Môn Forol Conservation Objectives and Advice on Operations Available: https://data.jncc.gov.uk/data/f4c19257-2341-46b3-8e29-49665cd8f3d2/NorthAnglesey-Conservation-Advice.pdf Accessed: November 2023.

JNCC. (2017). JNCC guidelines for minimising the risk of injury to marine mammals from geophysical surveys. Joint Nature Conservation Committee, Aberdeen, UK

Jones, E. L., Sparling, C. E., McConnell, B. J., Morris, C. D., and Smout, S. (2017). Fine-scale harbour seal usage for informed marine spatial planning. Scientific Reports, 7(1), 11581. Available: https://doi.org/10.1038/s41598-017-11174-4. Accessed: November 2023.

Joy et al., (2019) Preliminary information on dredging and harbour porpoises. JunoBioacoustics.

Kavet, R., M.T. Wyman, and A.P. Klimley. (2016). Modelling magnetic fields from a dc power cable buried beneath San Francisco Bay based on empirical measurements. PLoS One 11(2):e0148543.

Kröncke, I., Dippner, J., Heyen, H. and Zeiss, B., 1998. Long-term changes in macrofaunal communities off Norderney (East Frisia, Germany) in relation to climate variability. Marine Ecology Progress Series, 167, 25-36.

Lambert, R. (2001). Grey Seals on Scilly: Isles of Scilly bird and natural history review.

Lohrengel, K., Evans, P.G.H., Lindenbaum, C.P., Morris, C.W., Stringell, T.B. (2018) Bottlenose Dolphin Monitoring in Cardigan Bay 2014 - 2016, NRW Evidence Report No: 191, 162pp, Natural Resources Wales, Bangor. Available at: https://naturalresources.wales/evidence-and-data/research-and-reports/marine-reports/marine-and-coastal-evidence-reports/?lang=en Accessed: November 2023.

MacDonald, B. (2013). Atlantic Grey Seals (Halichoerus grypus) at Lundy, 2006-2013: Lundy Warden for Natural England.

Marley, S. A., Salgado Kent, C. P., Erbe, C., and Parnum, I. M. (2017). Effects of vessel traffic and underwater noise on the movement, behaviour and vocalisations of bottlenose dolphins in an urbanised estuary. Scientific Reports, 7(1), 13437. Available: https://doi.org/10.1038/s41598-017-13252-z. Accessed: November 2023.

Matthews, M. N. R., Ireland, D. S., Zeddies, D. G., Brune, R. H., and Pyć, C. D. (2021). A modeling comparison of the potential effects on marine mammals from sounds produced by marine vibroseis and air gun seismic sources. Journal of Marine Science and Engineering, 9(1).

McQueen, A. D., B. C. Suedel, C. de Jong, and F. Thomsen (2020) Ecological risk assessment of underwater sounds from dredging operations. Integrated environmental assessment and management 16:481-493.

Meza, C., Akkaya, A., Affinito, F., Öztürk, B., and Öztürk, A. A. (2020). Behavioural changes and potential consequences of cetacean exposure to purse seine vessels in the Istanbul Strait, Turkey. Journal of the Marine Biological Association of the United Kingdom, 100(5), 847–856. Available: https://doi.org/10.1017/S0025315420000314. Accessed: November 2023.

Mickle, M.F., Miehls, S.M., Johnson, N.S., and Higgs, D.M. (2019) Hearing capabilities and behavioural response of sea lamprey (Petromyzon marinus) to low-frequency sounds. Canadian Journal of Fisheries and Aquatic Sciences, 76(9), 1541-8, https://doi.org/10.1139/cjfas-2018-0359.

Mikkelsen, L., Johnson, M., Wisniewska, D.M., van Neer, A., Siebert, U., Madsen, P.T. and Teilmann, J. (2019). Long-term sound and movement recording tags to study natural behavior and reaction to ship noise of seals. Ecology and evolution, 9(5), pp.2588-2601.

Miller, L. J., and Kuczaj Ii, S. A. (2008). Immediate response of Atlantic bottlenose dolphins to high-speed personal watercraft in the Mississippi Sound. Marine Biological Association of the United Kingdom, 88(6), 1139–1143. Available: https://doi.org/10.1017/S0025315408000908. Accessed: November 2023.

