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MONA OFFSHORE WIND PROJECT

Habitats Regulations Assessment Stage 2 Information to Support an Appropriate Assessment

Image of an offshore wind farm

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Prepared by:	Prepared for:
RPS	**Mona Offshore Wind Ltd.**

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Glossary

Term	Meaning
Annelida	A large phylum that comprises the segmented worms, which include earthworms, lugworms, ragworms, and leeches.
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 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).
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 likely significant effects of a plan or project on a European site and (where likely significant effects 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.

Term	Meaning
Likely Significant Effect	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.
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.
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.
Migratory waterbirds	Species of waders and waterfowl that are ecologically dependant on wetlands and which make regular migrations along the coast of Ireland and/or non-breeding individuals that overwinter in Ireland.
Mona 440kV 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	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.

Term	Meaning
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.
Ramsar site	A wetland site designated to be of international importance under the Ramsar Convention. The Convention on Wetlands, known as the Ramsar Convention.
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.
Special Area of Conservation	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).
Special Protection Area	Special Protection Areas (SPAs) are sites classified under the EU Birds Directive (Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds) to protect rare or vulnerable birds (as listed on Annex I of the Directive), as well as regularly occurring migratory species.
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 Business, Energy And Industrial Strategy	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
ADD	Acoustic Deterrent Devices
AfL	Agreement for Lease
AIS	Air Insulated Switch gear
AL	Affect Level
BDMPS	Biologically Defined Minimum Population Scales
BEIS	Department for Business, Energy and Industrial Strategy
CCW	Countryside Council Wales
CEA	Cumulative Effects Assessment
CJEU	The Court of Justice of the European Union
CMS	Construction Method Statement
CPT	Cone Penetration Test
cSAC	Candidate Special Area of Conservation
CSIP	Cable Specification and Installation Plan
CSQGs	Canadian Sediment Quality Guidelines
CTV	Crew Transfer Vessel
DAERA	Department for Environment, Food and Rural Affairs
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
EcoW	Ecological Clerk of Works
EDR	Effective Deterrence Range
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EMP	Environmental Management Plan
EMU	Ecological Marine Unit
EnBW	Energie Baden-Württemberg
EWG	Expert Working Group
FCS	Favourable Conservation Status
HRA	Habitats Regulations Assessment
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IAQM	Institute of Air Quality Management
IEF	Important Ecological Feature
IMO	International Maritime Organisation
IMWWG	The Inter-agency Marine Mammal Working Group
INNS	Invasive Non-Native Species
iPCoD	Interim Population Consequences of Disturbance Model
IROPI	Imperative Reasons of Overriding Public Interest
ISAA	Information to Support an Appropriate Assessment
IWC	International Whaling Commission
JNCC	Joint Nature Conservation Committee
LAT	Lowest Astronomical Tide
LSE	Likely Significant Effect
MarESA	Marine Evidence Based Sensitivity Assessment
MARPOL	International Convention for the Prevention of Pollution from Ships
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
MOD	Military of Defence
MPCP	Marine Pollution Contingency Plan
MSL	Mean Sea Level
MU	Management Unit
MU	Management Unit
MV	Marine Vibroseis
NIEA	Northern Ireland Environment Agency
NRW	National Resources Wales
NSIP	Nationally Significant Infrastructure Project
OSP	Offshore Substation Platform
OSPAR	Oslo-Paris
PAH	Polycyclic Aromatic Hydrocarbons
PAM	Passive Acoustic Monitoring
PCB	Polychlorinated biphenyl

Acronym	Description
PDE	Project Design Envelope
PEIR	Preliminary Environmental Information Report
PEL	Probable Effect Level
pSAC	Possible Special Area of Conservation
pSPA	Potential Special Protection Area
PTS	Permanent Threshold Shift
RIAA	Report to Inform Appropriate Assessment
rms	Route mean square
SAC	Special Area of Conservation
SBES	Single Beam Echosounder
SBP	Sub-Bottom Profilers
SCANS	Small Cetacean Abundance in the North Sea
SCOS	Special Committee on Seals
SD	Standard Deviation
SEL	Sound Exposure Level
SEL_{cum}	Cumulative Sound Exposure Level
SMRU	Sea Mammal Research Unit
SNCB	Statutory Nature Conservation Bodies
SNH	Scottish Natural Heritage
SOSS	Strategic Ornithological Support Services
SOV	Service Operation Vessel
SPL	Sound Pressure Level
SPL_{pk}	Peak Sound Pressure Level
SSC	Suspended Sediment Concentration
SSS	Sidescan Sonar
TCE	The Crown Estate
TEL	Threshold Effect Level
TJB	Transition joint bays
TTS	Temporary Threshold Shift
UHRS	Ultra High Resolution Seismic
UXO	Unexploded Ordnance
WFD	Water Framework Directive
ZOI	Zone Of Influence

Units

Unit	Description
%	Percentage
µT	Microtesla
cm	Centimetres
dB	Decibel
Hz	Hertz
km	Kilometres
km^2	Square kilometres
kV	Kilovolts
m	Metre
m/h	Metres per hour
m/s	Metres per second
m^2	Square metres
m^3	Cubed metres
m^3/h	Cubed metres per hour
mG	Milligauss
mg/l	Milligrams per litre
Ml/d	Megalitres per day
mm	Millimetres
ms^{-1}	Metres per second
ms^{-2}	Metres per second squared
mV/cm	Millivolt per centimetre
MW	Megawatt
nm/s	Nanometres per second
°C	Degrees centigrade
s	Second
µPa	Micro Pascal

1 Habitats Regulations Assessment Stage 2 Information to Support an Appropriate Assessment

1.1 Non-technical summary

1.1.1.1 This report sets out the findings of a study to inform the second stage of the Habitats Regulations Assessment (HRA) required for the Mona Offshore Wind Project to ensure compliance with the Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (referred to together as the "Habitats Regulations").

1.1.1.2 The study set out in this report (an Information to Support an Appropriate Assessment (ISAA) report) 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 53 designated European sites for which the potential for Likely Significant Effects (LSE) has been previously established in the HRA Stage 1 Screening Report.

1.1.1.3 This HRA Stage 2 ISAA report assesses the potential environmental effects resulting from the Mona Offshore Wind Project. An assessment off adverse effects of the Mona Offshore Wind Project alone and in-combination has been carried out against the conservation objectives for each relevant European site screened into the assessment. This assessment has taken account of the best available baseline information and has been undertaken in view of the measures proposed to be adopted as part of the Mona Offshore Wind Project to mitigate the potential for adverse effects.

1.1.1.4 The consideration of the potential for adverse effects on the integrity of European sites is made with reference to the overall ecological functions and the lasting preservation of the constitutive characteristics of the sites.

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

1.1.1.5 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy Special Area of Conservation (SAC). The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex I habitats that are qualifying features of this European site, and were screened into assessment include:

- Reefs
- Sandbanks which are slightly covered by seawater all the time.

1.1.1.6 The ISAA assessed the following impacts:

- Temporary habitat loss/disturbance (Mona Offshore Cable Corridor only)
- Increase in Suspended Sediment Concentration (SSC) and sediment deposition (Mona Offshore Cable Corridor only)
- Release of sediment bound contaminants (Mona Offshore Cable Corridor only)
- Electromagnetic Field (EMF)
- Changes in physical processes
- Accidental pollution
- In-combination effects.

1.1.1.7 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Dee Estuary/Aber Dyfrdwy SAC/Ramsar

1.1.1.8 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Dee Estuary/Aber Dyfrdwy SAC/Ramsar. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex I habitats and Annex II diadromous fish that are qualifying features of this European site, and were screened into assessment include:

- Estuaries
- Mudflats and sandflats not covered by seawater at low tide
- Sea lamprey
- River lamprey.

1.1.1.9 The ISAA assessed the following impacts for Annex I habitats:

- Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only)
- Release of sediment bound contaminants (Mona Offshore Cable Corridor only)
- Changes in physical processes
- In-combination effects.

1.1.1.10 The ISAA assessed the following impacts for Annex II diadromous fish:

- Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only)
- Release of sediment bound contaminants (Mona Offshore Cable Corridor only)
- Underwater sound
- EMF
- In-combination effects.

1.1.1.11 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC/Ramsar as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

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

1.1.1.12 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II diadromous fish that are qualifying features of this European site, and were screened into assessment include:

- Atlantic salmon
- Sea lamprey
- River lamprey.

1.1.1.13 The ISAA assessed the following impacts:

- Underwater sound
- EMF
- In-combination effects.

1.1.1.14 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

River Ehen SAC

1.1.1.15 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the River Ehen SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II diadromous fish that are qualifying features of this European site, and were screened into assessment include:

- Atlantic salmon
- Freshwater pearl mussel.

1.1.1.16 The ISAA assessed the following impacts:

- Underwater sound
- EMF
- In-combination effects.

1.1.1.17 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the River Ehen SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

River Eden SAC

1.1.1.18 The impacts of the Mona Offshore Wind Project have been assessed with respect to the Conservation objectives of this site. Annex II diadromous fish that are qualifying features of this European site, and were screened into assessment include:

- Atlantic salmon
- Sea lamprey
- River lamprey.

1.1.1.19 The ISAA assessed the following impacts:

- Underwater sound
- EMF
- In-combination effects.

1.1.1.20 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the River Eden SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

River Derwent and Bassenthwaite Lake SAC

1.1.1.21 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the River Derwent and Bassenthwaite Lake SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II diadromous fish that are qualifying features of this European site, and were screened into assessment include:

- Atlantic salmon
- Sea lamprey
- River lamprey.

1.1.1.22 The ISAA assessed the following impacts:

- Underwater sound
- EMF
- In-combination effects.

1.1.1.23 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the River Derwent and Bassenthwaite Lake SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Solway Firth SAC

1.1.1.24 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Solway Firth SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II diadromous fish that are qualifying features of this European site, and were screened into assessment include:

- Sea lamprey
- River lamprey.

1.1.1.25 The ISAA assessed the following impacts:

- Underwater sound
- EMF
- In-combination effects.

1.1.1.26 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Solway Firth SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

River Kent SAC

1.1.1.27 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the River Kent SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II diadromous fish that are qualifying features of this European site, and were screened into assessment include:

- Freshwater pearl mussel.

1.1.1.28 The ISAA assessed the following impacts:

- Underwater sound
- EMF
- In-combination effects.

1.1.1.29 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the River Kent SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

River Bladnoch SAC

1.1.1.30 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the River Bladnoch SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II diadromous fish that are qualifying features of this European site, and were screened into assessment include:

- Atlantic salmon.

1.1.1.31 The ISAA assessed the following impacts:

- Underwater sound
- EMF
- In-combination effects.

1.1.1.32 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the River Bladnoch SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Afon Gwyrfai a Llyn Cwellyn SAC

1.1.1.33 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Afon Gwyrfai a Llyn Cwellyn SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II diadromous fish that are qualifying features of this European site, and were screened into assessment include:

- Atlantic salmon.

1.1.1.34 The ISAA assessed the following impacts:

- Underwater sound
- EMF
- In-combination effects.

1.1.1.35 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Afon Gwyrfai a Llyn Cwellyn SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

North Anglesey Marine/Gogledd Môn Forol SAC

1.1.1.36 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the North Anglesey Marine/Gogledd Môn Forol SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.37 The ISAA assessed the following impacts:

- Underwater sound from piling
- Underwater sound from clearance of Unexploded Ordnance (UXO)
- Underwater sound from pre-construction site surveys
- Underwater sound from vessels and other vessel activities
- Changes in prey availability (construction only)
- In-combination effects.

1.1.1.38 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the North Anglesey Marine/Gogledd Môn Forol SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

North Channel SAC

1.1.1.39 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the North Channel SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.40 The ISAA assessed the following impacts:

- 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.

1.1.1.41 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the North Channel SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC

1.1.1.42 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Bottlenose dolphin
- Grey seal.

1.1.1.43 The ISAA assessed the following impacts:

- 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.

1.1.1.44 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC as a result of the Mona Offshore Wind Project alone.

1.1.1.45 On the basis of the preliminary assessments undertaken to date it is considered unlikely that there will be 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 from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects. It is not, however, possible to conclude this definitively at this stage (i.e. beyond reasonable scientific doubt) until further assessment work, on the population level effects, is complete. The final conclusion of potential adverse effect on integrity is, therefore, deferred to the assessments which will be presented in the ISAA submitted with the application for consent.

West Wales Marine/Gorllewin Cymru Forol SAC

1.1.1.46 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the West Wales Marine/Gorllewin Cymru Forol SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.47 The ISAA assessed the following impacts:

- 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.

1.1.1.48 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the West Wales Marine/Gorllewin Cymru Forol SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Cardigan Bay/Bae Ceredigion SAC

1.1.1.49 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Cardigan Bay/Bae Ceredigion SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Bottlenose dolphin.

1.1.1.50 The ISAA assessed the following impacts:

- 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.

1.1.1.51 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Cardigan Bay/Bae Ceredigion SAC as a result of the Mona Offshore Wind Project alone.

1.1.1.52 On the basis of the preliminary assessments undertaken to date it is considered unlikely that there will be an adverse effect on the integrity of the 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. It is not, however, possible to conclude this definitively at this stage (i.e. beyond reasonable scientific doubt) until further assessment work, on the population level effects, is complete. The final conclusion of potential adverse effect on integrity is, therefore, deferred to the assessments which will be presented in the ISAA submitted with the application for consent.

Pembrokeshire Marine/Sir Benfro Forol SAC

1.1.1.53 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Pembrokeshire Marine/Sir Benfro Forol SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Grey seal.

1.1.1.54 The ISAA assessed the following impacts:

- 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.

1.1.1.55 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

1.1.1.56 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.57 The ISAA assessed the following impacts:

- 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.

1.1.1.58 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Isles of Scilly Complex SAC

1.1.1.59 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Isles of Scilly Complex SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Grey seal.

1.1.1.60 The ISAA assessed the following impacts:

- 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.

1.1.1.61 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Isles of Scilly Complex SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Lundy SAC

1.1.1.62 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Lundy SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Grey seal.

1.1.1.63 The ISAA assessed the following impacts:

- 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.

1.1.1.64 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Lundy SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

The Maidens SAC

1.1.1.65 The HRA Stage 1 Screening Report could not rule out the risk of LSE on The Maidens SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Grey seal.

1.1.1.66 The ISAA assessed the following impacts:

- 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.

1.1.1.67 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of The Maidens SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Strangford Lough

1.1.1.68 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Strangford Lough SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour seal.

1.1.1.69 The ISAA assessed the following impacts:

- 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.

1.1.1.70 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of Strangford Lough SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Murlough SAC

1.1.1.71 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Murlough SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour seal.

1.1.1.72 The ISAA assessed the following impacts:

- 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.

1.1.1.73 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of Murlough SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Rockabill to Dalkey Island SAC

1.1.1.74 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Rockabill to Dalkey Island SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.75 The ISAA assessed the following impacts:

- 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.

1.1.1.76 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of Rockabill to Dalkey Island SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Roaringwater Bay and Islands SAC

1.1.1.77 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Roaringwater Bay and Islands SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.78 The ISAA assessed the following impacts:

- 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.

1.1.1.79 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of Roaringwater Bay and Islands SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Blasket Islands SAC

1.1.1.80 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Blasket Islands SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.81 The ISAA assessed the following impacts:

- 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.

1.1.1.82 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of Blasket Islands SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Saltee Islands SAC

1.1.1.83 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Saltee Islands SAC. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Grey seal.

1.1.1.84 The ISAA assessed the following impacts:

- 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.

1.1.1.85 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of Saltee Islands SAC as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Mers Celtiques - Talus du golfe de Gascogne Site of Community Importance (SCI)

1.1.1.86 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Mers Celtiques - Talus du golfe de Gascogne SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.87 The ISAA assessed the following impacts:

- 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.

1.1.1.88 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Mers Celtiques - Talus du golfe de Gascogne SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Abers - Côte des legends SCI

1.1.1.89 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Abers - Côte des legends SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.90 The ISAA assessed the following impacts:

- 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.

1.1.1.91 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Abers - Côte des legends SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Ouessant-Molène SCI

1.1.1.92 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Ouessant-Molène SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.93 The ISAA assessed the following impacts:

- 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.

1.1.1.94 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Ouessant-Molène SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Côte de Granit rose-Sept-Iles SCI

1.1.1.95 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Côte de Granit rose-Sept-Iles SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.96 The ISAA assessed the following impacts:

- 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.

1.1.1.97 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Anse de Goulven, dunes de Keremma SCI

1.1.1.98 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Anse de Goulven, dunes de Keremma SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.99 The ISAA assessed the following impacts:

- 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.

1.1.1.100 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Anse de Goulven, dunes de Keremma SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Tregor Goëlo SCI

1.1.1.101 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Tregor Goëlo SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.102 The ISAA assessed the following impacts:

- 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.

1.1.1.103 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Tregor Goëlo SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Côtes de Crozon SCI

1.1.1.104 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Côtes de Crozon SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.105 The ISAA assessed the following impacts:

- 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.

1.1.1.106 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Côtes de Crozon SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Chaussée de Sein SCI

1.1.1.107 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Chaussée de Sein SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.108 The ISAA assessed the following impacts:

- 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.

1.1.1.109 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Chaussée de Sein SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Cap Sizun SCI

1.1.1.110 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Cap Sizun SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.111 The ISAA assessed the following impacts:

- 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.

1.1.1.112 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Cap Sizun SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Récifs du talus du golfe de Gascogne SCI

1.1.1.113 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Récifs du talus du golfe de Gascogne SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.114 The ISAA assessed the following impacts:

- 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.

1.1.1.115 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Récifs du talus du golfe de Gascogne SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Anse de Vauville SCI

1.1.1.116 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Anse de Vauville SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.117 The ISAA assessed the following impacts:

- 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.

1.1.1.118 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Anse de Vauville SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Cap d'Erquy-Cap Fréhel SCI

1.1.1.119 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Cap d'Erquy-Cap Fréhel SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.120 The ISAA assessed the following impacts:

- 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.

1.1.1.121 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Cap d'Erquy-Cap Fréhel SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Baie de Saint-Brieuc – Est SCI

1.1.1.122 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Baie de Saint-Brieuc – Est SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.123 The ISAA assessed the following impacts:

- 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.

1.1.1.124 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Baie de Saint-Brieuc – Est SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Banc et récifs de Surtainville SCI

1.1.1.125 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Banc et récifs de Surtainville SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.126 The ISAA assessed the following impacts:

- 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.

1.1.1.127 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Banc et récifs de Surtainville SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.1.1.128 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCII. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.129 The ISAA assessed the following impacts:

- 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.

1.1.1.130 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no 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 the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Estuaire de la Rance SCI

1.1.1.131 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Estuaire de la Rance SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.132 The ISAA assessed the following impacts:

- 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.

1.1.1.133 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Estuaire de la Rance SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Baie du Mont Saint Michel SCI

1.1.1.134 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Baie du Mont Saint Michel SCI. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Annex II marine mammals that are qualifying features of this European site, and were screened into assessment include:

- Harbour porpoise.

1.1.1.135 The ISAA assessed the following impacts:

- 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.

1.1.1.136 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Baie du Mont Saint Michel SCI as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Liverpool Bay/Bae Lerpwl Special Protection Area (SPA)

1.1.1.137 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Liverpool Bay/Bae Lerpwl SPA. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Seabird species that are qualifying features of this European site, and were screened into assessment include:

- Red-throated diver
- Little gull
- Common scoter
- Little tern
- Common tern.

1.1.1.138 The ISAA assessed the following impacts:

- Temporary habitat loss/disturbance and increased SSC
- Disturbance and displacement from airborne sound and presence of vessels and infrastructure
- Changes in prey availability (construction only)
- Accidental pollution
- In-combination effects.

1.1.1.139 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Irish Sea Front SPA

1.1.1.140 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Irish Sea Front SPA. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Seabird species that are qualifying features of this European site, and were screened into assessment include:

- Manx shearwater.

1.1.1.141 The ISAA assessed the following impacts:

- Changes in prey availability (construction phase only).

1.1.1.142 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Irish Sea Front SPA as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Ribble and Alt Estuaries SPA

1.1.1.143 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Ribble and Alt Estuaries SPA. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Seabird species that are qualifying features of this European site, and were screened into assessment include:

- Lesser black-backed gull.

1.1.1.144 The ISAA assessed the following impacts:

- Changes in prey availability (construction only).

1.1.1.145 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Ribble and Alt Estuaries SPA as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Morecambe Bay and Duddon Estuary SPA

1.1.1.146 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Morecambe Bay and Duddon Estuary SPA. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Seabird species that are qualifying features of this European site, and were screened into assessment include:

- Lesser black-backed gull
- Herring gull.

1.1.1.147 The ISAA assessed the following impacts:

- Changes in prey availability (construction only).

1.1.1.148 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Morecambe Bay and Duddon Estuary SPA as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Lambay Island SPA

1.1.1.149 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Lambay Island. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Seabird species that are qualifying features of this European site, and were screened into assessment include:

- Guillemot.

1.1.1.150 The ISAA assessed the following impacts:

- Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only).

1.1.1.151 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Lambay Island SPA as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Grassholm SPA

1.1.1.152 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Grassholm SPA. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Seabird species that are qualifying features of this European site, and were screened into assessment include:

- Gannet.

1.1.1.153 The ISAA assessed the following impacts:

- Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only)
- Collision risk (in-combination effect only).

1.1.1.154 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Grassholm SPA as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Ailsa Craig SPA

1.1.1.155 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Ailsa Craig SPA. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Seabird species that are qualifying features of this European site, and were screened into assessment include:

- Gannet.

1.1.1.156 The ISAA assessed the following impacts:

- Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only)
- Collision risk (in-combination effect only).

1.1.1.157 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Ailsa Craig SPA as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

Ireland's Eye SPA

1.1.1.158 The HRA Stage 1 Screening Report could not rule out the risk of LSE on the Ireland's Eye SPA. The impacts of the Mona Offshore Wind Project have been assessed with respect to the conservation objectives of this site. Seabird species that are qualifying features of this European site, and were screened into assessment include:

- Guillemot.

1.1.1.159 The ISAA assessed the following impacts:

- Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only).

1.1.1.160 Based on the evidence set out in this report the assessment concluded that the conservation objectives for the site would not be undermined and there would be no adverse effect on the integrity of the Ireland's Eye SPA as a result of the Mona Offshore Wind Project alone, or in combination with other plans and projects.

1.2 Introduction

1.2.1 Overview

1.2.1.1 A joint venture of bp Alternate Energy Investments Ltd (hereafter referred to as bp) and Energie Baden-Württemberg AG (hereafter referred to as EnBW) on behalf of the Mona Offshore Wind Project Ltd. (hereafter referred to as the Applicant), is developing the Mona Offshore Wind Project (Figure 1.1). The Mona Offshore Wind Project is a proposed wind farm located in the east Irish Sea.

1.2.1.2 This HRA Stage 2 ISAA has been prepared for the Mona Offshore Wind Project. The Mona Offshore Wind Project includes both the offshore and onshore infrastructure required to generate and transmit electricity from the offshore wind turbines to an onshore National Grid substation. The key components of the Mona Offshore Wind Project include:

- Offshore wind turbines
- Foundations (for wind turbines and Offshore Substation Platforms (OSPs))
- Scour protection and cable protection
- Inter-array cables linking the wind turbines to the OSPs
- Connection works to the existing Bodelwyddan National Grid substation
- Temporary construction compounds, including storage areas
- Permanent and temporary access roads
- High Voltage Alternating Current (HVAC) transmission system including:
  - OSPs
  - Offshore interconnector cables
  - Offshore export cable(s)
  - Mona 400kV Grid connection cable
  - Onshore export cable(s)
  - Onshore substation.

1.2.1.3 As the Mona Offshore Wind Project is an offshore generating station with a capacity of greater than 350MW located in both Welsh and English waters, it is a Nationally Significant Infrastructure Project (NSIP) requiring a Development Consent Order (DCO) under the Planning Act 2008. The application for development consent for the Mona Offshore Wind Project will cover all offshore aspects of the project located within Welsh offshore waters and English offshore waters as well as all onshore aspects of the Mona Offshore Wind Project.

1.2.1.4 The consents, licences and permissions (in addition to the DCO) that will be sought by the Applicant for the Mona Offshore Wind Project include:

- A marine licence under the Marine and Coastal Access Act 2009, deemed under the DCO, for licensable activities in English waters and Welsh offshore waters (i.e. all licensable activities related to the offshore wind farm infrastructure located within the Mona Array Area)
- A marine licence under the Marine and Coastal Access Act 2009, from Natural Resources Wales (NRW), for licensable activities within 12 nautical miles (nm) of the Welsh coast (i.e. for the offshore export cables and related works located within and between the Mona Array Area and the landfall at Mean High Water Springs (MHWS)).

1.2.1.5 This HRA Stage 2 ISAA has been prepared to inform the statutory consultation alongside the Preliminary Environmental Information Report (PEIR).

1.2.2 Project summary

1.2.2.1 An overview of the Mona Offshore Wind Project is outlined in the paragraphs below and the full project description is provided in volume 1, chapter 3: Project description of the PEIR.

1.2.2.2 The Mona Offshore Wind Project will be located in the east Irish Sea, with a landfall on the North Wales coastline and a connection to the existing Bodelwyddan National Grid substation.

1.2.2.3 The Mona Offshore Wind Project will consist of up to 107 wind turbines. The offshore infrastructure will also include up to 360km of offshore export cables, 50km of interconnector cable and 500km of inter-array cable.

1.2.2.4 The onshore infrastructure will consist of up to 12 onshore export cables buried in up to four trenches and an onshore HVAC substation to allow the power to be transferred to the National Grid via the existing Bodelwyddan National Grid substation.

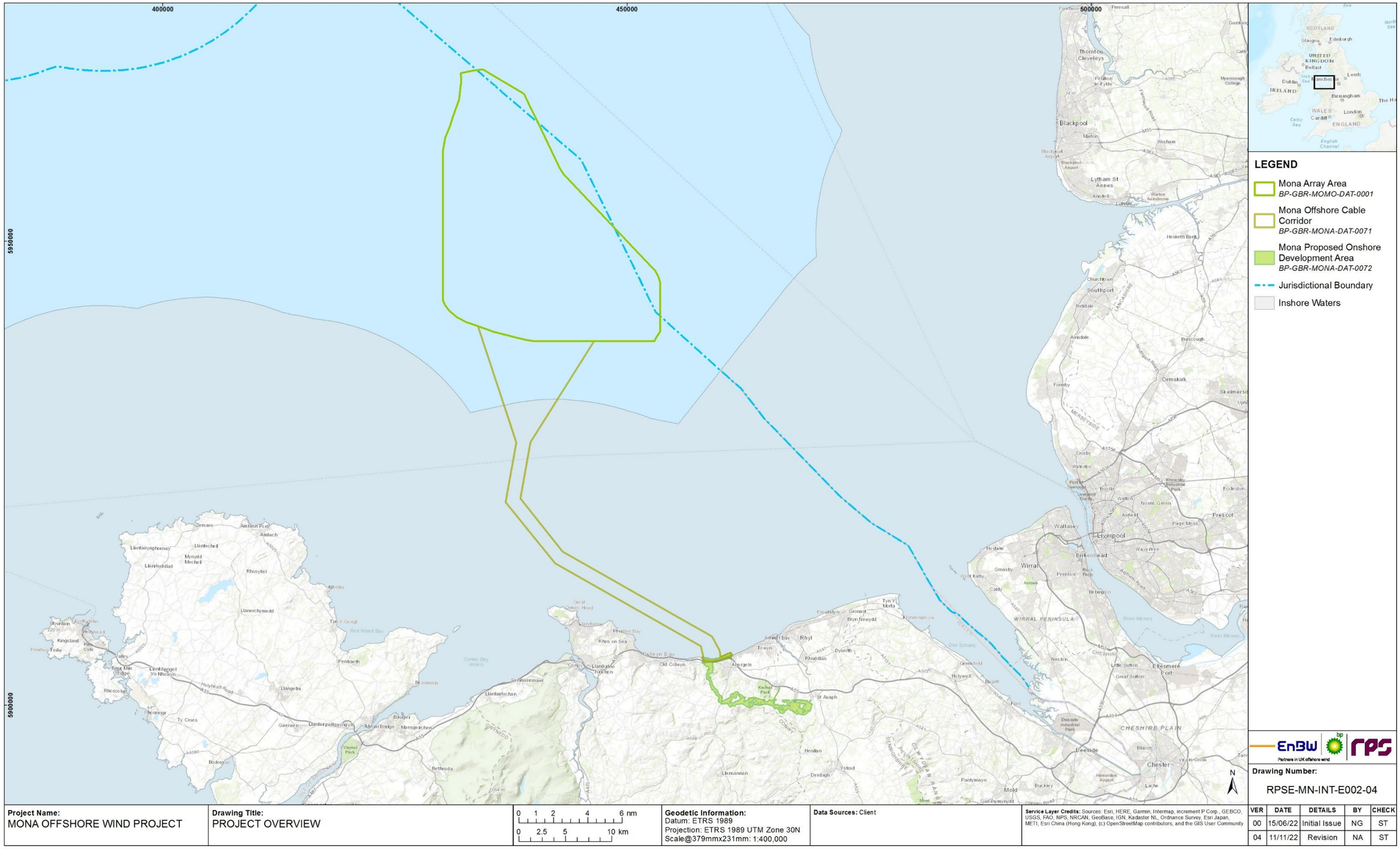
1.2.2.5 The key components of the Mona Offshore Wind Project are presented in Table 1.1.

1.2.2.6 The Applicant intends to commence construction of the Mona Offshore Wind Project in 2026 and for it to be fully operational by 2030 in order to help meet UK and Welsh Government renewable energy targets. The Mona Offshore Wind Project will have a lifetime of 35 years.

Table 1.1: Key parameters for the Mona Offshore Wind Project.

Parameter	Value
Mona Array Area (km^2)	449.97
Average water depth (m LAT)	-39.23
Maximum number of wind turbines	107
Maximum blade tip height above LAT (m)	324
Maximum number of OSPs	4
Maximum number of offshore export cables	4
Maximum number of onshore export cables	12
Maximum length of inter-array cables (km)	500
Maximum length of interconnector cables (km)	50
Maximum length of offshore export cables (km)	360

Parameter	Value
Maximum length of onshore export cables (km)	216



Project Name: MONA OFFSHORE WIND PROJECT	**Drawing Title:** PROJECT OVERVIEW	0 1 2 4 6 nm 0 2.5 5 10 km	**Geodetic Information:** Datum: ETRS 1989 Projection: ETRS 1989 UTM Zone 30N Scale@379mmx231mm: 1:400,000	**Data Sources:** Client	**Service Layer Credits:** Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Drawing Number: RPSE-MN-INT-E002-04

VER	DATE	DETAILS	BY	CHECK
00	15/06/22	Initial Issue	NG	ST
04	11/11/22	Revision	NA	ST

Figure 1.1: Location of the Mona Offshore Wind Project.

1.2.3 Habitats Regulations Assessment

1.2.3.1 The United Kingdom (UK) departed from the EU on 31 December 2020 (EU Exit) and, as such, is no longer an EU Member State. The Habitats Regulations, however, continue to provide the legislative context for HRA in the UK. The 2019 (EU Exit) Regulations, including the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 ("2019 Regulations"), implemented minor changes to the HRA regime which currently have no material implication on the requirement or process for a HRA for the Mona Offshore Wind Project.

1.2.3.2 Under the Habitats Regulations, an Appropriate Assessment must be carried out on all plans and projects that are likely to have a significant effect on a European site. European sites include SACs, candidate SACs (cSACs), SCIs, SPAs and as a matter of policy (Defra, 2021), possible SACs (pSACs) and potential SPAs (pSPAs). In the UK, the requirements of the Habitats Regulations are also extended to consider the effects on Ramsar sites (listed under the Ramsar Convention on Wetlands of International Importance). These sites in the UK now form part of the National Site Network but the term “European site” has been retained for sites protected in European Member States, England and Wales and the rest of the UK in accordance with guidance issued by the UK Government on the 2019 (EU Exit) Regulations (Defra, 2021).

1.2.3.3 The Defra (2021) guidance outlines that the HRA process can have up the three stages, as outlined below, where the outcome of each successive stage determines whether a further stage in the process is required:

1. Screening - to check if the proposal is likely to have a significant effect on the site’s conservation objectives
2. Appropriate Assessment - to assess the likely significant effects of the proposal on the integrity of the site and its conservation objectives and to consider ways to avoid or minimise any effects
3. Derogation - to consider if proposals that would have an adverse effect on a European site qualify for an exemption, subject to three legal tests being satisfied (i.e. alternative solutions, imperative reasons of overriding public interest and compensatory measures).

1.2.3.4 Further information on HRA methods, guidance and case law is provided in section 1.3.3.

1.2.4 Purpose of the report

1.2.4.1 This document presents the ISAA under Section 63 of the Conservation of Habitats and Species Regulations 2017 and Section 28 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 for the Mona Offshore Wind Project.

1.2.4.2 This report has been prepared by RPS on behalf of the Applicant to support the HRA of the Mona Offshore Wind Project in the determination of the implications for European sites. The ISAA builds upon the HRA Stage 1 Screening Report and considers the likely significant environmental effects of the Mona Offshore Wind Project as they relate to relevant European site integrity. This report will provide the Competent Authority with the information required to undertake an HRA Stage 2 Appropriate Assessment (see section 1.3 for more detail on the HRA process).

1.2.4.3 The scope of this document covers all relevant European sites and designated features where LSEs have been identified due to the potential impacts arising from the Mona Offshore Wind Project. This includes both ‘offshore’ European sites and features (seaward of 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)).

1.2.5 Progress to date

1.2.5.1 A HRA Stage 1 Screening Report for the Mona Offshore Wind Project has been produced to determine whether the Mona Offshore Wind Project could result in an LSE on a European site, with reference to the conservation objectives of the site. The screening exercise determined that, on the basis of theoretical spatial connectivity, the potential for LSEs to result from component elements of the Mona Offshore Wind Project could not be discounted.

1.2.5.2 The HRA Stage 1 Screening Report presents the screening exercise, the purpose of which is summarised below:

- Identification of the relevant European sites and their qualifying features which may be sensitive or vulnerable to potential impacts arising from the construction, operations and maintenance and decommissioning of the Mona Offshore Wind Project
- Identification of the qualifying features of relevant European sites which are not considered likely to be at risk of significant effects arising from the Mona Offshore Wind Project, either alone or in-combination with other plans or projects, so that they can be eliminated from further consideration within the HRA process
- Identification of the qualifying features of relevant European sites which are considered likely to be at risk of significant effects so that they can be taken forward to HRA Stage Two Appropriate Assessment
- Consideration of the supporting habitats of qualifying species of relevant European sites and identification of those which are considered likely to be at risk of significant effects so that they can be taken forward within the HRA process
- Consideration of which of the potential impacts arising from the Mona Offshore Wind Project, either alone or in-combination with other plans or projects, are considered likely to result in LSEs to features of European sites and which potential impacts can be eliminated from consideration in further stages of the HRA.

1.2.5.3 A summary of the screening exercise for the Mona Offshore Wind Project is provided in section 1.11.

1.2.6 Structure of the report

1.2.6.1 This ISAA is structured as follows:

- Section 1.1: Non-technical summary
- Section 1.2: Introduction – this section describes the Mona Offshore Wind Project and establishes the need for, the purpose and structure of the ISAA
- Section 1.3 Habitats Regulations Assessment – this section sets out the process, principles, tests, (including those established by case law) and guidance applied to the ISAA
- Section 1.4: Consultation – this section provides a summary of the consultation undertaken to date of relevance to the ISAA, responses provided, and how these have been addressed
- Section 1.5: Summary of LSE Screening – this section presents the European sites potentially at risk of LSE and the features and pathways for which HRA Stage Two Appropriate Assessment is required, both alone and in-combination.

1.2.6.2 Information to support the HRA Stage Two Appropriate Assessment is provided in:

- Section 1.6: Information to support the Appropriate Assessments, including MDS, 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 1.7: Assessment of potential adverse effects on the integrity of European sites designated for Annex I habitats, alone and in-combination
- Section 1.8: Assessment of potential adverse effects on the integrity of European sites designated for Annex II diadromous fish species, alone and in-combination
- Section 1.9: Assessment of potential adverse effects on the integrity of European sites designated for Annex II marine mammals, alone and in-combination
- Section 1.10: Assessment of potential adverse effects on the integrity of European sites designated for offshore ornithological features, alone and in-combination
- Section 1.11: Conclusions of the assessment and the overall finding of the ISAA.

1.3 Habitats Regulations Assessment

1.3.1 Legislative context

1.3.1.1 The Habitats Directive (92/43/EEC) on the conservation of natural habitats and of wild fauna and flora, protects habitats and species of European nature conservation importance. Together with Council Directive (2009/147/EC) on the conservation of wild birds (the 'Birds Directive'), the Habitats Directive provide the EU's legal framework for the protection of wild fauna and flora and birds and establishes a network of internationally important sites, known as Natura 2000 sites or European sites, designated for their ecological status. This network of designated sites includes:

- SACs which are designated under the Habitats Directive and promote the protection of flora, fauna and habitats
- SPAs which are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds.

1.3.1.2 These Directives are transposed into UK law by the Conservation of Habitats and Species Regulations 2017 (as amended) – inshore/territorial waters (onshore and out to 12nm and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended) – offshore waters (12nm to Exclusive Economic Zone (EEZ) boundary). Collectively, these are known as the Habitats Regulations.

1.3.1.3 The UK is no longer an EU Member State, but the Habitats Directive as implemented by the Habitats Regulations, continues to provide the legislative framework for HRA in the UK. The HRA process implemented under the Habitats Regulations continues to apply (subject to minor changes effected by the 2019 Regulations) and the UK is bound by HRA judgments handed down by The Court of Justice of the European Union (CJEU) prior to 31 to December 2020[1].

1.3.1.4 The objective of the Habitats Regulations is to conserve, at a favourable conservation status (FCS), those qualifying habitats and species and supporting habitats of qualifying species listed under the Habitats Directive and Birds Directive. Post EU Exit, the Habitats Regulations continue to refer to Annexes I and II of the Habitats Directive and Annex I of the Birds Directive and as such, reference is made to the annexes of the Habitats and Birds Directives in this report.

1.3.1.5 In addition to sites formally defined as European sites in the Habitats Regulations, UK Government policy (ODPM Circular 06/2005) states that Wetlands of International Importance listed and proposed under the Ramsar Convention 1971 (Ramsar sites) are afforded the same protection. As a matter of policy, the UK Government also affords sites going through the formal designation process (i.e. pSPAs, cSACs and pSACs), SCIs and potential Ramsar sites, the same level of protection.

1.3.1.6 Under the Habitats Regulations, before granting approval (i.e. planning permissions, licenses and consents) for a development likely to have a significant effect on an SAC or SPA/Ramsar site, an Appropriate Assessment must be made by the competent authority, of the proposed plan or project's potential for adverse effects on integrity of the site in view of that site's conservation objectives.

1.3.2 European sites (post EU exit)

1.3.2.1 European sites (SACs and SPAs) in the UK no longer form part of the EU's Natura 2000 ecological network. The 2019 Regulations have created a National Site Network on land and at sea, including both the inshore and offshore marine areas in the UK.

[1] The UK Supreme Court may depart from binding pre-EU Exit case law if they consider it 'right to do so' and the Inner House of the Court of Session may depart from such case law in certain circumstances

The National Site Network comprises of European sites (SACs and SPAs) in the UK that already existed (i.e. were established under the Habitats or Birds Directives) on 31 December 2020 (or proposed to the European Commission (EC) before that date) and any new sites designated under the Habitats Regulations under an amended designation process.

1.3.2.2 Ramsar sites do not form part of the National Site Network. Many Ramsar sites overlap with SACs and SPAs and all Ramsar sites remain protected in the same way as SACs and SPAs.

1.3.3 The HRA process

1.3.3.1 Regulation 28 of the Conservation of Offshore Marine Habitats and Species Regulations 2017 and Regulation 63 of the Conservation of Habitats and Species Regulations 2017, require that wherever a plan or project that is not directly connected to, or necessary for, the management of a European site is likely to have a significant effect on the conservation objectives of the site (directly, indirectly, alone or in-combination with other plans or projects), an 'Appropriate Assessment' of the implications of the plan or project for that site in view of that site's conservation objectives must be undertaken by the Competent Authority before consent or authorisation can be given for the plan or project.

1.3.3.2 The Habitats Regulations make it clear that the person applying for the consent of the plan or project must provide such information as the competent authority may reasonably require for the purposes of the assessment. This ISAA provides this information.

1.3.3.3 HRA is a multi-stage process which helps to determine LSE, assesses adverse impact on the integrity of a European site, and examines alternative solutions and provides justification of Imperative Reasons of Overriding Public Interest (IROPI), as required. The Defra (2021) guidance describes that the process can have up to three stages as outlined below and shown in Figure 1.2:

- Screening - the first stage involves a screening for LSE which is a simple assessment to check or screen if, in the absence of mitigation, a proposal:
  - Is directly connected with or necessary for the conservation management of a European site
  - Risks having a significant effect on a European site on its own or in-combination with other proposals
- Appropriate Assessment - the second stage is an Appropriate Assessment, which must be carried out if it is decided that there is a risk of a LSE on a European site or if there is not enough evidence to rule out a risk (as required by Article 6(3) of the Habitats Directive). The Appropriate Assessment should assess the likely significant effects of a proposal on the integrity of the site and its conservation objectives and consider ways to avoid or reduce (mitigate) any potential for an 'adverse effect on the integrity of the site'
- Derogations - the third stage is known as a derogation (as outlined in Article 6(4) of the Habitats Directive) where, in certain circumstances, a proposal that has failed the integrity test may be allowed to go ahead. To decide if the proposal qualifies for a derogation, three legal tests must be applied. All three tests must be passed in sequence for a derogation to be granted:
  - There are no feasible alternative solutions that would be less damaging or avoid damage to the site
  - The proposal needs to be carried out for imperative reasons of overriding public interest
  - The necessary compensatory measures can be secured.

1.3.3.4 This report considers the second stage 'Appropriate Assessment' in the HRA process in Figure 1.1.

1.3.3.5 The 2019 Regulations establish management objectives for the National Site Network. These are called the network objectives. The objectives in relation to the National Site Network are to:

- Maintain or restore certain habitats and species listed in the Habitats Directive to favourable conservation status
- Contribute to ensuring the survival and reproduction of certain species of wild bird in their area of distribution and to maintaining their populations at levels which correspond to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements.

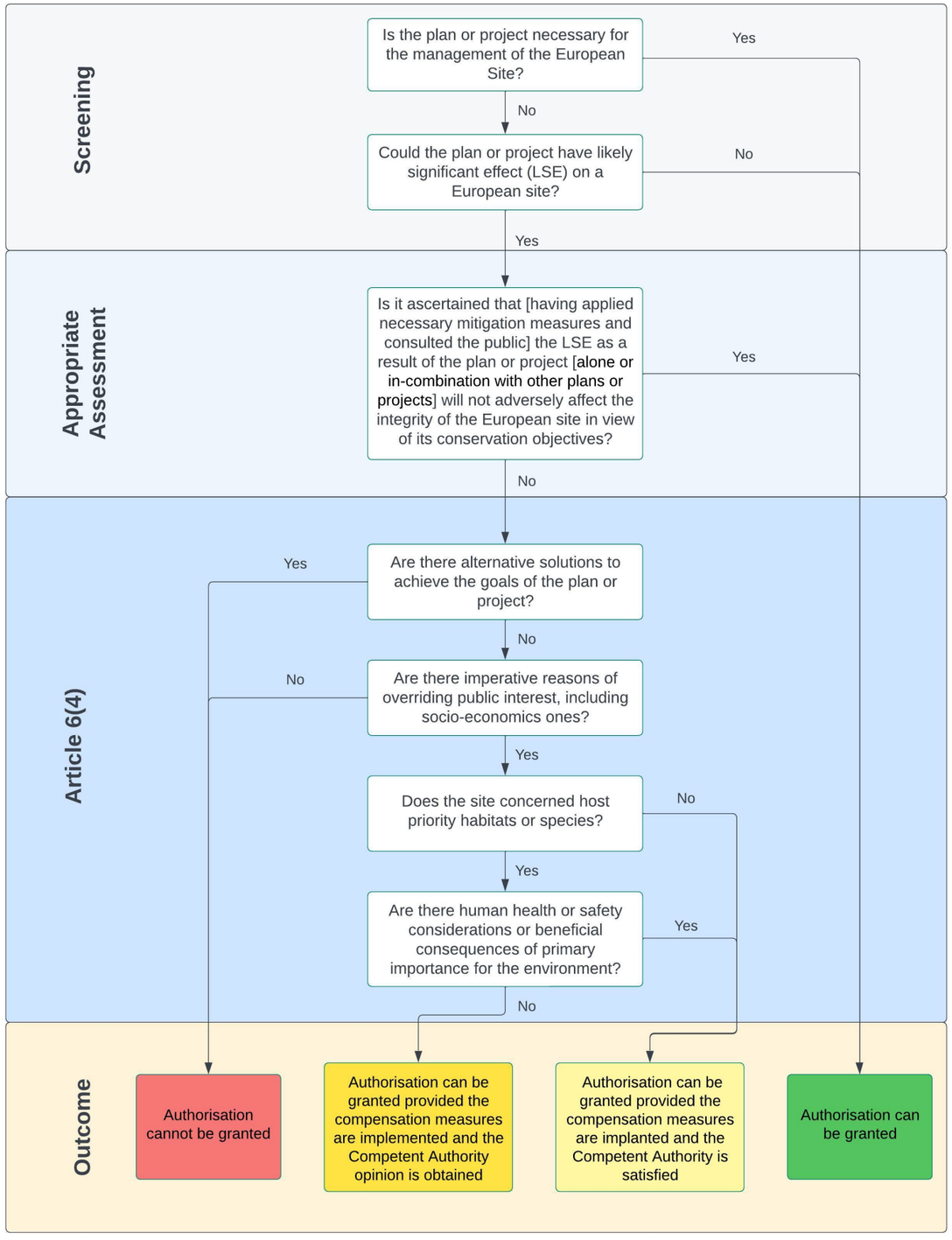


Figure 1.2: Stages in the HRA process (adapted from European Commission, 2021).

1.3.4 The Crown Estate Plan-Level HRA

1.3.4.1 The Crown Estate (TCE), in its role as competent authority, has conducted a Plan-Level HRA for the Offshore Wind Leasing Round 4. The Plan-Level HRA assessed the potential impacts of the six potential offshore wind projects identified through the Offshore Wind Leasing Round 4, including the Mona Offshore Wind Project, on the National Site Network.

1.3.4.2 The Plan-Level HRA process involved engagement and consultation with an Expert Working Group (EWG) consisting of relevant UK statutory marine planning authorities, Statutory Nature Conservation Bodies (SNCBs) and relevant non-governmental organisations.

1.3.4.3 TCE's Plan-Level HRA (TCE, 2022) concluded that the possibility of an adverse effect on site integrity as a result of the Offshore Wind Leasing Round 4 could not be ruled out for two protected sites forming part of the National Site Network. The two protected sites, and relevant features, are: 1) Sandbank features of the Dogger Bank SAC alone and in-combination; and 2) kittiwake feature of the Flamborough and Filey Coast SPA for in-combination effects only. It should be noted, however, that the Mona Offshore Wind Project was not identified as a preferred project required to be considered in the Appropriate Assessment for either of these sites. Therefore, no Adverse Effect on Site Integrity was identified for the Mona Offshore Wind Project in the Plan-Level HRA.

1.3.4.4 On the basis of these conclusions, TCE considered derogation and concluded that: a) there are no alternative solutions to deliver the Offshore Wind Leasing Round 4 objectives; b) there are clear imperative reasons of overriding public interest to proceed under the government's targets for offshore wind and net-zero; and c) the Offshore Wind Leasing Round 4 provides a robust framework for the delivery of compensatory measures. TCE therefore considered that the three derogation tests have been met and the Secretary of State has since agreed that TCE can proceed with the plan, and Welsh Ministers have not raised any objection to the notice.

1.3.4.5 The Plan-Level HRA notes that TCE expects developers to undertake project-specific environmental assessments - including a detailed project-level HRA - as part of their application for development consent. This document comprises Stage 2 of the HRA, which carries out the Appropriate Assessment of the Mona Offshore Wind Project with respect to its potential to have an adverse effect on integrity on European sites. This HRA Stage 2 ISAA has taken into account the information and approach taken by the Plan Level HRA as set out below in paragraph 1.3.5.1.

1.3.5 Guidance

1.3.5.1 This HRA Stage 2 ISAA as drawn upon a number of information sources, HRA principles, regulations and guidance documents, including:

- The Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017
- EC (2006) Nature and Biodiversity Cases Ruling of the European Court of Justice
- EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EE. Clarification on the Concepts of: Alternative Solutions, Imperative

Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission

- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC'
- EC (2020) Guidance document on wind energy developments and EU nature legislation. European Commission Notice Brussels (2020) 7730 final
- 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
- Joint Defra, Welsh Government, Natural England and Natural Resources Wales guidance (2021) 'Habitats regulations assessments: protecting a European site'
- The Planning Inspectorate Advice Note ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects (The Planning Inspectorate, 2022)
- The Planning Inspectorate Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects (The Planning Inspectorate, 2019)
- The Habitats Regulations Assessment Handbook (DTA Publications Limited, 2016)
- TCE Plan Level HRA (TCE, 2022)
- Feedback received from the Mona Offshore Wind Project and Morgan Offshore Wind Project (hereafter referred to as 'Morgan Generation Assets') Evidence Plan Process to date (see section 1.4).