Mitchell, P.I., Newton, S.F, Ratcliffe, N. and Dunn, T.E. (2004) Seabird Populations of Britain and Ireland. Results of the Seabird 2000 Census (1998-2002). London, T. & A.D. Poyser.

MMO. (2018) Displacement and habituation of seabirds in response to marine activities. A report produced for the Marine Management Organisation,. MMO Project No: 1139, May 2018, 69pp

Mona Offshore Wind Project Ltd. (2023) Preliminary Environmental Information Report. Volume 2, chapter 8: Fish and Shellfish of the Environmental Statement.

Mona Offshore Wind Project EIA Scoping Report. Available: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010137/EN010137-000011-EN010137%20-%20 scoping%20Report.pdf Accessed: November 2023.

Moore, A. & Riley, W.D. (2009). Magnetic particles associated with the lateral line of the European eel (Anguilla anguilla L.). Journal of Fish Biology 74, 1629-1634.

Morgan Offshore Wind Project Ltd. (2023) Preliminary Environmental Information Report. Volume 1, chapter 3: Project Description.

Morgan Generation Assets EIA Scoping Report. Available: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010136/EN010136-000039-Morgan%20Offshore%20Wind%20Farm%20-%20EIA%20 scoping%20Report.pdf Accessed: November 2023.

Morecambe Offshore WindFarm Limited. (2022b) Scoping Report Morecambe Offshore Windfarm Generation Assets. V 3.0. Available: https://indd.adobe.com/view/bf00c482-4784-4430-99ed-38208cf3a495https://indd.adobe.com/view/bf00c482-4784-4430-99ed-38208cf3a495

Natural England (2005a) EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora Citation for Special Area of Conservation (SAC): Solway Firth.

Natural England (2005b) EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora Citation for Special Area of Conservation (SAC): River Kent.

Natural England (2018a) River Eden SAC: Designated Sites View. Available at: https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK0012643&SiteName=river%20eden&countyCode=&responsiblePerson=&SeaArea=&IFCAArea= Accessed November 2022.

Natural England (2018b) European Site Conservation Objectives for Lundy Special Area of Conservation Site Code: UK0013114.

Natural England (2018c) European Site Conservation Objectives for Isles of Scilly Complex Special Area of Conservation Site Code: UK0013694.

Natural England (2019a) European Site Conservation Objective Supplementary advice on conserving and restoring site feature River Ehen Special Area of Conservation (SAC) Site code: UK0030057

Natural England (2019b) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features River Eden Special Area of Conservation (SAC) Site Code: UK0012643

Natural England (2019c) European Site Conservation Objectives: Supplementary advice on conserving and restoring site features River Derwent and Bassenthwaite Lake Special Area of Conservation (SAC) Site Code: UK0030032

Natural England (2022a) European site conservation objectives: supplementary advice on conserving and restoring site features. Available at: https://designatedsites.naturalengland.org.uk/TerrestrialAdvicePDFs/UK0030057.pdf Accessed: November 2023.

Natural England (2022b) River Ehen SAC: Designated Sites View. Available at: https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK0030057&SiteName=river%20ehen&countyCode=&responsiblePerson=&SeaArea=&IFCAArea= Accessed: November 2023.

Natural England (2022c) River Kent SAC: Designated Site View. Available at: https://designatedsites.naturalengland.org.uk/SiteSACFeaturesMatrix.aspx?SiteCode=UK0030256&SiteName=River%20Kent%20 sAC Accessed: November 2023.

(Natural England And CCW, 2010) The Dee Estuary Marine Site. Available at: https://naturalresources.wales/media/673576/Dee%20Estuary-Reg33-Volume%201-English-091209_1.pdf Accessed on: September 2023.Natural England and NRW (2010) The Dee Estuary European Marine Site comprising: Dee Estuary /Aber Dyfrdwy Special Area of Conservation The Dee Estuary Special Protection Area

Natural England, NRW and the JNCC (2022) Liverpool Bay / Bae Lerpwl Special Protection Area Conservation Advice Package. Natural England, Natural Resources Wales, Joint Nature Conservation Committee. Available at: http://publications.naturalengland.org.uk/publication/3236717. Accessed: November 2023.

NatureScot (2020) River Bladnoch Special Area Of Conservation (Sac) Conservation Advice Package.

NatureScot (2022) Available at: https://sitelink.nature.scot/site/8377 Accessed: November 2023.

Nedwell, J., Turnpenny, A., Lovell, J.M., and Edwards, B. (2006) An investigation into the effects of underwater piling noise on salmonids. The Journal of the Acoustical Society of America, 120(5,1) pp. 2550-4, DOI:10.1121/1.2335573, Accessed: November 2023.

Newell, R.C., Seiderer, L.J. and Hitchcock, D.R. (1998) The impact of dredging works in coastal waters: a review of the sensitivity to disturbance and subsequent recovery of biological resources in the sea bed. Oceanography and Marine Biology: Annual Review, 36, p. 127-178.

NIEA (2012) Inshore Special Area of Conservation: The Maidens SAC Selection Assessment. Available at: The Maidens SAC Site Selection Assessment.pdf (daera-ni.gov.uk). Accessed: November 2023.

Nielsen, N. H, Hansen, R. G., Teilmann, J. and Heide-Jorgensen, M. P. (2013). Extensive offshore movements of harbour porpoises (*Phocoena phocoena*). NAMMCO SC/20/HP/08. Harbour porpoise working group.

Niemi, M., Auttila, M., Valtonen, A., Viljanen, M., and Kunnasranta, M. (2013). Haulout patterns of Saimaa ringed seals and their response to boat traffic during the moulting season. Endangered Species Research, 22(2), 115–124. Available: https://doi.org/10.3354/esr00541. Accessed: November 2023.

Niermann, U., Bauerfeind, E., Hickel, W. and Westernhagen, H.V., 1990. The recovery of benthos following the impact of low oxygen content in the German Bight. Netherlands Journal of Sea Research, 25, 215-226.

NMFS (2005) 'Scoping Report for NMFS EIS for the National Acoustic Guidelines on Marine Mammals'. National Marine Fisheries Service.

North Celtic Sea Wind Limited. (2023). North Celtic Sea Offshore Wind Project Environmental Impact Assessment (EIA) Scoping Report. Available at: northcelticseawind.ie/wp-content/uploads/2023/05/North_Celtic_-Sea_Environmental_Scoping_Report_Final_May2023.pdf. Accessed: November 2023.

North Channel Wind Limited. (2023). North Channel Wind 1 and 2 Projects Offshore EIA Scoping Report.

NRW (2016) Menai Strait and Conwy Bay SAC Non-interactive map. Available: https://cdn.cyfoethnaturiol.cymru/media/681446/menai-strait-conwy-bay-non-interactive-a3-map.pdf. Accessed: November 2023.

NRW (2018a) Menai Strait and Conwy Bay /Y Fenai a Bae Conwy Special Area of Conservation Advice provided by Natural Resources Wales in fulfilment of Regulation 37 of the Conservation of Habitats and Species Regulations 2017. Available at: https://cdn.cyfoethnaturiol.cymru/media/687997/eng-menai-strait-reg-37-report-2018.pdf. Accessed: November 2023.

NRW (2018b) Y Fenai a Bae Conwy /Menai Strait and Conwy Bay Special Area of Conservation Indicative site level feature condition assessments 2018 NRW Evidence Report No: 232. Available at: https://cdn.cyfoethnaturiol.cymru/media/683683/cym-menai-strait-and-conwy-bay-sac-ica-2018.pdf. Accessed: November 2023.

NRW (2018d) Pen Llŷn a'r Sarnau /Lleyn Peninsula and the Sarnau Special Area of Conservation Advice provided by Natural Resources Wales in fulfilment of Regulation 37 of the Conservation of Habitats and Species Regulations 2017. https://cdn.cyfoethnaturiol.cymru/media/688001/eng-pen-llyn-ar-sarnau-reg-37-report-2018.pdf Accessed: November 2023.

NRW (2018e) Pen Llŷn a`r Sarnau /Lleyn Peninsula and the Sarnau Special Area of Conservation Indicative site level feature condition assessments 2018 https://naturalresources.wales/media/673816/Pen%20Llyn%20ar%20 sarnau%20%20R33%20Feb%202009.pdf Accessed: November 2023.