1.3.6 Case law relevant to the ISAA

Consideration of mitigation measures

1.3.6.1 In case C-323/17 'People Over Wind and Sweetman v Coillte Teoranta' (April 2018) (Sweetman 2), the CJEU ruled that mitigation measures could not be taken into account at the screening stage. The approach taken in the HRA Stage 1 Screening Report for the Mona Offshore Wind Project complied with this judgement and no mitigation measures were considered at the HRA Stage 1 Screening stage.

Adverse effects on integrity

1.3.6.2 The European Commission's guidance on managing Natura 2000 sites (EC, 2018) states that the purpose of the Appropriate Assessment is to assess the implications of the plan or project in regards to the conservation objectives of the European site or Ramsar, this may be from the plan/project alone or in-combination with other plans or projects. The conclusions should enable the relevant competent authority to conclude whether the plan or project will adversely affect the integrity of the site concerned. The focus of the Appropriate Assessment is therefore specifically on the designated features (species and/or the habitats) of the European site.

1.3.6.3 The best scientific knowledge should always be used when undertaking an Appropriate Assessment in order to enable the competent authorities to conclude with certainty that there will be no adverse effects on the integrity of the site. The EC (2018) guidance notes that it is at the time of the decision authorising the implementation of the project that there must be no reasonable scientific doubt remaining as to the potential for adverse effects on the integrity of the site being assessed.

1.3.6.4 The judgment of the CJEU confirmed in its ruling in Sweetman, Ireland, Attorney General, Minister for the Environment, Heritage and Local Government v An Bord Pleanála) (C-258/11) (Sweetman 1) that 'Article 6(3) of the Habitats Directive must be interpreted as meaning that a plan or project not directly connected with or required for the management of a site will adversely affect the integrity of that site if it is liable to prevent the lasting preservation of the constitutive characteristics of the site that are connected to the presence of a priority natural habitat whose conservation was the objective justifying the designation of the site in the list of SCIs. The precautionary principle should be applied for the purposes of that appraisal'. EC (2018) advises that this interpretation would also be relevant to non-priority habitat types and to habitats of the designated species.

1.3.6.5 EC (2018) defines the 'integrity of the site' as the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated. In Sweetman 1 it was determined that the ecological structure and function of a European site would be adversely affected with regards to the site's overall ecological functions and "the lasting preservation of the constitutive characteristics of the site."

1.3.6.6 EC (2018) also states that if the competent authority considers that the relevant mitigation measures are sufficient to avert the adverse effects on site integrity identified in the Appropriate Assessment, they are then required to become an essential element of the of the final plan or project design or may be listed as a condition for project consent.

1.3.6.7 EC (2020) states it is the competent authority's responsibility to approve the plan or project, a decision made on the basis of the information provided by the applicant to inform the Appropriate Assessment. The decision can only be made after the competent authority is satisfied beyond reasonable scientific doubt that the plan or project will not adversely affect the integrity of the site.

1.3.6.8 EC (2020) also reaffirms that the authorisation criterion laid down in the second sentence of Article 6(3) of the Habitats Directive integrates the precautionary principle and makes it possible to effectively prevent the protected sites from suffering adverse effects on their integrity as the result of the plans or projects in question. A less stringent authorisation criterion could not as effectively ensure the fulfilment of the objective of site protection intended under that provision. The onus is therefore on demonstrating the absence of adverse effects rather than their presence, reflecting the precautionary principle. The Appropriate Assessment must therefore be adequately detailed and justified to highlight the absence of adverse effects, using the best scientific knowledge available.

1.3.6.9 In accordance with the decision of the CJEU in Waddenzee (C-127/02), the measure of significance is made against the conservation objectives for which the European sites were designated.

Consideration of *ex situ* effects

1.3.6.10 EC (2018) advises that Article 6(3) safeguards be applied to any development pressures, including those which are outside of the boundaries European sites, but which are likely to have significant effects on that European site.

1.3.6.11 The CJEU developed this point when it issued a ruling in case C-461/17 ("Brian Holohan and Others v An Bord Pleanála") that determined *inter alia* that Article 6(3) of Directive 92/43/EEC must be interpreted as meaning that an Appropriate Assessment must identify all of the habitat types and species for which a site is protected, and, identify and assess both the effects of the proposed plan or project for the species present on that site, and for which that site has not been listed, and the implications for habitat types and species to be found outside the boundaries of that site, provided that the identified effects have the potential to affect the conservation objectives of the site.

1.3.6.12 On this basis, consideration has been given in this ISAA to implications for designated habitats and species located both inside and outside of the identified European site boundaries considered in the HRA Stage 1 Screening Report, with reference to those sites' conservation objectives where effects upon those habitats and/or species could potentially undermine the conservation objectives of the sites concerned.

1.4 Consultation

1.4.1 The Evidence Plan process

1.4.1.1 The Applicant is facilitating the Evidence Plan process for the Mona Offshore Wind Project. Evidence plans are formal mechanisms to agree what information the Applicant needs to supply to the Planning Inspectorate as part of an application for development consent. This also helps to ensure compliance with the Habitats Regulations and helps ensure Applicants provide sufficient information as part of their DCO application.

1.4.1.2 An evidence plan steering group has been established for the Mona Offshore Wind Project and the Morgan Generation Assets. It was determined appropriate to have a joint evidence plan process across the Mona Offshore Wind Project and the Morgan Generation Assets so as to ensure common issues and cumulative/in-combination issues are appropriately addressed. The steering group is comprised of the Applicant, the Planning Inspectorate, NRW, Natural England, the Joint Nature Conservation Committee (JNCC) and the Marine Management Organisation (MMO) as the key regulatory bodies and SNCBs. The steering group has met and will continue to meet at key milestones throughout the EIA process.

1.4.1.3 In addition, EWGs have been established to discuss topic specific issues with relevant stakeholders. EWG meetings have been held and will continue to be held at key stages in the EIA process or when new information becomes available for each topic, to provide the opportunity for stakeholders to provide feedback and advice at an early stage. EWGs have been established for the following topics:

- Physical processes, benthic ecology and fish and shellfish ecology
- Marine mammals
- Offshore ornithology
- Terrestrial ecology.

1.4.2 Consultation to date

1.4.2.1 A summary of the key consultation undertaken to date is presented inTable 1.2.

Table 1.2: Summary of key consultation on LSE screening for the Mona Offshore Wind Project.

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
Steering Group				
November 2021	NRW, Natural England, MMO, JNCC and the Planning Inspectorate.	Steering Group meeting	• Meeting purpose was to set up and establish the Evidence Plan process and to gain feedback on the EWGs.	N/A
December 2021	Natural England, NRW, MMO, JNCC, Planning Inspectorate, Environment Agency	Steering Group meeting	• Meeting to introduce the cable route selection process.	N/A
July 2022	NRW, Natural England, MMO, JNCC and Planning Inspectorate	Steering Group meeting	• Meeting to provide an update on the cable route selection process • LSE Methodology circulated to members of the Steering Group to gain feedback and agreement on the methodology to be used.	Feedback has been incorporated into HRA Stage 1 Screening and HRA Stage 2 ISAA.

Date	Consultee	Type of Consultation	Summary of Consultation	Where addressed
Expert Working Groups				
Marine mammals				
December 2021	NRW, Natural England, MMO, JNCC, Cefas and The Wildlife Trusts (TWT).	EWG meeting	• Meeting to introduce the Mona Offshore Wind Project and to establish the EWG • Overview of approach to baseline characterisation and study areas and ongoing surveys and preliminary findings • 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.	Feedback has been incorporated into the PEIR. Marine mammal MUs have been used when screening for LSE.
July 2022	NRW, Natural England, MMO, JNCC, Cefas and TWT.	EWG meeting	• Discussion of actions from first EWG meeting, scoping opinion discussion and underwater sound methodology • LSE Methodology presented and discussed to the EWG for agreement on the methodology to be used.	Feedback has been incorporated into HRA Stage 1 Screening and HRA Stage 2 ISAA.
November 2022	NRW, Natural England, MMO, JNCC, Cefas and TWT.	EWG meeting	• Baseline characterisation • Baseline populations • Approach to LSE screening.	Discussion on marine mammals. Due to the timing of the workshop ahead of publishing the PEIR, discussion outputs will be incorporated into the ISAA to accompany the DCO application.
Ornithology				
December 2021	NRW, Natural England, MMO, JNCC, TWT, Royal Society for the Protection of Birds (RSPB)	EWG meeting	• Meeting to introduce the Mona Offshore Wind Project and to establish the EWG • Discussion of ongoing surveys, preliminary findings and the approach to baseline characterisation.	Feedback has been incorporated into the PEIR and this HRA Stage 2 ISAA.
July 2022	Natural England, NRW, MMO, JNCC, RSPB and TWT.	EWG meeting	• Meeting to agree the approach to baseline characterisation, collision risk modelling and displacement • Opportunity for discussion of the Scoping Opinion • LSE Methodology presented and discussed to the EWG for agreement on the methodology to be used.	Feedback has been incorporated into HRA Stage 1 Screening and HRA Stage 2 ISAA.
November 2022	Natural England, NRW, MMO, JNCC and TWT.	EWG meeting	• Baseline characterisation • Baseline populations • Approach to LSE screening.	Discussion on offshore ornithology. Due to the timing of the workshop ahead of publishing the PEIR, discussion outputs will be incorporated into the ISAA to accompany the DCO application.
Benthic, fish and shellfish and physical processes				
February 2022	Natural England, NRW, MMO, JNCC, Royal Society for the Protection of Birds (RSPB) and TWT.	EWG meeting	• Meeting to discuss benthic survey feedback, preliminary results and desktop data sources • Physical processes baseline characterisation: Site specific data and desktop data sources • Fish and shellfish baseline characterisation: Site specific and desktop data sources.	Feedback has been incorporated into the PEIR and this Stage 2 ISAA.
April 2022	Natural England, NRW and JNCC	Email	• Benthic subtidal and intertidal survey scope of work was consulted on to gain feedback on the methodology.	Advice has been incorporated into Benthic Ecology Survey Scope of Work in order to inform the characterisation of benthic subtidal and intertidal ecology, including Annex I habitats.
November 2022	Natural England, NRW, MMO, JNCC and TWT.	EWG meeting	• Baseline characterisation • Baseline populations • Approach to LSE screening.	Discussion on benthic ecology, physical processes and fish and shellfish. Due to the timing of the workshop ahead of publishing the PEIR, discussion outputs will be incorporated into the ISAA to accompany the DCO application.

1.5 Summary of LSE screening conclusions

1.5.1.1 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 the HRA Stage 2 ISAA.

1.5.2 Screening outcomes for the Mona Offshore Wind Project alone

1.5.2.1 The potential for LSE as a result of the Mona Offshore Wind Project alone has been identified following HRA Stage 1 Screening Report with respect to 45 SACs and eight SPAs.

Annex I habitats (offshore and coastal)

1.5.2.2 The following three European sites designated for Annex I habitats (offshore and coastal) were advanced to the ISAA:

- Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC
- Dee Estuary/Aber Dyfrdwy SAC
- Dee Estuary Ramsar.

Annex II otter

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

Annex II diadromous fish

1.5.2.4 The following nine European sites designated for Annex II diadromous fish were advanced to the 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

1.5.2.5 A total of 33 European sites were advanced to the 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.

Marine ornithological features

1.5.2.6 As detailed in the HRA Stage 1 Screening Report, a total of eight European sites designated for ornithological features were advanced to the ISAA. These comprised two marine SPAs and six breeding seabird colony SPAs:

- Liverpool Bay/Bae Lerpwl SPA
- Irish Sea Front SPA
- Ribble and Alt Estuaries SPA
- Morecambe Bay and Duddon Estuary SPA
- Lambay Island
- Grassholm SPA
- Ailsa Craig SPA
- Ireland's Eye SPA.

1.5.3 LSE in-combination

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

1.5.3.1 One European site (Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC) designated for Annex I habitats overlaps with the Mona Offshore Wind Project. A search area of 15km was applied in order to identify relevant sites designated for Annex I habitats which may be within the zone of influence (ZOI) of effects associated with the Mona Offshore Wind Project. A search area of 15km was considered sufficiently precautionary and was based on one mean tidal excursion from the Mona Offshore Wind Project.

1.5.3.2 For Annex I habitats, the potential for LSE alone was identified for three sites within 15km: Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, Dee Estuary/Aber Dyfrdwy SAC and Dee Estuary Ramsar therefore effects in-combination will be considered at Stage Two Appropriate Assessment.

1.5.3.3 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

1.5.3.4 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 100km from the Mona Offshore Array Area and Mona Offshore Cable Corridor 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.

1.5.3.5 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 Two 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

1.5.3.6 A precautionary approach to selection of relevant sites for Annex II marine mammals was adopted in the HRA Stage 1 Screening Report. 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.

1.5.3.7 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 (SCOS, 2020), as well as recent sources on seal foraging ranges (Carter *et al.*, 2022) and telemetry data presented in appendix 2 of volume 2, chapter 9.1: Marine mammals technical report of the PEIR, (Wright and Sinclair, 2022) were considered. These were in line with feedback from stakeholders via the marine mammals EWG (see section 1.4.2).

1.5.3.8 Potential for LSE alone has been identified for all UK sites within species' range, therefore in-combination effects for these sites will be assessed at Stage Two Appropriate Assessment.

1.5.3.9 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 marine ornithological features

1.5.3.10 The HRA Stage 1 Screening Report used site-specific information, including the baseline characterisation for ornithology set out in volume 2, annex 10.1: Ornithology baseline of the PEIR, and site-specific modelling outputs for displacement, collision and apportioning of impacts (volume 2, annex 10.2: Offshore ornithology displacement assessment of the PEIR, volume 2, annex 10.3: Offshore ornithology non-migratory seabird collision risk assessment of the PEIR, volume 2, annex 10.4: Offshore ornithology migratory seabird collision risk assessment of the PEIR and volume 2, annex 10.5: Offshore ornithology apportioning assessment of the PEIR). These were then used to screen sites/features in to the ISAA and used to inform the assessment of adverse effects on site integrity presented in section 1.10.

1.5.3.11 The approach taken in TCE Plan level HRA has been broadly followed in the HRA Stage 1 LSE Screening Report, i.e. if the predicted magnitude is between 0.5% and 1% or >1% of the baseline mortality of the reference population for a qualifying feature, then further consideration will be given to the magnitude of the likely effect, including the contribution of impacts from other plans and projects, in-combination. If it cannot be concluded that the combined magnitude of the potential impact will not exceed 1% then each of the component SPAs will be screened into the assessment (with respect to the relevant feature and pressure considered) (TCE, 2022). Although these broad thresholds have been used as a guide for determining whether there is potential for LSE alone and in-combination, each site and feature is considered individually based on the outputs of site specific modelling and assessments set out above and screening conclusions based on these.

1.5.3.12 On this basis in-combination are considered for

- Liverpool Bay/Bae Lerpwl SPA
- Irish Sea Front SPA
- Ribble and Alt Estuaries SPA
- Morecambe Bay and Duddon Estuary SPA
- Lambay Island SPA (guillemot only)
- Ireland's Eye SPA (guillemot only)
- Ailsa Craig SPA (gannet only)
- Grassholm SPA (gannet only).

1.5.4 Summary table of LSE screening outcomes

1.5.4.1 Table 1.3 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 1.3: 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.

ID	European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor (km)	Relevant qualifying features	Project phase	Impact
SACs/Ramsar sites						
1	Dee Estuary/Aber Dyfrdwy SAC	34.5	13.1	Estuaries	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • In-combination effects.
					Operations and maintenance	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Changes in physical processes (Mona Offshore Cable Corridor only) • In-combination effects.
				Mudflats and sandflats not covered by seawater at low tide	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • In-combination effects.
					Operations and maintenance	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Changes in physical processes (Mona Offshore Cable Corridor only) • In-combination effects.
				Sea lamprey	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • Underwater sound • In-combination effects.
					Operations and maintenance	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • EMF from subsea electric cables • In-combination effects.
				River lamprey	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • Underwater sound • In-combination effects.
					Operations and maintenance	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • EMF from subsea electric cables • In-combination effects.
2	Dee Estuary Ramsar	35.2	13.51	Estuaries	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • In-combination effects.
					Operations and maintenance	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Changes in physical processes (Mona Offshore Cable Corridor only) • In-combination effects.
				Mudflats and sandflats not covered by seawater at low tide	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • In-combination effects.

ID	European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor (km)	Relevant qualifying features	Project phase	Impact
					Operations and maintenance	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Changes in physical processes (Mona Offshore Cable Corridor only) • In-combination effects.
3	Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC	25.6	0.0	Reefs	Construction/decommissioning	• Temporary habitat loss/disturbance (Mona Offshore Cable Corridor only) • Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • Accidental pollution • In-combination effects.
					Operations and maintenance	• Temporary habitat loss/disturbance (Mona Offshore Cable Corridor only) • Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Long-term subtidal habitat loss • Changes in physical processes (Mona Offshore Cable Corridor only) • EMF from subsea electric cables • Accidental pollution • In-combination effects.
					Decommissioning (only)	• Long-term subtidal habitat loss/alteration (Mona Offshore Cable Corridor only)
				Sandbanks which are slightly covered by seawater all the time	Construction/decommissioning	• Temporary habitat loss/disturbance (Mona Offshore Cable Corridor only) • Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • Accidental pollution • In-combination effects.
					Operations and maintenance	• Temporary habitat loss/disturbance (Mona Offshore Cable Corridor only) • Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Long-term subtidal habitat loss • Changes in physical processes • EMF from subsea electric cables • Accidental pollution • In-combination effects.
					Decommissioning (only)	• Long-term subtidal habitat loss/alteration (Mona Offshore Cable Corridor only)
4	River Dee and Bala Lake/Afon Dyfrydwy a Llyn Tegid SAC	59.13	40.58	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
				Sea lamprey *Petromyzon marinus*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.

ID	European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor (km)	Relevant qualifying features	Project phase	Impact
				River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
5	River Ehen SAC	83.01 83.34 83.01 83.34	106.4 106.73 106.4 106.73	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects
				Freshwater pearl mussel *Margaritifera margaritifera*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
6	River Eden SAC	83.01	106.4	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
				Sea lamprey *Petromyzon marinus*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
				River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
7	River Derwent and Bassenthwaite SAC	95.06	121.1	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
				Sea lamprey *Petromyzon marinus*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
				River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound • In-combination effects.

ID	European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor (km)	Relevant qualifying features	Project phase	Impact
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
8	Solway Firth SAC	109.46	136.1	Sea lamprey *Petromyzon marinus*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
				River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
9	River Kent SAC	96.27	106.3	Freshwater pearl mussel *Margaritifera margaritifera*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
10	River Bladnoch SAC	114.88	142.9	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
11	Afon Gywrfai a Llyn Gwellyn SAC	92.18	91.2	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound • In-combination effects.
					Operations and maintenance	• EMF from subsea electric cables • In-combination effects.
12	North Anglesey Marine/Gogledd Môn Forol SAC	22.58 79.58	17.5 96.2	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 • Changes in prey availability (construction only) • In-combination effects.
					Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
13	North Channel SAC	94.00 22.58	93.1 17.5	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.

ID	European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor (km)	Relevant qualifying features	Project phase	Impact
					Operations and maintenance	• Underwater sound from vessels and other vessel activities • In-combination effects.
14	Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC	79.58	96.2	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 • 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.
15	West Wales Marine/Gorllewin Cymru Forol SAC	95.31	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.
16	Cardigan Bay/Bae Ceredigion SAC	163.29	162.4	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 • 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.

ID	European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor (km)	Relevant qualifying features	Project phase	Impact
17	Pembrokeshire Marine/Sir Benfro Forol SAC	211.72	210.9	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.
18	Bristol Channel Approaches SAC	275.83	275.6	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.
19	Isles of Scilly Complex SAC	439.25	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 • In-combination effects.
20	Lundy SAC	309.43	308.41	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.
21	The Maidens SAC	164.77	181.42	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.

ID	European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor (km)	Relevant qualifying features	Project phase	Impact
22	Strangford Lough SAC	110.17 114.16	126.69 128.66	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.
23	Murlough SAC	110.17	126.69	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.
24	Rockabill to Dalkey Island SAC	126.8	129.9	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.
25	Roaringwater Bay and Islands SAC	448.73	447.9	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.
26	Blasket Islands SAC	565.07	563.1	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.

ID	European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor (km)	Relevant qualifying features	Project phase	Impact
27	Saltee Islands SAC	235.32	234.36	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.
28-45	17 French Sites (as listed in paragraph 1.5.2.5)	See HRA Stage 1 Screening Report	See HRA Stage 1 Screening Report	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.
SPAs						
1	Liverpool Bay/Bae Lerpwl SPA	10.0	0.0	Red-throated diver *Gavia stellata* Little gull *Hydrocoloeus minutus* Common scoter *Melanitta nigra* Little tern *Sternula albifrons* Common tern *Sterna hirundo* Waterbird assemblage	Construction/decommissioning	• Temporary habitat loss/disturbance and increased SSC • Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Changes in prey availability (construction only) • Accidental pollution • In-combination effects.
					Operations and maintenance	• Temporary habitat loss/disturbance and increased SSC • Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Accidental pollution • In-combination effects.
2	Irish Sea Front SPA	57.2	61.4	Manx shearwater	Construction/decommissioning	• Changes in prey availability (construction only) • In-combination effects
3	Ribble and Alt Estuaries SPA	37.2	38.91	Lesser black-backed gull *Larus fuscus*	Construction/decommissioning	• Changes in prey availability (construction only) • In-combination effects
4	Morecambe Bay and Duddon Estuary SPA	47.0	58.7	Lesser black-backed gull *Larus fuscus* Herring gull *Larus argentatus*	Construction/decommissioning	• Changes in prey availability (construction only) • In-combination effects
5	Lambay Island	128.9	132.5	Guillemot	Construction/decommissioning	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only).
					Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only).

ID	European Site	Distance to Mona Array Area (km)	Distance to Mona Offshore Cable Corridor (km)	Relevant qualifying features	Project phase	Impact
6	Grassholm SPA	229.4	211.4	Gannet	Construction/decommissioning Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only) • Collison risk (in-combination effect only). These two pathways are presented as a single figure of annual mortality from disturbance, displacement and collision.
7	Ailsa Craig SPA	166.9	193.0	Gannet	Construction/decommissioning Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only) • Collison risk (in-combination effect only). These two pathways are presented as a single figure of annual mortality from disturbance, displacement and collision.
8	Ireland's Eye SPA	134.7	138.0	Guillemot	Construction/decommissioning	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only).
					Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only).

1.6 Information to Support the Appropriate Assessment

1.6.1 Maximum design scenarios

1.6.1.1 For all European sites considered in this ISAA, the assessments have been based on a realistic Maximum Design Scenario (MDS). Each MDS has been derived from the design envelope for the Mona Offshore Wind Project. Volume 1, chapter 3: Project description of the PEIR describes the Mona Offshore Wind Project design and identifies the range of potential parameters for all relevant components.

1.6.1.2 The MDS for each of the potential impacts for each receptor group are tabulated separately in each of the receptor sections of this ISAA according to the effect-pathway under consideration. The assessment scenarios are consistent with those used for assessment in relevant chapters of the PEIR.

1.6.2 Measures adopted as part of the Mona Offshore Wind Project

1.6.2.1 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 likely significant effects and development of measures to address these), this is explained in more detail in volume 1, chapter 5: Environmental Impact Assessment methodology of the PEIR. The incorporation of such measures within the design of the Mona Offshore Wind Project demonstrates commitment to implementing the identified measures.

1.6.2.2 The term 'measures adopted as part of the Mona Offshore Wind Project' is used in this 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).

1.6.3 Baseline information

1.6.3.1 Baseline information on the European sites identified for further assessment within the HRA Stage Two Appropriate Assessment 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 PEIR. Any additional sources of information used in the HRA Stage Two Appropriate Assessment 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 10.1: Benthic subtidal and intertidal ecology technical report of the PEIR and volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR. In the absence of site-specific survey data for the Mona Offshore Cable Corridor (noting these surveys have been undertaken but will be reported in the ISAA for consent application; see paragraph 1.7.2.1), the indicative locations of Annex I features, as mapped by NRW (2018), have also been drawn upon for the assessments of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC
- Annex II diadromous fish – informed by volume 2, annex 8.1: Fish and shellfish ecology technical report of the PEIR and volume 2, chapter 8: Fish and shellfish ecology of the PEIR
- Annex II marine mammals – informed by the 24 month site-specific aerial survey data and baseline characterisation presented in volume 6, annex 9.1: Marine mammal technical report of the PEIR and volume 2, chapter 9: Marine mammals of the PEIR
- Offshore ornithology – informed by the 24 month site-specific aerial survey data and baseline characterisation for ornithology (volume 2, annex 10.1: Ornithology baseline of the PEIR) and site-specific modelling outputs for displacement, collision and apportioning of impacts (volume 2, annex 10.2: Offshore ornithology displacement assessment of the PEIR, volume 2, annex 10.3: Offshore ornithology non-migratory seabird collision risk assessment of the PEIR, volume 2, annex 10.4: Offshore ornithology migratory seabird collision risk assessment of the PEIR and volume 2, annex 10.5: Offshore Ornithology apportioning assessment of the PEIR).

1.6.3.2 For brevity, information on the European sites is summarised within the main body of this ISAA.

1.6.4 Conservation objectives and advice

1.6.4.1 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.

1.6.4.2 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.

1.6.4.3 In this 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.

1.6.4.4 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.

1.6.4.5 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.

1.6.4.6 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'.

1.6.4.7 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 ISAA, a CAP document has only been produced for the River Bladnoch SAC and the Liverpool Bay/Bae Lerpwl SPA; 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.

1.6.4.8 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 ISAA.

1.6.4.9 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 ISAA, the most recently published conservation objectives have been used.

1.6.4.10 Where Ramsar interests coincide with qualifying features within an SPA or an SAC, the advice for overlapping designations is considered to be sufficient to support the management of the Ramsar interests. Therefore, the conservation objectives are referenced for both designations.

1.6.5 Approach to the in-combination assessments

1.6.5.1 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.

1.6.5.2 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'.

1.6.5.3 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.

1.6.5.4 The projects, plans and activities screened into the in-combination assessment will be consulted upon with the SNCBs through this ISAA, in order to seek agreement on the projects, plans and activities to be considered in the cumulative assessment.

1.6.5.5 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.

1.6.5.6 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.

1.6.5.7 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.

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

1.7.1.1 The HRA Stage 1 Screening Report identified the potential for LSEs on the following European sites designated for Annex I habitat features (section 1.5.2) as shown in Figure 1.3:

- Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC
- Dee Estuary/Aber Dyfrdwy SAC
- Dee Estuary Ramsar.

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

- During the construction and decommissioning phase
  - Temporary habitat loss/disturbance
  - Increases in SSC and sediment deposition
  - Release of sediment bound contaminants
  - Accidental pollution
  - In-combination impacts
- During the operations and maintenance phase
  - Temporary habitat loss/disturbance
  - Increases in SSC and sediment deposition
  - Long term subtidal habitat loss
  - Changes in physical processes
  - EMF
  - Accidental pollution
  - In-combination impacts.

1.7.1.3 This section presents the Stage Two 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 1.11).

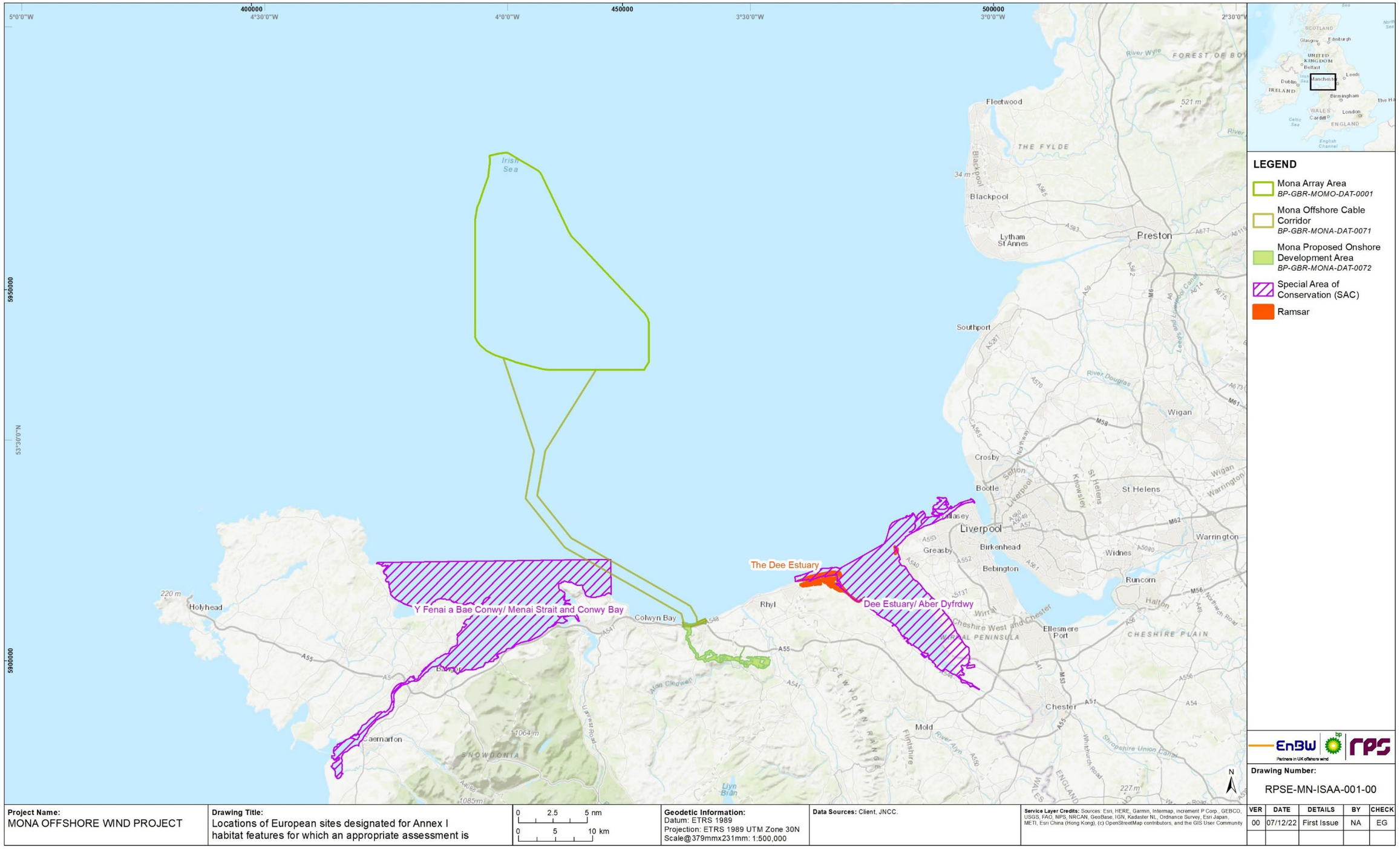


Figure 1.3: Locations of European sites with Annex I habitat features for which an Appropriate Assessment is required.

1.7.2 Baseline information

1.7.2.1 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 PEIR. Site-specific surveys were undertaken in the summer of 2022 to characterise the Mona Offshore Cable Corridor, including the area overlapping with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. This ISAA will therefore be updated with this site-specific data for the application for consent following completion of the data analysis.

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

Site description

1.7.2.2 The Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is located in northwest Wales and is located 26km from the Mona Array Area and overlaps the Mona Offshore Cable Corridor. 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, 2018). 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, 2018).

Feature accounts

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

1.7.2.4 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.

1.7.2.5 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.

1.7.2.6 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 taken forward to Appropriate Assessment (i.e. Annex I reefs and Annex I sandbanks which are slightly covered by seawater all the time). The distribution of the features within the SAC are shown in Figure 1.4.

Reefs

1.7.2.7 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 2022).

1.7.2.8 The Annex I reef habitat of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC include 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, 2022a). 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 (4m/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, 2022a). Subtidal clay outcrop reef communities are dominated by boring bivalves (piddocks) and are located at two known locations in the eastern Menai Strait, near Gallows Point just west of Beaumaris and between Beaumaris and Penmon (NRW, 2018). 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, 2018).

1.7.2.9 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, 2018). 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, 2018).

1.7.2.10 In areas of subtidal reef, seaweed cover is reduced and filter feeding animals dominate as a result of the turbid conditions (NRW, 2018). 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*.

1.7.2.11 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 eastern 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, 2018).

1.7.2.12 The indicative locations of the Annex I reef features, as mapped by NRW (2018), are presented in Figure 1.4. 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 idenfied from Countryside Council for Wales (CCW; now NRW) Phase 1 Intertidal Habitat Map (intertidal reef areas), admiralty charts and expert knowledge. The nearest instance of the Annex I reef feature is located 1km from the Mona Offshore Cable Corridor. However, it should be noted that this does not indicate habitat absence and the exact boundaries of each feature extent may not be accurate due to a lack of recent survey data (NRW, 2018). As discussed in paragraph 1.7.2.1, site-specific surveys were undertaken in the summer of 2022 to characterise the Mona Offshore Cable Corridor, including the area overlapping with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. This ISAA will therefore be updated with this site-specific data for the application for consent following completion of the data analysis. For the purposes of this draft ISAA, a precautionary approach has been adopted which assumes that there could be some overlap with this feature.

Sandbanks which are slightly covered by seawater all the time

1.7.2.13 This habitat feature consists of sandy sediments which are permanently covered by shallow sea water generally at depths less than 20m 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*.

1.7.2.14 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, 2018). The Menai Strait Sandbanks are located at the northern and southern entrances to the Menai Strait. The Conwy Bay Bank is situated to the west of Great Orme and extends approximately 6km 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 12km in a northwest/southeast direction from the west side of Puffin Island (NRW, 2018).

1.7.2.15 The indicative locations of the sandbank features, as mapped by NRW (2018), are presented in Figure 1.4. The nearest mapped location of the feature is 3km from the Mona Offshore Cable Corridor. However, due to the mobile nature of the feature and the lack of recent survey data (see paragraph 1.8.2.1 for details on the reporting of the site-specific surveys in the Mona Offshore Cable Corridor) it is possible that features may extend out of the areas shown/for features to be present in other locations within the SAC. For the purposes of this draft ISAA, a precautionary approach has been adopted which assumes that there could be some overlap with this feature.

Condition assessment

1.7.2.16 Table 1.4 outlines the indicative condition assessments (as detailed in NRW, 2018b[2]) 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 1.4: 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, WFD data and expert judgement	High	Low	Low
Typical species	Unknown		Monitoring data and expert judgement	High	Not applicable	Not applicable

[2] https://cdn.cyfoethnaturiol.cymru/media/684384/menai-strait-and-conwy-bay-sac-ica-2018.pdf

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
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

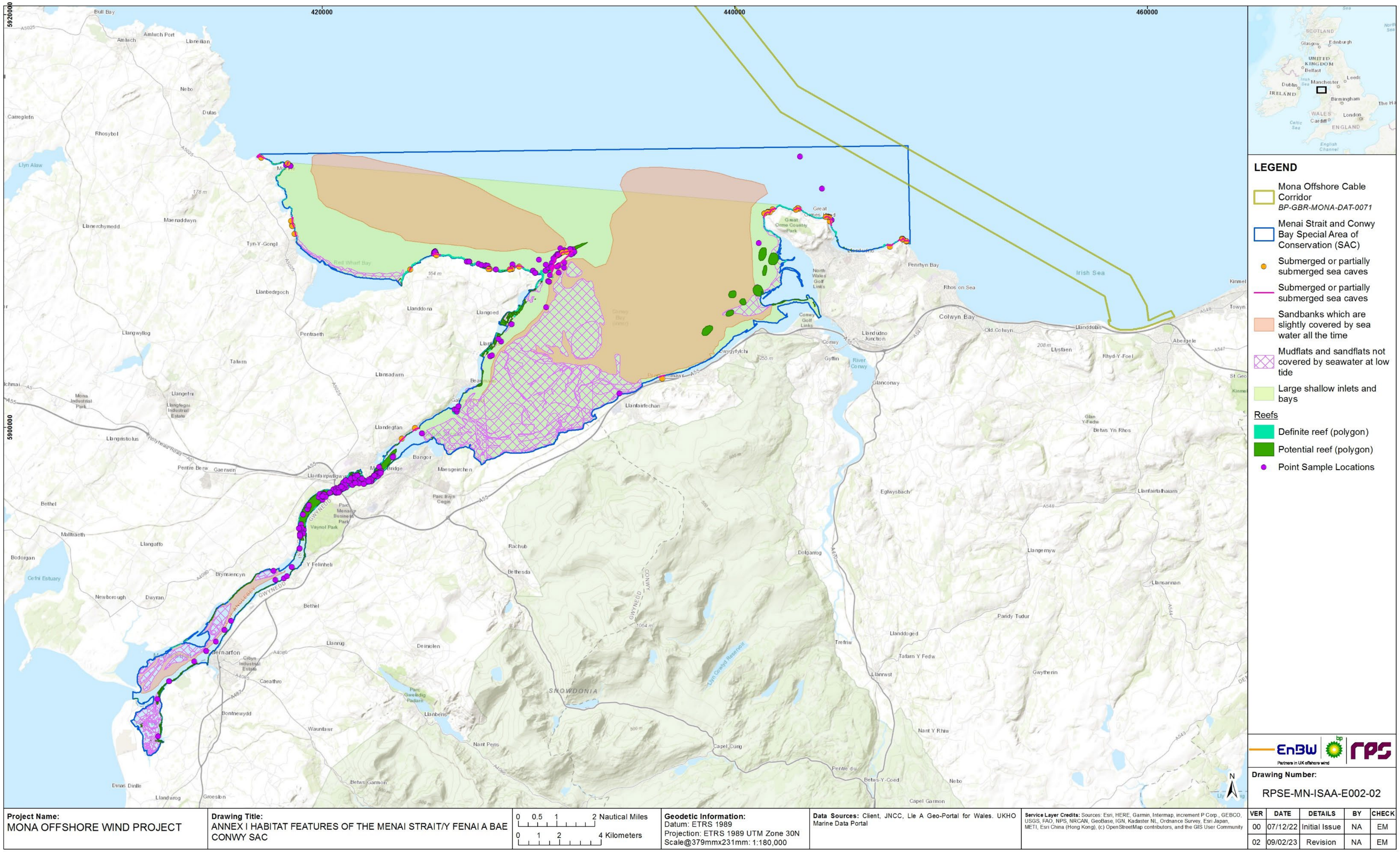


Figure 1.4: Annex I habitat distribution within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC (NRW, 2018).

Conservation objectives

1.7.2.17 The conservation objectives for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, as outlined in NRW (2008)[3], are provided under the headings set out below (i.e. Habitat Features, Range, Structure and Function etc.)

1.7.2.18 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

1.7.2.19 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.

1.7.2.20 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.

1.7.2.21 For the large shallow bay feature these include:

- Organically enriched muddy sediment areas.

Structure and function

1.7.2.22 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:

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

1.7.2.23 The 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 features species populations, their abundance and range.

1.7.2.24 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

1.7.2.25 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

1.7.2.26 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.

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

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

- 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.

Dee Estuary/Aber Dyfrdwy SAC and Ramsar

1.7.2.28 In this ISAA, the Dee Estuary/Aber Dyfrdwy SAC and Ramsar sites have been assessed together as the subtidal habitat qualifying features are the same for both. Considering the proximity of the sites it is considered appropriate to assess adverse effects on these sites together.

Site description

1.7.2.29 The Dee Estuary/Aber Dyfrdwy SAC and Ramsar is one of the largest estuaries in the UK, with an intertidal area primarily comprising of extensive mudflat and sandflat areas and some salt marsh habitat (Natural England and NRW, 2010). The Dee Estuary SAC and Ramsar are located 35km from the Mona Array Area, 13km from the Mona Offshore Cable Corridor, and 35km from the Mona Array Area and 14km from the Mona Offshore Cable Corridor, respectively. The estuary is hyper-tidal giving rise to a mean tidal range of 7.7m. The intertidal mud flats of the sheltered inner estuary in particular support populations of marine worms, molluscs and other invertebrates, which often occur at high densities and with high biomass and saltmarshes also provide roosting and foraging sites for waders and wildfowl species at high and low tide, respectively (Natural England and NRW, 2010). The subtidal area of the SAC provides important breeding and nursery areas for coastal fish species. The Dee is also used as a migratory passage for migratory fish species including river lamprey *Lampetra fluviatilis*, sea lamprey *Petromyzon marinus*, Atlantic salmon, sea trout *Salmo trutta*, twaite shad *Alosa fallax*, smelt *Osmerus eperlanus*, and European eels *Anguilla anguilla* to and from their spawning and nursery grounds in the River Dee upstream of the estuary or open sea (Natural England and NRW, 2010).

1.7.2.30 The estuary supports internationally important numbers of waterfowl and waders. On the upper shore salt marsh transitions into brackish freshwater swamp vegetation. Coastal fields provide important foraging habitat for wintering waders and freshwater lagoons and reedbeds support the largest common tern *Sterna hirundo* breeding colony in Wales (Natural England and NRW, 2010).

Feature accounts

1.7.2.31 The Annex I habitat qualifying features of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar are outlined below.

1.7.2.32 Annex I habitats that are a primary reason for selection of the site are:

- Mudflats and sandflats not covered by seawater at low tide
- *Salicornia* and other annuals colonizing mud and sand
- Atlantic salt meadows *Glauco – Puccinellietalia maritimae.*

1.7.2.33 Annex I habitats present as a qualifying feature, but not a primary reason for the selection of this site are:

- Estuaries.

1.7.2.34 The Dee Estuary also qualifies under Ramsar criterion 1 for extensive intertidal mud and sand flats with large expanses of saltmarsh towards the head of the estuary. The Annex I habitat qualifying features present in the SAC and listed under Ramsar Criterion 1 of the Dee Estuary/Aber Dyfrdwy Ramsar and are outlined below:

- Sandbanks which are slightly covered by sea water all the time
- Estuaries
- Mudflats and sandflats not covered by seawater at low tide
- Atlantic salt meadows *Glauco-Puccinellietalia maritimae.*

1.7.2.35 The sections below provide information on the range, extent and associated species of the relevant Annex I habitat features of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar which have been taken forward to Appropriate Assessment (i.e. estuaries and mudflats and sandflats not covered by seawater at low tide). The distribution of the features within the SAC are shown in Figure 1.5.

Estuaries

1.7.2.36 Estuaries often comprise an interdependent mosaic of subtidal and intertidal habitats, which are closely associated with surrounding terrestrial habitats. Many habitats that are associated with estuaries are identified as Annex I habitat types in their own right, including mudflats and sandflats not covered by sea water at low tide, saltmarshes, sandbanks which are slightly covered by sea water all the time and reefs.

1.7.2.37 The Dee estuary is a funnel-shaped coastal plain estuary and covers an area of 14,000 hectares making it the sixth largest estuary in the UK (Natural England and NRW, 2010). The estuary is characteristic of a coastal plain estuary with a large width to depth ratio, although the presence of a spit at the estuary mouth is unusual and usually a feature of bar-built estuaries. As outlined in paragraph 1.7.2.29, the Dee Estuary is hyper tidal with a tidal range of 7.7m at the mouth, the intertidal habitats which frame the estuary therefore dry out at low tide (Natural England and NRW, 2010). Only 10% of the intertidal habitat stays underwater at low water on spring tides. In the outer areas of the estuary the environment is highly dynamic and sand bars and beaches are exposed to wave action and tidal currents, whereas in the upper estuary the sheltered environment gives rise to areas of mudflats (Natural England and NRW, 2010).

Mudflats and sandflats not covered by seawater at low tide

1.7.2.38 The mudflats and sandflats feature of the Dee Estuary/Aber Dyfrdwy SAC span a total area of over 10,000ha and contribute to approximately 3% of the total UK resource of this habitat type (Natural England and NRW, 2010). The mudflats and sandflats change in shape from one year to the next owing to the highly dynamic nature of the

estuary. The intertidal flats of the Dee estuary range from sand, muddy sand and mud biotopes although are considered to be sandier than other coastal plain estuaries in the north-eastern Irish Sea, which may be attributed to the shortening of the estuary following canalisation (CCW, 2006).

1.7.2.39 The upper estuary shores of the Dee estuary are often dominated by amphipods *Bathyporeia pilosa* and *Corophium arenarium*. Whereas, the inner section of the estuary, are dominated by species such as the ragworm *Hediste diversicolor* and the Baltic tellin *Macoma balthica* (Natural England and NRW, 2010). Sheltered areas of intertidal muddy sediments are often characterised by high numbers of invertebrates including the ragworm *H. diversicolor*, the peppery furrow shell *Scrobicularia plana* and polychaete worms such as *Eteone longa* (Natural England and NRW, 2010). The outer section of the estuary also has dense cockle beds present on both the English and Welsh shores. Amphipods and polychaetes dominate the sandy areas to the sides of the estuary mouth, between Prestatyn and the Point of Ayr and off the north Wirral coast (Natural England and NRW, 2010).

Condition assessments

1.7.2.40 Table 1.5 outlines the indicative condition assessments of the relevant qualifying features of the Dee Estuary/Aber Dyfrdwy SAC which have been taken forward for detailed consideration in the Appropriate Assessment (as detailed in NRW, 2018c[4]). Overall, the condition assessment deemed that all features of the SAC are in a favourable condition, except for the Estuary feature, this is considered to be the result of water quality issues within the estuary (NRW, 2018c).

Table 1.5: Feature condition assessments and associated confidence levels for the Dee Estuary/Aber Dyfrdwy 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
Estuaries						
Distribution and extent within site	Favourable	Unfavourable	Monitoring data, casework monitoring, expert judgement	High	Medium	Medium
Structure and function	Unfavourable		Casework monitoring, expert judgement	Low	Medium	Low
Typical species	Favourable		Cockle fishery, WFD assessments	High	Low	Low
Mudflats and sandflats not covered by seawater at low tide						
Distribution and extent within site	Favourable	Favourable	Casework monitoring, expert judgement	High	Low	Low
Structure and function	Favourable		Casework monitoring, expert judgement	High	Low	Low
Typical species	Favourable		Casework monitoring, expert judgement	High	Low	Low

Conservation objectives

1.7.2.41 The most recent conservation objectives for the Dee Estuary/Aber Dyfrdwy SAC have been developed by Natural England (Natural England, 2018)[5] and apply to the site and the individual species and/or assemblage of species for which the site has been classified.

1.7.2.42 For the purposes of this ISAA, the conservation objectives for the Dee Estuary/Aber Dyfrdwy SAC have also been applied to the Dee Estuary Ramsar in the absence of conservation objectives for the Ramsar criterion 1 features listed in the Ramsar Information Sheet (RIS) for the Dee Estuary Ramsar (JNCC, 2013). As the features for both the SAC and the Ramsar are the same, the use of the conservation objectives for the SAC is deemed suitable.

1.7.2.43 The high-level objectives for the Dee Estuary/Aber Dyfrdwy SAC (and those assumed for the Ramsar) are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and 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

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

[5] http://publications.naturalengland.org.uk/publication/6124489284780032

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

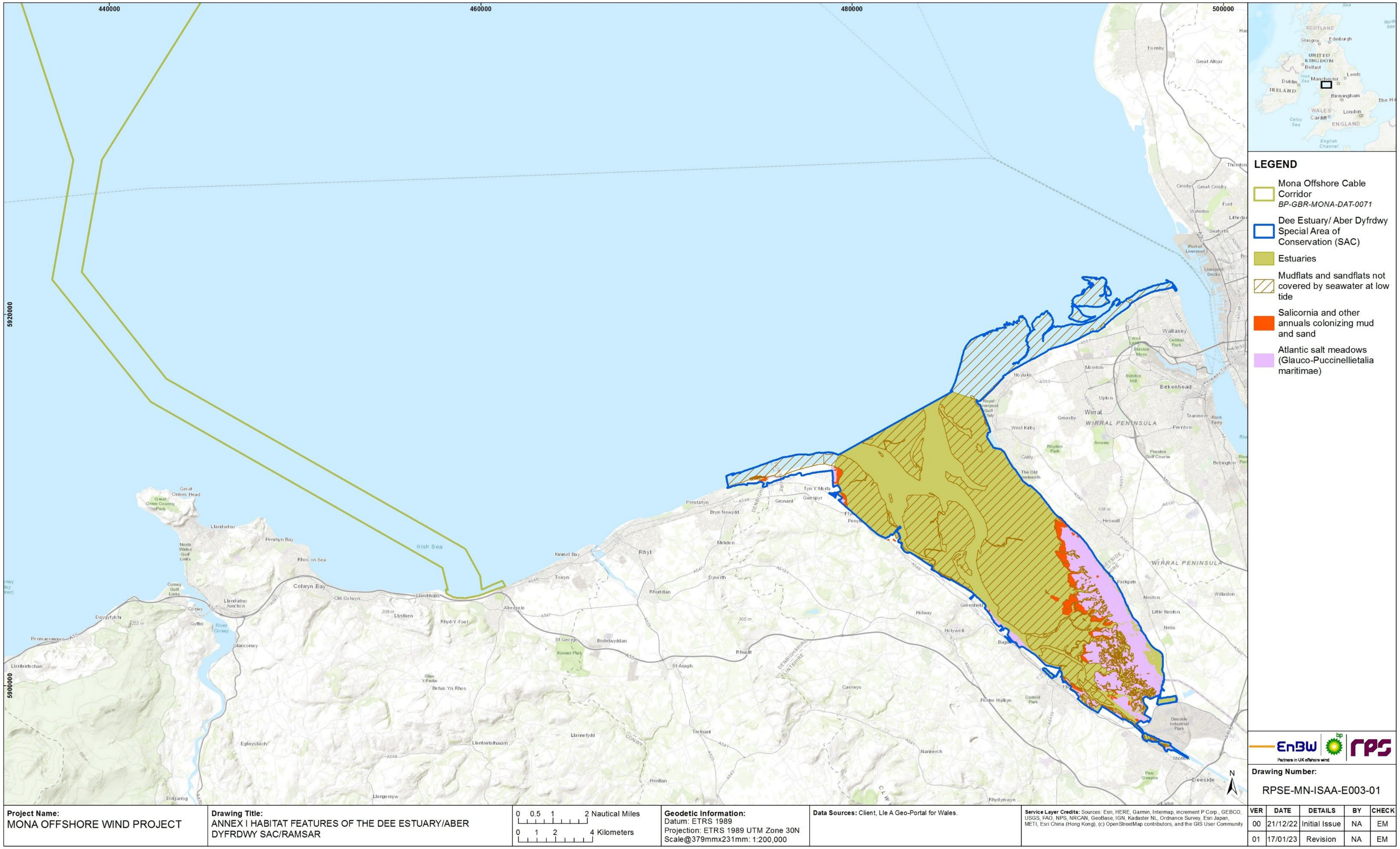


Figure 1.5: Annex I habitat distribution within the Dee Estuary/Aber Dyfrdwy SAC (NRW, 2018).