NRW (2018f) Cardigan Bay/Bae Ceredigion Special Area of Conservation Advice provided by Natural Resources Wales in fulfilment of Regulation 37 of the Conservation of Habitats and Species

NRW (2018g) Cardigan Bay /Bae Ceredigion Special Area of Conservation Indicative site level feature condition assessments 2018 NRW Evidence Report No: Available: https://cdn.cyfoethnaturiol.cymru/media/684241/indicative-condition-assessment-2018-cardigan-bay-sacv2.pdf Accessed: November 2023.

NRW (2018h) Pembrokeshire Marine /Sir Benfro Forol Special Area of Conservation Indicative site level feature condition assessments 2018

NRW (2018i) Pembrokeshire Marine /Sir Benfro Forol Special Area of Conservation Advice provided by Natural Resources Wales in fulfilment of Regulation 37 of the Conservation of Habitats and species Regulations 2017. March 2018. https://cdn.cyfoethnaturiol.cymru/media/687999/eng-pembrokeshire-marine-reg-37-report-2018.pdf Accessed: November 2023.

NRW (2022a) Dee Estuary/Aber Dyfrdwy special area of conservation indicative site level feature condition assessments 2018. Available at: https://cdn.cyfoethnaturiol.cymru/media/684383/dee-estuary-sac-ica-2018.pdf Accessed: November 2023.

NRW (2022b) Core management plan including conservation objectives for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. Available at:

https://naturalresources.wales/media/673374/River_Dee___Bala_Lake_32_Plan.pdf Accessed: November 2023.

NRW (2022c) Position statement: NRW's position on the use of Marine Mammal Management Units for screening and assessment in Habitats Regulations Assessments for Special Areas of Conservation with marine mammal features

NRW (2022d) Position statement NRW's position on determining Adverse Effect on Site Integrity for marine mammal site features in Wales in relation to potential anthropogenic removals mortality) from marine developments

NRW 2018c Dee Estuary /Aber Dyfrdwy Special Area of Conservation Indicative site level feature condition assessments 2018 NRW Evidence Report No: 229. Available at: https://cdn.cyfoethnaturiol.cymru/media/684383/dee-estuary-sac-ica-2018.pdf. Accessed: November 2023.

NRW and JNCC (2016) Inshore and Offshore Special Area of Conservation (SAC): North Anglesey Marine /Gogledd Môn Forol SAC Selection Assessment Document https://cdn.cyfoethnaturiol.cymru/media/681290/northangleseymarineselectionassessmentdocument.pdf?mode=pad&rnd=131625760740000000 Accessed: November 2023.

NRW Evidence Report No: 233 https://cdn.cyfoethnaturiol.cymru/media/684242/indicative-condition-assessment-2018-pembrokeshire-marine-sacv2.pdf Accessed: November 2023.

NRW, (2008) CORE MANAGEMENT PLAN INCLUDING CONSERVATION OBJECTIVES FOR GRASSHOLM SPA. Available at: https://naturalresources.wales/media/674134/Grassholm%20sPA%20 management%20Plan%2021%5B1%5D.4.08%20(English).pdf Accessed: November 2023..

NRW (2023). NRW's Position on assessing behavioural disturbance of harbour porpoise (Phocoena phocoena) from underwater noise. Position statement. NRW. Document Number Version 1.0.

Ohman, M. C., Sigray, P. and Westerberg, H. (2007). Offshore windmills and the effects ofelectromagnetic fields on fish. Ambio 36,630 – 633.

Orsted (2022). Wind Farms in Development. Isle of Man. Available: Our Offshore Wind Farms in the United Kingdom | Ørsted (orsted.co.uk) Accessed: November 2023.

Paxton, C. G. M., Scott-Hayward, L., Mackenzie, M., Rexstad, E., and Thomas, L. (2016). Revised Phase III Data Analysis of Joint Cetacean Protocol Data Resources JNCC Report No.517. Available: http://jncc.defra.gov.uk/page-6991. Accessed: November 2023.

Pearce, B. Taylor, J. and Seiderer, L.J. (2007) Recoverability of Sabellaria spinulosa Following Aggregate Extraction. Aggregate Levy Sustainability Fund MAL0027. Marine Ecological Surveys Limited, 24a Monmouth Place, BATH, BA1 2AY. p.87

Pérez Tadeo, M., Gammell, M., and O'Brien, J. (2021). Assessment of Anthropogenic Disturbances Due to Ecotourism on a Grey Seal (*Halichoerus grypus*) Colony in the Blasket Islands SAC, Southwest Ireland and Recommendations on Best Practices. Aquatic Mammals, 47(3), 268–282. Available: https://doi.org/10.1578/AM.47.3.2021.268. Accessed: November 2023.

Pesante G, Evans PGH, Baines ME, McMath M (2008b) Abundance and Life History Parameters of Bottlenose Dolphin in Cardigan Bay: Monitoring 2005-2007. CCW Marine Monitoring Report No. 61. Countryside Council for Wales, Bangor

Pirotta, E., Merchant, N. D., Thompson, P. M., Barton, T. R., and Lusseau, D. (2015). Quantifying the effect of boat disturbance on bottlenose dolphin foraging activity. Biological Conservation, 181, 82–89. Available: https://doi.org/10.1016/J.BIOCON.2014.11.003. Accessed: November 2023.

Popper, A. N. and Hoxter, B. (1987) Sensory and non-sensory ciliated cells in the ear of the sea lamprey, Petromyzon marinus. Brain, Behavior and Evolution, 30, 43-61.

Popper, A. N., Hawkins, A. D., Fay, R. R., Mann, D., Bartol, S., Carlson, Th., Coombs, S., Ellison, W. T., Gentry, R., Hal vorsen, M. B., Lokkeborg, S., Rogers, P., Southall, B. L., Zeddies, D. G. and Tavolga, W. N. (2014) ASA S3/SC1.4 TR-2014 Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1 and registered with ANSI. Springer and ASA Press, Cham, Switzerland.

Popper, A.N. (2005) A review of hearing by sturgeon and lamprey. Report to US Army Corps of Engineers, Portland District.

Potter, M. and Hatton-Ellis, T. 2003. Conservation Fish Surveys of Riverine proposed Special Areas of Conservation in Wales: Phase II. Bangor: Countryside Council for Wales and Environment Agency Wales.

Readman, J.A.J.,, Lloyd, K.A., and Watson, A. (2023) Cushion sponges and hydroids on turbid tide-swept variable salinity sheltered circalittoral rock. In Tyler-Walters H. Marine Life Information Network: Biology and Sensitivity Key Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. Available from: https://www.marlin.ac.uk/habitat/detail/1173 Accessed: November 2023.

Regulations 2017. https://cdn.cyfoethnaturiol.cymru/media/687993/eng-cardigan-bay-reg-37-report-2018.pdf Accessed: November 2023.

Richardson, H. (2012). The effect of boat disturbance on the bottlenose dolphin (*Tursiops truncatus)* of Cardigan Bay in Wales. In association with the Sea Watch Foundation.

Richardson, W.J., Greene, C.R. Jr., Malme, C.I., and Thomson, D.H. (1995). Marine Mammals and Noise. Academic Press, San Diego, CA, USA. 576p

Rojano-Doñate, L., McDonald, B. I., Wisniewska, D. M., Johnson, M., Teilmann, J., Wahlberg, M., Højer-Kristensen, J., and Madsen, P. T. (2018). High field metabolic rates of wild harbour porpoises. Journal of Experimental Biology, 221(23). Available: https://doi.org/10.1242/jeb.185827. Accessed: November 2023.

Morlais. (2019). Morlais Project Environmental Statement. Volume I. Chapter 12: Marine Mammals.

RPS (2019) Review of Cable installation, protection, migration and habitat recoverability, The Crown Estate.

Ruppel, C. D., Weber, T. C., Staaterman, E. R., Labak, S. J., and Hart, P. E. (2022). Categorizing Active Marine Acoustic Sources Based on Their Potential to Affect Marine Animals. Journal of Marine Science and Engineering, 10(9), 1278.

Russell, D.J., Brasseur, S.M., Thompson, D., Hastie, G.D., Janik, V.M., Aarts, G., McClintock, B.T., Matthiopoulos, J., Moss, S.E. and McConnell, B., (2014). Marine mammals trace anthropogenic structures at sea. Current Biology, 24(14), pp.R638-R639.

RWE. (2022). Awel y Môr Offshore Wind Farm Category 6: Environmental Statement. Volume 2, Chapter 7: Marine Mammals. Date: April 2022 Revision: B

RWE (2022) Awel y Môr Offshore Wind Farm Preliminary Environmental Information Report Volume 2, Chapter 8: Fish and Shellfish Ecology. Environmental Statement chapter.