1.7.3 Assessment of adverse effects alone

Temporary habitat loss/disturbance

1.7.3.1 There is potential for temporary habitat loss and disturbance as a result of site preparation activities in advance of installation activities, cable installation activities (including UXO detonation, pre-cabling seabed clearance and anchor placements and decommissioning activities). Operations and maintenance activities within the Mona Offshore Cable Corridor (i.e. cable repair/reburial events) also have the potential to result in temporary habitat loss/disturbance.

1.7.3.2 This impact will be spatially restricted to within the boundaries of the Mona Offshore Wind Project and there is no potential for spatial overlap between the Mona Array Area and any Annex I habitat features of the sites. This impact therefore is applicable to the Mona Offshore Cable Corridor only.

1.7.3.3 The assessment of LSE during the HRA screening process identified that during construction, operations and maintenance and decommissioning phases, LSE could not be ruled out for the potential impact of temporary habitat loss and disturbance within the Mona Offshore Cable Corridor. 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.

1.7.3.4 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.

1.7.3.5 The MDS considered for the assessment of potential impacts on Annex I habitat features from temporary habitat loss and disturbance across the construction, operations and maintenance and decommissioning phases of the Mona Offshore Wind Project is presented in Table 1.6.

Table 1.6: MDS considered for the assessment of potential impacts on Annex I habitats (offshore and coastal) of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC from temporary habitat loss/disturbance during the construction, operations and maintenance and decommissioning phases.

Phase	MDS	Justification
Construction phase	**Construction phase** Up to 1,456,000m^2 of habitat loss/disturbance within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC due to: • Cable installation: disturbance comprising: – Offshore export cables: up to 1,456,000m^2 disturbance from installation of up to 14km (i.e. four cables each up to 3.5km in length within the SAC) of buried offshore export cables (assumed 100% of all cables are buried) – Seabed disturbance width of up to 104m for sandwave clearance, including up to 20m for boulder clearance and up to 3m for cable burial within the sandwave clearance width • Sandwave clearance: required for up to 70% of all export cables but assumed to be required 100% of export cables within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC • Pre-lay preparation (boulder and debris clearance): is likely to be required across all export cables. Although, for the purposes of the MDS boulder clearance only has been assumed across up to 30% of export cables (see justification) • Maximum duration of the offshore construction phase is up to four years.	<u>Site preparation:</u> Maximum footprint which would be affected during the construction and decommissioning phases. Based on the assumption that the width of disturbance for sandwave and pre-lay preparation (boulder and debris clearance) also includes subsequent burial. Pre-lay preparation (boulder and debris clearance) is likely to be required across all inter-array, interconnector and offshore export cables. For the purposes of the MDS, and to avoid double counting of the total footprint with sandwave clearance activities, the MDS assumes up to 100% of offshore export cables will be subject to sandwave clearance which captures any disturbance arising from pre-lay preparation (boulder and debris clearance). The area of seabed affected by the placement of sandwave clearance material has been calculated based on the maximum volume of sediment to be placed on the seabed, assuming all this sediment is coarse material (i.e. is not dispersed through tidal currents; see "Increased suspended sediment concentrations" impact assessment below). The total footprint of seabed affected has been calculated, for the purposes of the MDS, assuming a mound of uniform thickness of 0.5m height. Temporary loss of benthic habitat is assumed beneath this. The disturbance width is driven by the need to survey for UXO over the Mona Offshore Cable Corridor. The actual disturbance width for cable installation is likely to be considerably less.
Operations and maintenance phase	Up to 280,000m^2 of habitat disturbance, per repair/reburial event, within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC due to: • Repair of up to 14km of subtidal export cable (i.e. four cables each with a length of 3.5km within the SAC), per repair event, within the SAC. Up to two repairs every five years per export cable. • Reburial of up to 14km of subtidal export cable (i.e. four cables each with a length of 3.5km within the SAC) per reburial event, within the SAC. Reburial events once every five years • Width of disturbance from repair and reburial of 20m • Operational phase up to 35 years.	The MDS for habitat disturbance associated with offshore export cable maintenance assumes that all of the offshore export cables within the area of overlap between the Mona Offshore Cable Corridor and the SAC (i.e. four cables with a length of 3,500m) will require repair and reburial.
Decommissioning phase	Temporary subtidal habitat loss/disturbance due to: • Cable removal: disturbance from the removal of 14km of offshore export cables (i.e. four cables each up to 3.5km in length within the SAC).	Parameters for decommissioning will be significantly lower than for the construction phase as sandwave clearance and pre-lay preparation will not be required in advance of cable removal and cable protection and scour protection are assumed to be left *in situ*. The MDS assumes the complete removal of all wind turbine and OSP foundations and all cables.

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 I habitat features from temporary habitat loss/disturbance during the construction, operations and maintenance and decommissioning phase are presented in Table 1.7.

Table 1.7: 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 temporary habitat loss/disturbance.

Measure	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
To minimise sandwave clearance within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC	To minimise potential impacts on Annex I habitats within the SAC. Investigations will be undertaken to identify opportunities to limit sandwave clearance within the Menai Strait and Conwy Bay SAC. This will be guided by site specific survey data and when all Mona Offshore Cable Corridor results have been evaluated this will inform the assessment within the ISAA accompanying the application for consent.	Subject to the findings of the further studies described under the 'Justification'. To be updated within the ISAA submitted with the application for consent.
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Development and adherence to a Cable Specification and Installation Plan (CSIP) which will include cables to be buried where possible and cable protection only as necessary.	The CSIP will aim to facilitate greater clarity with specific regard to sandwave clearance, cable burial and cable protection. The CSIP would be developed in line with standard industry approach to the CSIP documentation.	Proposed to be secured through a condition in the marine licence(s)
Development of, and adherence to, a Construction Method Statement (CMS).	The purpose of this measure is to confirm the actual methodology that will be employed to construct the Mona Offshore Wind Project, 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.	Proposed to be secured through a condition in the marine licence(s)
Development of, and adherence to, a Monitoring Plan.	This plan will be submitted prior to construction and will contain details of monitoring requirements, including pre-construction monitoring baselines.	Proposed to be secured through a condition in the marine licence(s)

Construction and decommissioning phases

Information to support assessment

1.7.3.7 The Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC overlaps with the Mona Offshore Cable Corridor and therefore some temporary habitat loss/disturbance may occur within the SAC as a result of the installation (and removal) of offshore export cables. The total area of the SAC is 264.83km^2 (CCW, 2012) and it is assumed there is potential for up to 14km of offshore export cables (i.e. four cables each up to 3.5km in length) to be installed within the site which could require sandwave clearance prior to installation (noting that this is precautionary and that not all cables within the SAC are likely to require sandwave clearance). On this basis there is the potential for up to 1.46km^2 of temporary habitat loss/disturbance within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC which equates to 0.55% of the total area of the SAC.

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

Reefs

1.7.3.8 The Marine Evidence Based Sensitivity Assessment (MarESA) identifies Annex I subtidal reefs in the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as having a high sensitivity to habitat structure change and penetration. The biotopes associated with this Annex I habitat (*Hiatella*-bored vertical sublittoral limestone rock (CR.MCR.SfR.Hia) and cushion sponges and hydroids on turbid tide-swept sheltered circalittoral rock (CR.MCR.CFaVS.CuSpH)) as outlined in the volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR are dependent on the presence of soft rock to support populations of the characterising species *Hiatella arctica*. Once removed recovery of *H. arctica* is not considered feasible. Sub-surface penetration and disturbance could therefore result in damage and removal of the surface epifauna associated with the Annex I reef designated feature.

1.7.3.9 Sandwave clearance may also damage or remove erect epifauna and may damage substratum resulting in loss of habitat and exposing burrowing species. Whilst a large proportion of the sponge community is likely to be affected by abrasion events, there is some debate as to it the level of effects depending on the size of the sponge and the type of abrasion effect (Coleman *et al.*, 2013). Trawling studies have shown barrel sponges such as Cliona sp. are the most likely to be negatively affected by abrasion however size was not a contributing factor to the level of impact (Tilmant, 1979). Tilmant (1979) also recorded some recovery of sponges 12 months after trawling but not full recovery. The majority of the literature agrees that damage would fall within the bracket of 25-75% reduction (Readman, 2018).

1.7.3.10 Despite sediment deposition being considered to have a negative impact on suspension feeders (Gerrodette and Flechsig, 1979), many encrusting sponges appear to be able to survive in highly sedimented conditions, and in fact, many species prefer such habitats (Bell *et al.*, 2015; Schönberg, 2015). Other sponge species however are not adapted to smothering and extended periods (e.g. four weeks) of burial can lead to mortality (Wulff, 2006). The activities involved in the construction of the Mona Offshore Wind Project are however unlikely to result in large areas of smothering for long periods of time, limiting the risk of mortality.

1.7.3.11 As outlined in paragraph 1.7.3.7 there is the potential for up to 1.46km^2 of temporary habitat loss/disturbance within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC which equates to 0.55% of the SAC as a whole. Temporary habitat disturbance associated with the Annex I reef feature is, however, expected to be considerably lower than this with primary presence of this feature associated with areas of the SAC closer to the coast. The nearest mapped record of the reef feature is 1km from the Mona Offshore Cable Corridor and so it is considered unlikely that this feature will be directly impacted. Site-specific surveys were undertaken in the summer of 2022 to

characterise the Mona Offshore Cable Corridor, including the area overlapping with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. This ISAA will therefore be updated with this site-specific data for the submission following completion of the data analysis. For the purposes of this draft ISAA, a precautionary approach has been adopted which assumes that there could be some overlap with, and temporary habitat disturbance to, this feature. This would, however, be small in the context of the total extent of this feature within the SAC.

Sandbanks which are slightly covered by seawater all the time

1.7.3.12 The MarESA identifies the Annex I habitat sandbanks which are slightly covered by seawater all the time feature of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC as having a low sensitivity to habitat structure change and penetration. As discussed in volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR, the biotopes typically associated with this Annex I habitat (*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)) were assessed as having low sensitivity to abrasion/disturbance and penetration or disturbance, medium sensitivity to habitat structure changes and low-medium sensitivity to smothering and siltation rate changes. It is reported that characterising species *Spio filicornis* of shallower sandbanks thrives in regularly disturbed environments (Kröncke, 1990; Niermann *et al.*, 1990). Recoverability has also been recorded as very high due to good local recruitment and larvae reaching maturity quickly.

1.7.3.13 The nearest mapped record of the sandbank feature is 3km from the Mona Offshore Cable Corridor and so it is considered unlikely that this feature will be directly impacted. Site-specific surveys were undertaken in the summer of 2022 to characterise the Mona Offshore Cable Corridor, including the area overlapping with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. This ISAA will therefore be updated with this site-specific data for the submission following completion of the data analysis. For the purposes of this draft ISAA, a precautionary approach has been adopted which assumes that there could be some overlap with, and temporary habitat disturbance to, this feature. This would, however, be small in the context of the total extent of this feature within the SAC.

Conclusions

1.7.3.14 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 temporary habitat loss/disturbance during construction. An assessment of the impact 'temporary habitat loss/disturbance' against each relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented in Table 1.8 below.

Table 1.8: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for temporary habitat loss/disturbance during the construction 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 temporary habitat loss/disturbance associated with offshore export cable installation and associated activities (e.g. sandwave clearance, pre-lay preparation) during construction and decommissioning activities will be temporary, of short-term duration and reversible. It should also be noted that sandwave clearance within the SAC will also be minimised, as outlined in Table 1.7. Whilst, on the basis of desktop data, it is unlikely that any Annex I features will be directly impacted, the ISAA submitted with the application for consent will be updated with the results of the site-specific surveys undertaken in 2022. Should Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time features be affected, it would only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time. Therefore, it is not considered that these activities will restrict the distribution or extent of identified Annex I habitat features 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	Habitat loss/disturbance associated with offshore export cable installation and associated activities (e.g. sandwave clearance, pre-lay preparation) will be temporary in nature, and the corresponding biological communities associated with the Annex I habitats are predicted to recover quickly following cable installation. It should also be noted that sandwave clearance within the SAC will also be minimised, as outlined in Table 1.7. It is not considered that offshore export cable installation and associated activities will affect the physical, biological and chemical structure and function of identified Annex I habitat features.
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	All temporary habitat loss/disturbance associated with offshore export cable installation and associated activities (e.g. sandwave clearance, pre-lay preparation) during construction and decommissioning activities will be temporary, of short-term duration and reversible. It should also be noted that sandwave clearance within the SAC will also be minimised, as outlined in Table 1.7. Whilst, on the basis of desktop data, it is unlikely that any Annex I features will be directly impacted, the ISAA submitted with the application for consent will be updated with the results of the site-specific surveys undertaken in 2022. Should Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time features be affected, it would only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time. Therefore, it is not considered that the typical benthic species associated with featured habitats will be affected in such a way that the habitat quality will be degraded.

1.7.3.15 Therefore, it can be concluded 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 temporary habitat loss/disturbance with respect to the construction and decommissioning of the Mona Offshore Wind Project alone.

Operations and maintenance phase

Information to support assessment

1.7.3.16 The Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC overlaps with the Mona Offshore Cable Corridor and therefore some temporary habitat disturbance may occur within the SAC during the operations and maintenance phase. In the operations and maintenance phase, the MDS assumes the repair and/or reburial of up to 14km (i.e.

four cables each with a length of 3.5km) of subtidal export cable, with a disturbance width of 20m, potentially resulting in the temporary habitat disturbance of up to 280,000m^2 per repair/reburial event (each event equating to 0.11% of the SAC). Over the 35 year lifetime of the Mona Offshore Wind Project there may be repeat habitat disturbance twice every five years for repair events and once every five years for reburial events. It is, however, anticipated that the communities will recover between these maintenance events. This approach is considered highly precautionary as only 16km of the total 360km of offshore export cables are expected to require repair every five years and only 15km 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, if any is required at all.

1.7.3.17 As noted in the construction phase (paragraph 1.7.3.11), on the basis of NRW's mapped distribution of designated features within the SAC (NRW, 2016), as shown in Figure 1.4, the Mona Offshore Cable Corridor does not spatially overlap with any protected features. This assessment has, however, adopted a precautionary approach which assumes that there may be some impact to the designated feature. This assessment will, however, be updated for the ISAA submitted with the application for consent to include the results of the site-specific surveys in the Mona Offshore Cable Corridor.

Reefs

1.7.3.18 As outlined in paragraph 1.7.3.16 there is the potential for up to 280,000m^2 of temporary habitat disturbance per repair/reburial event within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC during the operations and maintenance phase. This equates to 0.11% of the SAC as a whole. Any individual maintenance events would represent a short term, reversible event. Temporary habitat disturbance associated with the Annex I reef feature is also expected to be considerably lower than this with the primary presence of this feature associated with areas of the SAC closer to the coast. However, as outlined in paragraph 1.7.2.12, the nearest mapped record of the reef feature is 1km from the Mona Offshore Cable Corridor and so it is considered unlikely that this feature will be directly impacted.

1.7.3.19 Site-specific surveys were undertaken in the summer of 2022 to characterise the Mona Offshore Cable Corridor, including the area overlapping with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. This ISAA will therefore be updated with this site-specific data for the submission following completion of the data analysis. For the purposes of this draft ISAA, a precautionary approach has been adopted which assumes that there could be some overlap with, and temporary habitat disturbance to, this feature. This would, however, be small in the context of the total extent of this feature within the SAC. The sensitivity of the feature to this impact is outlined in paragraph 1.7.3.8 to 1.7.3.11.

Sandbanks which are slightly covered by seawater all the time

1.7.3.20 Effects associated with temporary habitat and disturbance for the sandbanks which are slightly covered by seawater all the time are considered to be similar to those outlined for the reef feature in paragraph 1.7.3.18. The MDS represents the maximum area of seabed that could be affected per reburial/repair event over the entire 35 year lifetime of the Mona Offshore Wind Project. Any individual maintenance events would represent a short term, reversible event. Furthermore, the nearest mapped record of the sandbank feature is 3km from the Mona Offshore Cable Corridor and so it is considered unlikely that this feature will be directly impacted. Site-specific surveys were undertaken in the summer of 2022 to characterise the Mona Offshore Cable Corridor, including the area overlapping with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. This ISAA will therefore be updated with this site-specific data for the application for consent following completion of the data analysis. For the purposes of this draft ISAA, a precautionary approach has been adopted which assumes that there could be some overlap with, and temporary habitat disturbance to, this feature. This would, however, be small in the context of the total extent of this feature within the SAC. The sensitivity of the feature to this impact is outlined in paragraph 1.7.3.39.

Conclusions

1.7.3.21 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 temporary habitat loss/disturbance. An assessment of the impact 'temporary habitat loss/disturbance' against each relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented in Table 1.9 below.

Table 1.9: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for temporary habitat loss/disturbance 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	All temporary habitat loss/disturbance associated with offshore export cable repair/reburial during the operations and maintenance phase will be temporary, of short-term duration and reversible. Whilst, on the basis of desktop data, it is unlikely that any Annex I features will be directly impacted, the ISAA submitted with the application for consent will be updated with the results of the site-specific surveys undertaken in 2022. Should Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time features be affected, it would only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time. The MDS for temporary habitat loss/disturbance during the operations and maintenance phase is also considered highly precautionary as only 16km of the 360km export cable is expected to require repair every five years and only 15km of export cable is expected to require reburial every five years therefore the actual extent of cable repair/reburial required in the SAC is likely to be much less, if any. Therefore, it is not considered that these activities will 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	Habitat loss/disturbance associated with operations and maintenance activities will be temporary in nature, and the corresponding biological communities associated with the Annex I habitats are predicted to recover. It is not considered that offshore export cable installation and associated activities will affect the physical, biological and chemical structure and function of identified Annex I habitat features.

Conservation Objective	Conclusion
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	All temporary habitat loss/disturbance associated with operations and maintenance activities will be temporary, of short-term duration and reversible. Whilst, on the basis of desktop data, it is unlikely that any Annex I features will be directly impacted, the ISAA submitted with the application for consent will be updated with the results of the site-specific surveys undertaken in 2022. Should Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time features be affected, it would only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time. The MDS for temporary habitat loss/disturbance during the operations and maintenance phase is also considered highly precautionary as only 16km of the 360km export cable is expected to require repair every five years and only 15km of export cable is expected to require reburial every five years therefore the actual extent of cable repair/reburial in the SAC is likely to be much less, if any. Therefore, it is not considered that the typical benthic species associated with featured habitats will be affected in such a way that the habitat quality will be degraded.

1.7.3.22 Therefore, it can be concluded 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 temporary habitat loss/disturbance impacts with respect to operations and maintenance of the Mona Offshore Wind Project alone.

Increases in SSC and associated sediment deposition

1.7.3.23 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 operations and maintenance phase as a result of activities within the Mona Array Area and Mona Offshore Cable Corridor (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 These activities may result in temporary changes to water clarity, smothering and siltation rate changes.

1.7.3.24 The HRA Stage 1 Screening Report determined that this potential impact pathway applies to the Mona Offshore Cable Corridor only. The Mona Array Area is at its closest point is located 26km and 35km from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and the Dee Estuary/Aber Dyfrdwy SAC and Ramsar respectively which is beyond the ZOI predicted for increased SSC and associated sediment deposition (predicted precautionarily to be 15km during LSE screening). As the Mona Offshore Cable Corridor overlaps with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and is located 13km from the Dee Estuary/Aber Dyfrdwy SAC and Ramsar, 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, for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC the impact is largely only applicable to the 14km of subtidal export cables that overlap with the SAC and the immediate surrounding area.

1.7.3.25 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. This relates to the following designated sites 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
- Dee Estuary/Aber Dyfrdwy SAC and Ramsar
  - Estuaries
  - Mudflats and sandflats not covered by seawater at low tide.

1.7.3.26 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 and Dee Estuary/Aber Dyfrdwy SAC and Ramsar has been quantified and assessed.

1.7.3.27 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 1.10.

Table 1.10: 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	<u>Site preparation:</u> • Sandwave clearance activities undertaken over an approximate 12 month duration within the four year construction programme • Offshore export cables: sandwave clearance along 252km of offshore export cables (noting that only 14km of export cables overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC), with a width of 104m, to an average depth of 5.1m. Total spoil volume of 12,051,955m^3 <u>Cable installation:</u> • Offshore export cables: installation via trenching of up to 360km of cable, with a trench width of up to 3m and a depth of up to 3m and a V-shaped profile. Total spoil volume of 1,620,000m^3. Installed over a period of 15 months.	<u>Site preparation:</u> 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. These details are not fully known at this stage, however based on the available data, it is anticipated that the sandwaves requiring clearance in the array area are likely to be in the range 15m in height. 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 disposal of material. Boulder and debris clearance activities will result in minimal increases in SSC and have therefore not been considered in the assessment. <u>Cable installation:</u> Cable routes inevitably include a variety of seabed material and in some areas 3m 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. The plume extent associated with open cut trenching in the intertidal area is predicted to be approximately 5km in total width (see volume 6, annex 6.1: Physical processes technical report of the PEIR). Given that both SACs are located more than 6km from the landfall, works in the intertidal have not been considered further for this impact pathway.
Operations and maintenance phase	Mona Offshore Wind Project lifetime of 35 years • Repair of up to 32km of subtidal export cables in eight events every five years • Reburial of up to 15km of subtidal export cables in one event every five years.	The greatest foreseeable number of cable reburial and repair events is considered to the MDS for sediment dispersion (noting that only 14km of export cables overlap 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 or trenchless exit pits in the intertidal zone and disposed of onshore.	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 in line with the construction phase.

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.28 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 1.11.

Table 1.11: 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		
To minimise sandwave clearance within the Menai Strait and Conwy Bay SAC	To minimise potential impacts on Annex I habitats within the SAC. Investigations will be undertaken to identify opportunities to limit sandwave clearance within the Menai Strait and Conwy Bay SAC. This will be guided by survey data and when all cable route results have been evaluated this will inform the assessment within the ISAA accompanying the application for consent.	Subject to the findings of the further studies described under the 'Justification'. To be updated within the ISAA submitted with the application for consent.

Construction and decommissioning phases

Information to support assessment

1.7.3.29 Site clearance activities may be undertaken using a range of techniques, but 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 disposal of material. Although a suction hopper dredger has been modelled in practice, plough dredging which mobilises a much smaller amount of sediment into suspension at the seabed and has reduced sediment plume concentrations and extents compared to other types of dredging activities may be undertaken. However, 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 to remove material from the crest of sandwaves and deposit on material in a trough as it progressed along the Mona Offshore Cable Corridor, resulting in higher quantification of sedimentation compared to the plough dredging.

1.7.3.30 The dredging phase plumes are predicted to be smaller (typically <50mg/l) than the plumes generated during the dumping phase. During the dumping phase the plume is slightly larger with concentrations reaching 1000mg/l at the release site. 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 to 500mg/l are predicted. The average SSC during the course of the operation is presented in Figure 1.101 of volume 6, annex 6.1: Physical processes technical report of the PEIR, with values <300mg/l predicted within a plume envelope total width of approximately 20km which corresponds with the tidal excursion.

1.7.3.31 Sedimentation of deposited material arising from sandwave clearance in the Mona Offshore Cable Corridor is focussed within 100m of the site of release with a maximum depth of 0.5 to 1m, whilst the finer sediment fractions are distributed in the vicinity at much smaller depths of 5 to 10mm. The dispersion of the released material is predicted to continue on successive tides.

1.7.3.32 During the installation of offshore export cables, the SSCs along the route are predicted to range between 50 and 1,000mg/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 6.1: Physical processes technical report of the PEIR predicted average SSCs of <300mg/l are predicted along the cable path, with the level dropping to background levels on the slack tide. 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 <0.5mm, and the greatest levels of deposition occur along the trenching route as coarser material settles. Although the material is widely dispersed, sediment remains within the cell and would be drawn into the baseline transport regime with small increases in bed sediment levels. It is noted that due to the nature of the tidal flow mobilised sediment is carried offshore and does not accumulate along the coastline. The suspended sediment plume envelope for the construction phase of offshore export cable installation has a width of approximately 20km which corresponds with the tidal excursion.

1.7.3.33 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 drilling and seabed preparation will not be required.

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

1.7.3.34 Seabed preparation (sandwave, boulder and debris clearance) and installation of offshore export cables may lead to increases in SSC and associated sediment deposition as described in paragraph 1.7.3.3, 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.

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

Reefs

1.7.3.36 As outlined in volume 2, chapter 7: benthic subtidal and intertidal ecology of the PEIR, the communities associated with the Annex I subtidal 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, 2016d). 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, 2016d). 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).

1.7.3.37 The representative biotope of the Annex I intertidal reefs IEF is assessed by the 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, 2016e). 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, 2016e). *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, 2016e). These species however have been found to rapidly regrow from their holdfasts following damage (Tillin, 2016e). Smothering by 5cm 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, 2016).

1.7.3.38 As outlined in paragraphs 1.7.3.29 to 1.7.3.33, the impact of increased SSC is predicted to be of local spatial extent and spatially restricted to within approximately one tidal excursion (i.e. a plume envelope with a total width of approximately 20km). Therefore, there is potential overlap with the Annex I reef feature of the SAC. Within these distances average increases in SSCs of <300mg/l are predicted during sandwave clearance and increases of between 50 and 1000mg/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 100m of the release site with maximum depths of 0.5 to 1m. During cable installation, sedimentation level is small (<0.5mm) and greatest in the immediate vicinity of trenching as the coarser material settles. The impact will be of 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 reversible.

Sandbanks which are slightly covered by seawater all the time

1.7.3.39 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 polychates 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.

1.7.3.40 As outlined in paragraphs 1.7.3.29 to 1.7.3.33 the impact of increased SSC is predicted to be of local spatial extent and spatially restricted to within approximately one tidal excursion (i.e. a plume envelope with a total width of approximately 20km). Therefore, there is potential overlap with the Annex I sandbank feature of the SAC. Within these distances average increases in SSCs of <300mg/l are predicted during sandwave clearance and increases of between 50 and 1000mg/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 100m of the release site with maximum depths of 0.5 to 1m. During offshore export cable installation, sedimentation level is small (<0.5mm) and greatest in the immediate vicinity of trenching as the coarser material settles. The impact will be of 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 reversible.

Conclusions

1.7.3.41 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. An assessment of the impact 'increased SSC and associated sediment deposition' against each relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented in Table 1.12 below.

Table 1.12: 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 and associated activities (e.g. sandwave clearance, pre-lay preparation) during construction and decommissioning activities will be limited in spatial extent, temporary, intermittent and will only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time. Therefore, these activities 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 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 and associated activities (e.g. sandwave clearance, pre-lay preparation) 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 affect the physical, biological and chemical structure and function of identified Annex I 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 and associated activities (e.g. sandwave clearance, pre-lay preparation) will be temporary and the corresponding communities are predicted to recover following these activities. The typical benthic species associated with featured habitats will, therefore, not be affected in such a way that the habitat quality will be degraded.

1.7.3.42 Therefore, it can be concluded 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.

Dee Estuary/Aber Dyfrdwy SAC and Ramsar

1.7.3.43 Seabed preparation (sandwave, boulder and debris clearance) and installation of offshore export cables may lead to increases in SSC and associated sediment deposition, which in turn may result in adverse effects on the Annex I designated features of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar through reduced water clarity and smothering.

1.7.3.44 Potential impacts associated with increases in SSC and associated sediment deposition for each designated feature are discussed below.

Estuaries

1.7.3.45 Volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR did not consider the estuaries feature of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar. This is due to the distance of the SAC from the Mona Offshore Wind Project (Dee Estuary/Aber Dyfrdwy SAC located 13km from the Mona Offshore Cable Corridor) resulting in the feature lying beyond the ZOI of the Mona Offshore Wind Project as determined by the project specific outputs of the physical processes assessment. Due to the location of the feature within the SAC any effects from the impact will be further reduced. Paragraph 1.7.3.42 concluded that there was no adverse effect on the integrity of the Menai Strait Conwy Bay/Y Fenai a Bae Conwy SAC from this potential impact. As the Dee Estuary/Aber Dyfrdwy SAC and Ramsar are located at an increased distance from the Mona Offshore Wind Project it is determined that effects on the Dee Estuary/Aber Dyfrdwy SAC and Ramsar would be of lower magnitude.

1.7.3.46 Given the location of this Annex I feature within the SAC, and the short term nature of any increases in SSC, this pressure is not expected to adversely affect the extent and distribution or the structure and function of the Annex I habitat estuaries. Therefore, it is determined there is no potential for an adverse effect on integrity, with regard to the conservation objectives of Annex I habitat estuaries feature of the Dee Estuary/Aber Dyfrdwy SAC from effects associated with increases in SSC and associated sediment deposition.

Mudflats and sandflats not covered by seawater at low tide

1.7.3.47 Volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR did not consider the mudflats and sandflats not covered by seawater at low tide feature of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar. This is due to the distance of the SAC from the Mona Offshore Cable Corridor (13km) and the location of the designated feature within the SAC (primarily within the estuary, Figure 1.5) resulting in the feature lying beyond the ZOI of the Mona Offshore Wind Project as determined by the project specific outputs of the physical processes assessment. This feature is associated with the intertidal area of the SAC and potential impacts within the intertidal zone of the SAC are likely to be reduced compared to the subtidal zone due to the increased distance from activities associated with the Mona Offshore Wind Project. Paragraph 1.7.3.42 concluded that there was no adverse effect on the integrity of the Menai Strait Conwy Bay/Y Fenai a Bae Conwy SAC from this potential impact. As the Dee Estuary/Aber Dyfrdwy SAC and Ramsar are located at an increased distance from the Mona Offshore Wind Project it is determined that effects on the Dee Estuary/Aber Dyfrdwy SAC and Ramsar would be of lower magnitude.

1.7.3.48 Given the location of this Annex I feature within the SAC, and the short term nature of any increases in SSC, this pressure is not expected to adversely affect the extent and distribution or the structure and function of the Annex I habitat estuaries. Therefore, it is determined there is no potential for an adverse effect on integrity, with regard to the conservation objectives of Annex I mudflats and sandflats not covered by seawater at low tide feature of the Dee Estuary/Aber Dyfrdwy SAC from effects associated with increases in SSC and associated sediment deposition.

Conclusions

1.7.3.49 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar will not occur as a result of increases in SSC and associated sediment deposition during construction and decommissioning activities. An assessment of the impact of 'increased SSC and associated deposition' (as presented in paragraph 1.7.2.41 to 1.7.2.43) is presented below in Table 1.13.

Table 1.13: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar for increases in SSC and associated sediment deposition during the construction and decommissioning phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species	All increases in SSC and associated sediment deposition will be limited in spatial extent, temporary, intermittent and will only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time (if any effects occur on Annex I habitats at all). A conclusion of no adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC was made above in paragraph 1.7.3.42, as the Dee Estuary/Aber Dyfrdwy SAC and Ramsar is located at a greater distance from the Mona Offshore Cable Corridor it is considered that potential impacts from increases in SSC on this SAC would be lower. Therefore, these activities will not restrict the distribution or extent of identified Annex I habitat features from being maintained or restored.
The structure and function (including typical species) of qualifying natural habitats	All increases in SSC and associated sediment will be limited in spatial extent, temporary, intermittent and will only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time (if any effects occur on Annex I habitats at all). A conclusion of no adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC was made above in paragraph 1.7.3.42, as the Dee Estuary/Aber Dyfrdwy SAC and Ramsar is located at a greater distance from the Mona Offshore Cable Corridor it is considered that potential impacts from increases in SSC on this SAC would be lower. Therefore, these activities will not restrict the structure and function of the habitats from being maintained or restored.
The structure and function of the habitats of qualifying species	All increases in SSC and associated sediment deposition will be limited in spatial extent, temporary, intermittent and will only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time. Therefore, these activities will not restrict the structure and function of the habitats of qualifying species from being maintained or restored.

Conservation Objective	Conclusion
The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely	All increases in SSC and associated sediment deposition will be limited in spatial extent, temporary, intermittent and will only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time (if any effects occur on Annex I habitats at all). A conclusion of no adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC above in paragraph 1.7.3.42, as the Dee Estuary/Aber Dyfrdwy SAC and Ramsar is located at a greater distance from the Mona Offshore Cable Corridor it is considered that potential impacts from increases in SSC on this SAC would be lower. Therefore, these activities will not restrict the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely from being maintained or restored.

1.7.3.50 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar as a result of increases in SSC and associated sediment 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

Reefs

1.7.3.51 The impact of increases in SSC and associated sediment deposition 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 the construction and decommissioning phase (see paragraph 1.7.3.36 to 1.7.3.38). The sensitivity of the feature to this impact is outlined in paragraph 1.7.3.36.

Sandbanks

1.7.3.52 The impact of increased SSC associated sediment deposition 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 the construction and decommissioning phase (see paragraph 1.7.3.36 to 1.7.3.38). The sensitivity of the feature to this impact is outlined in paragraph 1.7.3.36.

Conclusions

1.7.3.53 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 increased SSC and sediment deposition. An assessment of the impact 'increased SSC and associated sediment deposition' against each relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented below.

Table 1.14: 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 operations and maintenance activities will be limited in spatial extent, temporary, intermittent and will only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time. Therefore, these activities 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 functions necessary for the long-term maintenance and quality of the habitat are not degraded	Increases in SSC and associated sediment deposition associated with operations and maintenance activities will be temporary in nature, reversible and the corresponding biological communities associated with the Annex I habitats are predicted to recover. Therefore, these activities will not affect the physical, biological and chemical structure and function of identified Annex I 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 operations and maintenance activities will be temporary and that the corresponding communities are predicted to recover following these activities. Therefore, the typical benthic species associated with featured habitats will not be affected in such a way that the habitat quality will be degraded.

1.7.3.54 Therefore, it can be concluded 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.

Dee Estuary/Aber Dyfrdwy SAC and Ramsar

1.7.3.55 Temporary increases in SSC and associated sediment deposition may arise during maintenance activities (e.g. cable reburial or repair works) and may affect benthic communities. Potential impacts associated with increases in SSC and associated sediment deposition for each designated feature are discussed below.

Estuaries

1.7.3.56 The impact of increases in SSC and associated sediment deposition on the Annex I estuaries feature of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar will be the same or less than those predicted for the construction and decommissioning phase (see paragraph 1.7.3.45 and 1.7.3.46).

1.7.3.57 Due to the location of the feature within the SAC any effects from the impact, if they occur at all, will be low. Paragraph 1.7.3.54 concluded that there was no adverse effect on the integrity of the Menai Strait Conwy Bay/Y Fenai a Bae Conwy SAC. As the Dee Estuary/Aber Dyfrdwy SAC and Ramsar are located at an increased distance from the Mona Offshore Wind Project it is determined that effects on the Dee Estuary/Aber Dyfrdwy SAC and Ramsar would be of lower magnitude.

Mudflats and sandflats not covered by seawater at low tide

1.7.3.58 The impact of increases in SSC and associated sediment deposition on the Annex I mudflats and sandflats not covered by seawater at low tide feature of the Dee

Estuary/Aber Dyfrdwy SAC and Ramsar will be the same or less than those predicted for the construction and decommissioning phase (see paragraph 1.7.3.47 and 1.7.3.48).

1.7.3.59 Due to the location of the feature within the SAC any effects from the impact, if they occur at all, will be low. Paragraph 1.7.3.54 concluded that there was no adverse effect on the integrity of the Menai Strait Conwy Bay/Y Fenai a Bae Conwy SAC. As the Dee Estuary/Aber Dyfrdwy SAC and Ramsar are located at an increased distance from the Mona Offshore Wind Project it is determined that effects on the Dee Estuary/Aber Dyfrdwy SAC and Ramsar would be of lower magnitude.

Conclusions

1.7.3.60 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar will not occur as a result of increases in SSC and associated sediment deposition during operations and maintenance activities. Potential effects from this activity on the relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) are discussed in turn below in Table 1.15. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.15: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar for increases in SSC and associated sediment deposition during the operations and maintenance phase.

Conservation Objective	Conclusion
The extent and distribution of qualifying natural habitats and habitats of qualifying species	All increases in SSC and associated sediment deposition associated with maintenance activities (e.g. offshore export cable reburial or repair works) will be limited in spatial extent, temporary, intermittent and will only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time (if any effects occur on Annex I habitats at all). A conclusion of no adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC was stated above in paragraph 1.7.3.42, as the Dee Estuary/Aber Dyfrdwy SAC and Ramsar is located at a greater distance from the Mona Offshore Cable Corridor it is considered that potential impacts from increases in SSC on this SAC would be lower. Therefore, these activities will not restrict the distribution or extent of identified Annex I habitat features from being maintained or restored.
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**	All increases in SSC and associated sediment deposition associated with maintenance activities (e.g. cable reburial or repair works) will be limited in spatial extent, temporary, intermittent and will only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time (if any effects occur on Annex I habitats at all). A conclusion of no adverse effect on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC was stated above in paragraph 1.7.3.54, as the Dee Estuary/Aber Dyfrdwy SAC and Ramsar is located at a greater distance from the Offshore Cable Corridor it is considered that potential impacts from increases in SSC on this SAC would be lower. Therefore, these activities will not restrict the distribution or extent of identified Annex I habitat features from being maintained or restored. On the basis of the above, the offshore export cable operations and maintenance activities will not affect the structure and function (including typical species) of qualifying natural habitats, the physical biological and chemical structure and function of identified Annex I habitat features or the supporting processes of identified Annex I habitat features.

1.7.3.61 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar 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.

Release of sediment bound contaminants

1.7.3.62 Seabed disturbance associated with construction and decommissioning (e.g. cable installation and removal) could lead to the remobilisation of sediment-bound contaminants that may result in harmful and adverse effects on benthic communities.

1.7.3.63 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 release of sediment bound contaminants. This relates to the following designated sites 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
- Dee Estuary/Aber Dyfrdwy SAC and Ramsar
  - Estuaries
  - Mudflats and sandflats not covered by seawater at low tide.

1.7.3.64 As for the impact ‘increases in SSC and associated deposition’, this impact will be spatially restricted to within the boundaries of the Mona Offshore Wind Project and the surrounding area, the Mona Array Area is located 26km from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and 35km from the Dee Estuary/Aber Dyfrdwy SAC/Ramsar and therefore outside of the ZOI (predicted precautionarily to be 15km during LSE screening). The Stage 1 HRA Screening Report determined that this applies to the Mona Offshore Cable Corridor only which overlaps with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and is located 13km from the Dee Estuary/Aber Dyfrdwy SAC and Ramsar.

1.7.3.65 The impact is predicted to be of local spatial extent, short term duration, intermittent and have high reversibility.

1.7.3.66 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 and Dee Estuary/Aber Dyfrdwy SAC and Ramsar have been quantified and assessed.

1.7.3.67 The MDS considered for the assessment of potential potential impacts on Annex I habitat features from the release of sediment bound contaminants is presented in Table 1.16.

Table 1.16: MDS considered for the assessment of potential impacts on Annex I habitats (offshore and coastal) from the release of sediment bound contaminants during the construction and decommissioning phase.

Potential impact	MDS	Justification
Construction phase	MDS as described in Table 1.10 for increased SSC and associated deposition during the construction phase.	The justification for the disturbance/remobilisation of sediment-bound contaminants MDS is that same as that described in Table 1.10 for increased SSC and associated deposition during the construction phase as this MDS results in the release of the largest volume of sediment and associated contaminants.
Decommissioning phase	MDS as described in Table 1.10 for increased SSC and associated deposition during the decommissioning phase.	The justification for the disturbance/remobilisation of sediment-bound contaminants MDS is the same as that described in Table 1.10 for increased SSC and associated deposition during the decommissioning phase as this MDS results in the release of the largest volume of sediment and associated contaminants.

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.68 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 release of sediment bound contaminants during construction and decommissioning are presented in Table 1.17.

Table 1.17: 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 release of sediment bound contaminants.

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		
To minimise sandwave clearance within the Menai Strait and Conwy Bay SAC	To minimise potential impacts on Annex I habitats within the SAC. Investigations will be undertaken to identify opportunities to limit sandwave clearance within the Menai Strait and Conwy Bay SAC. This will be guided by survey data and when all cable route results have been evaluated this will inform the assessment within the ISAA accompanying the final submission.	Subject to the findings of the further studies described under the 'Justification'. To be updated within the ISAA submitted with the application for consent.

Construction and decommissioning phases

Information to support assessment

1.7.3.69 Seabed preparation (sandwave, boulder and debris clearance), drilling for and installation of export cables may lead to the release of sediment-bound contaminants. This 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 for each designated feature which are discussed below.

1.7.3.70 Sediment samples were collected from the Mona Offshore Cable Corridor in the summer of 2022. Whilst the result of the analyses of these samples were not available to inform this draft ISAA, they will be presented in the ISAA submitted with the application for consent. Samples collected from the Mona Array Area in 2021 were, however, available and analysed for contaminants including heavy metals, Polychlorinated biphenyl (PCBs) and Polycyclic Aromatic Hydrocarbons (PAHs). The full results of this sediment chemistry analysis are detailed in volume 6, annex 7.1: Benthic subtidal and intertidal ecology technical report of the PEIR. The concentrations of the heavy metals, PAHs and PCBs was compared to the corresponding Cefas Action Levels (1 and 2) and the Canadian Sediment Quality Guideline (CSQG) Threshold Effect Level (TEL) and Probable Effect Level (PEL). Within the Mona Array Area one site in the southwest exceeded the Cefas Action Level 1 (AL1) and the Canadian TEL for arsenic. Concentrations of PCBs and PAHs in all samples were found to be under Cefas AL1 and the CSQGs.

1.7.3.71 The total area that is likely to be disturbed by construction activities, and therefore the potential volume of material disturbed, resulting in the potential release of sediment bound contaminants is small and localised in extent as well as occurring gradually over the construction phase. The MDS is for 12,051,955m^3 of spoil from sandwave clearance within the Mona Offshore Cable Corridor (over a period of 12 months) and up to 1,620,000m^3 of spoil for offshore export cable installation (over a period of 15 months). These quantities of spoil relate to the whole Mona Offshore Cable Corridor, and only a very small proportion of the total spoil generated will arise in, or in close vicinity to, the SAC.

1.7.3.72 Following disturbance as a result of construction activities, the majority of re-suspended sediments are expected to be deposited in the immediate vicinity of the works.

1.7.3.73 Although scour and cable protection will remain *in situ* during the decommissioning phase, offshore export cables will be removed from within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC which could result in the remobilisation of sediment bound contaminants.

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

1.7.3.74 Seabed preparation (sandwave, boulder and debris clearance), and installation of export cables may lead to the release of sediment bound contaminants, 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.

1.7.3.75 Potential impacts associated with the release of sediment bound contaminants for each designated feature are discussed below.

Reefs

1.7.3.76 Aspects of the subtidal reef biotope were assessed in volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR. Although no information on the effects of heavy metals on the assessed hydroids was found, evidence suggests that hydroids may suffer at least sub-lethal effects and possibly morphological changes and reduced growth due to heavy metal contamination. The arsenic levels have been consistent in the Irish sea ensuring communities are well adapted to these conditions.

1.7.3.77 The Annex I intertidal reefs may be negatively affected by the introduction of heavy metals however at most naturally occurring levels algae are able to metabolise and store arsenic without experiencing damage or mortality (Neff, 2009). Furthermore, the benthic communities have developed in an environment of low levels of existing contamination, so any release of contaminants (if present in sediments) from construction activities is not likely to significantly increase bioavailability.

Sandbanks which are slightly covered by seawater all the time

1.7.3.78 Volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR assessed the sensitivity of the Annex I sandbank habitat. Whilst the representative biotopes for the subtidal habitat IEFs are not assessed by the MarESA, in general, tolerance to heavy metals varies depending on species and tolerance tends to be low for most groups of benthic species in these IEFs. Furthermore, the benthic communities have developed in an environment of low levels of existing contamination, so any low-level release of contaminants from construction activities is not likely to significantly increase bioavailability. The release of contaminants from the small proportion of fine sediments is also likely to be rapidly dispersed with the tide and/or currents. Therefore increased bioavailability resulting in adverse eco-toxicological effects are not expected.

1.7.3.79 Volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR assessed the Annex I sandbank IEF as having low sensitivity to release of sediment bound contaminants.

Conclusions

1.7.3.80 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 release of sediment bound contaminants. An assessment of the impact 'release of sediment bound contaminants' against each relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented below in Table 1.18.

Table 1.18: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for the release of sediment bound contaminants 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	Given the low levels of PCBs and PAHs within the Mona Array Area and therefore likely low levels within the Mona Offshore Cable Corridor, consistent arsenic levels throughout the Irish Sea and likely tolerant nature of the benthic communities present, adverse effects are not predicted. It should be noted that ISAA submitted with the application for consent will however be updated with the results of the site-specific surveys undertaken in 2022. Any effects will be limited in spatial extent, temporary, and of short-term duration. Therefore, these activities 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 functions necessary for the long-term maintenance and quality of the habitat are not degraded **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.**	Given the low levels of PCBs and PAHs within the Mona Array Area and therefore likely low levels within the Mona Offshore Cable Corridor, consistent arsenic levels throughout the Irish Sea and likely tolerant nature of the benthic communities present, adverse effects are not predicted. It should be noted that ISAA submitted with the application for consent will however be updated with the results of the site-specific surveys undertaken in 2022. Any effects will be limited in spatial extent, temporary, and of short-term duration. Therefore, these activities will not degrade the structure or function of identified Annex I habitat features. Contaminant levels in the water column and sediments will remain in line with the requirements of the conservation objective.
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	Given the low levels of PCBs and PAHs within the Mona Array Area and therefore likely low levels within the Mona Offshore Cable Corridor, consistent arsenic levels throughout the Irish Sea and likely tolerant nature of the benthic communities present, adverse effects are not predicted. It should be noted that the ISAA submitted with the application for consent will however be updated with the results of the site-specific surveys undertaken in 2022. Any effects will be limited in spatial extent, temporary, and of short-term duration. Therefore, these activities will not degrade the presence, abundance, condition and diversity of the typical species of the habitat.

1.7.3.81 Therefore, it can be concluded 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 release of sediment bound contaminants impact with respect to the construction and decommissioning of the Mona Offshore Wind Project alone.

Dee Estuary/Aber Dyfrdwy SAC and Ramsar

Estuaries

1.7.3.82 Volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR did not consider the estuaries feature of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar. This is due to the distance of the SAC from the Mona Offshore Wind Project (Dee Estuary/Aber Dyfrdwy SAC located 13km from the Mona Offshore Cable Corridor) resulting in the feature lying beyond the ZOI of the Mona Offshore Wind Project as determined by the project specific outputs of the physical processes assessment.

1.7.3.83 This Annex I feature is located in the coastal areas of the SAC. Given the SAC is located 13km from the point of any release of sediment, any associated sediment bound contaminants, if they were also released, would be subject to high dilution and dispersal before reaching the SAC. This will reduce the risk to the Annex I estuaries feature of the Dee Estuary/Aber Dyfrdwy SAC, even if contaminants are present in sediments. This pressure is not expected to adversely affect the extent and distribution or the structure and function of the Annex I habitat estuaries.