Santos, M. B., Pierce, G. J., Reid, R. J., Patterson, I. A. P., Ross, H. M., and Mente, E. (2001). Stomach contents of bottlenose dolphins (*Tursiops truncatus*) in Scottish waters. Journal of the Marine Biological Association of the United Kingdom, 81(5), 873-878.

Santos, M.B. and Pierce, G.J. (2003). The diet of harbour porpoise (*Phocoena phocoena)* in the northeast Atlantic. Oceanography and Marine Biology, 41:355-390

Sarnocińska, J., Teilmann, J., Balle, J. D., van Beest, F. M., Delefosse, M., and Tougaard, J. (2020). Harbor porpoise (Phocoena phocoena) reaction to a 3D seismic airgun survey in the North Sea. Frontiers in Marine Science, 6, 824.

Sayer, S. and Witt, M. (2018). Special Area of Conservation Condition Assessment Monitoring Grey seals (*Halichoerus grypus*) in the Isles of Scilly during the 2016 pupping season: Cornwall Seal Group and University of Exeter.

Sayer, S., Allen, R., Hawkes, L., Hockley, K., Jarvis, D. and Witt, M. (2018). Pinnipeds, people and photo identification: the implications of grey seal movements for effective management of the species. Journal of the Marine Biological Association of the United Kingdom

Schönberg, C.H.L. (2015) Happy relationships between marine sponges and sediments–a review and some observations from Australia. Journal of the Marine Biological Association of the United Kingdom, 1-22.

SCOS (2022). Scientific Advice on Matters Related to the Management of Seal Populations: 2021 Natural Environment Research Council Special Committee on Seals.

Senior, B., Bailey, H., Lusseau, D., Foote A., and Thompson, P.M. (2008). Anthropogenic noise in the Moray Firth SAC; potential sources and impacts on bottlenose dolphins. Scottish Natural Heritage Commissioned Report No.265 (ROAME No. F05LE02).

Shelmalere Offshore Wind Farm Ltd. (2022). EIAR Scoping Report. Document Number: S004IE_RPT_EIAR Scoping Report_20220623 Accessed: November 2023.

Sills, J. M., Ruscher, B., Nichols, R., Southall, B. L., and Reichmuth, C. (2020). Evaluating temporary threshold shift onset levels for impulsive noise in seals. The Journal of the Acoustical Society of America, 148(5), 2973-2986.

Skinner,A,Young M & Hastie L (2003). Ecology of the Freshwater Pearl Mussel. Conserving Natura 2000 Rivers Ecology Series No. 2 English Nature, Peterborough.

NH (2011) Distribution, abundance and population structure of bottlenose dolphins in Scottish waters. Available: https://www.nature.scot/sites/default/files/2018-10/Publication%202011%20-%20 sNH%20Commissioned%20Report%20354%20-%20Distribution%2C%20abundance%20and%20population%20 structure%20of%20bottlenose%20dolphins%20in%20 scottish%20waters.pdf Accessed: November 2023.

Southall, B.L., Bowles, A.E., Ellison, W.T., Finneran, J.J., Gentry, R.L., Greene Jr, C.R., Kastak, D Miller, J.H., Nachtigall, P.E. and Richardson, W.J. (2007). Marine Mammal Noise-Exposure Criteria: Initial Scientific Recommendations. Aquatic Mammals 33 (4): 411–521.

Southall, B.L., Finneran, J.J., Reichmuth, C., Nachtigall, P.E., Ketten, D.R., Bowles, A.E. Ellison, W.T., Nowacek, D.P. and Tyack, P.L. (2019). Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. Aquatic Mammals 45 (2): 125–232.

Special Committee on Seals (SCOS). (2018) Scientific Advice on Matters Related to the Management of Seal Populations: 2018. Sea Mammal Research Unit.. Available: SCOS Reports | SMRU (st-andrews.ac.uk) Accessed: November 2023.

Staehr, P.A. and Wernberg, T., 2009. Physiological responses of Ecklonia radiata (Laminariales) to a latitudinal gradient in ocean temperature. Journal of Phycology, 45, 91-99.

Stone, C. J., and Tasker, M. L. (2006). The effects of seismic airguns on cetaceans in UK waters. Journal of Cetacean Research and Management, 8(3), 255.