Mudflats and sandflats not covered by seawater at low tide

1.7.3.84 Volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR did not consider the mudflats and sandflats not covered by seawater at low tide feature of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar. This is due to the distance of the SAC from the Mona Offshore Wind Project (Dee Estuary/Aber Dyfrdwy SAC located 13km from the Mona Offshore Cable Corridor) resulting in the feature lying beyond the ZOI of the Mona Offshore Wind Project as determined by the project specific outputs of the physical processes assessment.

1.7.3.85 This Annex I feature is located in the coastal areas of the SAC. If contaminants are present in sediments, any sediment contaminants released are likely to be rapidly dispersed and highly diluted due to the SAC being located 13km from the Mona Offshore Cable Corridor. This pressure is not expected to adversely affect extent and distribution or the structure and function of the Annex I Mudflats and sandflats not covered by seawater at low tide feature.

Conclusions

1.7.3.86 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar will not occur as a result of increases in SSC and associated sediment deposition during construction and decommissioning activities. An assessment of the impact of 'release of sediment bound contaminants' against each relevant conservation objective (as presented in paragraph 1.7.2.41 to 1.7.2.43) 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 Dee Estuary/Aber Dyfrdwy SAC and Ramsar for the release of sediment bound contaminants during the construction and decommissioning phase.

Conservation Objective	Conclusion
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**	Given the low levels of PCBs and PAHs within the Mona Array Area and therefore likely low levels within the Mona Offshore Cable Corridor, consistent arsenic levels throughout the Irish Sea and likely tolerant nature of the communities present adverse effects are not predicted. It should be noted that the ISAA submitted with the application for consent will however be updated with the results of the site-specific surveys undertaken in 2022. Any effects will be limited in spatial extent, temporary, and of short-term duration. Given the SAC is located 13km from the point of any release of sediment, any associated sediment bound contaminants, if they were also released, would be subject to high dilution and dispersal before reaching the SAC. This alone will further reduce the risk to the Annex I habitat features of the Dee Estuary/Aber Dyfrdwy SAC, even if contaminants are present in sediments. Therefore, these activities will not restrict the distribution or extent of identified Annex I habitat features from being maintained or restored. The structure and function (including typical species) of qualifying natural habitats, the habitats of qualifying species and supporting processes of the qualifying natural habitats will also not be prevented from being maintained or restored.

1.7.3.87 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC or Ramsar as a result of the release of sediment bound contaminants impact with respect to the construction and decommissioning of the Mona Offshore Wind Project alone.

Long-term subtidal habitat loss

1.7.3.88 Long term habitat loss will occur directly under all wind turbine and OSP foundation structures. The installation of scour protection and cable protection (including at cable crossings), where this is required, will also lead to habitat alteration and a physical change to another seabed type.

1.7.3.89 This impact will be spatially restricted to within the Mona Offshore Wind Project Boundaries and there is no potential for spatial overlap between the Mona Array Area and any Annex I habitat features of the sites. This impact therefore is applicable to the Mona Offshore Cable Corridor only.

1.7.3.90 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 long-term subtidal habitat loss with respect to the Mona Offshore Cable Corridor. 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.

1.7.3.91 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.

1.7.3.92 The MDS considered for the assessment of potential impacts on Annex I habitat features from long-term habitat loss is presented in Table 1.20.

Table 1.20: MDS considered for the assessment of potential impacts on Annex I habitats (offshore and coastal) from long-term subtidal habitat loss during the operations and maintenance and decommissioning phases.

Phase	MDS	Justification
Operations and maintenance phase	Up to 28,000m^2 of long term habitat loss within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC due to: • Offshore export cable protection for up to 20% of 14km of offshore export cables within the SAC requiring cable protection (10m width of cable protection) • Operational phase up to 35 years.	The MDS for the Mona Offshore Wind Project assumes the need for cable protection over up to 20% of the entire length of the offshore export cable, therefore the MDS for the SAC assumes that up to 20% of the offshore export cable within the Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC will have cable protection with a width of 10m.
Decommissioning phase	As above for operations and decommissioning phase.	MDS assumes that cable protection will be left *in situ*.

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.93 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 of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC from long term habitat loss during the operations and maintenance and decommissioning phases are presented in Table 1.21.

Table 1.21: 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 long term habitat loss.

Measure	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
To minimise cable protection placed within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC	Commitment to investigate opportunities to limit the extent of cable protection within the Menai Strait SAC and Constable Bank once the site specific geophysical and geotechnical data for the Mona Offshore Cable Corridor are available.	Subject to the findings of the further studies described under the 'Justification'. To be updated within the ISAA submitted with the application for consent.

Operations and maintenance phase

Information to support assessment

1.7.3.94 As the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC overlaps spatially with the Mona Offshore Cable Corridor there is the potential for long term habitat loss within the SAC, if cable protection is required for the offshore export cables within the SAC. The MDS assumes the need for cable protection for up to 20% of the entire length of the offshore export cable, therefore the MDS assumes that up to 20% of the offshore export cable within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will have cable protection with a width of 10m. This results in long term habitat loss of 28,000m^2, which represents 0.01% of the total area of the SAC. On the basis of NRW's mapped distribution of designated features within the SAC (NRW, 2016), as shown in Figure 1.4, the Mona Offshore Cable Corridor does not spatially overlap with any protected features. This assessment for PEIR has, however, adopted a precautionary approach which assumes that there may be some long term loss of the Annex I sandbanks and the Annex I subtidal reefs. This assessment will, however, be updated for the ISAA submitted with the application for consent to include the results of the site-specific surveys in the Mona Offshore Cable Corridor. It should also be noted that any potential impacts on the designated Annex I habitats of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be further reduced by the measure outlined in Table 1.21, which will minimise cable protection placed within the SAC.

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

Reefs

1.7.3.95 As presented in volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR, the MarESA determines that the Annex I subtidal reefs habitat which occurs within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, has a high sensitivity to the pressures associated with long term subtidal habitat loss. It is likely however that cable protection will largely be required in sedimentary habitats within the SAC, and this introduced hard substrate could be colonised by similar communities which have been identified as part of the Annex I subtidal reefs.

1.7.3.96 As outlined in paragraph 1.7.3.11, the nearest mapped record of the reef feature is 1km from the Mona Offshore Cable Corridor and so it is considered unlikely that this feature will be directly impacted. Site-specific surveys were undertaken in the summer of 2022 to characterise the Mona Offshore Cable Corridor, including the area overlapping with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. This ISAA will therefore be updated with this site-specific data for the application for consent following completion of the data analysis. For the purposes of this draft ISAA, a precautionary approach has been adopted which assumes that there could be some overlap with, and temporary habitat disturbance to, this feature. This would, however, be small in the context of the total extent of this feature within the SAC. It should also be noted that any impacts on the designated Annex I habitats of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be reduced by the measure outlined in Table 1.21, which will minimise cable protection placed within the SAC.

Sandbanks which are slightly covered by seawater all the time

1.7.3.97 The MarESA determines that the Annex I sandbanks habitat which occurs within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC has a high sensitivity to the pressures associated with long term subtidal habitat loss.

1.7.3.98 As the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC overlaps spatially with the Mona Offshore Cable Corridor there may be long term habitat loss within the SAC should cable protection be required in the area of overlap. The nearest mapped record of the sandbank feature is 3km from the Mona Offshore Cable Corridor and so it is considered unlikely that this feature will be directly impacted. Site-specific surveys were undertaken in the summer of 2022 to characterise the Mona Offshore Cable Corridor, including the area overlapping with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. This ISAA will therefore be updated with this site-specific data for the application for consent following completion of the data analysis. For the purposes of this draft ISAA, a precautionary approach has been adopted which assumes that there could be some overlap with, and temporary habitat disturbance to, this feature. This would, however, be small in the context of the total extent of this feature within the SAC. It should also be noted that any potential impacts on the designated Annex I habitats of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be reduced by the measure outlined in Table 1.21 which will minimise cable protection placed within the SAC.

Conclusions

1.7.3.99 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 long-term habitat loss. An assessment of the impact 'long-term subtidal habitat loss' against each relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented below in Table 1.22.

Table 1.22: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for long-term habitat loss 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	All long-term habitat loss associated with the operations and maintenance phase will be local spatial extent, long term duration, continuous and low reversibility. Whilst, on the basis of desktop data, it is unlikely that any Annex I features will be directly impacted, the ISAA submitted with the application for consent will be updated with the results of the site-specific surveys undertaken in 2022. Should Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time features be affected, it would only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time. Any potential impacts on the designated Annex I habitats of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be further reduced by the measure outlined in Table 1.21, which will minimise cable protection placed within the SAC. Therefore, 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	Long-term habitat loss associated with the operations and maintenance phase will be local spatial extent, long term duration, continuous and low reversibility. Any potential impacts on the designated Annex I habitats of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be further reduced by the measure outlined in Table 1.21, which will minimise cable protection placed within the SAC. Therefore these activities will not result in the physical, biological and chemical structure and function of identified Annex I habitat features being degraded.
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	Any long-term habitat loss associated with the operations and maintenance phase will be local spatial extent, long term duration, continuous and low reversibility. Whilst, on the basis of desktop data, it is unlikely that any Annex I features will be directly impacted, SAA submitted with the application for consent will be updated with the results of the site-specific surveys undertaken in 2022. Should Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time features be affected, it would only affect a very small percentage of the total available extent of Annex I habitats within the SAC at any one time. Any potential impacts on the designated Annex I habitats of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be further reduced by the measure outlined in Table 1.21, which will minimise cable protection placed within the SAC where possible. Therefore, the typical benthic species associated with featured habitats will not be affected in such a way that the habitat quality will be degraded.

1.7.3.100 Therefore, it can be concluded 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 long term habitat impacts with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Decommissioning phase

Information to support assessment

1.7.3.101 The information to support an assessment is consistent with the information outlined in paragraph 1.7.3.93 for the construction/operations and maintenance phase. As the MDS assumes that all cable protection will remain *in situ* the area of the SAC affected by impact long term subtidal habitat loss/alteration during the decommissioning phase and extending into the post-decommissioning phase will be the same as assessed for the construction/operations and maintenance phase.

1.7.3.102 In areas of previously soft sediments where the cable protection is left *in situ* on the seabed, the substrate will not return to soft sediments and therefore there is no potential for recovery of sedimentary communities. Throughout the operations and maintenance phase however it is likely that the Mona Offshore Wind Project infrastructure will have been colonised by hard structure adapted communities similar to those which occur on the natural hard substrates (further detail on the colonisation of hard structures can be found in volume 2, chapter 7: Benthic Ecology of the PEIR). As a result of this it may be more accurate to refer to the permanent placement of Mona Offshore Wind Project infrastructure as habitat alteration rather than loss, as used for the other phases, as these artificial habitats will provide a basis for benthic communities although they are likely to be different from those originally found at these sites.

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

Reefs

1.7.3.103 As outlined in paragraph 1.7.3.101 and 1.7.3.102, the extent of the impact on the Annex I reef habitat will be as described for the operations and maintenance phase in paragraph 1.7.3.95 and 1.7.3.96. As the MDS assumes that all cable protection will remain *in situ* (see Table 1.20), the area of the SAC affected by impact long term subtidal habitat loss/alteration during the decommissioning phase and extending into the post-decommissioning phase will be the same as assessed for the construction/operations and maintenance phase. The sensitivity of the Annex I reef habitat is as described previously for the operations and maintenance phase assessment in paragraph 1.7.3.96. The persistence of cable protection, long-term, following the decommissioning of the Mona Offshore Wind Project may potentially confer some benefits on the Annex I reef feature of the SAC as the structures are likely to become colonised by communities of species typically found on stony reefs in the area. There is the potential that, if the cable protection does not become buried in sediment, it may extend the reef feature within the SAC.

Sandbanks which are slightly covered by seawater all the time

1.7.3.104 As outlined in paragraph 1.7.3.101 and 1.7.3.102, the extent of the impact on the Annex I sandbank habitat will be as described for the operations and maintenance phase in paragraph 1.7.3.97 and 1.7.3.98. As the MDS assumes that all cable protection will remain *in situ* the area of the SAC affected by impact long term subtidal habitat loss/alteration during the decommissioning phase and extending into the post-decommissioning phase will be the same as assessed for the construction/operations and maintenance phase. The sensitivity of the Annex I sandbanks which are slightly covered by seawater all the time habitat is as described previously for the construction/operations and maintenance phase assessment in paragraph 1.7.3.98. The persistence of cable protection, long-term, following the decommissioning of the Mona Offshore Wind Project is not predicted to represent a barrier to the movement, or expansion, of the sandbanks which are slightly covered by seawater all the time feature in the SAC. There is the potential that any cable protection placed within the SAC could become buried over time.

Conclusions

1.7.3.105 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 long-term habitat loss/alteration during the decommissioning and post-decommissioning phase. An assessment of the impact 'long-term subtidal habitat loss/alteration' against each relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) 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 long-term habitat loss during the 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**	All long-term habitat loss/alteration associated with the decommissioning phase will be highly limited in spatial extent, long term duration, continuous and low reversibility. Whilst, on the basis of desktop data, it is unlikely that any Annex I features will be directly impacted, the ISAA submitted with the application for consent will be updated with the results of the site-specific surveys undertaken in 2022. Should Annex I reef or Annex I sandbanks which are slightly covered by seawater all the time features be affected, it would only affect a very small percentage of the total available extent of Annex I habitats within the SAC. Any potential impacts on the designated Annex I habitats of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC will be reduced by the measure outlined in Table 1.21, which will minimise cable protection placed within the SAC. In addition, cable protection left *in situ* is expected to be colonised by communities similar to those associated with areas of natural reef throughout the operations and maintenance phase, the cable protection will provide artificial habitats for benthic communities albeit likely different from those originally found at these sites. Therefore, these activities will not restrict the distribution or extent of identified Annex I habitat features from increasing or remaining stable. Similarly, these activities will not result in the physical, biological and chemical structure and function of identified Annex I habitat features being degraded. The typical benthic species associated with featured habitats will also not be affected in such a way that the habitat quality will be degraded.

1.7.3.106 Therefore, it can be concluded 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 long term habitat impacts with respect to the decommissioning phase of the Mona Offshore Wind Project alone.

Changes in physical processes

1.7.3.107 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 6.1: Physical processes technical report of the PEIR provides a full description of the modelling used to inform this assessment.

1.7.3.108 This impact will be spatially restricted to within the boundaries of the Mona Offshore Wind Project and the surrounding area, there is no potential for spatial overlap between the Mona Array Area and any Annex I habitat features of the sites. The HRA Stage1 Screening Report determined that this potential impact pathway applies to the Mona Offshore Cable Corridor only. The Mona Array Area is at its closest point is located 26km and 35km, from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and the Dee Estuary/Aber Dyfrdwy SAC and Ramsar respectively which is beyond the ZOI predicted for increased SSC and associated sediment deposition (predicted precautionarily to be 15km during LSE screening). As the Mona Offshore Cable Corridor overlaps with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and is located 13km from the Dee Estuary/Aber Dyfrdwy SAC and Ramsar, 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, for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC the impact is largely only applicable to the 14km of subtidal export cables that overlap with the SAC and the immediate surrounding area.

1.7.3.109 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 changes in physical processes for the Mona Offshore Cable Corridor. 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
- Dee Estuary/Aber Dyfrdwy SAC and Ramsar
  - Estuaries
  - Mudflats and sandflats not covered by seawater at low tide.

1.7.3.110 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 and Dee Estuary/Aber Dyfrdwy SAC and Ramsar has been quantified and assessed.

1.7.3.111 The MDS considered for the assessment of changes in physical processes on Annex I habitat features is presented in Table 1.24.

Table 1.24: 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 phase.

Phase	MDS	Justification
Operations and maintenance phase	• Offshore export cables: cable protection along 72km of the Mona Offshore Cable Corridor, with a height of up to 3m and up to 10m width. See Table 1.20 for cable protection assumptions within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC • Up to 24 cable crossings, each crossing has a height of up to 3m, a width of up to 30m and a length of up to 50m. Noting there are no cable crossings within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC or the Dee Estuary/Aber Dyfrdwy SAC.	This provides the largest obstruction to flow in the water column (noting that only 14km of export cables overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC). See volume 2, chapter 6: Physical processes of the PEIR.

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.112 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 phase are presented in Table 1.21.

Operations and maintenance phase

Information to support assessment

1.7.3.113 The results of the modelling presented in volume 6, annex 6.1: Physical processes technical report of the PEIR indicated that peak tidal flows are redirected in the immediate proximity of foundations and cable protection by a maximum variation of 5cm/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 200m of the installation changes are <2mm which would be indiscernible from baseline conditions.

1.7.3.114 With regard to wave climate, the presence of the Mona Offshore Wind Project (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 would be reversible on decommissioning. The limited nature of these changes would not influence the tidal regime which underpins sediment transport.

1.7.3.115 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 will be used to determine cable protection requirements and inform detailed design parameters.

1.7.3.116 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.

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

Reefs

1.7.3.117 The MarESA identifies the Annex I subtidal 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 characterizing 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, 2016d).

1.7.3.118 Volume 6, annex 6.1: Physical processes technical report of the PEIR 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 would be reversible on decommissioning. 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. The changes to tidal currents, wave climate, littoral currents, and sediment transport are insignificant in terms of the hydrodynamic regime and would not alter reef features.

1.7.3.119 Potential mpacts 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 Annex I intertidal reefs 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.

Sandbanks which are slightly covered by seawater all the time

1.7.3.120 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.

1.7.3.121 Volume 6, annex 6.1: Physical processes technical report of the PEIR 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 Cable Corridor. 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. The changes to tidal currents, wave climate, littoral currents, and sediment transport are insignificant in terms of the hydrodynamic regime and would not alter sandbank features.

Conclusions

1.7.3.122 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 objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented below in Table 1.25.

Table 1.25: 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 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	The impact is predicted to be limited in spatial extent (i.e. in the immediate vicinity of cable protection), and due to meteorological conditions, the scale of potential impacts are well within the natural variation. Therefore, 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	The impact is predicted to be limited in spatial extent (i.e. in the immediate vicinity of cable protection), due to meteorological conditions and the scale of potential impacts are well within the natural variation. Therefore, changes in physical processes will not affect the physical, biological and chemical structure and function of identified Annex I habitat features.
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	Volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR assessed the qualifying features of the SAC and associated characterising species as not sensitive to the relevant pressures. it is not considered that the typical benthic species associated with featured habitats will be affected in such a way that the habitat quality will be degraded.

1.7.3.123 Therefore, it can be concluded 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 of the Mona Offshore Wind Project alone.

Dee Estuary/Aber Dyfrdwy SAC and Ramsar

Estuaries

1.7.3.124 The Dee Estuary/Aber Dyfrdwy SAC/Ramsar is located 13km from the Mona Offshore Cable Corridor resulting in the feature lying beyond the ZOI of the Mona Offshore Wind Project as determined by the project specific outputs of the physical processes assessment. As discussed in paragraph 1.7.3.113 to 1.7.3.116, any changes in physical processes will only occur in the immediate vicinity of the cable protection and therefore will not extend to the Dee Estuary/Aber Dyfrdwy SAC/Ramsar.

Mudflats and sandflats not covered by seawater at low tide

1.7.3.125 The Dee Estuary/Aber Dyfrdwy SAC is located 13km from the Mona Offshore Cable Corridor resulting in the feature lying beyond the ZOI of the Mona Offshore Wind Project as determined by the project specific outputs of the physical processes assessment. Any changes in physical processes will only occur in the immediate vicinity of the cable protection and therefore will not extend to the Dee Estuary/Aber Dyfrdwy SAC/Ramsar.

Conclusions

1.7.3.126 Adverse effects on the qualifying Annex I habitats which undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar will not occur as a result of changes in physical processes during the operations and maintenance phase. An assessment of the impact of 'changes in physical processes' (as presented in paragraph 1.7.2.41 to 1.7.2.43) is presented below in Table 1.26. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.26: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar for changes in physical processes during the operations and maintenance phase.

Conservation Objective	Conclusions
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**	Any changes in physical processes will only occur in the immediate vicinity of the cable protection within the Mona Offshore Cable Corridor and therefore will not extend to the Dee Estuary/Aber Dyfrdwy SAC/Ramsar (which is located 13km from the Mona Offshore Cable Corridor. Therefore, changes in physical processes will not restrict the distribution or extent, the structure and function or the supporting processes on which qualifying natural habitats and the habitats of qualifying species rely from being maintained or restored.

1.7.3.127 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar as a result of changes in physical processes with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

EMF from subsea electric cables

1.7.3.128 The presence and operation of offshore export cables within the Mona Offshore Cable Corridor may lead to localised EMF affecting benthic subtidal receptors.

1.7.3.129 This impact will be spatially restricted to within the Mona Offshore Wind Project Boundary and the surrounding area, there is no potential for spatial overlap between the Mona Array Area and any Annex I habitat features of the sites. This impact therefore is applicable to the Mona Offshore Cable Corridor only.

1.7.3.130 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 for the Mona Offshore Cable Corridor. 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.

1.7.3.131 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.

1.7.3.132 The MDS considered for the assessment of potential impacts on Annex I habitat features from EMF is presented in Table 1.27.

Table 1.27: MDS considered for the assessment of potential impacts on Annex I habitats (offshore and coastal) from EMF from subsea electric cables during the operations and maintenance phase.

Phase	MDS	Justification
Operations and maintenance phase	Presence of offshore export cables: • Offshore export cables: up to 360km of 275kV HVAC cables (up to 14km of which will be within the SAC) • Minimum burial depth 0.5m • Assumes up to 20% of offshore export cables may require cable protection • Cable protection: cables will also require cable protection at asset crossings (up to up to 24 crossings for offshore export cables) • Operations and maintenance phase of up to 35 years.	Maximum length of cables across the offshore export cable route and minimum burial depth (the greater the burial depth, the more the EMF is attenuated).

1.7.3.133 Based on the proportion of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC which overlaps with the Mona Offshore Cable Corridor, for the purposes of this assessment it is assumed that there may be up to 14km of HVAC offshore export cables installed within the SAC. Although there is potential for the Mona Offshore Wind Project to impact upon this SAC the current mapped distributions of features within the SAC does not overlap with the Mona Offshore Cable Corridor. This assessment however will be updated for the ISAA submitted with the application for consent and will include the results of the site-specific surveys in the Mona Offshore Cable Corridor.

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.134 Measures adopted as part of the project relevant to EMF from subsea electric cables effects on Annex I habitats are outlined in Table 1.28.

Table 1.28: Measures adopted as part of the project relevant to the assessment of adverse effect on European sites designated for Annex habitat features from EMF from subsea electric cables.

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		
Commitment to cable burial where possible.	This commitment will help to reduce the amount of EMF which benthic organisms are exposed to during the operations and maintenance phase by increasing the distance between the seabed surface and the surface of the cables. Committed with the project design (see volume 1, chapter 3: Project description of the PEIR).	Proposed to be secured through a condition in the marine licence(s).
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Development and adherence to a CSIP which will include cables to be buried where possible and cable protection only as necessary.	The CSIP will aim to facilitate greater clarity with specific regard to sandwave clearance, cable burial and cable protection. The CSIP would be developed in line with standard industry approach to the CSIP documentation.	Proposed to be secured through a condition in the marine licence(s).

Operations and maintenance phase

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

Reefs

1.7.3.135 The current literature suggests that EMF influences behavioural and physiological effects in benthic invertebrates. However, if any effects are observed, they will only occur within close proximity to the source of EMF. The MarESA deemed the representative biotopes of the Annex I subtidal reef feature as having low sensitivity to EMF. In addition, although it is assumed that there may be up to 14km of HVAC export cables installed within the SAC there is no spatial overlap with the distribution of Annex I subtidal reef feature, as mapped by NRW (2018), and the Mona Offshore Cable Corridor. Additionally, the majority of Annex I reef feature associated with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC is located in the intertidal area where effects will be much lower. The impact is predicted to be of local spatial extent and high reversibility (when the cables cease transmitting electricity post-decommissioning), effects associated with EMF are predicted to be limited and occur over a small spatial area.

Sandbanks which are slightly covered by seawater all the time

1.7.3.136 Effects associated with EMF from subsea electric cables for the sandbanks which are slightly covered by seawater all the time are considered to be consistent with those outlined for the reef feature in paragraph 1.7.3.135. The MarESA deemed the representative biotopes of the Annex I sandbank feature as having low sensitivity to EMF from subsea electric cables.

Conclusions

1.7.3.137 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 EMF from subsea electric cables. An assessment of the impact 'EMF from subsea electric cables' against each relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented below in Table 1.29.

Table 1.29: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for EMF 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	The impact is predicted to be limited in spatial extent (i.e. in the immediate vicinity of cables) and is reversible on decommissioning, and the Annex I features are considered to have low sensitivity to the effect. Therefore, it is not considered that these activities will 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	The impact is predicted to be limited in spatial extent (i.e. in the immediate vicinity of cables) and is reversible on decommissioning, and the Annex I features are considered to have low sensitivity to the effect. It is not considered that changes in physical processes will affect the physical, biological and chemical structure and function of identified Annex I habitat features.
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	The MarESA assessed the qualifying features of the SAC and associated characterising species as having low sensitivity to the relevant pressures, it is not considered that the typical benthic species associated with featured habitats will be affected in such a way that the habitat quality will be degraded.

1.7.3.138 Therefore, it can be concluded 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 EMF from subsea electric cables with respect to the operations and maintenance of the Mona Offshore Wind Project alone.

Accidental pollution

1.7.3.139 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.

1.7.3.140 Accidental pollution during construction, operations and maintenance and decommissioning was scoped out of the volume 2, chapter 7: Benthic subtidal and intertidal ecology of the PEIR. This was on the basis that the risk of accidental pollution events being managed by the implementation of measures set out in standard post consent plans (e.g. Environmental Management Plan (EMP), including a Marine Pollution Contingency Plan (MPCP)). These plans include planning for accidental spills, address all potential contaminant releases and include key emergency contact details. It will also set out industry good practice and OSPAR, International Maritime Organisation (IMO) and MARPOL (International Convention for the Prevention of Pollution from Ships) guidelines for preventing pollution at sea. Therefore, the likelihood of an accidental spill occurring is very low and in the unlikely event that such events did occur, the magnitude of these will be minimised through measures such as a MPCP.

1.7.3.141 As outlined in 1.3.6.1, case C-323/17 'People Over Wind and Sweetman v Coillte Teoranta' (April 2018) (Sweetman 2), the CJEU has ruled that measures adopted as part of the Mona Offshore Wind Project should not be taken into account at the screening stage. The approach taken in the HRA Stage 1 Screening Report 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.

1.7.3.142 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.

1.7.3.143 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 were screened into this HRA Stage 2 ISAA 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.

1.7.3.144 An MDS has not been quantified for this impact, but accidental pollution events may include consumables contained within the wind turbines including for example grease, oils, lubricants, diesel and coolants.

Measures adopted as part of the Mona Offshore Wind Project

1.7.3.145 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 1.30.

Table 1.30: 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 of, and adherence to, an EMP, including actions to minimise Invasive and Non-Native Species (INNS), and a MPCP which will include planning for accidental spills, address all potential contaminant releases and include key emergency details.	These measures will aim to manage and reduce the risk of potential introduction and spread of INNS so far as reasonably practicable. Measures will also be adopted to ensure that the potential for release of pollutants from construction, operations and maintenance and decommissioning plant is reduced so far as reasonably practicable. 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 tanks containing hazardous substances, and storage of these substances in impenetrable bunds.	Proposed to be secured through a condition in the marine licence(s)

Construction and decommissioning phases

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

Reefs

1.7.3.146 Effects of an accidental spill could potentially kill, smother or poison benthic fauna associated with Annex I habitat 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. However, accidental pollution events are very unlikely and with the implementation of measures such as an EMP and MPCP and 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 will not occur.

Sandbanks which are slightly covered by seawater all the time

1.7.3.147 Effects of an accidental spill could potentially kill, smother or poison benthic fauna associated with Annex I habitat 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. However, accidental pollution events are very unlikely and with the implementation of measures such as an 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 will not occur.

Conclusions

1.7.3.148 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. An assessment of the impact 'accidental pollution' against each relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented below in Table 1.31. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.31: 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 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.

1.7.3.149 Therefore, it can be concluded 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

1.7.3.150 Effects associated with accidental pollution for the reef feature are considered to be consistent or of lower magnitude than those outlined for the construction phase in paragraph 1.7.3.146.

Sandbanks which are slightly covered by seawater all the time

1.7.3.151 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 1.7.3.147.

Conclusions

1.7.3.152 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. An assessment of the impact 'accidental pollution' against each relevant conservation objectives (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented below in Table 1.32.

Table 1.32: 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 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.
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 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 EMP and MPCP. Should a pollution event occur, effects will be temporary, reversible and limited in spatial extent. Therefore, 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 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 EMP and MPCP. Should a pollution event occur, effects will be temporary, reversible and limited in spatial extent. Therefore, this impact will not affect the presence, abundance, condition and diversity of typical species and the habitat quality will not be degraded.

1.7.3.153 Therefore, it can be concluded 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.

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

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 I benthic features of the European sites identified have been summarised in Table 1.33 and are shown in Figure 1.6.

1.7.4.2 As outlined in the HRA Stage 1 Screening Report published within the PEIR, where the potential for LSE has been concluded alone, the potential for LSE has also been concluded in-combination (see paragraph 1.5.3.3). 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.

1.7.4.3 On this basis, the potential impacts identified for assessment as part of the benthic subtidal and intertidal ecology CEA in chapter 7: Benthic subtidal and intertidal ecology of the Environmental Statement, and which have been brought forward for consideration in the in-combination assessment of the ISAA are:

- In-combination temporary habitat loss/disturbance
- In-combination increases in SSC and sediment deposition
- In-combination release of sediment bound contaminants
- In-combination long-term subtidal habitat loss
- In-combination changes in physical processes
- In-combination EMF from subsea electric cables
- In-combination accidental pollution.

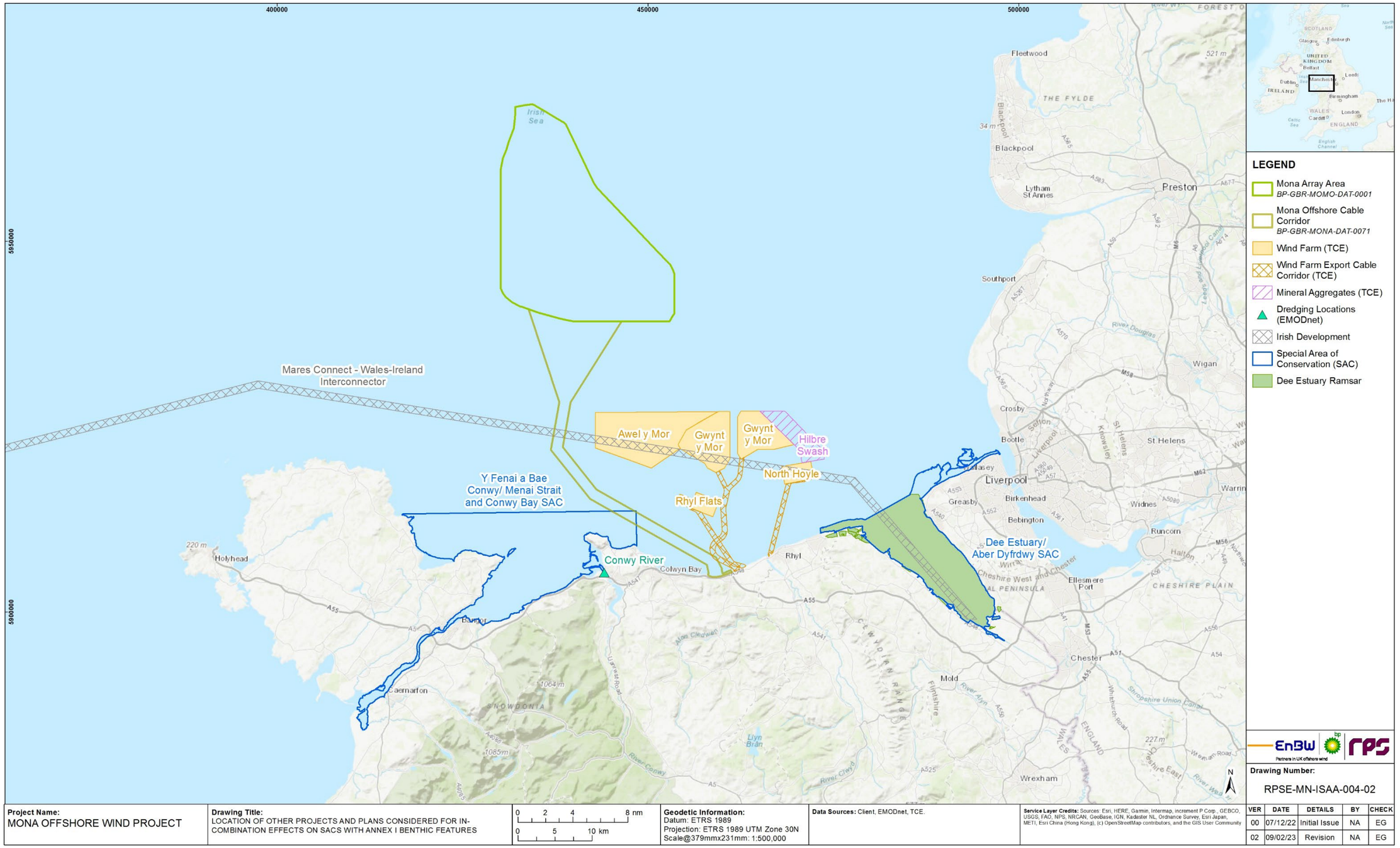


Figure 1.6: Location of other projects and plans considered for in-combination effects on SACs with Annex I habitat features[6].

[6] 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 1.33: List of other projects and plans with potential for in-combination effects on Annex I habitat features (offshore and coastal).

Plan/project	Status	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of construction (C) /operation (O)	Spatial overlap	Temporal overlap	Further assessment required? (Yes/No)
Mona Offshore Wind Project	-	-	-	-	-	C: Q1 2026 – Q4 2029 O: Q1 2030 – Q4 2065		-	-
Awel y Môr Offshore Wind Farm	Application Submitted	Up to 100MW (48 to 91 wind turbines)	Tier 1	12.2	0.0	C: 2026 to 2030 O: 2030 to 2055	Yes	The construction, operations and maintenance and decommissioning phases of this project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project.	Yes
Gwynt y Môr Offshore Wind farm	Operational (with ongoing activities)	Up to 750MW (150 to 250 wind turbines)	Tier 1	13.8	9.9	C: 2008 to 2011 O: 2011 to 2061	No	The operations and maintenance and decommissioning phases of this project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project.	Yes
Hilbre Swash (392/393)[7]	Operational (with ongoing activities)	Licence to extract up to 12 million tonnes of aggregate (mainly sand) over 15 years.	Tier 1	14.5	20.1	O: 2015 to 2029	No	Aggregate extraction activities associated with this project will overlap with the construction phase of the Mona Offshore Wind Project.	Yes
Rhyl Flats Offshore Wind Farm	Operational (with ongoing activities)	Up to 150MW (30 wind turbines)	Tier 1	23.3	3.8	C: 2004 O: 2004 to 2024	No	The decommissioning phase of this project overlaps with the construction phase of the Mona Offshore Wind Project.	yes
North Hoyle Offshore Wind Farm	Operational (with ongoing activities)	Up to 60MW (30 wind turbines)	Tier 1	24.7	13.6	C: 2002 to 2003 O: 2003 to 2028	No	The operations and maintenance and decommissioning phases of this project will overlap with the construction phase of the Mona Offshore Wind Project.	Yes
Conwy Dredge site	Operational (with ongoing activities)	Dredging, no further information given.	Tier 1	33.9	7.7	O: 2022 to 2037	Yes	Dredging and disposal activities associated with this project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project.	Yes

[7] Marine aggregate extraction area number (NRW)

Plan/project	Status	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of construction (C) /operation (O)	Spatial overlap	Temporal overlap	Further assessment required? (Yes/No)
Llanddulas to Kinmel Bay coastal defence scheme	Application submitted	Coastal defence scheme	Tier 1	35.0	0.0	C: 2023 to 2024	No	No	No, the landfall, works in the intertidal were screened out for the Mona Offshore Wind Project alone (see Table 1.10) and so have not been considered for in-combination with this project. There is also no temporal overlap and therefore will not contribute to an in-combination impact.
Morgan Offshore Wind Project and the Morecambe Offshore Windfarm: transmission assets	Pre-application	The design envelope includes: Up to 5 interconnector cables with a maximum total length of 80km and 6 offshore export cables with a maximum total length of 580km.	Tier 2	0.0	10.0	C: 2028 to 2029 O: 2030 to 2065	No	Project construction phase overlaps with Mona Offshore Wind Farm construction phase.	No, the project is located 34km from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and 28km from the Dee Estuary/Aber Dyfrdwy SAC and Ramsar and therefore will not contribute to an in-combination impact.
Morgan Generation Assets	Pre- application	Up to 107 wind turbines	Tier 2	5.5	32.9	C: 2028 to 2029 O: 2030 to 2065	No	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.	No, the project is located 60km from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and 70km from the Dee Estuary/Aber Dyfrdwy SAC and Ramsar and therefore will not contribute to an in-combination impact.
MaresConnect – Wales-Ireland Interconnector Cable	Pre- application	A proposed subsea and underground electricity interconnector system linking the existing electricity grids in Ireland and Great Britain.	Tier 3	14.7	0.0	C: 2025 O: 2027 to 2037	Yes	This project will overlap with the construction and operations and maintenance phases of the Mona Offshore Wind Project.	Yes

In-combination temporary habitat loss/disturbance

1.7.4.4 There is the potential for temporary habitat loss and/or disturbance as a result of construction and operations and maintenance activities associated with the Mona Offshore Wind Project in-combination with activities associated with the following projects/plans: Tier 1 projects, River Conwy dredging site as this dredge site is located within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. No other projects spatially overlap with the SAC and therefore there is no pathway for them to contribute to in-combination effects. Similarly, there are no projects active in the Mona Offshore Wind Project decommissioning phase to consider for in-combination impacts based on current knowledge.

Construction phase

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

Tier 1

1.7.4.5 There is no publicly available information on the river Conwy dredge site. However, dredging in the river Conwy is likely to result in small scale temporary habitat disturbance/loss in the form of sediment removal. Therefore this activity is unlikely to contribute in any significant way to in-combination effects on the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC during both the construction phases.

Operations and maintenance phase

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

Tier 1

1.7.4.6 Dredging at the river Conwy dredge site may temporally overlap with maintenance activities during the operations and maintenance phase of the Mona Offshore Wind Project. Whilst there is no publicly available information on the river Conwy dredge site, the activities are is likely to result in small scale temporary habitat disturbance/loss in the form of sediment removal. Therefore this activity is unlikely to contribute in any significant way to in-combination effects on the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC during both the operations and maintenance phase.

Conclusions

1.7.4.7 Adverse effects on the qualifying features which undermine the conservation objectives of the SAC will not occur as a result of in-combination temporary habitat loss/disturbance. An assessment of the impact 'habitat loss/disturbance' against each relevant conservation objective (as presented in paragraph 1.7.2.17 to 1.7.2.27) is presented below in Table 1.34.

Table 1.34: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for in-combination temporary habitat loss/disturbance 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	Any in-combination effects associated with temporary habitat loss and disturbance will be limited in spatial extent and temporary with recovery of habitat features following cessation of operations. Therefore, 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	Any in-combination effects will be limited in spatial extent and temporary, with any effects on structure and functions associated with the qualifying habitat being reversible following cessation of operations. Therefore it is concluded that effects in-combination will not affect the physical, biological and chemical structure and function of identified Annex I habitat features.
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	Any in-combination effects will be limited in spatial extent and temporary, with characteristic species recovering into the habitats affected following cessation of activities, therefore it is concluded that the typical species associated with featured habitats will not be affected in such a way that the habitat quality will be degraded.

1.7.4.8 Therefore, it can be concluded 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 temporary habitat loss and disturbance impacts with respect to the Mona Offshore Wind project in-combination with other plans/projects.

In-combination increases in SSC and associated sediment deposition

1.7.4.9 There is the potential for increases in SSC and associated sediment deposition as a result of activities associated with the construction and operations and maintenance 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 site

- Tier 3:
  - MaresConnect Interconnector cable.

1.7.4.10 All other projects are located over 30km from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and so will not contribute to in-combination effects.

1.7.4.11 The construction phase of the Mona Offshore Wind Project coincides with the operations and maintenance phase 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.

Construction phase

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

Tier 1

1.7.4.12 The construction phase of the Mona Offshore Wind Project coincides with the proposed development of 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 runs adjacent to Awel y Môr array area and interaction of SSC plumes on spring tide events may occur should trenching activities be undertaken simultaneously. However, this is unlikely. SSC plumes would most likely reach background levels before overlapping with the Awel y Môr array area, when travelling on the flood tide as they would run in parallel. Resultant overlapping plumes may have increased SSC between 2mg/l on the outer extent of the plume.

1.7.4.13 The in-combination effects assessment encompasses aggregate extraction at both Hilbre Swash licensed areas located within 14km of the Mona Array Area and 17km of the Mona Offshore Cable Corridor. Resultant plumes from the disposal of dredged material and extraction of aggregate would be advected on the tidal current running in parrallel and not coincide.

1.7.4.14 Similarly, the in-combination effects assessment considers sea disposal of dredged material at the Conwy River disposal site, located 33km and 7km from the Mona Array Area and Mona Offshore Cable Corridor respectively. 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.

1.7.4.15 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 1.7.4.12 to 1.7.4.14 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. Any in-combination impacts would be short term, intermittent and reversible and as discussed in section 1.7.3 the Annex I reef and sandbank habitats of the SAC and associated communities have low sensitivity to this impact.

Tier 3

1.7.4.16 During the Mona Offshore Wind Project construction phase, the MaresConnect cable may be in construction which may result in increased SSC. The MaresConnect cable is located 14km and 0km from the Mona Offshore Array Area and Mona Offshore Cable Corridor respectively. 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 10mg/l around 80km away therefore the potential overlap of resultant plumes would be low.

Conclusions

1.7.4.17 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 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 1.7.2.17 to 1.7.2.27) is presented below in Table 1.35. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.35: 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. Any in-combination impacts would be short term, intermittent and reversible and the Annex I estuaries and Annex I mudflats habitats of the SAC and associated communities have low sensitivity to this impact. Therefore, 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.

1.7.4.18 Therefore, it can be concluded 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 in-combination with other plans/projects.

Dee Estuary/Aber Dyfrdwy SAC and Ramsar

1.7.4.19 In-combination effects are also considered for the Dee Estuary/Aber Dyfrdwy SAC and Ramsar, given the greater distance between the Dee Estuary/Aber Dyfrdwy SAC and Ramsar and the Mona Offshore Wind Project, it is considered that the magnitude of any in-combination increases in SSC and sediment deposition would be considerably lower than those associated with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The alone assessment for the Dee Estuary/Aber Dyfrdwy SAC and Ramsar concluded no adverse effect on integrity of the SAC as a result of increases in SSC and associated deposition during the construction phase of the Mona Offshore Wind Project. On the basis that the Dee Estuary/Aber Dyfrdwy SAC and Ramsar are 13km from the Mona Offshore Cable Corridor, increased SSCs and deposition will be imperceptible against background levels once in the vicinity of the SAC, based on the physical processes modelling. As such it is determined that there is no potential for any in-combination effect during the construction phase of the Mona Offshore Wind Project.

Conclusions

1.7.4.20 Adverse effects on the qualifying features which undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar will not occur as a result of in-combination increased SSC and associated sediment deposition. An assessment of the impact 'increased SSC and associated sediment deposition' against each relevant conservation objective (as presented in paragraph 1.7.2.41 to 1.7.2.43) is presented below in Table 1.36.

Table 1.36: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar for in-combination increases in SSC during the construction and decommissioning phase.

Conservation Objective	Conclusion
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 supporting processes on which qualifying natural habitats and the habitats of qualifying species rely**	Considering the distance at which the Dee Estuary/Aber Dyfrdwy SAC and Ramsar is located from the Mona Offshore Cable Corridor (13km), there is limited potential for in-combination increases in SSC to occur with any increases in SSC imperceptible against background levels once in the vicinity of the SAC. Any in-combination effects will be of limited spatial extent, short term duration and intermittent in nature and result in small increases in SSC above that outlined in the alone assessment (see section 1.7.3). Therefore, the Mona Offshore Wind Project in-combination with other plans/projects will not restrict the distribution or extent or the structure or function of the identified Annex I habitat features from increasing or remaining stable. The supporting processes on which qualifying natural habitats will not be restricted from being maintained or restored.

1.7.4.21 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar as a result of increases in SSC and associated sediment deposition impacts with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Operations and maintenance phase

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

Tier 1

1.7.4.22 The in-combination assessment considers the operations and maintenance phase of the Awel y Môr Offshore Wind Farm coinciding with the operations and maintanence phase of Mona Offshore Wind Project. Maintenance activities are both intermittent and a smaller scale than that of the construction phase and therefore any potential cumulative impacts are less likely to occur and be on a smaller scale.

1.7.4.23 Potential in-combination impacts may relate to maintenance of offshore cables coinciding with the use of the Conwy River disposal site and aggregate extraction from Hilbre Swash. 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.

1.7.4.24 The operations and maintenance phase of the Mona Offshore Wind Project may also coincide with the maintenance activities associated with the Rhyl Flats Offshore Wind Farm, and Gwynt y Môr Offshore Wind Farm. 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 maintenance activities. With resultant plumes from the Mona Offshore Wind Project being smaller in scale than during the construction phase potential in-combination impacts are less likely to occur during this operations and maintenance phase.

1.7.4.25 The projects cited within the construction phase in-combination assessment will all be within the operational and maintenance phases therefore, as previously, maintenance activities may result in increased suspended sediment concentrations, however these activities would be of limited spatial extent and frequency. The cumulative impacts would therefore be of a lesser magnitude (i.e. also negligible).

Tier 3

1.7.4.26 During the operations and maintenance phase of the Mona Offshore Wind Project, the MaresConnect cable will also be in its operations and maintenance phase. Cable repair/reburial activities may result in increased SSC. The MaresConnect cable is located 14km and 0km from the Mona Offshore Array Area and Mona Offshore Cable Corridor respectively. Any increases in SSC as a result of maintenance for this project would be highly localised, short term and intermittent during the lifetime of the project and would be unlikely to spatially or temporally overlap with maintenance activities along the Mona Offshore Cable Corridor.

Conclusions

1.7.4.27 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 1.7.2.17 to 1.7.2.27) 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 D 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 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. Any in-combination impacts would be short term, intermittent and reversible and the Annex I estuaries and Annex I mudflats habitats of the SAC and associated communities have low sensitivity to this impact. Therefore, these activities will not restrict the distribution or extent of identified Annex I habitat 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.

1.7.4.28 Therefore, it can be concluded 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 in-combination with other plans/projects.

Dee Estuary/Aber Dyfrdwy SAC and Ramsar

1.7.4.29 Given the greater distance between the Dee Estuary/Aber Dyfrdwy SAC and Ramsar and the Mona Offshore Wind Project, it is considered that the magnitude of any in-combination increases in SSC and sediment deposition would be considerably lower than those associated with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. The alone assessment for the Dee Estuary/Aber Dyfrdwy SAC and Ramsar concluded no adverse effect on integrity of the SAC as a result of increases in SSC and associated deposition during the operations and maintenance phase of the Mona Offshore Wind Project. On the basis that the Dee Estuary/Aber Dyfrdwy SAC and Ramsar are 13km from the Mona Offshore Cable Corridor, increased SSCs and deposition will be imperceptible against background levels once in the vicinity of the SAC, based on the physical processes modelling. As such it is determined that there is no potential for any in-combination effect during the operations and maintenance phase of the Mona Offshore Wind Project.

Conclusions

1.7.4.30 Adverse effects on the qualifying features which undermine the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar 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 1.7.2.41 to 1.7.2.43) 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 D 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
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 supporting processes on which qualifying natural habitats and the habitats of qualifying species rely**	Considering the distance at which the Dee Estuary/Aber Dyfrdwy SAC and Ramsar is located from the Mona Offshore Cable Corridor (13km), there is limited potential for in-combination increases in SSC to occur with any increases in SSC imperceptible against background levels once in the vicinity of the SAC. Any in-combination effects will be of limited spatial extent, short term duration and intermittent in nature and result in small increases in SSC above that outlined in the alone assessment (see section 1.7.3). Therefore, the Mona Offshore Wind Project in-combination with other plans/projects will not restrict the distribution or extent or the structure or function of the identified Annex I habitat features from increasing or remaining stable. The supporting processes on which qualifying natural habitats will not be restricted from being maintained or restored.

1.7.4.31 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar as a result of increases in SSC and associated sediment deposition impacts with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination release of sediment bound contaminants

1.7.4.32 There is the potential for the release of sediment bound contaminants as a result of construction activities associated with the Mona Offshore Wind Project to act 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 site
- Tier 3
  - MaresConnect Interconnector cable.

1.7.4.33 All other projects are located beyond 30km from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and will not contribute to in-combination effects. In-combination effects are considered for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC only.

Construction phase

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

Tier 1

1.7.4.34 The construction phase of the Mona Offshore Wind Project coincides with the proposed development of Awel y Môr Offshore Wind Farm. Construction activities may result in the release of sediment bound contaminants; however, these activities would be of limited spatial extent and frequency and unlikely to interact with the release of sediment bound contaminants from the Mona Offshore Cable Corridor.