Stott, R.S. and Olson, D.P. (1973) Food habitat relationship of seaducks on the New Hampshire coastline. Ecology 54: 996–1007.

Tasker & Amundin, Mats & André, Michel & T., Hawkins & W., Lang & T., Merck & A, Scholik-Schlomer & Teilmann, Jonas & Thomsen, Frank & Werner, Stefanie & Zakharia, Manell. (2010). Marine Strategy Framework Directive - Task Group 11 Report - Underwater noise and other forms of energy,

TCE (2022) Report to Inform Appropriate Assessment Offshore Wind Leasing Round 4 Plan Level HRA 38255_NIRAS_REP_106_V1.1 Issued for Consultation.

The Dee Estuary Ramsar Site Natural England and the Countryside Council for Wales" advice given under Regulation 33(2) of the Conservation (Natural Habitats &c.) Regulations 1994

Thompson, P. M., Brookes, K. L., Graham, I. M., Barton, T. R., Needham, K., Bradbury, G., and Merchant, N. D. (2013). Short-term disturbance by a commercial two-dimensional seismic survey does not lead to long-term displacement of harbour porpoises. Proceedings of the Royal Society B: Biological Sciences, 280(1771), 20132001.

Tillin, H.M. (2016) *Mastocarpus stellatus* and *Chondrus crispus* on very exposed to moderately exposed lower eulittoral rock. In Tyler-Walters H. and Hiscock K. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 11-01-2024]. Available from: https://www.marlin.ac.uk/habitat/detail/11, Accessed January 2024

Tillin, H.M., Garrard, S.L.,, Lloyd, K.A., and Watson, A. (2023a). Nephtys cirrosa and Bathyporeia spp. in infralittoral sand. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. Available from: https://www.marlin.ac.uk/habitat/detail/154, Accessed January 2024.

Tillin, H.M., Lloyd, K.A., and Watson, A. (2023b) Hiatella-bored vertical sublittoral limestone rock. In Tyler-Walters H. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. Available from: https://www.marlin.ac.uk/habitat/detail/36222]. Available: https://www.marlin.ac.uk/habitats/detail/362/hiatella-bored_vertical_sublittoral_limestone_rock#:~:text=infralittoral%20soft%20rock-,Description,there%20is%20poor%20light%20penetration. , Accessed January 2024.

Tillin, H.M. and Rayment, W. (2023) Fabulina fabula and Magelona mirabilis with venerid bivalves and amphipods in infralittoral compacted fine muddy sand. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 01-09-2023]. Available from: Fabulina fabula and Magelona mirabilis with venerid bivalves and amphipods in infralittoral compacted fine muddy sand - MarLIN - The Marine Life Information Network, Accessed: November 2023.

Tillin, H.M. and Watson, A. (2023a) *Mediomastus fragilis, Lumbrineris spp. and venerid bivalves in circalittoral coarse sand or gravel*. In Tyler-Walters H. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. Available: https://www.marlin.ac.uk/habitats/detail/382/mediomastus_fragilis_lumbrineris_spp_and_venerid_bivalves_in_circalittoral_coarse_sand_or_gravel, Accessed January 2024.

Tillin, H.M. and Watson, A. (2023b) Polychaete-rich deep Venus community in offshore gravelly muddy sand. In Tyler-Walters H. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 10-11-2023]. Available from: https://www.marlin.ac.uk/habitat/detail/1117

Tilmant, J.T. (1979) Observations on the impact of shrimp roller frame trawls operated over hard-bottom communities, Biscayne Bay, Florida: National Park Service.

Toro, F., Alarcón, J., Toro-Barros, B., Mallea, G., Capella, J., Umaran-Young, C., Abarca, P., Lakestani, N., Peña, C., Alvarado-Rybak, M., Cruz, F., Vilina, Y., and Gibbons, J. (2021). Spatial and Temporal Effects of Whale Watching on a Tourism-Naive Resident Population of Bottlenose Dolphins (Tursiops truncatus) in the Humboldt Penguin National Reserve, Chile. Frontiers in Marine Science, 8. Available: https://doi.org/10.3389/fmars.2021.624974. Accessed: November 2023.

Tougaard, J., Buckland, S., Robinson, S. and Southall, B. (2013). An analysis of potential broad-scale impacts on harbour porpoise from proposed pile driving activities in the North Sea. Report of an expert group convened under the Habitats and Wild Birds Directive – Marine Evidence Group MB0138. 38pp.