1.7.4.35 The in-combination effects assessment encompasses aggregate extraction at both Hilbre Swash licensed areas located within 14km of the Mona Array Area and 17km of the Mona Offshore Cable Corridor. Any resultant release of sediment bound contaminants from the disposal of dredged material and extraction of aggregate would be advected on the tidal current running in parrallel and not coincide.

1.7.4.36 Similarly, the in-combination effects assessment considers sea disposal of dredged material at the Conwy River disposal site, located 33km and 7km from the Mona Array Area and Mona Offshore Cable Corridor respectively. If the offshore cable installation and dredge material dumping coincided any release of sediment contaminants 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.

1.7.4.37 The potential release of contaminants from the projects outlined above would be small (if any) and are also likely to be rapidly dispersed with the tide and/or currents. Considering that the majority of the projects are located over 5km from the Mona Offshore Cable Corridor, should any contaminants be released from the other plans/projects considered these would be diluted prior to reaching the SAC. Furthermore, as outlined in paragraph 1.7.3.78 of the alone assessment, the benthic communities associated with the Annex I habitat features have developed in an environment of low levels of existing contamination, so any low-level release of contaminants from construction activities is not likely to significantly increase bioavailability.

Tier 3

1.7.4.38 During the Mona Offshore Wind Project construction phase, the MaresConnect cable will be in construction which may result in increased SSC. The proposed cable is located 14km and 0km from the Mona Offshore Array Area and Mona Offshore Cable Corridor respectively. However, any release of sediment contaminants is likely to be of low magnitude, subject to rapid dispersal and dilution, and will not contribute to an in-combination effect.

Conclusions

1.7.4.39 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 release of sediment bound contaminants. An assessment of the impact 'release of sediment bound contaminants' against each relevant conservation objective (as presented in paragraph 1.7.2.17 to 1.7.2.27) 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 Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for in-combination release of sediment bound contaminants during the construction 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 potential release of contaminants from other projects/plans would be small (if any) and are also likely to be rapidly dispersed with the tide and/or currents. Considering that the majority of the projects are located over 5km from the Mona Offshore Cable Corridor (except for the MaresConnect cable which overlaps with the Mona Offshore Cable Corridor), should any contaminants be released from the other plans/projects considered these would be diluted prior to reaching the SAC. Furthermore, as outlined in paragraph 1.7.3.78 of the alone assessment, the benthic communities associated with the Annex I habitat features have developed in an environment of low levels of existing contamination, so any low-level release of contaminants from construction activities is not likely to significantly increase bioavailability. These activities will not restrict the distribution or extent of identified Annex I habitat features from increasing or remaining stable. This is turn 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. The typical species associated with featured habitats will not be affected in such a way that the habitat quality will be degraded.

1.7.4.40 Therefore, it can be conlcuded 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 release of sediment bound contaminants impacts with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

Dee Estuary/Aber Dyfrdwy SAC and Ramsar

1.7.4.41 In-combination effects are also considered for the Dee Estuary/Aber Dyfrdwy SAC and Ramsar. Given the greater distance between the Dee Estuary/Aber Dyfrdwy SAC and Ramsar and the Mona Offshore Wind Project, the magnitude of any release of sediment bound contaminants would be lower than those associated with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. Paragraph 1.7.4.40 concluded that there would be no impacts on the integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC from in-combination release of sediment bound contaminants. As the nature of the release of sediment bound contaminants on the Dee Estuary/Aber Dyfrdwy SAC and Ramsar are assessed as being of a lower magnitude, it is determined that there is no potential for any in-combination effects.

Conclusions

1.7.4.42 Adverse effects on the qualifying features which undermine the conservation objectives of the SAC will not occur as a result of in-combination release of sediment bound contaminants. An assessment of the impact 'release of sediment bound contaminants' against each relevant conservation objective (as presented in paragraph 1.7.2.41 to 1.7.2.43) 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 Dee Estuary/Aber Dyfrdwy SAC and Ramsar for in-combination release of sediment bound contaminants during the construction phase.

Conservation Objective	Conclusion
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 supporting processes on which qualifying natural habitats and the habitats of qualifying species rely**	The potential release of contaminants from other projects/plans would be small (if any) and are also likely to be rapidly dispersed with the tide and/or currents. Considering that the majority of the projects are located over 5km from the Mona Offshore Cable Corridor, should any contaminants be released from the other plans/projects considered these would be diluted prior to reaching the SAC. In addition the Mona Offshore Cable Corridor is also locate 13km from the Dee Estuary/Aber Dyfrdwy SAC and Ramsar, therefore in-combination impacts on the SAC will not occur. If an in-combination impact were to occur the benthic communities associated with the Annex I habitat features have developed in an environment of low levels of existing contamination, so any low-level release of contaminants from construction activities is not likely to significantly increase bioavailability. The Mona Offshore Wind Project in-combination with other plans/projects will not restrict the distribution or extent, or supporting processes on which qualifying natural habitats and habitats of qualifying species rely from increasing or remaining stable.

1.7.4.43 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar as a result of the release of sediment bound contaminants impacts with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination long-term subtidal habitat loss

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

1.7.4.44 There is no potential for long-term subtidal habitat loss as a result of the Mona Offshore Wind Project to act in-combination with other projects/plans. The Conwy River dredging site is located within the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, however no long term habitat loss would be associated with dredging activity any habitat loss/disturbance would be temporary. There is therefore no pathway for an in-combination impact to occur. No other projects spatially overlap with the SAC and therefore there is no pathway for them to contribute to in-combination effects. The alone assessment in paragraph 1.7.3.99 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. As such there is no potential for in-combination effects from other projects as no other projects which could result in long-term habitat loss spatially overlap with the SAC.

In-combination changes in physical processes

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

1.7.4.45 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 1.7.3.122 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 protection (i.e. within the boundary of the Mona Offshore Cable Corridor) 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.

Dee Estuary/Aber Dyfrdwy SAC and Ramsar

1.7.4.46 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 Dee Estuary/Aber Dyfrdwy SAC and Ramsar. The alone assessment presented in paragraph 1.7.3.126 concluded that there would be no adverse effects on the integrity of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar 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 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 projects are outwith the boundary of the SAC.

In-combination EMF from subsea electric cables

1.7.4.47 There are no relevant projects with cables that overlap with the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC. Therefore, there will be no EMF impacts from the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination accidental pollution

1.7.4.48 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 3
  - MaresConnect cable.

1.7.4.49 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

1.7.4.50 As outlined in section 1.7.3, 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 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 1.7.4.48 (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.

Tier 3

1.7.4.51 As outlined in section 1.7.3, 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 EMP and MPCP). Should an accidental pollution event occur, effects will be temporary, reversible and limited in spatial extent. It is expected that the Tier 3 project, MaresConnect, would be required to implement similar measures such that an accidental pollution incidents arising from this 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.

Conclusions

1.7.4.52 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 1.7.2.17 to 1.7.2.27) is presented below in Table 1.41.

Table 1.41: Conclusions against the conservation objectives of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC for in-combination accidental pollution during the construction 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	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. Therefore 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	Given that any in-combination effects should an event occur, will be temporary, reversible, limited in spatial extent and considered unlikely due to mitigation measures, in-combination accidental pollution effects will not affect the physical, biological and chemical structure and function of identified Annex I habitat features.
The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded	Given that any in-combination effects should an event occur, will be temporary, reversible, limited in spatial extent and considered unlikely due to mitigation measures. The typical species associated with featured habitats will not be affected in such a way that the habitat quality will be degraded.

1.7.4.53 Therefore, it can be concluded 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.

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

1.8.1.1 The HRA Stage 1 Screening Report identified the potential for LSEs on the following European sites designated for Annex II fish features and freshwater pearl mussel (Figure 1.7):

- 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 Derwent and Bassenthwaite Lake SAC
- River Kent SAC
- Solway Firth SAC
- River Bladnoch SAC.

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

- During the construction and decommissioning phases
  - Increases in SSC and sediment deposition (Mona Offshore Cable Corridor only and for the Dee Estuary/Aber Dyfrdwy SAC only)
  - Release of sediment bound contaminants (Mona Offshore Cable Corridor only and for the Dee Estuary/Aber Dyfrdwy SAC only)
  - Underwater sound
- During the operations and maintenance phase
  - Increases in SSC and sediment deposition (Mona Offshore Cable Corridor only and for the Dee Estuary/Aber Dyfrdwy SAC only)
  - EMF from subsea electric cables.

1.8.1.3 This section presents the Stage Two 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 1.11). 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 Atlantic salmon or brown trout, which are relevant host species for freshwater pearl mussel within the SACs assessed.

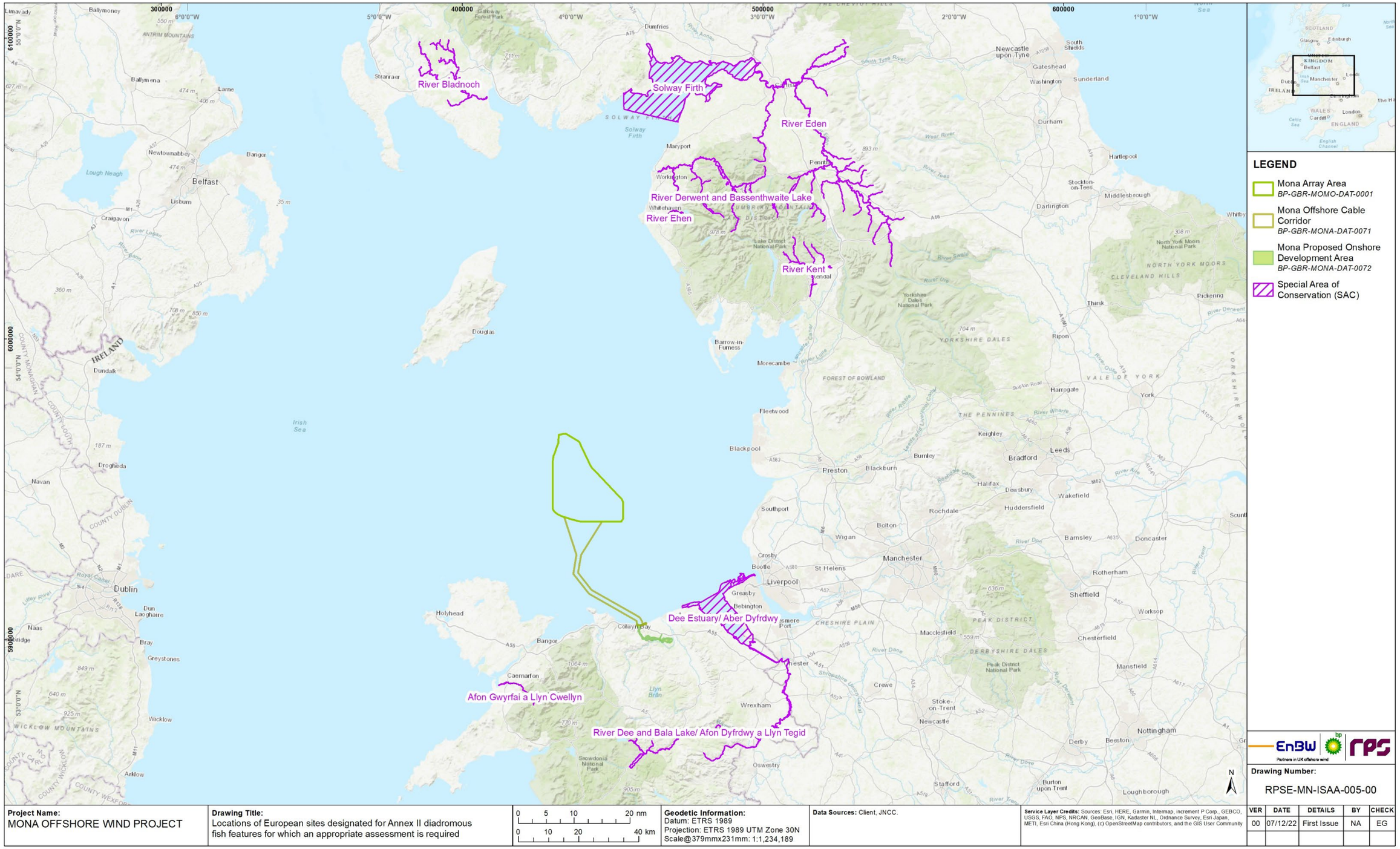


Figure 1.7: Locations of European sites designated for Annex II fish features for which an Appropriate Assessment is required.

1.8.2 Baseline information

1.8.2.1 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 PEIR and volume 6, annex 8.1: Fish and shellfish technical report of the PEIR.

Dee Estuary/Aber Dyfrdwy SAC

Site description

1.8.2.2 The Dee Estuary Aber Dyfrdwy SAC is located 34km from the Mona Array Area and 13km from the Mona Offshore Cable Corridor. 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

1.8.2.3 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, 2021a).

1.8.2.4 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

1.8.2.5 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, 2021b). 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.

1.8.2.6 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-April) or late summer/autumn (August-November).

Condition assessment

1.8.2.7 Table 1.42 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)[8].

Table 1.42: 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

1.8.2.8 The conservation objectives for the Dee Estuary/Aber Dyfrdwy SAC (Natural England, 2018a)[9] are outlined below.

1.8.2.9 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

- 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

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

[9] http://publications.naturalengland.org.uk/publication/6124489284780032

- 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.

1.8.2.10 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.8.3; conservation objectives relating to the qualifying habitats of the SAC will not be considered.

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

Site description

1.8.2.11 The River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC, which is 59km from the Mona Array Area and 41km from the Mona Offshore Cable Corridor, 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 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.

Feature accounts

Atlantic salmon

1.8.2.12 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).

1.8.2.13 Figure 1.8 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 1.8.1.2 in section 1.8.3 and 1.8.4.

1.8.2.14 No site specific information is available for this feature.

Sea lamprey

1.8.2.15 No site specific information is available for this feature. An overview of the ecology of the species is provided in paragraph 1.8.2.3.

River lamprey

1.8.2.16 No site specific information is available for this feature. An overview of the ecology of the species is provided in paragraph 1.8.2.5 and 1.8.2.6.

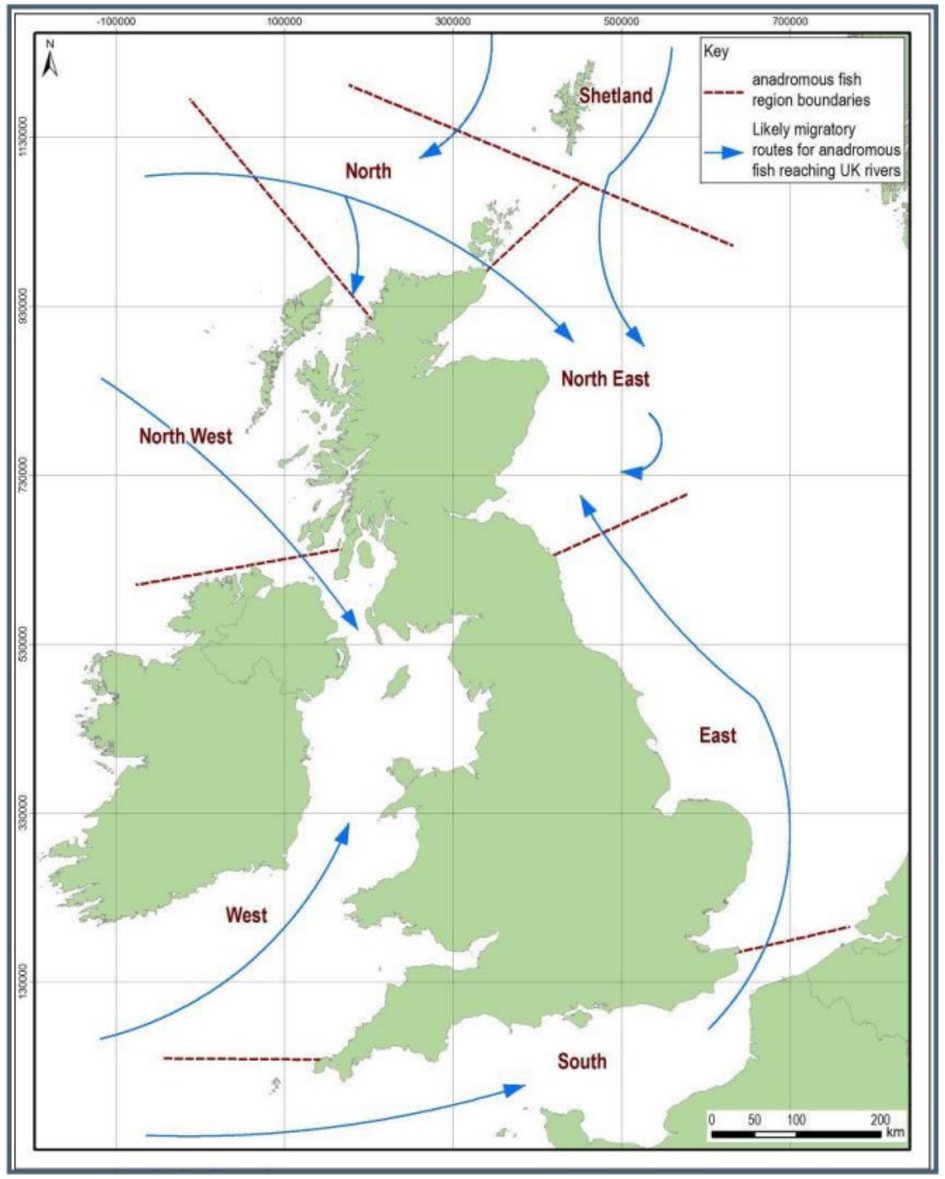


Figure 1.8: Likely migration routes for anadromous fish reaching UK rivers (ABPmer, 2014).

Condition assessment

1.8.2.17 Table 1.43 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 isn't 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)[10].

Table 1.43: 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

1.8.2.18 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 above 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
  - 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.

1.8.2.19 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.8.3, conservation objectives relating to the qualifying habitats of the SAC will not be considered.

River Ehen SAC

Site description

1.8.2.20 The River Ehen SAC which is 83km from the Mona Array Area and 106km from the Mona Offshore Cable Corridor, forms the outfall from Ennerdale Water and flows some 20km 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

1.8.2.21 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, 2019).

1.8.2.22 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 20cm 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.

1.8.2.23 The River Ehen supports the largest freshwater pearl mussel population (>100,000) in England with high densities of greater than 100m^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

1.8.2.24 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

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

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 – 390Ml/d with peak migration occurring around 240Ml/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

1.8.2.25 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)[11].

Conservation objectives

1.8.2.26 The conservation objectives for the River Ehen SAC (Natural England, 2018b)[12] are outlined below.

1.8.2.27 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

1.8.2.28 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

1.8.2.29 The River Eden SAC is located 83km from the Mona Array Area and 106km from the Mona Offshore Cable Corridor. 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, 2019b). 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 extensive areas of gravel outlined above, and generally good quality water, provides habitat for bullheads *Cottus gobio* and the tributaries, specifically those flowing over limestone, also hold high numbers of bullhead (Natural England, 2019b).

Feature accounts

Atlantic salmon

1.8.2.30 The Eden represents one of the largest populations of Atlantic salmon in northern 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

1.8.2.31 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

1.8.2.32 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

1.8.2.33 A condition assessment was carried out for units of the River Eden and Tributaries Site of Special Scientific Interest (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)[13].

Conservation objectives

1.8.2.34 The conservation objectives for the River Eden SAC (Natural England, 2018c)[14] are outlined below.

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

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

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

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

1.8.2.35 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

1.8.2.36 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 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.

1.8.2.37 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.8.3, 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

1.8.2.38 The Afon Gwyrfai a Llyn Cwellyn SAC is located 92km from the Mona Array Area and 91km from the Mona Offshore Cable Corridor. 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

1.8.2.39 The Afon Gwyrfai in north-west 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, 2022f). Electrofishing data from the Environment Agency indicates the presence of healthy juvenile populations downstream of Llyn Cwellyn within the SAC (JNCC, 2022f).

Condition assessment

1.8.2.40 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)[15].

Conservation objectives

1.8.2.41 The conservation objectives for the Afon Gwyrfai a Llyn Cwellyn SAC (Countryside Council for Wales, 2012)[16] are outlined below.

- The conservation objective for the water course as outlined in Countryside Council Wales (2012) 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 Derwent and Bassenthwaite Lake SAC

Site description

1.8.2.42 The River Derwent and Bassenthwaite SAC is located 95km from the Mona Array Area and 121km from the Mona Offshore Cable Corridor. 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

1.8.2.43 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). 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

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

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

shoals, makes it a particularly suitable river for breeding and enables it to support a large population (JNCC, 2022b).

Sea lamprey

1.8.2.44 The Derwent represents sea lamprey in a high-quality oligotrophic river in northern 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

1.8.2.45 The Derwent represents river lamprey in an oligotrophic river in northern 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

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

Conservation objectives

1.8.2.47 The conservation objectives for the Derwent and Bassenthwaite Lake SAC (Natural England, 2018d)[17] are outlined below.

1.8.2.48 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

1.8.2.49 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.

1.8.2.50 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.8.3, 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 Kent SAC

Site description

1.8.2.51 The River Kent SAC is located 96km from the Mona Array Area and 106km from the Mona Offshore Cable Corridor. The River Kent's main tributaries have their catchments in the south eastern Lake District fells which provide natural mineral enrichment in the form the calcium necessary for growth (Natural England, 2005b). 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

1.8.2.52 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

1.8.2.53 A condition assessment was carried out for a unit of the River Kent and Tributaries Site of Special Scientific Interest (SSSI) which overlaps with the River Kent SAC. Within this unit the freshwater pearl mussel feature was deemed to be in unfavourable condition (Natural England, 2022d)[18].

Conservation objectives

1.8.2.54 The conservation objectives for the River Kent SAC (Natural England, 2018e)[19] are outlined below.

1.8.2.55 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

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

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

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

1.8.2.56 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.

1.8.2.57 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.8.3, 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

1.8.2.58 The Solway Firth SAC is located 109km from the Mona Array Area and 136km from the Mona Offshore Cable Corridor. The Solway is a large, complex estuary with moderately strong tidal streams and wave action (Natural England, 2005). 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, 2005).

Feature accounts

Sea lamprey

1.8.2.59 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

1.8.2.60 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

1.8.2.61 The condition of the sea lamprey and river lamprey features of the Solway Firth SAC have not been assessed (NatureScot, 2022)[20].

Conservation objectives

1.8.2.62 The conservation objectives for the Solway Firth SAC (Natural England, 2018e)[21] are outlined below.

1.8.2.63 With regard to the SAC and the natural habitats and/or species for which the site has been designated (the 'Qualifying Features' listed below), and subject to natural change;

1.8.2.64 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
- The populations of qualifying species
- The distribution of qualifying species within the site.

1.8.2.65 Only conservation objectives relevant to the qualifying species (Annex II diadromous fish qualifying features) of the SAC will be assessed in section 1.8.3, conservation objectives relating to the qualifying habitats of the SAC will not be considered.

River Bladnoch SAC

Site description

1.8.2.66 The River Bladnoch SAC is located 115km from the Mona Array Area and 143km from the Mona Offshore Cable Corridor. 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).

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

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

Feature accounts

Atlantic salmon

1.8.2.67 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

1.8.2.68 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)[22].

Conservation objectives

1.8.2.69 The conservation objectives for the River Bladnoch SAC (Nature Scot, 2020)[23] 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
- 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.

1.8.3 Assessment of adverse effects alone

Increases in SSC and sediment deposition

1.8.3.1 Increases in SSC and associated sediment deposition during construction and decommissioning phase have the potential to cause behavioural responses (avoidance) in diadromous fish. Increases in SSC and associated sediment deposition are predicted to occur during the construction and decommissioning phases as a result of seabed preparation (seabed feature clearance prior to cable installation), and installation/removal of export cables.

1.8.3.2 Temporary increases in SSC and associated sediment deposition are also predicted to occur during the operations and maintenance phase as a result of activities within the Mona Array Area and Mona Offshore Cable Corridor (i.e. cable repair/reburial events). These activities may result in temporary changes to water clarity, smothering and siltation rate changes.

1.8.3.3 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 increased SSC and associated sediment deposition. This relates to the following designated site and relevant Annex II diadromous fish features:

- Dee Estuary/Aber Dyfrdwy SAC
  - Sea lamprey
  - River lamprey.

1.8.3.4 The HRA Screening determined that this applies to the Mona Offshore Cable Corridor only which is located 13km from the Dee Estuary/Aber Dyfrdwy SAC.

1.8.3.5 The Mona Array Area is located at its closest point 35km from the Dee Estuary/Aber Dyfrdwy SAC and Ramsar respectively which is beyond the ZOI predicted for increased SSC and associated sediment deposition (predicted precautionarily to be 15km and as also confirmed by the physical processes modelling undertaken for the PEIR) during LSE screening.

1.8.3.6 mpacts are predicted to be of local spatial extent (i.e. largely within the Mona Offshore Wind Project fish and shellfish ecology study area), short-term duration, and intermittent during construction and decommissioning.

1.8.3.7 The following sections explain how this potential impact on Annex II diadromous fish features of the Dee Estuary/Aber Dyfrdwy SAC has been quantified and assessed.

1.8.3.8 For the purposes of the assessment sea lamprey and river lamprey have been assessed together due to their similar sensitivity to increased SSC and sediment desposition and the fact that their conservation objectives are the same at the site and therefore effects and associated conclusions are considered to be alike.

1.8.3.9 The MDS considered for the assessment of potential impacts on Annex I habitat features from the release of sediment bound contaminants is presented in Table 1.44.

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

[23] 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

Table 1.44: MDS considered for the assessment of potential impacts on diadromous fish from increases in SSC and sediment deposition during the construction, operations and maintenance and decommissioning phases.

Phase	MDS	Justification
Construction phase	• Sandwave clearance - activities undertaken over an approximate 12 month duration within the wider four year construction programme: – Offshore export cables: sandwave clearance along 252km of export cable, with a width of 104m, to an average depth of 5.1m. Total spoil volume of 12,051,955m^3 – Removal of up to 46km of disused cables. • Cable installation: – Offshore export cables: installation via trenching of up to 360km of cable, with a trench width of up to 3m and a depth of up to 3m with a V-shaped profile. Total spoil volume of 1,620,000m^3. Installed over a period of 15 months – Intertidal export cable: installation via open trenching of up to 6km of cable, with a trench width of 1m and a depth of up to 3m. Total spoil volume of 18,000m^3. Installed over a period of approximately nine months.	Sandwave clearance: • 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. These details are not fully known at this stage, however based on the available data, it is anticipated that the sandwaves requiring clearance in the array area are likely to be in the range 5m in height • 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 disposal of material • Boulder clearance activities will result in minimal increases in SSCs and have therefore not been considered in the assessment. Cable installation: • Cable routes inevitably include a variety of seabed material and in some areas 3m 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 SSCs.
Operations and maintenance phase	Mona Offshore Wind Project lifetime of 35 years • Repair of up to 32km of subtidal export cables in eight events every five years • Reburial of up to 15km of subtidal export cables in one event every five years • Repair of up to 1.6km of intertidal export cables every five years.	The greatest foreseeable number of cable reburial and repair events is considered to the MDS for sediment dispersion.
Decommissioning phase	Offshore export cables will be removed up to the HDD or trenchless exit pits in the intertidal zone and disposed of onshore.	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 in line with the construction phase.

Measures adopted as part of the project

1.8.3.10 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 increased SSC and sediment deposition are presented in Table 1.11.

Construction and decommissioning phase

Information to support assessment

1.8.3.11 Increases in SSCs by sandwave clearance and cable installation were modelled in volume 6, annex 6.1: Physical processes technical report of the PEIR, based on the MDS parameters provided in Table 1.44, with a deposition period of 45 minutes following cessation of seabed disturbance activity. The average SSC during the course of the construction activities was expected to be <300mg/l with a plume envelope width of approximately 20km which corresponds to the local tidal excursion, with a maximum concentration of up to 1000mg/l at the release site during the disposal phase. The plume however is expected to be most extensive when the deposited material is redistributed on the successive tides; under these circumstances, concentrations of 300 to 500mg/l are seen in the model. Sedimentation of deposited material is focused within 100m of the site of release, with a maximum mound depth of 0.5 to 1m, whilst the finer sediment fractions are deposited in the wider vicinity at expected depths of 5 to 10mm. The dispersion of the released material would continue on successive tides. Sedimentation rates during construction are likely to be similar to rates one day following construction, with an extension of the spatial area covered by the sedimentation.

1.8.3.12 For the installation of offshore export cables, the SSCs along the route range between 50 and 1000mg/l where the greatest levels are located at the source of the sediment release in the shallowest water. The modelling outputs predicted average SSCs of up to 100 to 300mg/l at the source whilst more generally the plume is predicted to be approximately one tenth of this value, typically <50mg/l. 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 <0.5mm, and the greatest levels of deposition occur along the trenching route as coarser material settles. Although the material is widely dispersed, sediment remains within the cell and would be drawn into the baseline transport regime with small increases in bed sediment levels. It is noted that due to the nature of the tidal flow mobilised sediment is carried offshore and does not accumulate along the coastline.

1.8.3.13 The impact of cable removal as part of the decommissioning phase is not expected to be greater than the activities associated with the construction phase of the Mona Offshore Wind Project. The release of sediment in the decommissioning phase will be lower than the construction phase as it does not include activities such as seabed drilling and seabed preparation.

Dee Estuary/Aber Dyfrdwy SAC

Sea lamprey and River lamprey

1.8.3.14 Diadromous fish species known to occur in the area are expected to have some tolerance to naturally high SSC, given their migration routes typically require them to travel through estuarine habitats, which have background SSC that are considerably higher than those expected in the offshore areas of the Mona Offshore Wind Project. As it is predicted that construction activities associated with the Mona Offshore Wind Project will produce temporary and short-lived increases in SSC, with levels well below those experienced in estuarine environments, it would be expected that any diadromous species should only be temporarily affected (if they are affected at all, based on the timing of the construction phase).

1.8.3.15 Any negative effects on these species are likely to be short term behavioural effects, such as avoidance (Boubee, *et al*., 1996), or temporary slightly erratic alarmed swimming behaviour (Chiasson, 2011), and are not expected to create any significant barrier to migration to rivers or estuaries used by these species in the Mona Offshore Wind Project and surrounding area. However, these studies were laboratory based, and do not cover the species found within the Mona Offshore Wind Project and surrounding area, so the potential for other responses does exist, but these are unlikely, given the naturally highly turbid nature of estuarine environments that these species are adapted to traverse.

Conclusions

1.8.3.16 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 increased SSC and associated sediment deposition during construction and decommissioning activities. An assessment of the impact 'increased SSC and associated sediment deposition' against each relevant conservation objectives (as presented in paragraph 1.8.2.8 to 1.8.2.10) is presented in Table 1.45 below. 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 Dee Estuary/Aber Dyfrdwy SAC for increases in SSC and associated deposition 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]**	The qualifying natural habitats and habitats of qualifying species of the Dee Estuary/Aber Dyfrdwy SAC were assessed in section 1.7.3 (Annex I habitats alone assessment). Paragraph 1.7.3.49 and 1.7.3.50 concludes that the extent and distribution, structure and function and the supporting processes on which the habitats of qualifying species rely will be unaffected.
The populations of qualifying species within the site [are maintained or restored]	Although some diadromous fish may avoid areas of increased SSCs during the construction and decommissioning phases, such effects will be localised, temporary and short-lived and are not predicted to result in barrier effects to the migration of the qualifying diadromous fish species of the SAC when moving to and from this SAC. As such, the population of qualifying species will be maintained.

Conservation Objective	Conclusion
The distribution of qualifying species within the site [are maintained or restored]	Although some diadromous fish may avoid areas of increased SSCs during the construction and decommissioning phases, such effects will be temporary and short-lived and are not predicted to result in barrier effects to the migration of the qualifying diadromous fish species of the SAC, when moving to and from this SAC. As such, the distribution of qualifying species within the site will be maintained.

1.8.3.17 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC as a result of increases in SSC and associated deposition impacts with respect to construction and decommissioning of the Mona Offshore Wind Project alone.

Operations and maintenance phase

Information to support assessment

1.8.3.18 Maintenance activities within the Mona Offshore Cable Corridor may lead to increases in SSC and associated sediment deposition over the operational lifetime of the Mona Offshore Wind Project. Table 1.44 describes MDS which assumes the repair of 32km of offshore export cable every five years. Table 1.44 also describes the reburial of 15km of offshore export cable in one event every five years.

1.8.3.19 The magnitude of the potential impacts would be a fraction of those quantified for the construction phase. The sediment plumes and sedimentation footprints would be dependent on which section of the cable is being repaired and the kind of sediment that the repairs took place in however, for the purposes of this assessment, the impacts of the operational and maintenance activities (i.e. cable repair and reburial) are predicted to be no greater than those for construction.

Dee Estuary/Aber Dyfrdwy SAC

Sea lamprey and River lamprey

1.8.3.20 As outlined in paragraph 1.8.3.14 sea lamprey and river lamprey are expected to have some tolerance to increased SSC and sediment deposition. Any increased SSC associated with the operations and maintenance phase will be of a lower magnitude than those associated with the construction and decommissioning phase. Cable repairs resulting in increased SSC and sediment deposition will also be very intermittent with discrete events occurring over the lifetime of the Mona Offshore Wind Project.

1.8.3.21 Any negative effects on these species are likely to be short term behavioural effects, such as avoidance (Boubee, *et al.*, 1996), or temporary slightly erratic alarmed swimming behaviour (Chiasson, 2011), and are not expected to create any significant barrier to migration to rivers or estuaries used by these species in the Mona Offshore Wind Project and surrounding area. However, these studies were laboratory based, and do not cover the species found within the Mona Offshore Wind Project and surrounding area, so the potential for other responses does exist, but these are unlikely, given the naturally highly turbid nature of estuarine environments that these species are adapted to traverse.

Conclusions

1.8.3.22 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 underwater sound during operations and maintenance activities. An assessment of the impact 'underwater sound' against each relevant conservation objectives (as presented in paragraph 1.8.2.8 to 1.8.2.10) is presented in Table 1.46 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.46: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC for increases in SSC and associated deposition during the operations and maintenance 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]**	The qualifying natural habitats and habitats of qualifying species of the Dee Estuary/Aber Dyfrdwy SAC were assessed in section 1.7.3 (Annex I habitats alone assessment). Paragraph 1.7.3.60 and 1.7.3.61 concludes that the extent and distribution, structure and function and the supporting processes on which the habitats of qualifying species rely will be unaffected.
The populations of qualifying species [are maintained or restored] **The distribution of qualifying species within the site [are maintained or restored]**	Although some diadromous fish may avoid areas of increased SSCs during the operations and maintenance phase, such effects will be localised, temporary and short-lived and are not predicted to result in barrier effects to the migration of the qualifying diadromous fish species of the SAC. As such, the population and distributions of qualifying species will be maintained.

1.8.3.23 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC as a result of increases in SSC with respect to operations and maintenance phase of the Mona Offshore Wind Project alone.

Release of sediment-bound contaminants

1.8.3.24 Seabed disturbance associated with construction (e.g. export cable installation) could lead to the remobilisation of sediment-bound contaminants that may result in harmful and adverse effects on Annex II fish.

1.8.3.25 The assessment of LSE during the HRA screening process identified that during construction, LSE could not be ruled out for the potential impact of remobilisation of sediment-bound contaminants. This relates to the following designated site and relevant Annex II diadromous fish features:

- Dee Estuary/Aber Dyfrdwy SAC
  - Sea lamprey
  - River lamprey.

1.8.3.26 The HRA Screening determined that this applies to the Mona Offshore Cable Corridor only which is located 13km from the Dee Estuary/Aber Dyfrdwy SAC.

1.8.3.27 The Mona Array Area is located at its closest point, 35km from the Dee Estuary/Aber Dyfrdwy SAC and Ramsar respectively which is beyond the ZOI predicted for increased SSC and associated sediment deposition (predicted precautionarily to be 15km and as also confirmed by the physical processes modelling undertaken for the PEIR) during LSE screening.

1.8.3.28 Potential impacts are predicted to be of local spatial extent (i.e. largely within the Mona Offshore Wind Project fish and shellfish ecology study area), short-term duration, and intermittent during the construction phase.

1.8.3.29 The following sections explain how this potential impact on Annex II diadromous fish features of the Dee Estuary/Aber Dyfrdwy SAC has been quantified and assessed.

1.8.3.30 For the purposes of the assessment sea lamprey and river lamprey have been assessed together due to their similar sensitivity to increased SSC and sediment desposition and the fact that their conservation objectives are the same at the site and therefore effects and associated conclusions are considered to be alike.

1.8.3.31 The MDS considered for the assessment of potential impacts on Annex I habitat features from the release of sediment bound contaminants is presented in Table 1.47.

Table 1.47: MDS considered for the assessment of potential impacts on diadromous fish from the release of sediment bound contaminants.

Potential impact	MDS	Justification
Construction phase	• Sandwave clearance - activities undertaken over an approximate nine month duration: – Offshore export cables: sandwave clearance along 252km of export cable, with a width of 104m, to an average depth of 5.1m. Total spoil volume of 12,051,955m^3 • Cable installation: – Offshore export cables: installation via trenching of up to 360km of cable, with a trench width of up to 3m and a depth of up to 3m with a V-shaped profile. Total spoil volume of 1,620,000m^3. Installed over a period of 15 months.	The justification for the disturbance/remobilisation of sediment-bound contaminants MDS is that same as that described in Table 1.44 for increased SSC and associated deposition during the construction phase as this MDS results in the release of the largest volume of sediment and associated contaminants

Measures adopted as part of the project

1.8.3.32 There are no measures adopted as part of the Mona Offshore Wind Project which are relevant to the impact release of sediment bound contaminants during the construction phase.

Construction phase

Information to support assessment

1.8.3.33 The installation of the Mona Offshore Wind Project infrastructure will likely lead to remobilisation of sediment-bound contaminants. Sediment grab samples from the Mona Array Area were analysed for contaminants including heavy metals, PCBs, and PAHs. The full results of this sediment chemistry analysis are detailed in volume 6, annex 7.1: Benthic ecology technical report of the PEIR. The concentrations of the heavy metals, PAHs and PCBs was compared to the corresponding Cefas Action Levels 1 and 2 (AL1 and AL2) and the relevant Canadian TEL and PEL. Within the Mona Array Area one site in the southwest exceeded the Cefas AL1 limit and the Canadian TEL for arsenic. Concentrations of PAHs and PCBs in all samples were found to be under Cefas AL1 and the CSQGs.

1.8.3.34 The total area that is likely to be disturbed by construction activities, and therefore the potential volume of material disturbed, resulting in the potential release of sediment bound contaminants is set out in section 1.7.3. While the area affected is relatively large, the proportion of this area affected at any one time will only be a fraction of this overall total for the construction phase. The MDS is for 12,051,955m^3 of spoil from sandwave clearance within the Mona Offshore Cable Corridor (over a period of 12 months; noting sandwaves will be comprised of mobile sands with minimal fine sediments). The MDS also assumes up to 1,620,000m^3 of spoil from export cable installation (over a period of 15 months).

1.8.3.35 Following disturbance as a result of construction activities, the majority of re-suspended sediments are expected to be deposited in the immediate vicinity of the works. The release of contaminants from the small proportion of fine sediments is likely to be rapidly dispersed with the tide and currents, and therefore increased bioavailability resulting in significant adverse eco-toxicological effects are not expected.

Dee Estuary/Aber Dyfrdwy SAC

Sea lamprey and river lamprey

1.8.3.36 Annex II diadromous fish will likely only be present within the fish and shellfish ecology study area when migrating to or from rivers flowing into the east Irish Sea. Therefore, the possibility for temporal and spatial overlap of these species and the very short-term remobilisation of sediment-bound contaminants, which will likely resettle within a small number of tidal cycles, is very low. Also, it is known that many diadromous species are exposed naturally to levels of PCBs, such as in sea lamprey (Madenjian *et al*., 2013). Similarly, bioaccumulation of heavy organometals has been noted on trout gills (Tkachenko *et al*., 2019), alongside a range of other low levels of natural exposure in other IEF species. Given this acclimation to natural contaminants, with no significant detriments to health or spawning noted at low levels, it is therefore likely that this impact will have little impact on diadromous species during construction.

Conclusions

1.8.3.37 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 Release of sediment-bound contaminants during hte construction phase. An assessment of the impact ‘Release of sediment-bound contaminants’ against each relevant conservation objectives (as presented in paragraph 1.8.2.8 to 1.8.2.10) is presented in Table 1.48 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.48: Conclusions against the conservation objectives of the Dee Estuary/Aber Dyfrdwy SAC from the release of sediment bound contaminants.

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]**	The qualifying natural habitats and habitats of qualifying species of the Dee Estuary/Aber Dyfrdwy SAC were assessed in section 1.7.3 (Annex I habitats alone assessment). Table 1.19 concludes that the extent and distribution, structure and function and the supporting processes on which the habitats of qualifying species rely will be unaffected.
The populations of qualifying species [are maintained or restored] **The distribution of qualifying species within the site [are maintained or restored]**	Annex II diadromous fish will likely only be present within the fish and shellfish ecology study area when migrating to or from rivers flowing into the east Irish Sea. Given the acclimation to natural contaminants outlined in paragraph 1.8.3.36, with no significant detriments to health or spawning noted at low levels, it is therefore likely that this impact will have little impact on diadromous species during construction. Therefore, the possibility for temporal and spatial overlap of these species and the very short-term remobilisation of sediment-bound contaminants, which will likely resettle within a small number of tidal cycles, is very low. As such, the population and distributions of qualifying species will be maintained.

1.8.3.38 Therefore, it can be concluded that there is **no risk of an adverse effect** on the integrity of the Dee Estuary/Aber Dyfrdwy SAC as a result of the release of sediment bound contaminants with respect to the construction phase of the Mona Offshore Wind Project alone.

Underwater sound

1.8.3.39 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. The greatest potential impacts from underwater sound emissions are predicted to result from piling activities (for the installation of monopile or jacket foundations) and UXO clearance including detonation within the Mona Array Area. No piling or UXO activities will be carried out during the decommissioning phase and therefore potential impacts during this phase are predicted to be lower than for the construction phase.

1.8.3.40 All other sound sources including cable installation, foundation drilling and pre-construction site investiation 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.

1.8.3.41 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. This relates to the designated sites and relevant Annex II diadromous fish features listed in Table 1.49.

Table 1.49: 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 Derwent and Bassenthwaite Lake SAC	Sea lamprey River lamprey Atlantic salmon
River Kent SAC	Freshwater pearl mussel
Solway Firth SAC	Sea lamprey River lamprey
River Bladnoch SAC	Atlantic salmon

1.8.3.42 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.

1.8.3.43 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 Euopean sites assessed and therefore effects and associated conclusions are considered to be alike.

1.8.3.44 The MDS considered for the assessment of potential impacts on Annex II diadromous fish features is presented in Table 1.50.

Table 1.50: MDS considered for the assessment of potential impacts on diadromous fish from underwater sound.

Phase	MDS	Justification
Construction phase	Monopiles: • Wind turbines: installation of up to 68 wind turbines with a 16m diameter monopile foundations installed by impact piling • Offshore substation platforms (OSPs): installation of one OSP with foundations consisting of two 16m diameter piled monopile foundations installed by impact piling • Maximum hammer energy of up to 5,500kJ	For both monopiles and 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
	• Up to two vessels piling concurrently (minimum distance 980m, maximum distance 35.2km, between piling vessels) • Maximum of up to 9.5 hours of piling for a monopile with a cumulative total of up to 665 hours. • Consecutive piling over a maximum of 24 hours • One monopile installed per 24 hours per vessel = 70 days (68 wind turbines and 2 OSP foundation monopiles) for a single vessel (maximum temporal) or 35 days for two vessels (maximum spatial). Pin piles: • Wind turbines: installation up to 68 3-legged jacket foundations with either one or two piles per leg (a total of up to 408 piles) and each pile with a diameter of 5.5m installed by impact piling • OSP: installation of one OSP with 6-legged jacket foundations, with three piles per leg (a total of 18 piles) and each pile with a diameter of 5.5 m installed by impact piling • Maximum hammer energy of up to 2,800kJ • Up to two vessels piling concurrently (minimum distance 980m, maximum distance 35.2km, between piling vessels) • Wind turbines: maximum duration of up to 6.4 hours per pile where there is one pile per leg or 3.2 hours per pile where there are two piles per leg • Total duration of piling per wind turbine foundation = 19 hours (cumulative total of up to 1,305.6 hours) with total foundation installation of up to one day (24 hours) • OSP: maximum duration of up to 6.4 hours per pile • Total duration of piling per OSP foundation =115.2 hours with total installation of up to 6 days • Consecutive piling over a maximum of 24 hours. Single piling of 68 days for wind turbine plus approx. 6 days for OSP = 74 days (maximum temporal) or 37 days for two vessels (maximum spatial). Total piling phase (foundation installation) of up to two years within a four-year construction programme. 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) – Ultra High Resolution Seismic (UHRS). For further detail regarding geophysical sound sources and levels, see volume 5, annex 3.1: Underwater sound technical report of the PEIR.	from adjacent foundations could combine to produce a greater radius of effect compared to a single piling event. Number of OSPs (one) chosen for examination in MDS due to having largest hammer energy compared to lower hammer energy for each of the four OSPs examined in other impacts. For both monopiles and pin piles 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. Consecutive piling is assumed 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.

Measures adopted as part of the project

1.8.3.45 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 1.51.

Table 1.51: 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		
Implementation of piling soft-start and ramp-up measures	This measure will minimise the risk of injury to fish species in the immediate vicinity of piling activities, allowing individuals to move away from the area before sound levels reach a level at which injury may occur.	Proposed to be secured through a condition in the marine licence(s) requiring the development and adherence to a Marine Mammal Mitigation Protocol (MMMP).

Construction and decommissioning phases

Information to support assessment

Hearing sensitivity of Annex II diadromous fish features

1.8.3.46 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 PEIR). 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 500Hz
- 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.

1.8.3.47 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

1.8.3.48 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 PEIR. A summary of the underwater sound modelling has been provided below in paragraphs 1.8.3.49 to 1.8.3.51 and additional detail is also included in volume 2, chapter 8: Fish and shellfish ecology of the PEIR, including full details of sound exposure criteria used to inform the assessment, in line with Popper *et al*. (2014). Of the different types of piling impacts investigated (including pin piles) the single monopile scenario resulted in the greatest realistic predicted injury ranges and therefore formed the focus of the assessment for injury.

1.8.3.49 For peak pressure sound levels when piling energy is at its maximum (i.e. 5,500kJ), mortality and recoverable injury to fish may occur within a maximum of 670m of the piling activity for Group 2 Fish (e.g. Atlantic salmon) and within 420m for Group 1 fish (e.g. sea lamprey and river lamprey; see volume 2, chapter 8: Fish and shellfish ecology of the PEIR). 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 fish to move away from the areas of highest sound levels, before they reach a level that would cause an injury. The initial injury ranges for soft start initiation will be smaller than those maximum ranges presented (i.e. with a maximum of 224m, for group 2 fish).

1.8.3.50 For cumulative Sound Exposure Levels (SEL_{cum}), injury ranges were calculated for piling activities wherein fish are treated as fleeing and static receptors. These ranges indicate that with the implementation of soft start initiation, when fish are modelled as fleeing receptors, the mortality injury ranges are considerably smaller than those predicted for peak Sound Pressure Levels (SPL_{pk}), and the mortality thresholds were not exceeded for group 1 and 2 fish. Similarly, the recoverability ranges were much lower, with thresholds not exceeded for group 1 fish, and group 2 had a maximum range of 67m. However, when fish were modelled as static receptors, mortality and recoverable injury ranges were significantly higher than for both SPL_{pk} and SEL_{cum}. Fish were modelled as static receptors, with a maximum mortality range of up to 780m and 2,090m in group 1 and group 2 fish, respectively and a recoverable injury range of up to 1,085m and 4,400m in group 1 and group 2 fish, respectively.

1.8.3.51 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 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 (see volume 2, chapter 8: Fish and shellfish ecology of the PEIR for more information). The expected fleeing behaviour of fish from the area affected when exposed to high levels of sound and the soft start procedure, mean that it is likely that 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 67m. If the fish were to remain in the area and not have any behavioural response to the piling sound, the potential range for both mortality and recoverable injury would be much greater, out to the range of hundreds of metres to a few kilometres (see volume 2, chapter 8: Fish and shellfish ecology of the PEIR for more information).

1.8.3.52 Temporary Threshold Shift (TTS) is a temporary reduction in hearing sensitivity caused by 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. Volume 2, chapter 8: Fish and shellfish ecology of the PEIR outlines the predicted ranges of effect for TTS for all fish groups modelled as fleeing receptors which may occur as a result of piling for one 16m diameter pile, with TTS predicted to occur to a maximum range of 18,100m from piling operations. For group 1 and group 2 fish species modelled as static receptors, TTS is predicted to occur out to a maximum range of 26,240m from piling operations.

1.8.3.53 When concurrent piling is considered and modelled, the TTS ranges for fish modelled as fleeing receptors have a maximum range of 19.78km, and fish modelled as stationary receptors have a maximum range of 27.58km. These ranges are not significantly further than the impacts of the single piling and are thus unlikely to significantly increase the level of impact.