Tougaard, J., Wright, A. J. and Madsen, P. T. (2015). Cetacean noise criteria revisited in the light of proposed exposure limits for harbour porpoises. Mar. Pollut. Bull. 90, 196–208.

Tougaard, J. 2021. Thresholds for noise induced hearing loss in marine mammals. Background note to revision of guidelines from the Danish Energy Agency, Roskilde, Denmark. 34.

Tricas, T.C. and Carlson, B.A. (2012) Electroreceptors and magnetoreceptors. In: Cell Physiology Source Book: Essentials of Membrane Biophysics (N. Sperlakis, ed.), 4th ed. Academic Press, San Diego, pp. 705-725.

Van Beest, F.M., Teilmann, J., Hermannsen, L., Galatius,. A, Mikkelsen, L., Sveegaard, S., Balle, J.D., Dietz, R. and Nabe-Nielsen, J. (2018). Fine-scale movement responses of free-ranging harbour porpoises to capture, tagging and short-term noise pulses from a single airgun. R. Soc. open sci.5: 170110.

Vella, G., Rushforth, I., Mason, E., Hough, A., England, R., Styles, P., Holt, T. and Thorne, P., 2001. Assessment of the effects of noise and vibration from offshore wind farms on marine wildlife.

Verboom, W (2014) Preliminary information on dredging and harbour porpoises. JunoBioacoustics.

Weir, C. R. (2008). Overt responses of humpback whales, sperm whales and Atlantic spotted dolphins to seismic exploration off Angola. Aquatic Mammals, 34.

Westerberg, H. and I. Langenfelt. (2008) Sub-sea power cables and the migration behaviour of the European eel. Fisheries Management and Ecology 15:369-375.

Westerberg, H., Langenfelt, I., Andersson, I., Wahlberg, M., and Sparrevik, E. (2007) Inverkan på fisk och fiske av SwePol Link - Fiskundersökningar 1999-2006 (in Swedish). Swedish Fisheries Agency.

Western Star Wind Ltd. (2023). Western Star Floating Offshore Wind Project EIA Scoping Report.

White Cross (2022) White Cross Offshore Wind Farm EIA Scoping Report. VErsion 03. Available https://whitecrossoffshorewind.com/wp-content/uploads/2022/03/PC2978_RHD-ZZ-XX-RP-Z-0009-White-Cross-Offshore-Windfarm-EIA-Scoping-Report.pdf Accessed: November 2023.

Wilhelmsson, D., Malm, T., Thompson, R., Tchou, J., Sarantakos, G., McCormick, N., Luitjens, S., Gullström, M., Patterson Edwards, J.K., Amir, O. and Dubi, A. (2010) Greening Blue Energy: Identifying and Managing the Biodiversity Risks and Opportunities of Offshore Renewable Energy. Edited by Gland, Switzerland: IUCN. 102 pp.

Wilson, B., Batty, R. S., Daunt, F. and Carter, C. (2007). Collision risks between marine renewable energy devices and mammals, fish and diving birds. Report to the Scottish Executive. Scottish Association for Marine Science, Oban.

Wisniewska, D. M., Johnson, M., Teilmann, J., Rojano-Doñate, L., Shearer, J., Sveegaard, S. and Madsen, P. T. (2016). Ultra-high foraging rates of harbor porpoises make them vulnerable to anthropogenic disturbance. Current Biology, 26(11), 1441-1446.

Wisniewska, D. M., Johnson, M., Teilmann, J., Siebert, U., Galatius, A., Dietz, R., and Madsen, P. T. (2018). High rates of vessel noise disrupt foraging in wild harbour porpoises (Phocoena phocoena). Proceedings of the Royal Society B: Biological Sciences, 285(1872). Available: https://doi.org/10.1098/RSPB.2017.2314. Accessed: November 2023.

Wright, P and Sinclair, R.R. (2022) Seal haul-out and telemetry data in relation to the Morgan and Mona offshore wind farms. Report number SMRUC-RPS-2022-004. Submitted to RPS, June 2022.

Wulff, J. (2006) Resistance vs recovery: morphological strategies of coral reef sponges. Functional Ecology, 20 (4), pp. 699-708.