1.8.3.54 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, with the risk of behavioural effects on group 1 and group 2 fish from piling operations considered to be moderate to high in the near to intermediate field (i.e. <1km from piling operations) and low in the far field (i.e. in the range of kilometres form piling operations).

1.8.3.55 While behavioural effect thresholds proposed by Popper *et al*. (2014) are qualitative, a more quantitative assessment is presented in volume 2, chapter 8: Fish and shellfish ecology of the PEIR, using sound modelling outputs for SPL peak from three locations around the Mona Array Area. The contours showed peak SPL associated with the greatest hammer energy for monopiles and based on the studies summarised within volume 2, chapter 8: Fish and shellfish ecology of the PEIR above, it can be expected that behavioural effects on fish species could be expected within the 160dB re 1uPa peak contours (see Figure 1.9); noting that this contour is likely to be highly conservative for group 1 and group 2 fish species as these are known to be less sensitive to underwater sound. Sound contours in volume 2, chapter 8: Fish and shellfish ecology of the PEIR indicated that while these contours extended over 10km from the piling operations, these 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 for monopiles 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 1.50, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 73 days over a two year piling phase). As such, there is minimal risk of disruption to migration of lamprey species or Atlantic salmon.

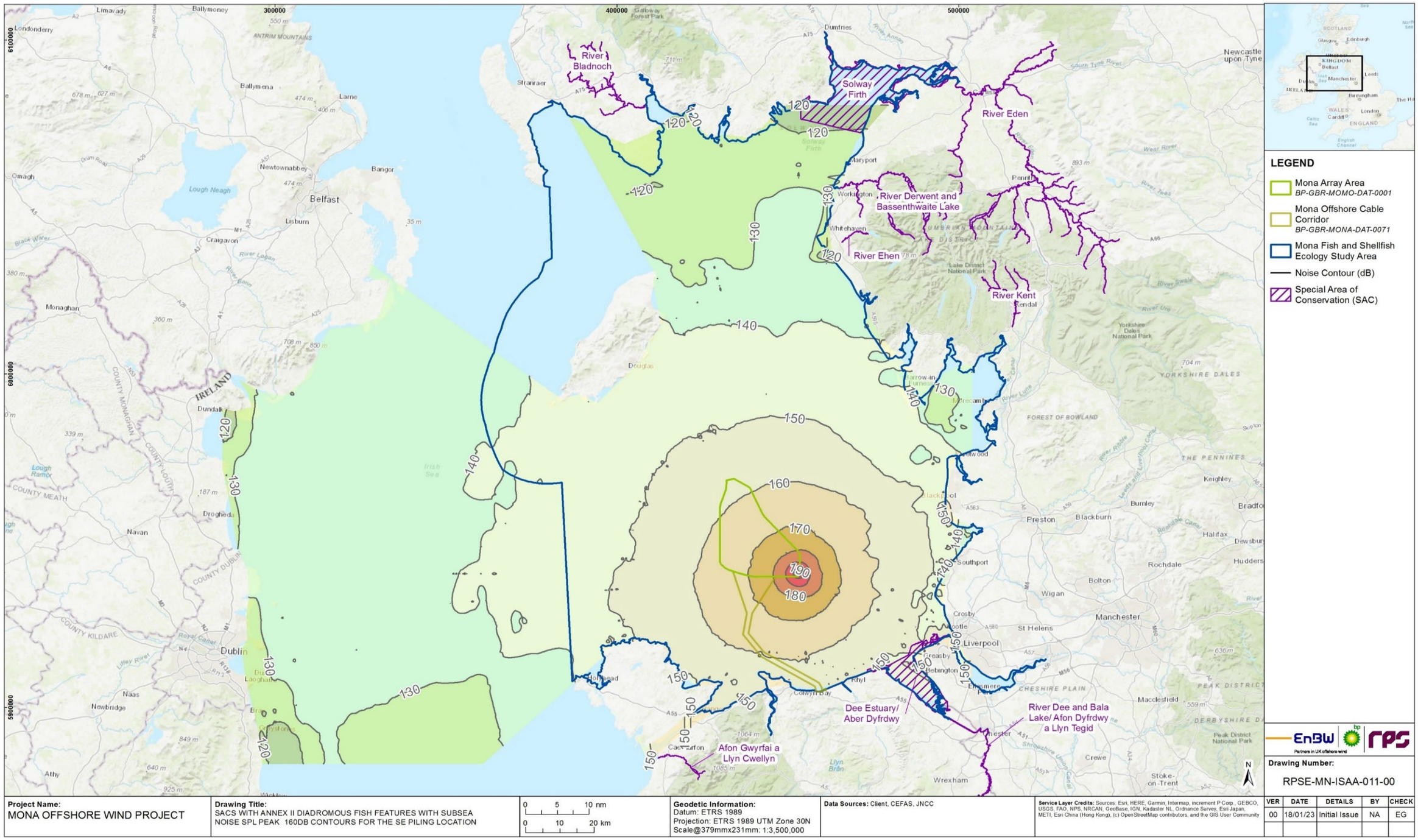


Figure 1.9: SACs with Annex II diadromous fish features with underwater sound SPL peak 160dB re 1uPa contours for the SE piling location

1.8.3.56 Underwater sound modelling has also been completed for underwater sound associated with UXO clearance and detonation. 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. For the purposes of this assessment, it has been assumed that the MDS will be clearance of UXO with a Net Explosive Quantity (NEQ) of 907kg cleared by either low order or high order techniques, see volume 2, chapter 8: Fish and shellfish Ecology of the PEIR. The outputs of sound modelling for UXO clearance concluded that injury effects may occur at range of tens to hundreds of metres, depending on the size of the UXO cleared and the method of detonation (i.e. smaller ranges for low order detonation, larger ranges for high order detonation) with a maximum range of up to ~900m.

Dee Estuary/Aber Dyfrdwy SAC

Sea lamprey and River lamprey

1.8.3.57 As outlined in paragraphs 1.8.3.48 to 1.8.3.52 sea lamprey features within close proximity to piling operations may experience injury or mortality. 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, 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 1.51 which outlines the use of soft start piling procedures) will also allow individuals in close proximity to piling to flee the ensonified area, further reducing the likelihood of injury and mortality on sea lamprey features.

1.8.3.58 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.

1.8.3.59 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 50-200Hz (Mickle *et al*., 2019), suggesting a low vulnerability to sound impacts overall.

1.8.3.60 The sound modelling outputs (including contours presented in volume 2, chapter 8: Fish and shellfish ecology of the PEIR) discussed in the previous sections indicated that piling related underwater sound would result in behavioural responses (e.g. as indicated by the 160dB 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). Further, the potential sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 73 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.

Conclusions

1.8.3.61 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' against each relevant conservation objectives (as presented in paragraph 1.8.2.8 to 1.8.2.10) 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 Dee Estuary/Aber Dyfrdwy SAC from underwater sound during the construction 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 potential impacts associated with the Mona Offshore Wind Project will not prevent the extent and distribution, the structure and function or the supporting processes on which qualifying natural habitats and 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]**	Sea lamprey and river lamprey 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 allow individuals in close proximity of piling to flee 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, and sound potential 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 or the distributions of the qualifying diadromous fish species from being maintained or restored.

1.8.3.62 Therefore, it can be concluded 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

1.8.3.63 Underwater effects 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 (35km from the Mona Array Area) in paragraph 1.8.3.57 to 1.8.3.62 due to the proximity of the locations. As the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (59km 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.

Atlantic salmon

1.8.3.64 As outlined in paragraphs 1.8.3.48 to 1.8.3.52 Atlantic salmon within close proximity to piling operations may experience injury or mortality. 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 1.51 outlining the use of soft start piling procedures) will also allow individuals in close proximity to piling to flee the ensonified area, which further reduces the likelihood of injury and mortality on Atlantic salmon features.

1.8.3.65 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 <160dB re 1µPa RMS, 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 218dB re 1µPa (Bagocius, 2015), although at these sound levels, it would be expected that avoidance reactions would occur, thus avoiding injury effects.

1.8.3.66 The underwater sound modelling outputs discussed in paragraph 1.8.3.48 to 1.8.3.56 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. Further, the potential underwater sound impacts will be short-term and intermittent in nature during the construction phase (i.e. piling occurring over approximately 73 days over a two year piling phase). As such, there is negligible risk of disruption to migration of these species.

Conclusions

1.8.3.67 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’ against each relevant conservation objectives (as presented in paragraph 1.8.2.18 to 1.8.2.18) 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 River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC from underwater sound during the construction phase.

Conservation Objective	Conclusion
The parameters defined in the vision for the watercourse as defined above 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 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, will only travel through the potential ZOI during migration and the use of soft start piling procedures will allow individuals in close proximity of piling to flee 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, 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.

1.8.3.68 Therefore, it can be concluded 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

1.8.3.69 Underwater sound effects 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 (59km from the Mona Array Area) outlined in paragraph 1.8.3.64 to 1.8.3.68, due to the proximity of the locations. As the River Ehen SAC (83km 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.

1.8.3.70 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.

Freshwater pearl mussel

1.8.3.71 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.

1.8.3.72 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 1.8.3.64 to 1.8.3.68) 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 that there will be no significant indirect effects to freshwater pearl mussel.

Conclusions

1.8.3.73 Adverse effects on the qualifying Annex II diadromous fish features of the River Ehen 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' against each relevant conservation objectives (as presented in paragraph 1.8.2.26 to 1.8.2.28) 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 Ehen SAC from underwater sound during the construction 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]**	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 allow individuals in close proximity of piling to flee 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, 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 maintained or restored.

1.8.3.74 Therefore, it can be concluded 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

1.8.3.75 Underwater sound effects 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 (35km from the Mona Array Area) outlined in paragraph 1.8.3.57 to 1.8.3.62. As the River Eden SAC (83km 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. As no adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC was concluded in paragraph 1.8.3.110, by proxy no adverse effect can also be concluded for the River Eden SAC.

Atlantic salmon

1.8.3.76 Underwater sound effects 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 (59km from the Mona Array Area) outlined in paragraph 1.8.3.64 to 1.8.3.68 due to the proximity of the locations. As the River Eden SAC (83km 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. No adverse effect on the integrity of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC was concluded in paragraph 1.8.3.68, by proxy no adverse effect can also be concluded for the River Eden SAC.

Conclusions

1.8.3.77 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' against each relevant conservation objectives (as presented in paragraph 1.8.2.34 to 1.8.2.37) 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 Eden SAC from underwater sound during the construction 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, 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 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, will only travel through the potential ZOI during migration and the use of soft start piling procedures will allow individuals in close proximity of piling to flee 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, 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.

1.8.3.78 Therefore, it can be concluded 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

1.8.3.79 Underwater sound effects 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 (59km from the Mona Array Area) outlined in paragraph 1.8.3.64 to 1.8.3.68 due to the proximity of the locations. As the Afon Gwyrfai a Llyn Cwellyn SAC (92km 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. No adverse effect on the integrity of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC was concluded in paragraph 1.8.3.68, by proxy no adverse effect can also be concluded for the Afon Gwyrfai a Llyn Cwellyn SAC.

Conclusions

1.8.3.80 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 during construction and decommissioning activities. An assessment of the impact 'underwater sound' against each relevant conservation objectives (as presented in paragraph 1.8.2.41) is presented below in Table 1.56.

Table 1.56: Conclusions against the conservation objectives of the Afon Gwyrfai a Llyn Cwellyn SAC from underwater sound during the construction 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, will only travel through the potential ZOI during migration and the use of soft start piling procedures will allow individuals in close proximity of piling to flee 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, 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, will only travel through the potential ZOI during migration and the use of soft start piling procedures will allow individuals in close proximity of piling to flee 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.

1.8.3.81 Therefore, it can be concluded 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 Derwent and Bassenthwaite Lake SAC

Sea lamprey and River lamprey

1.8.3.82 The River Derwent and Bassenthwaite Lake SAC is located at an increased distance from the Mona Offshore Wind Project 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 paragraph 1.8.3.57 to 1.8.3.62 for the Dee Estuary/Aber Dyfrdwy SAC. 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 1.8.3.62) 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

1.8.3.83 The Derwent and Bassenthwaite Lake SAC is located at an increased distance from the Mona Offshore Wind Project than the Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. It is therefore considered that effects on the Atlantic salmon feature of this site would be of lower magnitude that those described in paragraph 1.8.3.57 to 1.8.3.62 for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. No adverse effect on integrity was concluded for the Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (see paragraph 1.8.3.62) therefore no adverse effect on the Atlantic salmon feature of the Derwent and Bassenthwaite Lake SAC can also be concluded.

Conclusions

1.8.3.84 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 during construction and decommissioning activities. An assessment of the impact 'underwater sound' against each relevant conservation objectives (as presented in paragraph 1.8.2.47 to 1.8.2.50) 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 Derwent and Bassenthwaite SAC from underwater sound during the construction 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, will only travel through the potential ZOI during migration and the use of soft start piling procedures will allow individuals in close proximity of piling to flee 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, 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.

1.8.3.85 Therefore, it can be concluded 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.

River Kent SAC

Freshwater pearl mussel

1.8.3.86 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.

1.8.3.87 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 1.8.3.82 to 1.8.3.85) 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

1.8.3.88 Adverse effects on the qualifying Annex II diadromous fish features 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' against each relevant conservation objectives (as presented in paragraph 1.8.2.54 to 1.8.2.57) is presented below in Table 1.58. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.58: Conclusions against the conservation objectives of the River Kent SAC from underwater sound during the construction 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]**	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 allow individuals in close proximity of piling to flee 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, 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

Conservation Objective	Conclusion
	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 maintained or restored. Therefore, it can be concluded 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.

Solway Firth SAC

Sea lamprey and River lamprey

1.8.3.89 Underwater sound effects 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 (35km from the Mona Array Area) outlined in paragraph 1.8.3.57 to 1.8.3.62 due to the proximity of the locations. As the Solway Firth SAC (109km 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. As no adverse effect on the integrity of the Dee Estuary/Aber Dyfrdwy SAC was concluded in paragraph 1.8.3.62, by proxy no adverse effect can also be concluded for the Solway Firth SAC.

Conclusions

1.8.3.90 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' against each relevant conservation objectives (as presented in paragraph 1.8.2.62 to 1.8.2.65) is presented below 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 Solway Firth SAC from underwater sound during the construction 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, will only travel through the potential ZOI during migration and the use of soft start piling procedures will allow individuals in close proximity of piling to flee 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, 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.

1.8.3.91 Therefore, it can be concluded 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

1.8.3.92 The River Bladnoch SAC 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 therefore considered that effects on the Atlantic salmon feature of this site would be of lower magnitude than those described in paragraph 1.8.3.57 to 1.8.3.62 for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC. No adverse effect on integrity was concluded for the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC (see paragraph 1.8.3.62) therefore no adverse effect on the Atlantic salmon feature of the River Bladboch SAC can also be concluded.

Conclusions

1.8.3.93 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' against each relevant conservation objectives (as presented in paragraph 1.8.2.69) is presented below 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 Bladnoch SAC from underwater sound during the construction 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, will only travel through the potential ZOI during migration and the use of soft start piling procedures will allow individuals in close proximity of piling to flee 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, 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. 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.

1.8.3.94 Therefore, it can be concluded 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

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

1.8.3.96 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 1.61.

Table 1.61: 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 Derwent and Bassenthwaite Lake SAC	Sea lamprey River lamprey Atlantic salmon
River Kent SAC	Freshwater pearl mussel
Solway Firth SAC	Sea lamprey River lamprey
River Bladnoch SAC	Atlantic salmon

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

1.8.3.98 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 1.62.

1.8.3.99 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 1.62: 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 and offshore export cables: • Inter-array cables: between 450km and 500km of inter-array cables of 66kV to 132kV • Interconnector cables: up to 50km of 275kV High Voltage Alternating Current (HVAC) cables • Offshore export cables: up to 360km of 275kV HVAC cables • Minimum burial depth 0.5m • 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 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

1.8.3.100 Table 1.63 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 1.63: 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
Development and adherence to a CSIP	All electrical cables will be buried to depths of at least 0.5m as informed by a Cable Burial Risk Assessment (CBRA, within the CSIP). 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.	Proposed to be secured as a requirement of the marine licence(s).

Operations and maintenance phase

Information to support assessment

1.8.3.101 EMF comprise both the electrical fields, measured in volts per metre (V/m), and the magnetic fields, measured in microtesla (μT) or milligauss (mG). Background measurements of the magnetic field are approximately 50μT (i.e. 500mG) for example in the North Sea and Irish Sea (Tasker *et al.*, 2010; Eirgrid, 2015). 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).

1.8.3.102 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, configuration of cable and burial depth. The flow of electricity associated with an Alternating Current (AC) cable (proposed for the Mona Offshore Cable Corridor) changes direction (as per the frequency of the AC transmission) and creates a constantly varying electric field in the surrounding marine environment (Huang, 2005).

1.8.3.103 The strength of the magnetic field (and consequently, induced electrical fields) decreases rapidly horizontally and vertically with distance from source. A recent study conducted by CSA (2019) found that inter-array and offshore export cables buried between depths of 1m to 2m 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.

1.8.3.104 Further information on the EMF levels associated with offshore wind farm power cables is included within volume 2, chapter 8: Fish and shellfish ecology of the PEIR.

Dee Estuary/Aber Dyfrdwy SAC

Sea lamprey and River lamprey

1.8.3.105 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 100mV/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).

1.8.3.106 As outlined in paragraph 1.8.3.105, 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.

1.8.3.107 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.

1.8.3.108 Any effects of EMF from subsea electric cables will be localised in context with the wider Irish Sea region and will not result in any barriers to migration to and from the SAC. Any behavioural effects will be further minimised by the CSIP.

Conclusions

1.8.3.109 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 objectives (as presented in paragraph 1.8.2.8 to 1.8.2.10) is presented below 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 the River Dee Estuary/Aber Dyfrdwy 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 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 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.

1.8.3.110 Therefore, it can be concluded 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

1.8.3.111 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 1.8.3.105 to 1.8.3.107 due to the proximity of the locations.

1.8.3.112 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 59km 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.

1.8.3.113 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 CSIP (see Table 1.63 and volume 2, chapter 8: Fish and Shellfish Ecology of the PEIR).

Atlantic salmon

1.8.3.114 Atlantic salmon and European eel 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).

1.8.3.115 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 7,000km migration, with little to no impact on migratory behaviour noted beyond 500m 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.

1.8.3.116 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.

1.8.3.117 As outlined in paragraph 1.8.3.106 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.

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 the CSIP.

Conclusions

1.8.3.118 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 objectives (as presented in paragraph 1.8.2.18 to 1.8.2.19 is presented below 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 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 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.

1.8.3.119 Therefore, it can be concluded 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

1.8.3.120 As the River Ehen SAC is located at an increased distance (located 83km 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 1.8.3.114 to 1.8.3.118. Considering the likely migration routes of diadromous fish shown in Figure 1.8, the Mona Offshore Wind Project is unlikely to present a barrier to migration.

Freshwater pearl mussel

1.8.3.121 The freshwater pearl mussel has been considered within the Mona 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 1.8.3.120 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

1.8.3.122 Adverse effects on the qualifying Annex II diadromous fish 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 objectives (as presented in paragraph 1.8.2.26 to 1.8.2.28) is presented below 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 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.

1.8.3.123 Therefore, it can be concluded 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

1.8.3.124 The River Eden SAC is located at an increased distance from the Mona Offshore Wind Project (located 83km 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 1.8.3.105 to 1.8.3.110 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 1.8.3.110) therefore no adverse effect on the sea lamprey and river lamprey features of the River Eden SAC can also be concluded.

Atlantic salmon

1.8.3.125 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 1.8.3.114 to 1.8.3.120 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 1.8.3.119) therefore no adverse effect on the Atlantic salmon feature of the River Eden SAC can also be concluded.

Conclusions

1.8.3.126 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 objectives (as presented in paragraph 1.8.2.34 to 1.8.2.37) is presented below 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 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.

1.8.3.127 Therefore, it can be concluded 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

1.8.3.128 The Afon Gwyrfai a Llyn Cwellyn SAC is located at an increased distance from the Mona Offshore Wind Project (located 92km 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 1.8.3.114 to 1.8.3.119 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 1.8.3.119) therefore no adverse effect on the Atlantic salmon feature of the Afon Gwyrfai a Llyn Cwellyn SAC can also be concluded.

Conclusions

1.8.3.129 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 objectives (as presented in paragraph 1.8.2.41) is presented below 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 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.

1.8.3.130 Therefore, it can be concluded 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 Derwent and Bassenthwaite Lake SAC

Sea lamprey and river lamprey

1.8.3.131 The Derwent and Bassenthwaite Lake SAC is located at an increased distance from the Mona Offshore Wind Project (95km 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 1.8.3.105 to 1.8.3.107 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 1.8.3.110) 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

1.8.3.132 The Derwent and Bassenthwaite Lake SAC is located at an increased distance from the Mona Offshore Wind Project (located 95km 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 1.8.3.114 to 1.8.3.119 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 1.8.3.119) therefore no adverse effect on the Atlantic salmon feature of the Derwent and Bassenthwaite Lake SAC can also be concluded.

Conclusions

1.8.3.133 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 objectives (as presented in paragraph 1.8.2.47 to 1.8.2.50) is presented below 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 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.

1.8.3.134 Therefore, it can be concluded 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.

River Kent SAC

Freshwater pearl mussel

1.8.3.135 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.

1.8.3.136 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 1.8.3.114 to 1.8.3.117, as the River Kent SAC is located at an increased distance from the Mona Offshore Wind Project (located 96km 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 1.8.3.119) therefore no adverse effect on the Atlantic salmon feature of the River Kent can also be concluded.

Conclusions

1.8.3.137 Adverse effects on the qualifying Annex II diadromous fish 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 objectives (as presented in paragraph 1.8.2.54 to 1.8.2.57) is presented below 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 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.

Conservation Objective	Conclusion
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.

1.8.3.138 Therefore, it can be concluded 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.

Solway Firth SAC

Sea lamprey and river lamprey

1.8.3.139 The Solway Firth SAC is located at an increased distance from the Mona Offshore Wind Project (located 109km 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 1.8.3.105 to 1.8.3.108 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 1.8.3.110) therefore no adverse effect on the sea lamprey and river lamprey features of the Solway Firth SAC can also be concluded.

Conclusions

1.8.3.140 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 objectives (as presented in paragraph 1.8.2.62 to 1.8.2.65) is presented below 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 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.

1.8.3.141 Therefore, it can be concluded 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

1.8.3.142 The River Bladnoch SAC is located at an increased distance from the Mona Offshore Wind Project (115km 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 1.8.3.114 to 1.8.3.119 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 1.8.3.119) therefore no adverse effect on the Atlantic salmon feature of the River Bladnoch SAC can also be concluded.

Conclusions

1.8.3.143 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 objectives (as presented in paragraph 1.8.2.69) is presented below 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 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.

1.8.3.144 Therefore, it can be concluded 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.

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

1.8.4.1 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 1.73 and shown in Figure 1.10.

1.8.4.2 As outlined in The Stage 1 HRA Screening Report, 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

1.8.4.3 On this basis, the potential impacts identified for assessment as part of volume 2, chapter 8: Fish and shellfish ecology of the PEIR, and which have been brought forward for consideration in the in-combination assessment of the ISAA are:

- In-combination increases in SSC and sediment deposition
- In-combination release of sediment bound contaminants
- In-combination underwater sound
- In-combination EMF from subsea electric cables.

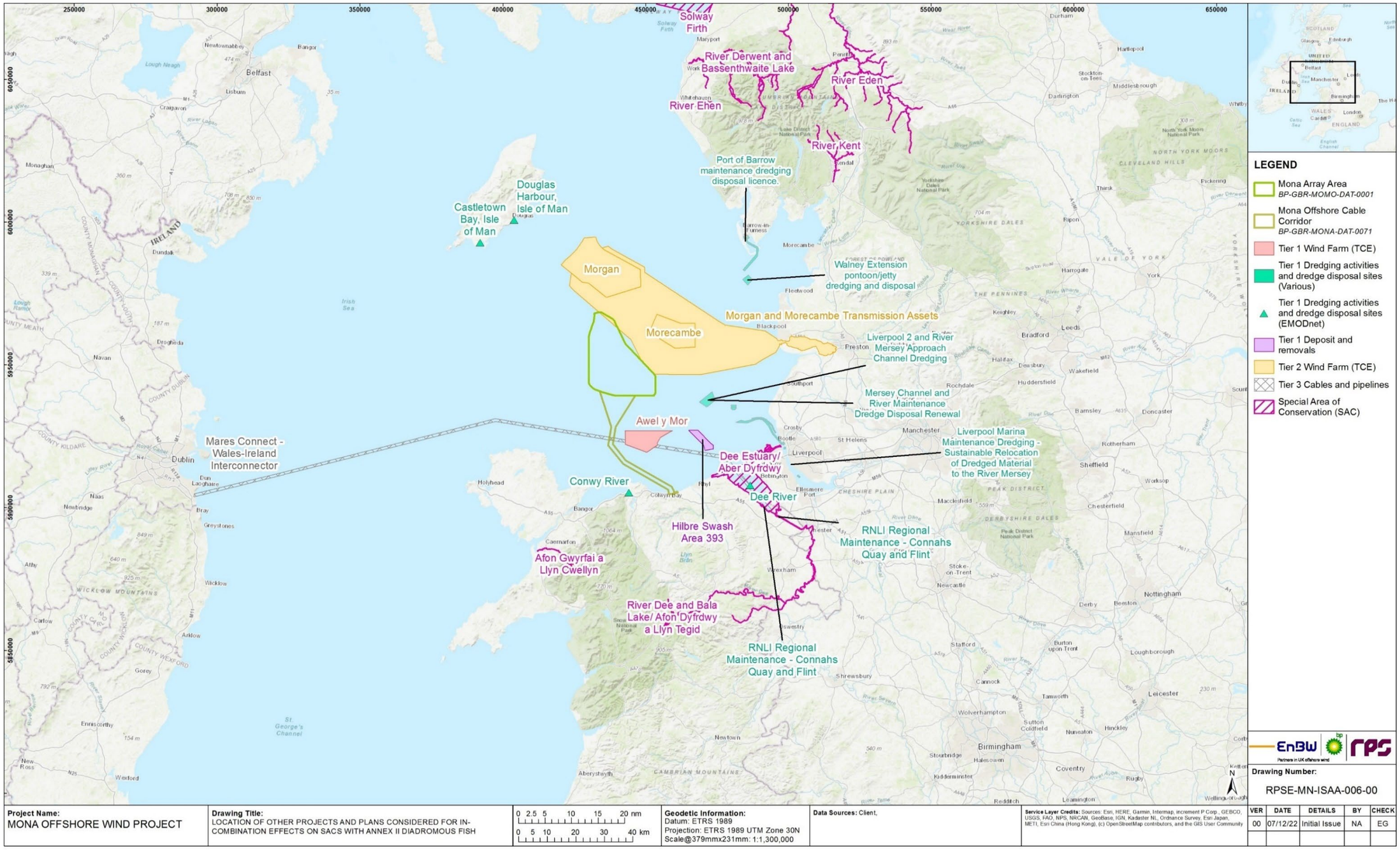


Figure 1.10: Locations of other projects and plans considered for in-combination effects on SACs with Annex II diadromous fish features[24].

[24] 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 1.73: List of other projects and plans with potential for in-combination effects on Annex II diadromous fish features.

Plan/project	Status	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of construction (C) /operation (O)	Spatial overlap	Temporal overlap	Further assessment required? (Yes/No)
Mona Offshore Wind Project	-	-	-	-	-	C: Q1 2026 – Q4 2029 O: Q1 2030 – Q4 2065	-	-	-
Awel y Môr Offshore Wind Farm	Application Submitted	Up to 100MW (48 to 91 wind turbines)	Tier 1	12.2	3.6	C: 2026 to 2030 O: 2030 to 2055	Yes	Yes	Yes
Hilbre Swash (NRW) (Marine aggregate extraction area number 392/393)	Operational	Licence to extract up to 12 million tonnes of aggregate (mainly sand) over 15 years.	Tier 1	14.5	20.1	O: 2015 to 2029	No	Yes	Yes
Liverpool 2 and River Mersey approach channel dredging (MLA/2018/00536/8)	Operational	Capital dredging in front of the proposed terminal to create a berth pocket.	Tier 1	15.5	22.4	O: 2019 to 2028	No	Yes	Yes
Mersey channel and river maintenance dredge disposal renewal (MLA/2021/00202)	Operational	The Mersey Docks and Harbour Company Ltd, as the Harbour Authority for the Port of Liverpool has an obligation to dredge the approaches to Liverpool in order to maintain navigation into the Mersey Estuary for all river users.	Tier 1	15.6	22.5	O: 2021 to 2031	No	Yes	Yes
Conwy River	Operational	Dredging, no further information given.	Tier 1	33.9	7.7	O: 2022 to 2037	No	Yes	Yes
Douglas Harbour, Isle of Man	Operational	Dredging to deepen harbour channels and capital dredging in front of the proposed terminal to create a berth pocket.	Tier 1	43.1	67.0	O: 2016 to 2031	No	Yes	Yes
Walney Extension pontoon/jetty dredging and disposal (MLA/2018/00403)	Operational	Twice yearly dredging campaigns over the next 10 years at each of the two dredge locations.	Tier 1	45.3	55.3	O: 2019 to 2029	No	Yes	Yes
Dee River	Operational	Dredging, no further information given.	Tier 1	46.1	26.7	O: 2022 to 2037	No	Yes	Yes
Castletown Bay, Isle of Man	Operational	Dredging to deepen harbour channels.	Tier 1	47.0	66.8	O: 2022 to 2037	No	Yes	Yes

Plan/project	Status	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of construction (C) /operation (O)	Spatial overlap	Temporal overlap	Further assessment required? (Yes/No)
Port of Barrow maintenance dredging disposal licence (MLA/2015/00458/1)	Operational	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.	Tier 1	47.7	58.1	O: 2016 to 2026	No	Yes	Yes
Liverpool Marina Maintenance Dredging - sustainable relocation of dredged material to the River Mersey (MLA/2020/00492)	Operational	Annual campaigns of maintenance dredging over the next ten years using small hydraulic dredger.	Tier 1	53.6					
RNLI Regional Maintenance (MLA/2015/00016)	Operational	Low impact maintenance works to RNLI operated lifeboat stations and associated slipways, berths and other infrastructure.	Tier 1	54.8	31.8	O: 2019 to 2029	No	Yes	Yes
Morgan/Morecambe Transmission Assets (scoping search area)	Pre-application	Morgan Transmission Assets	Tier 2	0.0	10.0	C: 2028 to 2029 O: 2030 to 2065	No	Yes	Yes
Morgan Generation Assets	Pre-application	1.5 GW (Up to 107 wind turbines)	Tier 2	5.5	32.9	C: 2028 to 2029 O: 2030 to 2065	No	Yes	Yes
Round 4 Preferred Project 5 (Morecambe)	Pre-application	12 -24MW (Up to 40 wind turbines)	Tier 2	8.9	21.5	C: 2026 to 2028 O: 2029 -2089	No	Yes	Yes
MaresConnect – Wales-Ireland Interconnector Cable	Permitted but not yet implemented	A proposed subsea and underground electricity interconnector system linking the existing electricity grids in Ireland and Great Britain.	Tier 3	14.7	0.0	C: 2025 O: 2027 to 2037	No	Yes	Yes

In-combination increases in SSC and sediment deposition

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

- Tier 1 projects
  - Construction of the Awel y Môr Offshore Wind Farm
  - Operational activities of nearby dredging and dredge disposal activities
  - One aggregate extraction and disposal site
- Tier 3 projects
  - MaresConnect Wales-Ireland Interconnector Cable.

1.8.4.5 In-combination effects from increases in SSC and associated sediment deposition during the operations and maintenance phase are not considered in the in-combination assessment on the basis that any plumes associated will be of limited spatial extent, short term duration, intermittent in nature and not expected to interact with plumes associated with other projects.

Construction phase

Tier 1

1.8.4.6 Construction of the Mona Offshore Wind Project will coincide with the construction phase of the Awel y Môr Wind Farm. Construction activities will result in temporary increased SSC and associated sediment deposition however, these activities would be of limited spatial extent and frequency and are unlikely to interact with sediment plumes from the Mona Array Area.

1.8.4.7 The Mona Offshore Cable Corridor runs adjacent to Awel y Môr array area and interaction of SSC plumes on spring tide events may occur should trenching activities be undertaken simultaneously, although this is unlikely. SSC plumes from the Mona Offshore Cable Corridor would most likely reach background levels through natural sediment depositional processes before overlapping with the Awel y Môr array area, when travelling on the flood tide as they would run in parallel. If the plumes did overlap due to local tidal and current conditions, SSCs could increase by up to approximately 2mg/l within the area of overlap, according to the respective technical reports of each of these projects, which is not significant compared to background conditions.

1.8.4.8 Aggregate extraction at both Hilbre Swash licensed areas located within 14km of the Mona Array Area and 17km of the Mona Offshore Cable Corridor. However, resultant plumes from the disposal of dredged material and extraction of aggregate would be advected on the tidal current running in parallel with those associated with the Mona Offshore Wind Project and not coincide.

1.8.4.9 In-combination effects could also result from sea disposal of dredged material at the Conwy River disposal site, located 33km and 7km from the Mona Array Area and Mona Offshore Cable Corridor respectively. However, 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. This will apply approximately equally to other licenced dredging activity and disposal sites, including the Mersey channel and river maintenance dredge disposal renewal; the Walney Extension pontoon/jetty dredging and disposal, the Dee River project; the RNLI Regional Maintenance Dredging; the Liverpool Marina Maintenance Dredging; the Douglas Harbour and Castletown Bay dredging in the Isle of Man, and the Port of Barrow maintenance dredging disposal.

Tier 3

1.8.4.10 The proposed construction of the MaresConnect Wales-Ireland Interconnector Cable has the potential to overlap with the construction phase of the Mona Offshore Wind Project. The proposed MaresConnect Interconnector Cable is 14km from the Mona Array Area and overlaps with the Mona Offshore Cable Corridor respectively, leading to a potential in-combination impact. Specifically, the likely jet trenching activities for the laying and burying of the cables for both projects may run concurrently and interaction of SSC plumes on spring tide events may occur. However, as with the Mona Offshore Wind Project, it is expected that the concentration of suspended sediment would reduce significantly quickly with distance from the activity and therefore the potential overlap of resultant plumes would be low.

Dee Estuary/Aber Dyfrdwy SAC

1.8.4.11 The in-combination effects are predicted to be of local spatial extent, short term duration and intermittent and of high reversibility and diadromous fish species are assessed as having low sensitivity to the effect. In addition, the Dee Estuary is located 13km from the Mona Offshore Cable Corridor and therefore further reducing any in-combination effects with other plans/projects on the Dee Estuary/Aber Dyfrdwy SAC. The sensitivity of the qualifying features to increases in SSC and associated deposition are outlined in paragraph 1.8.3.14 and 1.8.3.15.

Conclusions

1.8.4.12 Adverse effects on the qualifying features which undermine the conservation objectives of the SAC will not occur as a result of in-combination increases in SSC and associated deposition. An assessment of the impact 'increases in SSC and associated deposition' against each relevant conservation objective (as presented in paragraph 1.8.2.8 to 1.8.2.10) is presented 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 the Dee Estuary/Aber Dyfrdwy SAC for in-combination increases in SSC and sediment deposition.

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]**	No adverse effects were concluded for Annex I habitat features of the Dee Estuary/Aber Dyfrdwy SAC (see paragraph 1.7.3.56) for the Mona Offshore Wind Project in-combination with other projects. Any increases in SSC associated with the Mona Offshore Wind Project in-combination with other plans and projects will be intermittent and highly reversible and not significant in the context of natural variation in the wider Irish Sea. Therefore, increases in SSC and associated deposition associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the extent and distribution, the structure and function or the supporting processes on

Conservation objective	Conclusion
The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely [are maintained or restored]	which qualifying natural habitats and 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]**	Any increases in SSC and sediment deposition associated with the Mona Offshore in-combination with other projects will be intermittent, short-lived, highly reversible and not significant in the context of natural variation in the wider Irish Sea. Annex II diadromous fish features are considered to have low sensitivity to the effect, and therefore increases in SSC and associated deposition associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations and distributions of qualifying features from being maintained or restored.

1.8.4.13 Therefore, it can be concluded that there is **no risk of an adverse effect** on the integrity of the Dee Estuary/Aber Dyfrdwy SAC as a result of increases in SSC and associated sediment deposition impacts with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination release of sediment bound contaminants

1.8.4.14 There is the potential for the release of sediment bound contaminants as a result of construction activities associated with the Mona Offshore Wind Project to act 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 site
- Tier 3
  - MaresConnect Interconnector cable.

1.8.4.15 All other projects are located beyond 30km from the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC and will not contribute to in-combination effects. In-combination effects are considered for the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC only.

Construction phase

Tier 1

1.8.4.16 The construction phase of the Mona Offshore Wind Project coincides with the proposed development of Awel y Môr Offshore Wind Farm. Construction activities may result in the release of sediment bound contaminants; however, these activities would be of limited spatial extent and frequency and unlikely to interact with the release of sediment bound contaminants from the Mona Offshore Cable Corridor.

1.8.4.17 The in-combination effects assessment encompasses aggregate extraction at both Hilbre Swash licensed areas located within 14km of the Mona Array Area and 17km of the Mona Offshore Cable Corridor. Any resultant release of sediment bound contaminants from the disposal of dredged material and extraction of aggregate would be advected on the tidal current running in parrallel and not coincide.

1.8.4.18 Similarly, the in-combination effects assessment considers sea disposal of dredged material at the Conwy River disposal site, located 33km and 7km from the Mona Array Area and Mona Offshore Cable Corridor respectively. If the offshore cable installation and dredge material dumping coincided any release of sediment contaminants 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.

1.8.4.19 The potential release of contaminants from the projects outlined above would be small (if any) and are also likely to be rapidly dispersed with the tide and/or currents. Considering that the majority of the projects are located over 5km from the Mona Offshore Cable Corridor, should any contaminants be released from the other plans/projects considered these would be diluted prior to reaching the SAC. Furthermore, as outlined in paragraph 1.8.3.36 of the alone assessment, the diadromous fish features of the SAC have developed in an environment of low levels of existing contamination, so any low-level release of contaminants from construction activities is not likely to significantly increase bioavailability.

Tier 3

1.8.4.20 During the Mona Offshore Wind Project construction phase, the MaresConnect cable will be in construction which may result in increased SSC. The proposed cable is located 14km and 0km from the Mona Offshore Array Area and Mona Offshore Cable Corridor respectively. However, any release of sediment contaminants is likely to be of low magnitude, subject to rapid dispersal and dilution, and will not contribute to an in-combination effect.

Dee Estuary/Aber Dyfrdwy SAC

1.8.4.21 In-combination effects are considered for the Dee Estuary/Aber Dyfrdwy SAC. Annex II diadromous fish will likely only be present within the fish and shellfish ecology study area when migrating to or from rivers flowing into the east Irish Sea. Therefore, the possibility for temporal and spatial overlap of these species and the very short-term remobilisation of sediment-bound contaminants, which will likely resettle within a small number of tidal cycles, is very low. Diadromous fish species are also considered to be tolerant to natural contaminants as outlined in paragraph 1.8.4.19. The potential release of contaminants from the projects outlined above would be small (if any) and are also likely to be rapidly dispersed with the tide and/or currents. Considering that the majority of the projects are located over 5km from the Mona Offshore Cable Corridor, should any contaminants be released from the other plans/projects considered these would be diluted prior to reaching the SAC.

Conclusions

1.8.4.22 Adverse effects on the qualifying features which undermine the conservation objectives of the SAC will not occur as a result of in-combination release of sediment bound contaminants. An assessment of the impact 'release of sediment bound contaminants'' against each relevant conservation objective (as presented in paragraph 1.7.2.41 to 1.7.2.43) is presented in Table 1.75 below. 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 the Dee Estuary/Aber Dyfrdwy SAC for in-combination release of sediment bound contaminants.

Conservation Objective	Conclusion
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 supporting processes on which qualifying natural habitats and the habitats of qualifying species rely**	The potential release of contaminants from other projects/plans on the qualifying habitats of the Dee Estuary/Aber Dyfrdwy SAC is assessed in Table 1.39. The Mona Offshore Wind Project in-combination with other plans/projects will not restrict the distribution or extent, or supporting processes on which qualifying natural habitats and habitats of qualifying species rely from increasing or remaining stable.
The populations of qualifying species [are maintained or restored] **The distribution of qualifying species within the site [are maintained or restored]**	The potential release of contaminants from other projects/plans would be small (if any) and are also likely to be rapidly dispersed with the tide and/or currents. Considering that the majority of the projects are located over 5km from the Mona Offshore Cable Corridor, should any contaminants be released from the other plans/projects considered these would be diluted prior to reaching the SAC. In addition the Mona Offshore Cable Corridor is also locate 13km from the Dee Estuary/Aber Dyfrdwy SAC and Ramsar, therefore in-combination impacts on the SAC will not occur. Therefore, the release of sediment bound contaminants associated with the Mona Offshore Wind Project in-combination with other projects will not prevent the populations and distributions of qualifying features from being maintained or restored.

1.8.4.23 Therefore, it can be concluded that there **is no risk of an adverse effect** on the integrity of the Dee Estuary/Aber Dyfrdwy SAC and Ramsar as a result of the release of sediment bound contaminants impacts with respect to the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination underwater sound

1.8.4.24 There is potential for underwater sound impacts 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 Wind Farm, Morgan Offshore Wind Project, and the Morgan and Morecambe Transmission Assets.

Tier 1

1.8.4.25 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 1.8.4.

1.8.4.26 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 5,000kJ 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 up to 144 days and 1,561 hours of piling over construction phases of several years (i.e. three and four years for Mona and Awel y Môr, respectively).

1.8.4.27 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 1,200m for group 1 fish, <100m for group 2 fish, if modelled as static receptors (RWE, 2021a). In all cases, modelling the fish as fleeing receptors highly significantly reduced mortality distances, down to <100m even for group 3 fish. TTS ranges were calculated to reach out to up to 11,800m for group 3 static receptors, with this again reducing to 100m when fish were modelled as fleeing receptors, with similar patterns for all other groups of fish (i.e. group 1 and 2).

1.8.4.28 As with the Mona Offshore Wind Project, mitigation including soft starts will reduce the risk of injury and mortality to 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.

Tier 2

1.8.4.29 The construction phases of the Morgan Offshore Wind Project, 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.

1.8.4.30 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 up to 745m for group 1 fish and 2,120m for group 2 fish, if modelled as static receptors (Morgan Offshore Wind Project Ltd., 2023). In all cases, modelling the fish as fleeing receptors significantly reduced distances to threshold values for mortality. Injury distances were calculated to reach up to 4,760m for group 2-4 static receptors, with this again reducing to <100m in all cases when fish were modelled as fleeing receptors, with similar patterns for all other groups of fish.

1.8.4.31 Currently, no information is publicly available for the sound modelling and construction parameters of the Morecambe Offshore Wind Farm, although it is expected this will be a similar scale as the Morgan and Mona Offshore Wind Projects.

Dee Estuary/Aber Dyfrdwy SAC

1.8.4.32 Any in-combination effects are predicted to be of short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project will also have mitigation measures including soft starts which will further reduce the potential for in-combination sound effects.

Conclusions

1.8.4.33 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' against each relevant conservation objective (as presented in paragraph 1.8.2.8 to 1.8.2.10) 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 the Dee Estuary/Aber Dyfrdwy 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 will 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.

1.8.4.34 Therefore, it can be concluded 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

1.8.4.35 Any in-combination effects are predicted to be of short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind Project will also have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.8.4.36 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' against each relevant conservation objective (as presented in paragraph 1.8.2.18 to 1.8.2.19) is presented in Table 1.77. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.77: 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 (2008) 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 will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect, 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.

1.8.4.37 Therefore, it can be concluded 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

1.8.4.38 The in-combination effect is predicted to be of short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind will also have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.8.4.39 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' against each relevant conservation objective (as presented in paragraph 1.8.2.26 to 1.8.2.28) is presented in Table 1.78. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.78: 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.
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 will 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.

1.8.4.40 Therefore, it can be concluded 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

1.8.4.41 The in-combination effect is predicted to be of short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind will also have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.8.4.42 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' against each relevant conservation objective (as presented in paragraph 1.8.2.34 to 1.8.2.37) is presented in Table 1.79. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.79: 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 will 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.

1.8.4.43 Therefore, it can be concluded 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

1.8.4.44 The in-combination effect is predicted to be of short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind will also have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.8.4.45 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 1.8.2.41) is presented in Table 1.80. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.80: 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 (92km) 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 will implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect, 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.

1.8.4.46 Therefore, it can be concluded 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 Derwent and Bassenthwaite Lake SAC

1.8.4.47 The in-combination effect is predicted to be of short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind will also have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.8.4.48 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' against each relevant conservation objective (as presented in paragraph1.8.2.47 to 1.8.2.50) is presented in Table 1.81. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.81: 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]	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 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]**	
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 will 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.

1.8.4.49 Therefore, it can be concluded 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

1.8.4.50 The in-combination effect is predicted to be of short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind will also have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.8.4.51 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' against each relevant conservation objective (as presented in paragraph 1.8.2.62 to 1.8.2.65) is presented in Table 1.82. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.82: 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.

Conservation objective	Conclusion
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 will 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.

1.8.4.52 Therefore, it can be concluded 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 Kent SAC

1.8.4.53 The in-combination effect is predicted to be of short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind will also have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.8.4.54 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' against each relevant conservation objective (as presented in paragraph1.8.2.54 to 1.8.2.57) is presented in Table 1.83. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.83: 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 will 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.

1.8.4.55 Therefore, it can be concluded 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 Bladnoch SAC

1.8.4.56 The in-combination effect is predicted to be of short-term duration, intermittent and diadromous fish species are assessed as having low sensitivity to the effect. In addition, any projects/plans which may act in-combination with the Mona Offshore Wind will also have mitigation measures including soft starts which will reduce the potential for in-combination sound effects.

Conclusions

1.8.4.57 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' against each relevant conservation objective (as presented in paragraph 1.8.2.69) is presented in Table 1.84. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.84: 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 implement mitigation measures such as soft starts and diadromous fish features are expected to have low sensitivity to the effect, 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.

1.8.4.58 Therefore, it can be concluded 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

1.8.4.59 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 Morgan Offshore Wind Farm, Morecambe Offshore Wind Farm, and Morgan and Morecambe Transmission Assets, and the tier 3 MaresConnect Wales-Ireland Interconnector Cable.

Operations and maintenance phase

Tier 1

1.8.4.60 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 an in-combination effect with the cables of the Mona Offshore Wind Project. For the Awel y Môr Offshore Wind Farm this is likely to result from the operation of the 145km of inter-array cables, and 81km of export cables (RWE, 2021a). The minimum burial depth for cables for Awel y Môr is planned to be 1m, likely limiting EMFs to the range of up to 10m from the cable, in line with the predictions for the Mona Offshore Wind Project.

Tier 2

1.8.4.61 The maximum EMF impacts associated with the tier 2 projects will originate from the inter-array and interconnector cables of the Morgan Generation Assets and the Morecambe Offshore Wind Farm, and the Morgan and Morecambe Transmission Assets. For the Morgan Offshore Wind Project this is likely to result from the operation of the 450km and 500km of 66kV to 132kV inter-array cables respectively, and up to 60km of 275kV HVAC interconnector cable. The minimum burial depth for cables will be 0.5m, 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,).

1.8.4.62 The extent of EMFs associated with the Morecambe Offshore Wind Farm are not fully quantified due to the early stage of development of this project. However, the scoping report indicates the use of 66kV to 132kV HVAC inter-array cables, with all cables buried to an expected depth of 1m, and a minimum distance of the entire offshore wind farm to shore of 30km, with more cable required overall.

Tier 3

1.8.4.63 The proposed operation of the MaresConnect Interconnector Cable will temporally overlap with the operations and maintenance phase of the Mona Offshore Wind Project, resulting in an 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. However, the overall potential in-combination effect is expected to be small and limited to directly around the cable, with very little overlap between it and the Mona Offshore Wind Project.

Dee Estuary/Aber Dyfrdwy SAC

1.8.4.64 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 will implent 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

1.8.4.65 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 1.8.2.8 to 1.8.2.10) is presented in Table 1.85. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.85: Conclusions against the conservation objectives of Dee Estuary/Aber Dyfrdwy 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 will 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.

1.8.4.66 Therefore, it can be concluded 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

1.8.4.67 Whilst any in-combination effects are predicted to be of long term duration, and continuois 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 will implent 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

1.8.4.68 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 1.8.2.62 to 1.8.2.63) is presented in Table 1.86. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.86: 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 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 will 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.

1.8.4.69 Therefore, it can be concluded 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

1.8.4.70 Whilst any in-combination effects are predicted to be of long term duration, and continuois 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 will implent mitigation inclcuding 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

1.8.4.71 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 1.8.2.26 to 1.8.2.62) is presented in Table 1.87. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.87: 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 will 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.

1.8.4.72 Therefore, it can be concluded 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

1.8.4.73 Whilst any in-combination effects are predicted to be of long term duration, and continuois 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 columnrather than along the seabed. All projects which may contribute to an in-combination effect will implent mitigation inllcuding 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

1.8.4.74 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 paragraph1.8.2.34 to 1.8.2.37) is presented in Table 1.88. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.88: 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 will 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.

1.8.4.75 Therefore, it can be concluded 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

1.8.4.76 Whilst any in-combination effects are predicted to be of long term duration, and continuois 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 will implent mitigation inllcuding 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

1.8.4.77 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 1.8.2.41) is presented in Table 1.89. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.89: 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 (92km) 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 will 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.

1.8.4.78 Therefore, it can be concluded 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 Derwent and Bassenthwaite Lake SAC

1.8.4.79 Whilst any in-combination effects are predicted to be of long term duration, and continuois 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 will implent mitigation inllcuding 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

1.8.4.80 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 1.8.2.47 to 1.8.2.50) is presented in Table 1.90. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.90: 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 will 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.

1.8.4.81 Therefore, it can be concluded 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

1.8.4.82 Whilst any in-combination effects are predicted to be of long term duration, and continuois 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 columnrather than along the seabed. All projects which may contribute to an in-combination effect will implent mitigation inllcuding 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

1.8.4.83 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 paragraph1.8.2.62 to 1.8.2.65) is presented in Table 1.91. 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 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 will 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.

1.8.4.84 Therefore, it can be concluded 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 Kent SAC

1.8.4.85 Whilst any in-combination effects are predicted to be of long term duration, and continuois 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 columnrather than along the seabed. All projects which may contribute to an in-combination effect will implent mitigation inllcuding 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

1.8.4.86 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 1.8.2.54 to 1.8.2.57) is presented in Table 1.92. 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 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 will 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.
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 will 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.

1.8.4.87 Therefore, it can be concluded 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.

1.8.4.90 Therefore, it can be concluded 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.

River Bladnoch SAC

1.8.4.88 Whilst any in-combination effects are predicted to be of long term duration, and continuois 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 columnrather than along the seabed. All projects which may contribute to an in-combination effect will implent mitigation inllcuding 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

1.8.4.89 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 1.8.2.69) is presented 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 River Bladnoch SAC for in-combination EMF from subsea electric cables.

1.9 Assessment of potential Adverse Effect on Integrity: Annex II marine mammals

1.9.1.1 The screening exercise (HRA Stage 1 Screening Report), together with consultation feedback from NRW (see section 1.4), 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.

1.9.1.2 The screening exercise (HRA Stage 1 Screening Report) therefore identified the potential for LSEs on the European sites (Figure 1.11) designated for Annex II marine mammal features which are listed in Table 1.94.

Table 1.94: 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
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	
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	
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

SAC/SCI	Annex II marine mammal features
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

1.9.1.3 Following feedback from Natural England in the Marine Mammmal EWG 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 1.9.3 and 1.9.4). However, for European sites located exclusively in Welsh, Irish or French waters, an 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).

1.9.1.4 As detailed in paragraph 1.9.1.3, 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 1.9.3.

1.9.1.5 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 1.9.3.

1.9.1.6 For grey seal and harbour seal, as per the HRA Stage 1 Screening Report and consultation with NRW, all sites within the relevant MUs for each species were brought forward to the 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). 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 ISAA. For harbour seal, Strangford Lough SAC and Murlough SAC were also brought forward to the 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 most grey seal pupping within the Celtic and Irish Seas part of the OSPAR Region III area.

1.9.1.7 In light of paragraph 1.9.1.3 to 1.9.1.6, 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 1.95.

Table 1.95: 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

1.9.1.8 As outlined in paragraph 1.9.1.7, for the sites listed above a full assessment has been undertaken using information supplied in volume 2 chapter 9: Marine mammals of the PEIR. 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.

1.9.1.9 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 surveys
  - Injury and disturbance from underwater sound from vessels and other (non-piling) sound producing activities
  - Changes in prey availability
- During the operations and maintenance phase
  - Underwater sound from vessels and other vessel activities.

1.9.1.10 Baseline information is provided in section 1.9.2 for the European sites identified in paragraph 1.9.1.7, including information to support the Appropriate Assessment such as site descriptions, feature information, conservation objectives and condition assessments for the relevant European sites.

1.9.1.11 Section 1.9.3 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 1.11).

Figure 1.11: Location of European Sites designated for Annex II marine mammal features for which an Appropriate Assessment is required.

1.9.2 Baseline information

1.9.2.1 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 9.1: Marine mammal technical report of the PEIR and volume 2, chapter 9: Marine mammals of the PEIR.

North Anglesey Marine/Gogledd Môn Forol SAC

Site description

1.9.2.2 The North Anglesey Marine/Gogledd Môn Forol SAC is 23km away from the Mona Array Area and 18km away from the Mona Offshore Cable Corridor. The North Anglesey Marine/Gogledd Môn Forol SAC covers an area of 3,249km^2 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 100m with average depths of around 40-50km 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

1.9.2.3 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 southern 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).

1.9.2.4 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 - 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

1.9.2.5 There is no condition assessment available for the harbour porpoise feature of the North Anglesey Marine/Gogledd Môn Forol SAC.

Conservation objectives

1.9.2.6 The conservation objectives as outlined in JNCC, NRW and DAERA (2019)[25] and considered in the assessment which are relevant to the harbour porpoise feature are outlined below.

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

1.9.2.8 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[26] of the site in any given day[27]
    - an average of 10% of the relevant area of the site over a season[28][29]
- The condition of supporting habitats and processes, and the availability of prey is maintained.

North Channel SAC

Site description

1.9.2.9 The North Channel SAC, which is 80km away from the Mona Array Area and 96km away from the Mona Offshore Cable Corridor, 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 1604km^2. The SAC runs along the eastern 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 40m deep with a maximum of 150m to the eastern 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.

[25] https://data.jncc.gov.uk/data/f4c19257-2341-46b3-8e29-49665cd8f3d2/NorthAnglesey-Conservation-Advice.pdf

[26] 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).

[27] Applicable only in Habitats Regulations Assessments (HRA) due to impracticality of daily noise limit management of activities, but retrospective compliance analysis advised

[28] Summer defined as April to September inclusive, winter as October to March inclusive

[29] 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

1.9.2.10 Harbour porpoise are listed as Annex II species present as a qualifying feature and a primary reason for site selection.

1.9.2.11 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 - 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

1.9.2.12 There is no condition assessment available for the harbour porpoise feature of the North Channel SAC at the time of writing.

Conservation objectives

1.9.2.13 The conservation objectives as outlined in JNCC and DAERA (2019)[30] and considered in the assessment which are relevant to the harbour porpoise feature are outlined below.

1.9.2.14 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.

1.9.2.15 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

1.9.2.16 The Pen Llŷn a'r Sarnau SAC is 94km away from the Mona Array Area and 93km away from the Mona Offshore Cable Corridor. The Pen Llŷn a'r 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).

1.9.2.17 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

1.9.2.18 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

1.9.2.19 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).

1.9.2.20 The SAC contains several important pupping sites which are located around the north-west 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

1.9.2.21 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 2001-2007 (obtained from mark-recapture surveys), provided an estimate of 210 individuals for

[30] https://data.jncc.gov.uk/data/be0492aa-f1d6-4197-be22-e9a695227bdb/NorthChannel-conservation-advice.pdf

the population using Cardigan Bay SAC in 2007. A higher estimate of 379 individuals is made when calculated for the whole period 2001-2007 (NRW, 2018d).

1.9.2.22 As reported in Lohrengel *et al.* (2018) there has been an overall increase in the population size between 2001-2007 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).

1.9.2.23 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

1.9.2.24 Table 1.96 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)[31]. There are no activities identified as having a direct impact on the site condition (NRW, 2022a).

Table 1.96: 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

1.9.2.25 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)[32].

1.9.2.1 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 objectives relating to the qualifying habitats of the SAC have been screened out in the HRA Stage 1 Screening Report.

1.9.2.2 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

1.9.2.3 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.

1.9.2.4 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

1.9.2.5 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.

[31] https://cdn.cyfoethnaturiol.cymru/media/684243/indicative-condition-assessment-2018-for-pen-llyn-ar-sarnau-sacv2.pdf

[32] https://cdn.cyfoethnaturiol.cymru/media/688001/eng-pen-llyn-ar-sarnau-reg-37-report-2018.pdf

Species Features

- Grey seal *Halichoerus grypus*
- Bottlenose dolphin *Tursiops truncatus*
- Otter *Lutra lutra*

Populations

1.9.2.6 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.

1.9.2.7 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

1.9.2.8 For grey seal populations should not be reduced as a consequence of human activity.

1.9.2.9 Important elements include:

- Population size
- Structure
- Production
- Condition of the species within the site.

1.9.2.10 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

1.9.2.11 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.

1.9.2.12 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

1.9.2.13 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.

1.9.2.14 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.

1.9.2.15 For otter there are sufficient sources within the SAC and beyond of high-quality freshwater for drinking and bathing.

Restoration and recovery

1.9.2.16 As part of this objective, it should be noted that for the bottlenose dolphin and otter, populations should be increasing.

1.9.2.17 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 objectives relating to the qualifying habitats of the SAC have been screened out in the HRA Stage 1 Screening Report.

Strangford Lough SAC

Site description

1.9.2.18 The Strangford Lough SAC, which is 110km away from Mona Array Area and 127km away from Mona Cable Corridor extends from the north end, 15km east of Central Belfast, to Downpatrick in the southwest corner. The lough is a large marine inlet spanning 150km^2 on the east coast of County Down, of which about 50km^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

1.9.2.19 Harbour seal is a qualifying feature of the Strangford Lough SAC, however, is not a primary reason for site selection.

1.9.2.20 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 1995-2014, inclusive). Although it is highly likely that varying effort across years and areas has played an influential role in the trends identified.

Condition assessment

1.9.2.21 Overall the condition assessment deemed that harbour seal are in unfavourable, declining condition although the condition of supporting habitats is currently unknown (Daera, 2019)[33].

Conservation objectives

1.9.2.22 The conservation objectives outlined in DAERA (2018a)[34] 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

1.9.2.23 The Murlough SAC, which is 114km away from Mona Array Area and 129km away from Mona Offshore Cable Corridor, 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 119km^2 in the north-western Irish Sea.

Feature accounts

Harbour seal

1.9.2.24 Harbour seal is a qualifying feature of the Murlough SAC, however is not a primary reason for site selection.

1.9.2.25 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

1.9.2.26 There is no condition assessment available for the harbour seal feature of the Murlough SAC.

Conservation objectives

1.9.2.27 The conservation objectives outlined in DAERA (2018b)[35] 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

1.9.2.28 The Cardigan Bay/Bae Ceredigion SAC is located off the north Pembrokeshire coast in the southern region of Cardigan Bay. The SAC encompasses approximately 960km^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 30m deep but reaches 50m 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

1.9.2.29 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

[33] 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

[34] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/Strangford%20Lough%20SAC%20Conservation%20Objectives%202018_.pdf

[35] https://www.daera-ni.gov.uk/sites/default/files/publications/doe/Murlough%20SAC%20Conservation%20Objectives%202018%20%28002%29.pdf

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.

Grey seal

1.9.2.30 Grey seal individuals present within the Cardigan Bay/Bae Ceredigion SAC do not forma a 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).

1.9.2.31 It should be noted that although grey seal is a designated feature of the Cardigan Bay/Bae Ceredigion SAC, as outlined 1.9.1.3 to 1.9.1.8 in line with the iterative process followed this feature is not assessed fully in section 1.9.3 and 1.9.4 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

1.9.2.32 Table 1.97 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)[36]. There are no activities identified as having a direct impact on the site condition (NRW, 2022b).

Table 1.97: 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, contaminant burdens)	Favourable	Monitoring data, reports	Medium	High	Medium
Range (within site)	Favourable	Monitoring data, reports	Medium	Medium	Medium

Conservation objectives

1.9.2.33 The conservation objectives outlined in NRW (2018f)[37] and considered in the assessment which are relevant to the bottlenose dolphin feature are outlined below.

1.9.2.34 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

1.9.2.35 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.

1.9.2.36 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

[36] https://cdn.cyfoethnaturiol.cymru/media/684241/indicative-condition-assessment-2018-cardigan-bay-sacv2.pdf

[37] https://cdn.cyfoethnaturiol.cymru/media/687993/eng-cardigan-bay-reg-37-report-2018.pdf

- 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
  - 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.

1.9.2.37 Restoration and recovery

- As part of this objective it should be noted that for the bottlenose dolphin populations should be increasing.

1.9.2.38 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 objectives relating to the qualifying habitats of the SAC have either been screened out or are addressed in section 1.7.

The Maidens SAC

Site description

1.9.2.39 The Maidens SAC, which is 165km away from Mona Array Area and 181km away from the Mona Offshore Cable Corridor, is located in the North Channel to the north-east 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 74.6km^2 and ranges between Mean High Water and 200m deep and can experience currents of up to 4 knots.

Feature accounts

Grey seal

1.9.2.40 Grey seal is a qualifying feature of The Maidens SAC, however, is not a primary reason for site selection.

1.9.2.41 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

1.9.2.42 There is no condition assessment available for the grey seal feature of The Maidens SAC.

Conservation objectives

1.9.2.43 The conservation objectives outlined in DAERA (2017)[38] 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
- 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

1.9.2.44 The Pembrokeshire Marine/Sir Benfro Forol SAC 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

1.9.2.45 Grey seal are present as an Annex II species that are a primary reason for selection of this site.

1.9.2.46 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).

1.9.2.47 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

1.9.2.48 Table 1.98 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)[39]. There are no activities identified as having a direct impact on the site condition (NRW, 2018i).

Table 1.98: 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

1.9.2.49 The conservation objectives outlined in NRW (2018h)[40] 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

[38] https://www.daera-ni.gov.uk/sites/default/files/publications/daera/The%20Maidens%20SAC%20Conservation%20Objectives%202017.PDF

[39] https://cdn.cyfoethnaturiol.cymru/media/684242/indicative-condition-assessment-2018-pembrokeshire-marine-sacv2.pdf

[40] https://cdn.cyfoethnaturiol.cymru/media/687999/eng-pembrokeshire-marine-reg-37-report-2018.pdf

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.
- 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.

1.9.2.50 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.

1.9.2.51 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.

1.9.2.52 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 objectives relating to the qualifying habitats of the SAC have either been screened out or are addressed in section 1.7.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Site description

1.9.2.53 Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC, which is 276km away from the Mona Array Area and 276km away from the Mona Offshore Cable Corridor, 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 5,850km^2 with depths ranging from Mean Low Water to 70m 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

1.9.2.54 Harbour porpoise are listed as Annex II species present as a qualifying feature as a primary reason for site selection.

1.9.2.55 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 – 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

1.9.2.56 There is no condition assessment available for the harbour porpoise feature of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC.

Conservation objectives

1.9.2.57 The conservation objectives as outlined in JNCC, Natural England, DAERA (2019)[41] and considered in the assessment which are relevant to the harbour porpoise feature are outlined below.

1.9.2.58 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.

1.9.2.59 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

1.9.2.60 The Lundy SAC, which is 309km away from Mona Array Area and 308km away from Mona Offshore Cable Corridor, is located in the outer Bristol Channel off north Devon. The Lundy SAC covers an area of 30.7km^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 1.9.2.53.

Feature accounts

Grey seal

1.9.2.61 Grey seal is a qualifying feature of the Lundy SAC, however, is not a primary reason for site selection.

1.9.2.62 The SAC supports an average population of year round resident grey seals between 70 and 81 (2006-2013) with a maximum recorded of 239 in August 2011 (JNCC, 2015a; MacDonald, 2013). Pupping was observed on the site with 19 pups recorded

[41] https://data.jncc.gov.uk/data/505b3bab-a974-41e5-991c-c29ef3e01c0a/BCA-ConsAdvice.pdf

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

1.9.2.63 There is no condition assessment available for the grey seal feature of the Lundy SAC.

Conservation objectives

1.9.2.64 The conservation objectives as outlined in Natural England (2018a)[42] and considered in the assessment which are relevant to the harbour porpoise feature are outlined below.

1.9.2.65 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.

1.9.2.66 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 objectives relating to the qualifying habitats of the SAC have either been screened out or are addressed in section 1.7.

Isles of Scilly Complex SAC

Site description

1.9.2.67 The Isles of Scilly Complex, which is located 439km away from the Mona Array Area and 438km away from the Mona Offshore Cable Corridor, spans over 268.5km^2 in the Atlantic ocean 40km 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

1.9.2.68 Grey seal is a qualifying feature of the Isles of Scilly Complex SAC, however is not a primary reason for site selection.

1.9.2.69 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

1.9.2.70 There is no condition assessment available for the grey seal feature of the Isles of Scilly Complex SAC.

Conservation objectives

1.9.2.71 The conservation objectives as outlined in Natural England (2018b)[43] and considered in the assessment which are relevant to the harbour porpoise feature are outlined below.

1.9.2.72 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.

1.9.2.73 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 objectives relating to the qualifying habitats of the SAC have either been screened out or are addressed in section 1.7.

[42] http://publications.naturalengland.org.uk/publication/6356698386137088

[43] http://publications.naturalengland.org.uk/publication/6399318084812800

Reference populations

1.9.2.74 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.

1.9.2.75 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).

1.9.2.76 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 Sarnauand Cardigan Bay/Bae Ceredigion) and are highly connected (Feingold and Evans, 2014; Lohrengel *et al.,* 2018; Pesante *et al.,* 2008b).

1.9.2.77 The same approach is also considered appropriate for grey seal and harbour seal. 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. This is also supported by recent telemetry studies conducted by Wright and Sinclair (2022) which show connectivty between seal SACs in the Irish Sea.

1.9.2.78 The reference populations used within the Appropriate Assessment in section 1.9.3 and 1.9.4 are presented within Table 1.99.

Table 1.99: 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)	1,427
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'.	60,780 13,563

1.9.3 Assessment of adverse effects alone

Injury and disturbance from underwater sound generated during piling

1.9.3.1 During the construction phase sound emissions from the piling of foundations may lead to auditory injury and disturbance of marine mammals.

1.9.3.2 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 European sites and Annex II marine mammal features as listed in Table 1.95

1.9.3.3 The following sections explain how this potential impact on Annex II marine mammal features of the SACs outlined in Table 1.95 have been quantified and assessed.

1.9.3.4 The MDS considered for the assessment of potential impacts on Annex marine mammal features from underwater sound generated during piling is presented in Table 1.100.

Table 1.100: 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	• Monopiles: – Wind turbines: installation of up to 68 wind turbines with a 16m diameter monopile foundations installed by impact piling – OSPs: installation of one OSP with foundations consisting of two 16m diameter piled monopile foundations installed by impact piling – Maximum hammer energy of up to 5,500kJ – Up to two vessels piling concurrently (minimum distance 980m, maximum distance 35.2km, between piling vessels) – Maximum of up to 9.5 hours of piling for a monopile with a cumulative total of up to 665 hours. – Consecutive piling over a maximum of 24 hours. – One monopile installed per 24 hours per vessel = 70 days for a single vessel (maximum temporal) or 35 days for two vessels (maximum spatial). • Pin piles – Wind turbines: installation up to 68 3-legged jacket foundations with one pile per leg (a total of up to 204 piles) and each pile with a diameter of 5.5m installed by impact piling – OSP: installation of one OSP with 6-legged jacket foundations, with three piles per leg (a total of 18 piles) and each pile with a diameter of 5.5m installed by impact piling – Maximum hammer energy of up to 2,800kJ – Up to two vessels piling concurrently (minimum distance 980m, maximum distance 35.2km, between piling vessels) – Wind turbines: maximum duration of up to 6.4 hours piling per pile, total duration of piling per wind turbine foundation =19 hours (with a cumulative total of up to 1305.6 hours) – OSP foundation: maximum duration of up to 6.4 hours piling per pile with a cumlative total of up to 115.2 hours; installation of OSP over 6 days (=19 hours piling per day) – Consecutive piling over a maximum of 24 hours. – Single piling of 68 days for wind turbine plus approx. 6 days for OSP = 74 days (maximum temporal) or 37 days for two vessels (maximum spatial). Total piling phase (foundation installation) of up to two years within a four year construction programme.	For both monopiles and 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 marine mammals as sound from adjacent foundations could combine to produce a greater radius of effect compared to a single piling event. For both monopiles and pin piles 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. Consecutive piling is assumed over a maximum period of 24 hours.

Measures adopted as part of the Mona Offshore Wind Project

1.9.3.5 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 from underwater sound during construction are presented in Table 1.101.

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.

Measure	Justification	How the measure will be secured
Primary measures: Measures included as part of the project design		
Implementation of initiation stage, piling soft start and ramp up measures in the draft Marine Mammal Mitigation Protocol (MMMP). During piling operations, an initiation stage and soft starts will be used. This will involve the implementation of a low hammer energy with a low number of strikes used initially, followed by lower hammer energies at a higher strike rate at the beginning of the piling sequence before energy input is 'ramped up' (increased) over time to required higher levels. For monopiles, a 10 minute initiation phase is used with hammer energy of 550kJ (10% of full power piling) at a strike rate of 0.67 per minute (1 strike every 90 seconds) and then soft start duration is 20 minutes, with a hammer energy of 550kJ (10% of full power piling) and strike rate of 10 per minute. Ramp up will then increase from 550 to 5000kJ with strike rate of 15 strike per minute for 20 minutes. For pin-piles, a 10 minute initiation phase is used with hammer energy of 300kJ at a strike rate of 0.67 per minute (1 strike every 90 seconds) and then soft start duration is 20 minutes with hammer energy of 300kJ with strike rate of 10 per minute. Ramp up will then increase from 300 to 2500kJ with strike rate of 15 strike per minute for 20 minutes.	This measure will minimise the risk of injury 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 risk of injury to marine mammals to negligible levels.	Proposed to be secured through a condition in the marine licence(s)
Inclusion of low order techniques as a clearance option. Where detonation of UXO using low order techniques occurs this is considered to be primary mitigation noting, however, that it is not possible to fully commit to this measure at this stage.	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 MMMP will also include mitigation to reduce the risk of injury from UXO clearance.	Proposed to be secured through a condition in the marine licence(s)
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Development of and adherence to a MMMP, based on a draft MMMP submitted alongside the Environmental Statement. The MMMP will 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. The MMMP will be developed on the basis of the most recent published statutory guidance and in consultation with key stakeholders. Piling: for the purpose of developing the MMMP, a mitigation zone will be defined based on the maximum predicted injury range from the dual metric sound modelling for the maximum spatial scenario (monopiles and pin piles) and across all marine mammal species. The Draft MMMP will set out the measures to apply in advance of 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 (<200m) are not subject to the requirements of mitigation.	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).	Proposed to be secured through a condition in the marine licence(s)

Construction phase

Information to support assessment

Injury

1.9.3.6 The assessment of effects on marine mammals from piling considered both a maximum spatial and maximum temporal scenario for monopile and pin pile foundations. Maximum spatial scenarios assume concurrent piling of either monopiles or pin piles (leading to the largest area of effect at any one time) whilst maximum temporal scenarios are for single piling of either foundation (leading to the greatest number of days of piling). For full details on the piling scenarios assessed, see volume 2, chapter 9: Marine mammals of the PEIR.

1.9.3.7 The maximum spatial effect was predicted for monopiles with a hammer energy of 5,500kJ. At hammer initiation instantaneous injury leading to Permanent Threshold Shift (PTS), based on SPL_{pk}, could occur out to a maximum range of 330m across all species, with the maximum range predicted for harbour porpoise (Table 1.102). Using the same metric the maximum range of injury was predicted at 990m at full hammer (although this assumes animals do not move away at the start of piling, which is unlikely).

1.9.3.8 Spatial effects were smaller for the 2,800kJ pin piles with a maximum range of 196m for instantaneous injury (at hammer initiation) and 160m for cumulative exposure for concurrent piling, based on harbour porpoise (Table 1.102 and Table 1.103). Injury ranges were considerably smaller for the pin piles compared to monopiles due to: 1) lower source levels; 2) shorter installation time (relevant for the SEL_{cum} metric); and 3) reduction in source levels once the pile is below the water line (the maximum level occurred during the very short period of piling just before the pile is fully submerged).

1.9.3.9 The maximum temporal effect was predicted as the longest duration for either monopiles or 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 70 days for monopiles or 74 days for pin piles.

1.9.3.10 Tertiary mitigation in the form of a draft MMMP will be implemented as a result of the potential injury ranges predicted for marine mammals and in order to reduce the risk of PTS. Such mitigation will include deployment of an ADD, as recommended in the JNCC guidelines (2010), to deter animals from the area of impact.

1.9.3.11 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 PEIR).

Table 1.102: Summary of SPL_{pk} PTS injury ranges and areas of effect for marine mammals for single monopile and single pin pile installation (N/E = threshold not exceeded).

Species	Threshold (unweighted peak)	Hammer energy level	Monopile		Pin pile	
			Range of effect (m)	Area of effect (km^2)	Range of effect (m)	Area of effect (km^2)
Porpoise (VHF)	202dB re 1 µPa (pk)	Initiation (first strike)	330	0.34	196	0.12
		Full energy (maximum)	990	3.08	610	1.17
Bottlenose, Risso's, Common dolphin (HF)	230dB re 1 µPa (pk)	Initiation (first strike)	37	0.00	19	0.00
		Full energy (maximum)	111	0.04	59	0.01
Phocids (Grey seal and harbour seal) (PCW)	218dB re 1 µPa (pk)	Initiation (first strike)	95	0.03	52	0.01
		Full energy (maximum)	284	0.25	161	0.08

Table 1.1031: Summary of SEL_{cum} PTS injury ranges and areas of effect for marine mammals for monopile and pin pile installation (N/E = threshold not exceeded).

Species	Threshold (SEL weighted)	Scenario	Monopile		Pin pile	
			Range of effect (m)	Area of effect (km^2)	Range of effect (m)	Area of effect (km^2)
Porpoise (VHF)	PTS - 155dB re 1 µPa2s	Single	2,150	14.52	N/E	0.00
		Concurrent	3,330	34.84	N/E	0.00
		Consecutive (24hrs)	2,225	15.55	N/E	0.00
Bottlenose, Risso's, Common dolphin (HF)	PTS - 185dB re 1 µPa2s	Single	N/E	0.00	N/E	0.00
		Concurrent	N/E	0.00	N/E	0.00
		Consecutive (24hrs)	N/E	0.00	N/E	0.00
Phocids (Grey seal and harbour seal) (PCW)	PTS - 185dB re 1 µPa2s	Single	N/E	0.00	N/E	0.00
		Concurrent	N/E	0.00	N/E	0.00
		Consecutive (24hrs)	N/E	0.00	N/E	0.00

Harbour porpoise

1.9.3.12 For monopiles, with primary and tertiary mitigation applied, and based on the largest predicted range of 745m (i.e. using the SEL_{cum} metric), the maximum number of individuals that could be potentially injured calculated using the highest density value of 0.097 animals per km^2 is no more than one harbour porpoise. 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 ~23km.

1.9.3.13 Volume 2, chapter 9: Marine mammals of the PEIR shows that the use of an ADD reduced the maximum injury zones based on the SEL_{cum} metric at monopiles and 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.

Bottlenose dolphin

1.9.3.14 For bottlenose dolphin with primary and tertiary mitigation applied and based on the largest predicted range of 111m (i.e. using the SPL_{pk} metric), there is no residual risk of injury during piling.

Grey seal

1.9.3.15 For grey seal with primary and tertiary mitigation applied, and based on the largest predicted range of 284m (i.e. using the SPL_{pk} metric), there is no residual risk of injury during piling.

Harbour seal

1.9.3.16 For harbour seal, with primary and tertiary mitigation applied, and based on the largest predicted range of 284m (i.e. using the SPL_{pk} metric), there is no residual risk of injury during piling.

Disturbance

1.9.3.17 Disturbance during piling was predicted to have far-reaching 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 9: Marine mammals of the PEIR). 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 9: Marine mammals of the PEIR). The estimated numbers of animals predicted to experience potential disturbance as a result of different piling scenarios is presented in volume 2, chapter 9: Marine mammals of the PEIR, with the most conservative disturbance estimates summarised below for each relevant Annex II marine mammal feature.

1.9.3.18 The NMFS guidelines suggest a precautionary level of 140dB re 1µPa (rms) to indicate the onset of low-level marine mammal disturbance effects for all mammal groups for impulsive sound (NMFS, 2005), although this is not considered likely to lead to a 'significant' disturbance response. The assessment adopted the NMFS criteria of non-trivial (strong) disturbance (160dBrms) and trivial (mild) disturbance (140dBrms) for all impacts other than for piling which used a dose-response approach. For more information on the dose-response approach see volume 2, chapter 9: Marine mammals of the PEIR.

Harbour porpoise

1.9.3.19 The most conservative estimate of disturbance led to up to 587 animals (based on peak seasonal density) predicted to experience potential disturbance from concurrent piling of monopiles at a maximum hammer energy of 5,500kJ (based on the dose-response approach). This equates to 0.94% of the Celtic and Irish Seas MU population (based upon 586.61 animals). As a comparison with the US National Marine Fisheries Service thresholds NMFS (2005) for mild and strong disturbance ($140dB_{rms}$ and $160dB_{rms}$ respectively) it can be estimated that up to 119 animals are predicted to experience strong disturbance (i.e. above $160dB_{rms}$ ≡150dB SEL_{ss}), whist up to 450 animals are likely to experience mild disturbance (between 140 and $160dB_{rms}$ ≡ 130 to 150dB SEL_{ss}).

Bottlenose dolphin

1.9.3.20 The outermost sound contours predicted from the maximum hammer energy of 5,500kJ reaches the coastal areas North Wales and England and therefore overlaps with the key distribution of bottlenose dolphin. The most conservative estimate of disturbance led to up to 17 animals predicted to experience potential disturbance from concurrent piling of monopiles at a maximum hammer energy of 5,500kJ. This equates to 5.8% of the Irish Sea MU population (based upon 16.68 animals).

1.9.3.21 This is a highly conservative estimate using high density values for the coastal regions and assumes a uniform distribution throughout the area. In addition, the 6km coastal area lies ~22km from the nearest boundary of the Mona Array Area and at this distance the received level from piling will have lost much of the impulsive characteristics (see volume 2, chapter 9: Marine mammals PEIR). Thus, the estimated number of bottlenose dolphin with the potential to be disturbed in offshore waters, should be interpreted with caution as this is likely to be an overestimate.

Grey seal

1.9.3.22 For grey seal, the most conservative estimate of disturbance led to up to 93 animals (Carter *et al.,* 2022 densities) predicted to experience potential disturbance from concurrent piling of monopiles at a maximum hammer energy of 5,500kJ. This equates to 0.68% of the Grey Seal Reference Population (Wales, NW England, SW Scotland and Northern Ireland SMUs) or 0.15% of the OSPAR Region III population (based on 92.43 animals).

Harbour seal

1.9.3.23 For harbour seal, the most conservative estimate of disturbance led to up to one animal (using densities from Carter *et al.,* 2022) predicted to experience potential disturbance from concurrent piling of monopiles at a maximum hammer energy of 5,500kJ. This equates to 0.03% of the harbour seal reference population (Wales, NW England, Northern Ireland SMUs) (based upon 0.48 animals).

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

Injury

1.9.3.24 As outlined in paragraph 1.9.2.7, for monopiles, with primary and tertiary mitigation applied, and based on the largest predicted range the maximum number of harbour porpoise that could be potentially injured is no more than one animal. Volume 2, chapter 9: Marine mammals 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.

1.9.3.25 Whilst PTS could affect a small number of animals (one animal) leading to measurable changes at an individual level, this is unlikely to affect the wider population. The residual number of animals predicted to experience PTS were carried forward to the Interim Population Consequences of Disturbance (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 9: Marine mammals of the PEIR).

Disturbance

1.9.3.26 In line with guidance from stakeholders (JNCC, NRW and Natural England) the Effective Deterrence Range (EDR) approach has been used 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 26km deterrence range for piling (monopiles without sound mitigation at source) which is informed by studies from Tougaard *et al.* (2013) and Dähne *et al.* 2013. The implementation of a 26km EDR rules out potential disturbance to harbour porpoise features of all SACs screened into the ISAA, except for the North Anglesey Marine SAC (which is located 22km from the Mona Array Area).

1.9.3.27 Figure 1.12 shows the potential overlap between the 26km 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. During piling at this location, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC would be 85.03km^2 which equates to 2.6% of the relevant area of the SAC (for a single piling activity on any given day). This is well within the daily 20% disturbance threshold as outlined in Table 1.104. As this is the closest piling location, disturbance associated with all other piling locations within the Mona Array Area would result in a reduced extent of spatial overlap with the SAC.

1.9.3.28 In terms of disturbance across the site averaged over the season (summer, 183 days) a daily footprint of 85.03km^2 over 74 days of piling across the construction phase (see Table 1.100) would result in an average of 1.05% of the relevant area of the SAC being affected over the season. This therefore falls well within the threshold of 10% of the relevant area of the site over the season (Table 1.104).

Table 1.104: Disturbance thresholds for the North Anglesey Marine/Gogledd Môn Forol SAC

Guidance threshold	Justification
20% of the relevant area[44] of the site in any given day	Maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC would be 85.03km^2 (for a single piling activity on any given day), which equates to 2.6% 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 85.03km^2 over 74 days of piling across the construction phase would result in an average of 1.05% of the relevant area of the SAC over the season (summer, 183 days).[45]

[44] 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 3,249km^2 which is used as the relevant area to inform the calculations.

[45] A daily footprint of 2.6% for 74 days would result in an average of 2.6x74/183 days (summer) = 1.05%

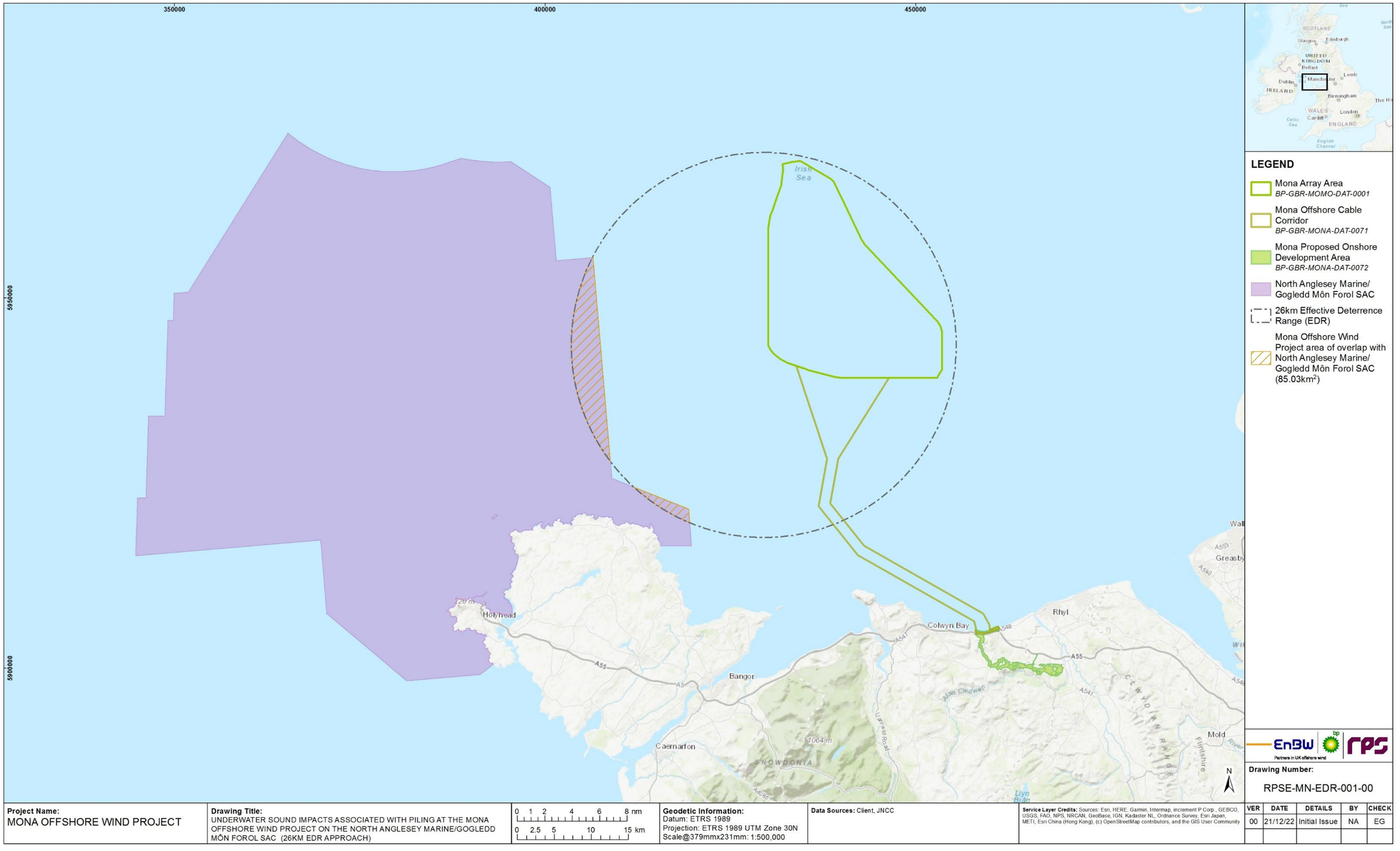


Figure 1.12: Maximum spatial overlap of underwater sound impacts associated with piling at the Mona Offshore Wind Project on the North Anglesey Marine/Gogledd Môn Forol SAC based on the 26km EDR approach.

Conclusions

1.9.3.29 Adverse effects on the qualifying Annex II marine mammal features which undermine the conservation objectives of the North West 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 1.9.2) is discussed in Table 1.105.

Table 1.105: 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	As outlined in paragraph 1.9.3.10, there is the potential for no more than one animal to be injured during piling activities associated with the construction phase. In addition, the implementation of the MMMP will reduce the number of individuals affected further as harbour porpoise features will be deterred beyond the predicted injury ranges. As outlined in paragraph 1.9.3.24, the maximum area of disturbance, based on the 26km EDR, within the North Anglesey Marine/ /Gogledd Môn Forol SAC would be 85.03km^2 (for a single piling activity on any given day) which does not exceed either of the thresholds for significant disturbance. 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 1.9.3.24, the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC would be 85.03km^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 the population 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, although some short-term disturbance is predicted to potential prey fish species (see volume 2, chapter 9: Fish and shellfish ecology of the PEIR), 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.

1.9.3.30 Therefore, it can be concluded 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

1.9.3.31 The North Channel SAC is located at an increased distance to the Mona Offshore Wind Project (80km from the Mona Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, assessed in paragraphs 1.9.3.24 to 1.9.3.30. 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

1.9.3.32 The North Channel SAC is located 80km from the Mona Array Area, which is beyond the 26km EDR outlined in JNCC (2020). There is therefore no spatial overlap with the North Channel SAC, and the thresholds for significant disturbance, as outlined in Table 1.104, would not be exceeded.

Conclusions

1.9.3.33 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 1.9.2) is discussed in Table 1.106.

Table 1.106: 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	As outlined in paragraph 1.9.3.10, there is the potential for no more than one animal to be injured during piling activities associated with the construction phase. In addition, the implementation of the MMMP will reduce the number of individuals affected further as harbour porpoise will be deterred beyond the predicted injury ranges. The North Channel SAC is located 80km from the Mona Array Area, which is beyond the 26km EDR outlined in JNCC (2020). There is therefore no spatial overlap with the North Channel SAC, the thresholds for significant disturbance as outlined in Table 1.38 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 80km from the Mona Array Area, which is outside the 26km EDR outlined in JNCC (2020). There is therefore no spatial overlap with the North Channel SAC, the thresholds for significant disturbance as outlined in Table 1.38 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.
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 (see volume 2, chapter 9: Fish and shellfish ecology of the PEIR), 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.

1.9.3.34 Therefore, it can be concluded 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

1.9.3.35 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located at an increased distance to the Mona Offshore Wind Project (276km from the Mona Array Area) than the North Channel SAC, assessed in paragraphs 1.9.3.31 to 1.9.3.34. 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

1.9.3.36 The Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located 276km from the Mona Array Area, which is beyond the 26km EDR 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 1.104 would not be exceeded.

Conclusions

1.9.3.37 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 1.9.2) is discussed in Table 1.107.

Table 1.107: 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	As outlined in paragraph 1.9.3.10, there is the potential for no more than one harbour porpoise to be injured during piling activities associated with the construction phase. In addition, the implementation of the MMMP 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 276km from the Mona Array Area, which is outside the 26km EDR 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 1.38 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 Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC is located 276km from the Mona Array Area, which is outside the 26km EDR 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 1.36, 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, although some short-term disturbance is predicted to potential prey fish species (see volume 2, chapter 9: Fish and shellfish ecology of the PEIR), 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.

1.9.3.38 Therefore, it can be concluded 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

1.9.3.39 As outlined in paragraph 1.9.3.14 for bottlenose dolphin, with the primary and tertiary mitigation detailed in Table 1.101 applied there is no residual risk of injury during piling.

Disturbance

1.9.3.40 As outlined in paragraph 1.9.3.20 and 1.9.3.21, the most conservative estimate of disturbance would result in up to 17 animals predicted to experience potential disturbance from concurrent piling of monopiles at a maximum hammer energy of 5,500kJ, which equates to 5.69% of the Irish Sea MU population. Volume 2, chapter 9: Marine mammals of the PEIR does however state that the estimated number of bottlenose dolphin with the potential to be disturbed in offshore waters, should be interpreted with caution as this is likely to be an overestimate as density values used assume for the coastal regions and assumes a uniform distribution throughout the area. In addition, the 6km coastal area lies ~22km from the nearest boundary of the Mona Array Area and at this distance the received level from piling will have lost much of the impulsive characteristics.

1.9.3.41 Whilst nearly 6% of the reference population would be affected during piling the results of the iPCoD modelling suggest 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 bottlenose dolphin population. The impact could result in some measurable changes to individuals that are disturbed (i.e. interruption of feeding or breeding and/or displacement to alternative areas), however, there would be no population-level consequences of disturbance. Further information on the iPCoD modelling is provided in Appendix A of volume 2, chapter 9: Marine mammals of the PEIR.

Grey seal

Injury

1.9.3.42 As outlined in paragraph 1.9.3.16, for grey seal, with the primary and tertiary mitigation detailed in Table 1.101: applied, and based on the largest predicted range of 284m, there is no residual risk of injury during piling.

Disturbance

1.9.3.43 As outlined in paragraph 1.9.3.22, for grey seal, the most conservative estimate of disturbance led to up to 93 animals which equates to 0.68% of the grey seal reference population or 0.15% of the OSPAR Region III population.

1.9.3.44 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 9: Marine mammal 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 448km 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.

1.9.3.45 In summary, as outlined above a small proportion (up to 0.68% of the grey seal reference population, or 0.15% of OSPAR Region III) would be affected during piling. Results of the 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 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 effects on this species. Further information on the iPCoD modelling is provided in Appendix A of volume 2, chapter 9: Marine mammals of the PEIR.

Conclusions

1.9.3.46 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 1.9.2) 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 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. For bottlenose dolphin the most conservative estimate of disturbance led to up to 17 animals predicted to experience potential disturbance, which equates to 5.8% of the Irish Sea MU. For grey seal the most conservative estimate of disturbance led to up to 93 animals which equates to 0.68% of the grey seal reference population or 0.15% 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 448km reported in Carter et al., 2022) seals could move to alternative foraging grounds during piling. The iPCoD modelling suggests 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 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 (see volume 2, chapter 8: Fish and shellfish ecology of the PEIR), 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. 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.

1.9.3.47 Therefore, it can be concluded 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

1.9.3.48 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Mona Offshore Wind Project (163km from the Mona Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.9.3.39 to 1.9.3.47. 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 1.101 applied there is no residual risk of injury during piling).

Conclusions

1.9.3.49 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 1.9.2) 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 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 1.35 applied, there is no residual risk of injury during piling. For bottlenose dolphin the most conservative estimate of disturbance led to up to 17 animals predicted to experience potential disturbance, which equates to 5.8% of the MU (noting that this is highly precautionary and likely to be an overestimate). However, the iPCoD modelling 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 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 (see volume 2, chapter 8: Fish and shellfish ecology of the PEIR), 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. 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.

1.9.3.50 Therefore, 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 associated with piling from the Mona Offshore Wind Project alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.9.3.51 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Mona Offshore Wind Project (212km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau, assessed in paragraphs 1.9.3.39 to 1.9.3.47. 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 1.101 applied there is no residual risk of injury during piling).

Conclusions

1.9.3.52 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 1.9.2) is discussed in Table 1.110. 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 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 1.35 applied, there is no residual risk of injury during piling. The most conservative estimate of disturbance led to up to 93 animals which equates to 0.68% of the grey seal reference population or 0.15% 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 448km reported in Carter et al., 2022) seals could move to alternative foraging grounds during piling. The iPCoD modelling 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 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 (see volume 2, chapter 8: Fish and shellfish ecology of the PEIR), 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. 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.

1.9.3.53 Therefore, it can be concluded 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

1.9.3.54 For harbour seal, with primary and tertiary mitigation detailed in Table 1.101 applied, and based on the largest predicted range of 284m (i.e. using the SPL_{pk} metric), there is no residual risk of injury during piling.

Disturbance

1.9.3.55 As outlined in paragraph 1.9.3.23, for harbour seal, the most conservative estimate of disturbance led to up to one animal which equates to 0.03% of the harbour seal reference population (Wales, NW England, Northern Ireland SMUs). Volume 2, chapter 9: Marine mammals of the PEIR 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 0.03% 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

1.9.3.56 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 1.9.2) is discussed 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 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 1.35 applied, there is no residual risk of injury during piling. For harbour seal, the most conservative estimate of disturbance led to up to one animal predicted to experience potential disturbance which equates to 0.03% of the harbour seal reference population (Wales, NW England, Northern Ireland SMUs). 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 0.03% 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.

1.9.3.57 Therefore, it can be concluded 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

1.9.3.58 The Murlough SAC is located at an increased distance to the Mona Offshore Wind Project (114km from the Mona Array Area) than the Strangford Lough SAC, assessed in paragraphs 1.9.3.54 to 1.9.3.57. 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 1.101 applied there is no residual risk of injury during piling).

Conclusions

1.9.3.59 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 1.9.2) is discussed in Table 1.112. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.112: 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 1.35 applied, there is no residual risk of injury during piling. For harbour seal, the most conservative estimate of disturbance led to up to one animal predicted to experience potential disturbance which equates to 0.03% of the harbour seal reference population (Wales, NW England, Northern Ireland SMUs). 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 0.03% 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.

1.9.3.60 Therefore, it can be concluded 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

1.9.3.61 The Maidens SAC is located at an increased distance to the Mona Offshore Wind Project (165km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.3.39 to 1.9.3.47. 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 1.101 applied there is no residual risk of injury during piling).

Conclusions

1.9.3.62 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 1.9.2) is discussed in Table 1.113 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.113: 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 1.35 applied, there is no residual risk of injury during piling. The most conservative estimate of disturbance led to up to 93 animals predicted to experience potential disturbance which equates to 0.68% of the grey seal reference population or 0.15% 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 448km reported in Carter et al., 2022), seals could move to alternative foraging grounds during piling. The iPCoD modelling 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 harbour 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.

1.9.3.63 Therefore, it can be concluded 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

1.9.3.64 The Lundy SAC is located at an increased distance to the Mona Offshore Wind Project (309km from the Mona Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.9.3.39 to 1.9.3.47. 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 1.101 applied there is no residual risk of injury during piling).

Conclusions

1.9.3.65 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 1.9.2) is discussed in Table 1.114 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.114: 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 1.35 applied there is no residual risk of injury during piling. The most conservative estimate of disturbance led to up to 93 animals predicted to experience potential disturbance which equates to 0.68% of the Grey Seal Reference Population or 0.15% 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 448km reported in Carter et al., 2022) seals could move to alternative foraging grounds during piling. The iPCoD modelling 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.

1.9.3.66 Therefore, it can be concluded 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

1.9.3.67 The Isles of Scilly Complex SAC is located at an increased distance to the Mona Offshore Wind Project (439km from the Mona Array Area) than the Lleyn Peninsula and the Sarnau/Pen Llyn a`r Sarnau SAC, assessed in paragraphs 1.9.3.39 to 1.9.3.47. 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 1.101 applied there is no residual risk of injury during piling).

Conclusions

1.9.3.68 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 1.9.2) 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 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 1.35 applied there is no residual risk of injury during piling. The most conservative estimate of disturbance led to up to 93 animals predicted to experience potential disturbance which equates to 0.68% of the Grey Seal Reference Population or 0.15% 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 448km reported in Carter et al., 2022) seals could move to alternative foraging grounds during piling. The iPCoD modelling 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.

1.9.3.69 Therefore, it can be concluded 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

1.9.3.70 As outlined in paragraphs 1.9.1.3 to 1.9.1.8, 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 1.9.3.24 to 1.9.3.69 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.9.3.71 to 1.9.3.93.

West Wales Marine/Gorllewin Cymru Forol SAC

1.9.3.71 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.9.3.72 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 1.9.3.39 to 1.9.3.47), 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 alone.

Saltee Islands SAC

1.9.3.73 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 1.9.3.39 to 1.9.3.47), 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 alone.

Rockabill to Dalkey Island SAC

1.9.3.74 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Roaringwater Bay and Islands SAC

1.9.3.75 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Blasket Islands SAC

1.9.3.76 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.9.3.77 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Abers - Côte des legends SCI

1.9.3.78 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Ouessant-Molène SCI

1.9.3.79 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Côte de Granit rose-Sept-Iles SCI

1.9.3.80 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 1.9.3.24 to 1.9.3.34), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCIas a result of underwater sound associated with piling from the Mona Offshore Wind Project alone.

Anse de Goulven, dunes de Keremma SCI

1.9.3.81 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 1.9.3.24 to 1.9.3.34), 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 piling from the Mona Offshore Wind Project alone.

Tregor Goëlo SCI

1.9.3.82 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Côtes de Crozon SCI

1.9.3.83 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Chaussée de Sein SCI

1.9.3.84 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Cap Sizun SCI

1.9.3.85 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Récifs du talus du golfe de Gascogne SCI

1.9.3.86 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Anse de Vauville SCI

1.9.3.87 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Cap d'Erquy-Cap Fréhel SCI

1.9.3.88 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Baie de Saint-Brieuc – Est SCI

1.9.3.89 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Banc et récifs de Surtainville SCI

1.9.3.90 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.9.3.91 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Estuaire de la Rance SCI

1.9.3.92 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Baie du Mont Saint-Michel SCI

1.9.3.93 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 1.9.3.24 to 1.9.3.34), 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 associated with piling from the Mona Offshore Wind Project alone.

Injury and disturbance from underwater sound generation from unexploded ordnance (UXO) detonation

1.9.3.94 UXO detonation during the construction phase may result in hearing damage/auditory injury or behavioural disturbance/displacement (including barrier effects) of marine mammals.

1.9.3.95 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 1.94.

1.9.3.96 The following sections explain how this potential impact on Annex II marine mammal features of the SACs oulined above have been quantified and assessed.

1.9.3.97 The MDS considered for the assessment of potential impacts on Annex II marine mammals for underwater sound from UXO detonation is presented in Table 1.116

Table 1.116: Maximum design scenario considered for the assessment of potential impacts on 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 • A range of UXO sizes assessed from 25kg up to 907kg with 130kg the most likely (common) maximum • For high order detonation donor charges of 1.2kg (most common) and 3.5kg (single barracuda blast charge) • Up to 0.5kg 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 0.08kg • Low yield clearance configurations of 0.75kg charges (up to 4x0.75kg).	Maximum number and maximum size of UXOs encountered in the Mona Array Area and Mona Offshore Cable Corridor. Due to uncertainties in size of UXOs the assessment presents a range, highlighting the most likely size (common) to be encountered. Most likely and maximum donor charges 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 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

1.9.3.98 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 1.101.

Construction phase

Information to support assessment

Injury-PTS

1.9.3.99 Volume 2, chapter 9: Marine mammals of the PEIR 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 two harbour porpoise. The number of animals predicted to experience PTS due to high order clearance of UXO is less than one bottlenose dolphin and harbour seal, up to six grey seal and up to 72 harbour porpoise. Additional information is provided in volume 2, chapter 9: Marine mammals of the PEIR.

1.9.3.100 As reported in volume 2, chapter 9: Marine mammals of the PEIR an explosive mass of 907kg (high order explosion) yielded the largest PTS ranges for all species, with the greatest range of effects (15,370m) predicted for harbour porpoise (SPL_{pk}). However, the more common 130kg charge sees this injury range reduce to 8,045m for harbour porpoise (SPL_{pk}). Conservatively, the number of harbour porpoise that could be potentially injured, based on the peak seasonal densities from the Mona digital aerial surveys, was estimated as 72 animals for 907kg UXO high order explosion equating to 0.12% of the Celtic and Irish Seas MU. Predicted numbers were much smaller for the 130kg with up to 20 animals potentially experiencing PTS, respectively. For low order techniques, the largest range of 2,290m was predicted from the 4x0.75kg low-yield charges, which could injure up to two harbour porpoise within this range.

1.9.3.101 The underwater sound assessment found that the maximum injury (PTS) range estimated for bottlenose dolphin using the SPL_{pk} metric is 890m for the detonation of charge size of 907kg, but this is reduced to 464m for 130kg and 268m for 25kg. Therefore conservatively, during high order detonation of any size of UXO up to the maximum the number of individuals that could be potentially injured for any of these species (based on densities presented in volume 2, chapter 9: Marine mammals of the PEIR) was estimated to be no more than one. With reference to the wider population, this equated to very small proportions of the relevant MU (0.03%). For low order techniques, the injury ranges were considerably lower with a maximum of 133m estimated with no more than one animal of any species likely to be present within this range.

1.9.3.102 The underwater sound assessment found that the maximum injury (PTS) range estimated for grey seal using the SPL_{pk} metric was 3,015m for the detonation of charge size of 907kg, but this was reduced to 1,580m for 130kg and 910m for 25kg. Therefore conservatively, 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, which equates to 0.04% of the grey seal reference population or 0.009% of the OSPAR III population, and less than two animals for 130kg UXO and less than one animal for 25kg UXO. For low order techniques, the maximum range predicted was up to 449m and there would be no more than one animal potentially within this impact range.

1.9.3.103 The underwater sound assessment found that the maximum injury (PTS) range estimated for harbour seal using the SPL_{pk} metric was 3,015m for the detonation of charge size of 907kg, but this was reduced to 1,580m for 130kg and 910m for 25kg. Therefore conservatively, the number of individuals that could be potentially injured, was estimated as less than one animal for 907kg UXO high order explosion, 130kg UXO and 25kg 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 449m and there would be no more than one animal potentially within this impact range.

1.9.3.104 Further detail on underwater sound modelling of UXO clearance are provided in volume 5, annex 3.1: Underwater sound technical report of the PEIR and volume 2, chapter 9: Marine mammals of the PEIR.

Behavioural displacement (TTS as a proxy)

1.9.3.105 Within volume 2, chapter 9: Marine mammals of the PEIR 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. The onset of TTS also corresponds to a 'moving away response' as this is the threshold at which animals are likely to move away or flee from the ensonified area. Thus, the onset of TTS also reflects the threshold at which behavioural displacement could occur.

1.9.3.106 As before, the assessment of TTS considered low order and low yield UXO clearance activities, donor charges for high order UXO disposal and high order explosions as there is potential for high order explosions. The largest ranges using SPL_{pk} were predicted for clearance of the 907kg UXO with potential TTS/moving away response over a distance of up to ~28km for harbour porpoise. Ranges predicted for other species using SPL_{pk} were smaller for all other species, with potential TTS/moving away response over a distance of up to 1.6km and 5.5km for bottlenose dolphin, grey seal and harbour seal, respectively.

1.9.3.107 As seen for PTS the highest number of animals affected, based on high order detonation of a 907kg UXO, was found for harbour porpoise where up to 245 animals could experience TTS within the 28km impact range equating to 0.39% of the MU population (based on SPL_{pk}). For bottlenose dolphin less than one animal could experience TTS within the 1.6km impact range (based on SPL_{pk}). The number of grey seal within a predicted 6.47km TTS range was estimated as 26 animals (0.19% of the Grey seal reference population or 0.042% of the OSPAR region III population) (based on SEL) and for harbour seal less than one animal could experience TTS within the 6.5km impact range (based on SEL).

1.9.3.108 Further detail on sound modelling of UXO clearance are provided in volume 5, annex 3.1: Underwater sound technical report of the PEIR and volume 2, chapter 9: Marine mammals of the PEIR.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.9.3.109 The conclusions presented onwards are based on the assessment for high order clearance.

1.9.3.110 As outlined in paragraph 1.9.3.100 the number of harbour porpoise that could be potentially injured was estimated as 72 animals for 907kg UXO high order explosion which equates to 0.12% of the Celtic and Irish Seas MU. For TTS, as outlined in paragraph 1.9.3.106 the number of harbour porpoise potentially affected by TTS based on high order detonation of a 907kg UXO, was up to 245 animals which equates to 0.39% of the MU population.

1.9.3.111 With the implementation of primary measures in place, (outlined in Table 1.101) volume 2, chapter 9: Marine mammals of the PEIR identified that there would be a residual risk of injury over a range of 2,290m 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 15km for a 907kg UXO and 8km for a 130kg UXO. Therefore, tertiary mitigation will be applied as part of a MMMP in line with standard industry practice (JNCC, 2010b). Tertiary mitigation will therefore also include the use of ADDs and scare charges to deter animals from the injury zone (see Table 1.101). 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.

1.9.3.112 For harbour porpoise the ranges of effect are large and there is considered to be a residual risk of PTS to a small 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.

Conclusions

1.9.3.113 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 1.9.2) is discussed in turn in Table 1.117 below.

Table 1.117: 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 1.9.3.111, where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to 15km for a 907kg UXO and 8km for a 130kg UXO. The North Anglesey Marine/Gogledd Môn Forol SAC is located 23km 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 (0.12%). TTS 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	TTS and behavioural disturbance is considered reversible and 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 behavioural 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 and the SAC and therefore harbour porpoise will not be excluded from any part of the SAC and the disturbance thresholds outlined in Table 1.104 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.

1.9.3.114 Therefore, it can be concluded 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

1.9.3.115 The North Channel SAC is located at an increased distance to the Mona Offshore Wind Project (80km from the Mona Array Area) than the North Anglesey Marine/Gogledd Môn Forol SAC, assessed in paragraphs 1.9.3.113 to 1.9.3.14. 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

1.9.3.116 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 1.9.2) is discussed in Table 1.118 below.

Table 1.118: 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 1.9.3.111, where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to 15km for a 907kg UXO and 8km for a 130kg UXO. The North Channel SAC is located 80km 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 (0.12%). TTS 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	TTS and behavioural disturbance is considered reversible and 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 behavioural 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 and the SAC and therefore harbour porpoise will not be excluded from any part of the SAC and the disturbance thresholds outlined in Table 1.104 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.

1.9.3.117 Therefore, it can be concluded 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

1.9.3.118 The Bristol Channel Approaches SAC is located at an increased distance to the Mona Offshore Wind Project (276km from the Mona Array Area) than the North Channel SAC, assessed in paragraphs 1.9.3.115 to 1.9.3.117. 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

1.9.3.119 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 1.9.2) is discussed in Table 1.119 below.

Table 1.119: 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 1.9.3.111, where low order/low yield measures are not possible there is a maximum risk of injury (predicted for harbour porpoise) out to 15km for a 907kg UXO and 8km for a 130kg UXO. The Bristol Channel Approaches SAC is 276km 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 (0.12%). TTS 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	TTS and behavioural disturbance is considered reversible and 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 behavioural 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 and the SAC and therefore harbour porpoise will not be excluded from any part of the SAC and the disturbance thresholds outlined in Table 1.104 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.

1.9.3.120 Therefore, it can be concluded 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

1.9.3.121 As outlined in paragraph 1.9.3.101, considering the maximum injury (PTS) range estimated for bottlenose dolphin using the SPL_{pk} metric (890m) the maximum the number of individuals that could be potentially injured for any of these species (based on densities presented in volume 2, chapter 9: Marine mammals of the PEIR) was estimated to be no more than one. With reference to the wider population, this equated to very small proportions of the relevant MU (0.03%). For low order techniques, the injury ranges were considerably lower. As outlined in paragraph 1.9.3.192, less than one bottlenose dolphin could experience TTS within the 1.6km impact range, which equates to 0.34% of the MU.

1.9.3.122 Tertiary mitigation will be applied as part of a MMMP in line with standard industry practice (JNCC, 2010b). Tertiary mitigation will therefore 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.

1.9.3.123 As outlined in paragraph 1.9.3.101, 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.

Grey seal

1.9.3.124 As outlined in paragraph 1.9.3.102, 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, which equates to 0.04% of the grey seal reference population or 0.009% of the OSPAR III population. For grey seal the number of animals within a predicted 6.47km TTS range was estimated as 26 animals (0.19% of the Grey seal reference population or 0.042% of the OSPAR region III population).

1.9.3.125 Tertiary mitigation will be applied as part of a MMMP in line with standard industry practice (JNCC, 2010b). Tertiary mitigation will therefore 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.

1.9.3.126 As outlined in paragraph 1.9.3.102, 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

1.9.3.127 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 1.9.2) is discussed in Table 1.120below. 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 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. TTS impacts are 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 the bottlenose dolphin 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. TTS 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 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 population 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 significant or long-term 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

1.9.3.128 Therefore, it can be concluded 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

1.9.3.129 The Cardigan Bay/Bae Ceredigion SAC is located at an increased distance to the Mona Offshore Wind Project (163km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.3.121 to 1.9.3.143. 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

1.9.3.130 As outlined in paragraph 1.9.3.101, considering the maximum injury (PTS) range estimated for bottlenose dolphin using the SPL_{pk} metric (890m) the maximum the number of individuals that could be potentially injured for any of these species (based on densities presented in volume 2, chapter 9: Marine mammals of the PEIR) was estimated to be no more than one. With reference to the wider population, this equated to very small proportions of the relevant MU (0.03%). For low order techniques, the injury ranges were considerably lower. As outlined in paragraph 1.9.3.107, <1 bottlenose dolphin could experience TTS within the 1.6km impact range, which equates to 0.34% of the MU.

1.9.3.131 Tertiary mitigation will be applied as part of a MMMP in line with standard industry practice (JNCC, 2010b). Tertiary mitigation will therefore 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.

1.9.3.132 As outlined in paragraph 1.9.3.101, 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 CIS MU potentially affected.

Conclusions

1.9.3.133 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 1.9.2) 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 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	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. TTS 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 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.
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 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 significant or long-term 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.

1.9.3.134 Therefore, 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 from the Mona Offshore Wind Project alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.9.3.135 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Mona Offshore Wind Project (212km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.3.121 to 1.9.3.143. 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

1.9.3.136 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 1.9.2) is discussed in Table 1.122

1.9.3.137 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 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. TTS 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 significant or long-term 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.

1.9.3.138 Therefore, it can be concluded 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

1.9.3.139 As outlined in paragraph 1.9.3.103, 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 907kg UXO high order explosion, 130kg UXO and 25kg UXO, which equates to up to 0.002% of the reference population (Wales, NW England and Northern Ireland SMUs).

1.9.3.140 Tertiary mitigation will be applied as part of a MMMP in line with standard industry practice (JNCC, 2010b). Tertiary mitigation will therefore 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.

1.9.3.141 As outlined in paragraph 1.9.3.103, 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 SMU potentially affected.

Conclusions

1.9.3.142 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 1.9.2) 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 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. TTS impacts are 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 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 1.9.2. 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.
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 significant or long-term ensuring that the Mona Offshore Wind Project will not prevent physical features from being maintained or enhanced.

1.9.3.143 Therefore, it can be concluded 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

1.9.3.144 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 (114km from the Mona Array Area) than the Strangford Lough SAC, assessed in paragraphs 1.9.3.139 to 1.9.3.143. 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

1.9.3.145 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 1.9.2) 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 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. TTS 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 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 1.9.2. 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.
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 significant or long-term ensuring that the Mona Offshore Wind Project will not prevent physical features from being maintained or enhanced.

1.9.3.146 Therefore, it can be concluded 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

1.9.3.147 The Maidens SAC is located at an increased distance to the Mona Offshore Wind Project (165km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.3.121 to 1.9.3.143. 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

1.9.3.148 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 1.9.2) 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 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. TTS 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 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 1.9.2. 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.
To maintain and enhance, as appropriate, physical features used by grey 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 significant or long-term ensuring that the Mona Offshore Wind Project will not prevent physical features from being maintained or enhanced.

1.9.3.149 Therefore, it can be concluded 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

1.9.3.150 The Lundy SAC is located at an increased distance to the Mona Offshore Wind Project (309km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.3.121 to 1.9.3.143. 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

1.9.3.151 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 1.9.2) is discussed in Table 1.126 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.126: 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 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. TTS 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 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

1.9.3.152 Therefore, it can be concluded 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

1.9.3.153 The Isles of Scilly Complex SAC is located at an increased distance to the Mona Offshore Wind Project (439km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.3.121 to 1.9.3.143. 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

1.9.3.154 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 1.9.2) is discussed in Table 1.127 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.127: 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 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. TTS 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 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.

1.9.3.155 Therefore, it can be concluded 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

1.9.3.156 As outlined in paragraphs 1.9.1.3 to 1.9.1.8, 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 1.9.3.109 to 1.9.3.155 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.9.3.157 to 1.9.3.179.

West Wales Marine/Gorllewin Cymru Forol SAC

1.9.3.157 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.9.3.158 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 1.9.3.121 to 1.9.3.128), 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 alone.

Saltee Islands SAC

1.9.3.159 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 1.9.3.121 to 1.9.3.128), 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 alone.

Rockabill to Dalkey Island SAC

1.9.3.160 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Roaringwater Bay and Islands SAC

1.9.3.161 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Blasket Islands SAC

1.9.3.162 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.9.3.163 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 1.9.3.109 to 1.9.3.117), 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 SCIas a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Abers - Côte des legends SCI

1.9.3.164 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Ouessant-Molène SCI

1.9.3.165 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Côte de Granit rose-Sept-Iles SCI

1.9.3.166 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 1.9.3.109 to 1.9.3.117), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCIas a result of underwater sound associated with UXO detonation from the Mona Offshore Wind Project alone.

Anse de Goulven, dunes de Keremma SCI

1.9.3.167 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 1.9.3.109 to 1.9.3.117), 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

1.9.3.168 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Côtes de Crozon SCI

1.9.3.169 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Chaussée de Sein SCI

1.9.3.170 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Cap Sizun SCI

1.9.3.171 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Récifs du talus du golfe de Gascogne SCI

1.9.3.172 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Anse de Vauville SCI

1.9.3.173 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Cap d'Erquy-Cap Fréhel SCI

1.9.3.174 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Baie de Saint-Brieuc – Est SCI

1.9.3.175 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Banc et récifs de Surtainville SCI

1.9.3.176 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 1.9.3.109 to 1.9.3.117), 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 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

1.9.3.177 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Estuaire de la Rance SCI

1.9.3.178 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Baie du Mont Saint-Michel SCI

1.9.3.179 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 1.9.3.109 to 1.9.3.117), 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 associated with UXO detonation from the Mona Offshore Wind Project alone.

Injury and disturbance from underwater sound from pre-construction site surveys

1.9.3.180 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.

1.9.3.181 Several sonar-like survey types will potentially be used for the geophysical surveys, including MBES, SSS, SBES, SBP and UHRS (0.05-4 kHz; 182dB re 1µPa re 1 m (rms). 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 PEIR.

1.9.3.182 The assessment of LSE during the HRA screening process identified that during construction and decomissioning, 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 1.94 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).

1.9.3.183 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 1.128.

Table 1.128: 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; 180-240dB re 1µPa re 1 m (rms) – Sidescan Sonar (SSS) - 200-700kHz; 216-228dB re 1µPa re 1 m (rms) – Single Beam Echosounder (SBES) - 120-400kHz; 180-240dB re 1µPa re 1 m (rms) – Sub-Bottom Profilers (SBP) - 0.2-14kHz chirp, 2-7 kHz pinger; 200-240 chirp dB re 1µPa re 1 m (rms), 200-235 pinger dB re 1µPa re 1 m (rms) – Ultra High Resolution Seismic (UHRS) (0.05-4kHz; 182dB re 1µPa re 1 m (rms)) • 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 effect (e.g. highest source, fastest pulse rate, longest pulse duration) and as such were those that would lead to the greatest spatial extent for injury.

Measures adopted as part of the Mona Offshore Wind Project

1.9.3.184 The measures adopted as part of the Mona Offshore Wind Project that are relevant to effects from underwater sound from pre-construction site surveys are outlined in Table 1.101.

Constuction Phase

Information to support assessment

1.9.3.185 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.

1.9.3.186 There is no direct evidence for a causal link between geophysical survey sound and physical injury or disturbance to marine mammals, but there is some evidence for short-term behavioural responses.

1.9.3.187 For geotechnical surveys, injury to marine mammals is unlikely to occur beyond a few tens of metres and sound from vessels themselves is likely to deter marine mammals beyond this range. The underwater sound assessment demonstrated that the PTS threshold was not exceeded for most marine mammal species, except harbour porpoise. PTS is expected to occur during CPTs out to a maximum of 55m for harbour porpoise, and for vibro-coring to a maximum of 79m. The maximum range for PTS from geophysical surveys (SBP) is 254m for harbour porpoise. For bottlenose dolphin, the maximum PTS is expected to occur out to 41m for MBES and for pinniped species out to 40m due to SBP.

1.9.3.188 The estimated maximum ranges for onset of disturbance are based on sound level being greater than the 120dB re 1µPa (rms) threshold applicable for all Annex II marine mammals species, noting that this threshold is for ‘mild disturbance’ and therefore is not likely to result in displacement of animals. The disturbance ranges as a result of geophysical and geotechnical site-investigation surveys (see volume 2, chapter 9: Marine mammals of the PEIR) 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 31km during vibro-coring. This is due to the higher source levels for this piece of equipment compared to other types of survey equipment. For geophysical surveys, the maximum disturbance ranges were predicted for the SBP with mild disturbance potentially up to 17.3km. For impulsive sound sources (UHRS (sparker) and cone penetration testing), the largest distance over which mild disturbance could occur is out to 1,350m, and the largest distance over which strong disturbance could occur is out to 158m. Quantitatively, this would lead to maximum disturbance of less than one animal for all Annex II marine mammal species.

1.9.3.189 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 (120dB re 1µPa (rms)), which is classed as the distance beyond which no animals would be disturbed. Given that ranges for disturbance for non-impulsive sound sources (MBES, SSS, SBES, SBP (chirp/pinger), borehole drilling and vibro-coring), are presented up to the 120dB re 1µPa (rms) threshold, and there is no distinction between mild and strong disturbance, it can be assumed that not all animals found within those ranges would be disturbed. 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 impacts will not be continuous over the construction phase, instead carried out over a shorter number of days within the period. As such, to avoid misrepresentation, the number of animals likely to be disturbed has not been quantified.

1.9.3.190 Due to low impact ranges, for all marine species, there is the potential for less 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.

1.9.3.191 All geotechnical and geophysical surveys will be very short duration (over a period of several months) and animals are expected to recover quickly after cessation of the survey activities. It is expected that, to some extent, marine mammals will be able to adapt their behaviour to reduce impacts on survival and reproduction rates and tolerate elevated levels of underwater sound during site investigation surveys. 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 254m (for SBP) and it is considered that standard industry measures will be effective at reducing the risk of injury over this distance. Some multi-beam surveys in shallow waters (<200m) are not subject to the requirements of mitigation (JNCC, 2017). Requirements for mitigation will be agreed with the consultees post PEIR submission. Therefore, the impact of site investigation surveys leading to behavioural effects and injury is predicted to be of local 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).

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.9.3.192 As outlined in paragraph 1.9.3.187, ranges for harbour porpoise within which there is a risk of PTS are small with a maximum of 79m for geotechnical surveys and 254m 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 surveys for the Mona Offshore Wind Project.

1.9.3.193 Less than one harbour porpoise during URHS and cone penetration testing are predicted to be potentially disturbed within ranges of 1,350m (mild disturbance) and 158m (strong disturbance). Given the distance from the Mona Offshore Wind Project to the North Anglesey Marine/Gogledd Môn Forol SAC (22.58km to Mona Array Area and 17.5km to Mona Offshore Cable Corridor), it is expected that harbour porpoise will avoid the area of the survey. Noting that pre-construction site surveys will not be undertaken nearby or within this SAC and with harbour porpoise recovering quickly after the surveys have ceased (see paragraphs 1.9.3.191), behavioural disturbance is unlikely to be significant (see paragraph 1.9.3.188). 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.

1.9.3.194 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

1.9.3.195 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 1.9.2) 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 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 surveys associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the designated site. Harbour porpoise will remain a viable component of the site. Similarly, underwater sound as a result of pre-construction site 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 surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site surveys associated with the Mona Offshore Wind Project will not hinder the conditions of supporting habitats and processes or reduce the availability of prey.

1.9.3.196 Therefore, it can be concluded 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 surveys from the Mona Offshore Wind Project alone.

North Channel SAC

Harbour porpoise

1.9.3.197 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 (22km from Mona Array Area and 17km from Mona Cable Corridor) outlined in paragraphs 1.9.3.192 and 1.9.3.193, due to the proximity of the locations. As the North Channel SAC (79km from Mona Array Area and 96km from Mona Cable Corridor) 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.

1.9.3.198 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

1.9.3.199 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 1.9.2) 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 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 surveys associated with the Mona Offshore Wind Project will not affect the survivability and reproductive potential of harbour porpoise using the designated site. Harbour porpoise will remain a viable component of the site. Similarly, underwater sound as a result of pre-construction site 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 surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site surveys associated with the Mona Offshore Wind Project will not hinder the conditions of supporting habitats and processes or reduce the availability of prey.

1.9.3.200 Therefore, it can be concluded 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 surveys from the Mona Offshore Wind Project alone.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

Bottlenose dolphin

1.9.3.201 Range for bottlenose dolphin within which there is a risk of PTS is small with a maximum of 41m for geophysical surveys (for geotechnical surveys, thresholds are not exceeded). The potential for bottlenose dolphin 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 bottlenose dolphin associated with underwater sound from pre-construction site surveys for Mona Offshore Wind Project.

1.9.3.202 Less than one bottlenose dolphin during URHS and cone penetration testing are predicted to be potentially disturbed within ranges of 1,350m (mild disturbance) and 158m (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 (94km to Mona Array Area and 93km to Mona Cable Corridor), it is expected bottlenose dolphins to avoid the area of the survey. Therefore, animals within the site are unlikely to be disturbed. As outlined in paragraph 1.9.3.188, bottlenose dolphin densities used in the estimates are more reflective of inshore densities and Paxton *et al*. (2016) described bottlenose dolphins as coastal. Therefore, in the case of surveys within Mona Array Area, lower densities of bottlenose dolphin than the ones used in the estimates are expected with less individuals from this SAC to be present in offshore waters. Noting that pre-construction site surveys will not be undertaken nearby or within this SAC and with bottlenose dolphins recovering quickly after the surveys have ceased (see paragraph 1.9.3.191), behavioural disturbance is unlikely to be significant (see paragraph 1.9.3.188). 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.

1.9.3.203 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

1.9.3.204 Range for grey seal within which there is a risk of PTS is small with a maximum of 40m 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 surveys for Mona Offshore Wind Project.

1.9.3.205 Less than one grey seal during URHS and cone penetration testing are predicted to be potentially disturbed within ranges of 1,350m (mild disturbance) and 158m (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 (94km to Mona Array Area and 93.1km to Mona Cable Corridor), animals within the site are unlikely to be disturbed. As outlined in paragraph 1.9.3.188, grey seal densities used in the estimates are more reflective of inshore densities. Therefore, in the case of surveys within Mona Array Area, lower densities of bottlenose dolphin than the ones used in the estimates are expected with less individuals from this SAC to be present in offshore waters. 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.

1.9.3.206 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

1.9.3.207 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 SACwill 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 1.9.2) 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 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 sound of vessel is likely to deter animals and that there is likely recovery from disturbance, underwater sound from pre-construction site 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 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 surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site 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.

1.9.3.208 Therefore, it can be concluded 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 surveys from the Mona Offshore Wind Project alone.

Strangford Lough SAC

Harbour seal

1.9.3.209 Range for harbour seal within which there is a risk of PTS is small with a maximum of 40m 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 surveys for the Mona Offshore Wind Project.

1.9.3.210 Up to 1 harbour seal during SBP and up to three harbour seals during vibro-coring are predicted to be potentially disturbed within ranges of 17.3km and 31km respectively. However, considering the distance from the Proposed Development to the Strangford Lough SAC (110km to Mona Array Area and 126km to Mona Cable Corridor), animals within the site are unlikely to be disturbed and it is unlikely to have 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.

1.9.3.211 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

1.9.3.212 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 1.9.2) is discussed in Table 1.132 below. 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 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 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 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 surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site 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.

1.9.3.213 Therefore, it can be concluded 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 surveys from the Mona Offshore Wind Project alone.

Murlough SAC

Harbour seal

1.9.3.214 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 (110km from Mona Array Area and 126.69km from Mona Cable Corridor) outlined in paragraphs 1.9.3.209 and 1.9.3.210, due to the proximity of the locations. As the Murlough SAC (114km from Mona Array Area and 128km from Mona Cable Corridor) 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.

1.9.3.215 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

1.9.3.216 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 1.9.2) is discussed in Table 1.133 below. 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 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 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 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 surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site 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.

1.9.3.217 Therefore, it can be concluded 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 surveys from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.9.3.218 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.201 and 1.9.3.202, due to the proximity of the locations. As the Cardigan Bay/Bae Ceredigion SAC (163km from Mona Array Area and 162km from Mona Cable Corridor) 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.

1.9.3.219 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

1.9.3.220 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 1.9.2) is discussed in Table 1.134 below. 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 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 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 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 surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site 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.

1.9.3.221 Therefore, 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 surveys from the Mona Offshore Wind Project alone.

The Maidens SAC

Grey seal

1.9.3.222 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 (94km from Mona Array Area and 9km from Mona Cable Corridor) outlined in paragraphs 1.9.3.204 and 1.9.3.205, due to the proximity of the locations. As The Maidens SAC (164km from Mona Array Area and 181km from Mona Cable Corridor) 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.

1.9.3.223 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

1.9.3.224 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 1.9.2) is discussed in Table 1.135 below. 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 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 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 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 harbour seal within the site.	There is no pathway for underwater sound from pre-construction site surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site 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.

1.9.3.225 Therefore, it can be concluded 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 surveys from the Mona Offshore Wind Project alone.

Pembrokeshire Marine/Sir Benfro Forol SAC

Grey seal

1.9.3.226 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 (94km from Mona Array Area and 93.1km from Mona Cable Corridor) outlined in paragraphs 1.9.3.204 and 1.9.3.205, due to the proximity of the locations. As the Pembrokeshire Marine/Sir Benfro Forol SAC (211.72km from Mona Array Area and 210.9km from Mona Cable Corridor) 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.

1.9.3.227 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

1.9.3.228 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 1.9.2) is discussed in Table 1.136 below. 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 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 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 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 surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site 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.

1.9.3.229 Therefore, it can be concluded 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 surveys from the Mona Offshore Wind Project alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.9.3.230 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 (22km from Mona Array Area and 17km from Mona Cable Corridor) outlined in paragraphs 1.9.3.192 and 1.9.3.193, due to the proximity of the locations. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (275km from Mona Array Area and 275km from Mona Cable Corridor) 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.

1.9.3.231 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

1.9.3.232 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 1.9.2) is discussed in Table 1.137 below. 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 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 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 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 surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site surveys associated with the Mona Offshore Wind Project will not hinder the conditions of supporting habitats and processes or reduce the availability of prey.

1.9.3.233 Therefore, it can be concluded 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 surveys from the Mona Offshore Wind Project alone.

Lundy SAC

Grey seal

1.9.3.234 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 (94km from Mona Array Area and 93.1km from Mona Cable Corridor) outlined in paragraphs 1.9.3.204 and 1.9.3.205, due to the proximity of the locations. As the Lundy SAC (309km from Mona Array Area and 308km from Mona Cable Corridor) 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.

1.9.3.235 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

1.9.3.236 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 1.9.2) is discussed in Table 1.138 below. 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 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 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 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 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 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 surveys will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.9.3.237 Therefore, it can be concluded 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 surveys from the Mona Offshore Wind Project alone.

Isles of Scilly Complex SAC

Grey seal

1.9.3.238 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.204 and 1.9.3.205, due to the proximity of the locations. As the Isles of Scilly Complex SAC (439km from Mona Array Area and 439km from Mona Cable Corridor) 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.

1.9.3.239 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

1.9.3.240 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 1.9.2) is discussed in Table 1.139 below. 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 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 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 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 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 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 surveys will not prevent the distribution of the marine mammal qualifying species from being maintained or restored.

1.9.3.241 Therefore, it can be concluded 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 surveys from the Mona Offshore Wind Project alone.

Sites assessed in line with the iterative approach

1.9.3.242 As outlined in paragraphs 1.9.1.3 to 1.9.1.8, 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 1.9.3.192 to 1.9.3.241 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.9.3.243 to 1.9.3.265.

West Wales Marine/Gorllewin Cymru Forol SAC

1.9.3.243 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.9.3.244 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 1.9.3.201 to 1.9.3.208), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Saltee Islands SAC

1.9.3.245 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 1.9.3.201 to 1.9.3.208), 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

1.9.3.246 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Roaringwater Bay and Islands SAC

1.9.3.247 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Blasket Islands SAC

1.9.3.248 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.9.3.249 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 1.9.3.192 to 1.9.3.199), 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 SCIas a result of underwater sound from pre-construction site surveys with respect to construction of the Mona Offshore Wind Project alone.

Abers - Côte des legends SCI

1.9.3.250 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Ouessant-Molène SCI

1.9.3.251 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Côte de Granit rose-Sept-Iles SCI

1.9.3.252 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Anse de Goulven, dunes de Keremma SCI

1.9.3.253 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Tregor Goëlo SCI

1.9.3.254 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Côtes de Crozon SCI

1.9.3.255 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Chaussée de Sein SCI

1.9.3.256 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Cap Sizun SCI

1.9.3.257 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Récifs du talus du golfe de Gascogne SCI

1.9.3.258 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Anse de Vauville SCI

1.9.3.259 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Cap d'Erquy-Cap Fréhel SCI

1.9.3.260 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Baie de Saint-Brieuc – Est SCI

1.9.3.261 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Banc et récifs de Surtainville SCI

1.9.3.262 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 1.9.3.192 to 1.9.3.199), 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 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

1.9.3.263 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Estuaire de la Rance SCI

1.9.3.264 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Baie du Mont Saint-Michel SCI

1.9.3.265 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 1.9.3.192 to 1.9.3.199), 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 surveys with respect to construction of the Mona Offshore Wind Project alone.

Injury and disturbance from underwater sound from vessels and other (non-piling) sound producing activities

1.9.3.266 The assessment of LSE during the HRA screening process identified that during construction, operations and maintenance and decomissioning, LSE could not be ruled out for the potential impact of underwater sound from vessels and other activities. This relates to the designated sites listed in paragraph 1.9.1.7 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).

1.9.3.267 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 will likely follow existing shipping routes to/from the ports.

1.9.3.268 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, SOVs or similar vessels, excavators/backhoe dredgers.

1.9.3.269 The assessment of 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 PEIR. 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.

1.9.3.270 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 1.140.

Table 1.140: 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 80 construction vessels on site at any one time (22 main installation and support vessels, eight tug/anchor handlers, ten cable lay installation and support vessels, two guard vessels, seven survey vessels,11 seabed preparation vessels, 13 Crew Transfer Vessels (CTVs), three scour protection installation vessels and four cable protection installation vessels) • Up to 2,004 installation vessel movements (return trips) during construction (521 main installation and support vessels, 74 tug/anchor handlers, 48 cable lay installation and support vessels, 68 guard vessel, 33 survey vessels, 42 seabed preparation vessels, 1,155 CTVs, 41 scour protection installation vessels and 22 cable protection installation vessels) **Other activities:** • Up to 100% of overall piles are anticipated to require drilling (107 4-legged wind turbine jacket foundations with a jacket leg diameter of 2.6m and four four-legged OSP jacket foundations with a jacket leg diameter of 3.0m), up to two concurrent drilling vessels. • Burial of up to 500km of inter-array cables, 50km of interconnector cables and 360km of offshore export cable via ploughing, trenching and jetting; cable burial and rock dumping. • Maximum offshore construction duration of up to 4 years.	*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.
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 2,351 operations and maintenance vessel movements (return trips) each year (2,190 CTVs/workboats, 25 jack-up vessels, 16 cable repair vessels, 104 SOV or similar and 16 excavators/backhoe dredgers) • Operational lifetime of up to 35 years.	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 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

1.9.3.271 The measures adopted as part of the Mona Offshore Wind Project that are relevant to effects from underwater sound from pre-construction site surveys are outlined in Table 1.101.

Construction and decommissioning phase

Information to support assessment

Auditory injury

1.9.3.272 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 of the PEIR). 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.

1.9.3.273 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). 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 except for cable trenching, where PTS was <10m for harbour porpoise. 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 conducted for TTS for completeness (see volume 5, annex 3.21: Underwater sound technical report of the PEIR), however ranges indicated are likely to be overestimates. Ranges for TTS were between <15m and 6,800m for vessels, and between <15m and 5,200m for drilled piling and cable burial activities.

1.9.3.274 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

1.9.3.275 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.

1.9.3.276 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 1.141.

1.9.3.277 Installation vessels and construction vessels, rock placement vessels, and cable installation vessels resulted in the greatest modelled disturbance out to 22km for all marine mammal species (Table 1.141). The greatest disturbance range for other non-vessel continuous sound behavioural effects was predicted to be 19km due to underwater sound from cable laying activities. In comparison, survey vessel and support vessels, crew transfer vessel, scour/cable protection and seabed preparation/installation vessels all resulted in a predicted disturbance range of 10km; vessels for boulder clearance had a disturbance range of 1km; tug/anchor handlers had a disturbance range of 6.5km; and jack up rigs had a disturbance range of 10m (0.01km).

Table 1.141: Estimated disturbance ranges for marine as a result of vessels and other activities.

Threshold	Disturbance Range (km)
Vessels	
Sandwave clearance, Installation vessel, construction vessel (Dynamic Positioning), rock placement vessel and cable installation vessels	8
Boulder Clearance	1
Jack-up Rig	<1
Tug/anchor handlers, Guard vessels	6.5
Survey vessel and support vessels, Crew transfer vessel, Scour/Cable Protection/Seabed Preparation/Installation Vessels	22
Other activities	
Cable trenching	19
Cable laying	8
Jack-up rig	<1
Drilled piling	1.4

1.9.3.278 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 (120dB re 1µPa (rms)), which is classed as the distance beyond which no animals would be disturbed. Given that ranges for disturbance for vessels are presented up to the 120dB re 1µPa (rms) threshold, and there is no distinction between mild and strong disturbance, it can be assumed that not all animals found within those ranges (Table 1.141) would be disturbed. 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 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. As such, this value has not been quantified.

1.9.3.279 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

1.9.3.280 As outlined in paragraph 1.9.3.273, ranges for harbour porpoise within which there is a risk of PTS are small with a maximum of 10m during cable trenching and for some types of vessels. Other activities and vessels do not exceed the threshold. The potential for harbour porpoise 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 porpoise associated with underwater sound from vessels and other activities for Mona Offshore Wind Project.

1.9.3.281 Activities and vessel movements will be restricted to the Mona Array Area and Mona Cable Corridor, 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 1.9.3.279). 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.

1.9.3.282 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 9: Marine Mammals of the PEIR).

Conclusions

1.9.3.283 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in Table 1.142 below. 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 North Anglesey Marine/Gogledd Môn Forol SAC for 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, 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. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the habitats processes or reduce the availability of prey.

1.9.3.284 Therefore, it can be concluded 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 vessels and other activities from the Mona Offshore Wind Project alone.

North Channel SAC

Harbour porpoise

1.9.3.285 Underwater sound from vessels 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 (22.58km from Mona Array Area and 17.5km from Mona Cable Corridor) outlined in paragraphs 1.9.3.280 to 1.9.3.281, due to the proximity of the locations. As the North Channel SAC (79.58km from Mona Array Area and 96.2km from Mona Offshore Cable Corridor) 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.

1.9.3.286 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

1.9.3.287 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in Table 1.143 below. 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 North Channel SAC for 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, 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. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the habitats processes or reduce the availability of prey.

1.9.3.288 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result of underwater sound from vessels and other activities from the Mona Offshore Wind Project alone.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

Bottlenose dolphin

1.9.3.289 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 underwater sound from vessels and other activities for the Mona Offshore Wind Project.

1.9.3.290 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 (94km to Mona Array Area and 93km to Mona Cable Corridor), 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 Cable Corridor, 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 1.9.3.279). 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.

1.9.3.291 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

1.9.3.292 Maximum range for grey seal within which there is a risk of PTS do not exceed the thresholds. The potential for grey 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 bottlenose dolphin associated with underwater sound from vessels and other activities for the Mona Offshore Wind Project.

1.9.3.293 Considering the distance from the Mona Offshore Wind Project to the SAC (94km to Mona Array Area and 93.1km to Mona Cable Corridor), 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 Cable Corridor, 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 1.9.3.279). 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.

1.9.3.294 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

1.9.3.295 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 underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in Table 1.144 below. 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 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, underwater sound from vessels 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, underwater sound from vessels 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.

Conservation Objectives	Conclusion
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 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 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.

1.9.3.296 Therefore, it can be concluded 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 vessels and other activities from the Mona Offshore Wind Project alone.

Strangford Lough SAC

Harbour seal

1.9.3.297 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 bottlenose dolphin associated with underwater sound from vessels and other activities for Mona Offshore Wind Project.

1.9.3.298 Considering the distance from the Mona Offshore Wind Project to the Strangford Lough SAC (110km to Mona Array Area and 126km to Mona Cable Corridor), 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 Cable Corridor, 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 1.9.3.279). 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.

1.9.3.299 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

1.9.3.300 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) 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 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, underwater sound from vessels 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, underwater sound from vessels 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 vessels and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from vessels 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.

1.9.3.301 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of underwater sound from vessels and other activities from the Mona Offshore Wind Project alone.

Murlough SAC

Harbour seal

1.9.3.302 Underwater sound from vessels and other activities on harbour seal features of the Murlough SAC are predicted to be similar to those associated with the Strangford Lough SAC (110km from Mona Array Area and 126km from Mona Cable Corridor) outlined in paragraphs 1.9.3.297 to 1.9.3.298, due to the proximity of the locations. As the Murlough SAC (114km from Mona Array Area and 128km from Mona Cable Corridor) 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.

1.9.3.303 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

1.9.3.304 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 1.9.2) 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 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, underwater sound from vessels 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, underwater sound from vessels 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 vessels and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from vessels 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.

1.9.3.305 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of underwater sound from vessels and other activities from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.9.3.306 Underwater sound from vessels 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.289 to 1.9.3.291, due to the proximity of the locations. As the Cardigan Bay/Bae Ceredigion SAC (163km from Mona Array Area and 162km from Mona Cable Corridor) 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.

1.9.3.307 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

1.9.3.308 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) 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 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, underwater sound from vessels 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, underwater sound from vessels 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 underwater sound 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 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.

1.9.3.309 Therefore, 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 from the Mona Offshore Wind Project alone.

The Maidens SAC

Grey seal

1.9.3.310 Underwater sound from vessels 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.292 to 1.9.3.294, due to the proximity of the locations. As the Maidens SAC (164km from Mona Array Area and 181km from Mona Cable Corridor) 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.

1.9.3.311 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

1.9.3.312 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) 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 Maidens 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 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, underwater sound from vessels 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, underwater sound from vessels 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 underwater sound from vessels and other activities to result in adverse effects on the physical features used by grey seal within the site. Therefore, underwater sound from vessels 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.

1.9.3.313 Therefore, it can be concluded 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

1.9.3.314 Underwater sound from vessels 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.292 to 1.9.3.294, due to the proximity of the locations. As the Pembrokeshire Marine/Sir Benfro Forol SAC (211km from Mona Array Area and 210km from Mona Cable Corridor) 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.

1.9.3.315 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

1.9.3.316 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) 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 Pembrokeshire Marine/Sir Benfro Forol 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, underwater sound from vessels 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, underwater sound from vessels 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 underwater sound 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 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.

1.9.3.317 Therefore, it can be concluded 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 vessels and other activities from the Mona Offshore Wind Project alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.9.3.318 Underwater sound from vessels 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 (22km from Mona Array Area and 17km from Mona Offshore Cable Corridor) outlined in paragraphs 1.9.3.280 to 1.9.3.281, due to the proximity of the locations. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (275km from Mona Array Area and 275km from Mona Cable Corridor) 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.

1.9.3.319 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

1.9.3.320 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 underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) 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 Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for 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, 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. Therefore, underwater sound from vessels and other activities associated with the Mona Offshore Wind Project will not prevent the habitats processes or reduce the availability of prey.

1.9.3.321 Therefore, it can be concluded 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

1.9.3.322 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.292 to 1.9.3.294, due to the proximity of the locations. As the Lundy SAC (309km from Mona Array Area and 308km from Mona Cable Corridor) 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.

1.9.3.323 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

1.9.3.324 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 1.9.2) is discussed in turn below in Table 1.151. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.151: Conclusions against the conservation objectives of Lundy SAC for underwater sound generated from vessels and other non-piling 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 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 from 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.

1.9.3.325 Therefore, it can be concluded 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

1.9.3.326 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.292 to 1.9.3.294, due to the proximity of the locations. As the Isles of Scilly Complex SAC (439km from Mona Array Area and 438km from Mona Cable Corridor) 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.

1.9.3.327 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

1.9.3.328 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 1.9.2) is discussed in turn below in Table 1.152. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.152: Conclusions against the conservation objectives of Isles of Scilly Complex SAC for underwater sound generated from vessels and other non-piling 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 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 from 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.

1.9.3.329 Therefore, it can be concluded 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

1.9.3.330 As outlined in paragraphs 1.9.1.3 to 1.9.1.8, 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 1.9.3.280 to 1.9.3.329 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.9.3.331 to 1.9.3.353.

West Wales Marine/Gorllewin Cymru Forol SAC

1.9.3.331 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 1.9.3.280 to 1.9.3.288), 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 alone.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.9.3.332 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 1.9.3.292 to 1.9.3.296), 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 alone.

Saltee Islands SAC

1.9.3.333 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 1.9.3.292 to 1.9.3.296), 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

1.9.3.334 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 1.9.3.280 to 1.9.3.288), 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 alone.

Roaringwater Bay and Islands SAC

1.9.3.335 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 1.9.3.280 to 1.9.3.288), 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 alone.

Blasket Islands SAC

1.9.3.336 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 1.9.3.280 to 1.9.3.288), 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 alone.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.9.3.337 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 1.9.3.280 to 1.9.3.288), 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 alone.

Abers - Côte des legends SCI

1.9.3.338 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 1.9.3.280 to 1.9.3.288), 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 alone.

Ouessant-Molène SCI

1.9.3.339 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 1.9.3.280 to 1.9.3.288), 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 alone.

Côte de Granit rose-Sept-Iles SCI

1.9.3.340 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 1.9.3.280 to 1.9.3.288), 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 alone.

Anse de Goulven, dunes de Keremma SCI

1.9.3.341 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 1.9.3.280 to 1.9.3.288), 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 alone.

Tregor Goëlo SCI

1.9.3.342 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 1.9.3.280 to 1.9.3.288), 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 alone.

Côtes de Crozon SCI

1.9.3.343 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 1.9.3.280 to 1.9.3.288), 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 alone.

Chaussée de Sein SCI

1.9.3.344 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 1.9.3.280 to 1.9.3.288), 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 alone.

Cap Sizun SCI

1.9.3.345 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 1.9.3.280 to 1.9.3.288), 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 alone.

Récifs du talus du golfe de Gascogne SCI

1.9.3.346 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 1.9.3.280 to 1.9.3.288), 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 alone.

Anse de Vauville SCI

1.9.3.347 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 1.9.3.280 to 1.9.3.288), 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 alone.

Cap d'Erquy-Cap Fréhel SCI

1.9.3.348 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 1.9.3.280 to 1.9.3.288), 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 alone.

Baie de Saint-Brieuc – Est SCI

1.9.3.349 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 1.9.3.280 to 1.9.3.288), 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 alone.

Banc et récifs de Surtainville SCI

1.9.3.350 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 1.9.3.280 to 1.9.3.288), 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 alone.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.9.3.351 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 1.9.3.280 to 1.9.3.288), 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 alone.

Estuaire de la Rance SCI

1.9.3.352 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 1.9.3.280 to 1.9.3.288), 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 alone.

Baie du Mont Saint-Michel SCI

1.9.3.353 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 1.9.3.280 to 1.9.3.288), 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 alone.

Operations and maintenance phase

Information to support assessment

1.9.3.354 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 will follow the provisions for vessels and vessel movements within the EMP.

1.9.3.355 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.

1.9.3.356 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 1.9.3.272 to 1.9.3.279 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

1.9.3.357 On the basis of the rationale outlined in paragraphs 1.9.3.280 and 1.9.3.281 for the contruction 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.

1.9.3.358 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

1.9.3.359 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) 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 underwater sound generated from vessels and other non-piling 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, 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.

Conservation Objectives	Conclusion
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. 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.

1.9.3.360 Therefore, it can be concluded 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 vessels and other activities from the Mona Offshore Wind Project alone.

North Channel SAC

Harbour porpoise

1.9.3.361 Underwater sound from vessels 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 (22km from Mona Array Area and 17km from Mona Cable Corridor) outlined in paragraph 1.9.3.357, due to the proximity of the locations. As the North Channel SAC (79km from Mona Array Area and 96km from Mona Cable Corridor) 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.

1.9.3.362 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

1.9.3.363 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in turn below in Table 1.154. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.154: Conclusions against the conservation objectives of the North Channel SAC for underwater sound generated from vessels and other non-piling 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, 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. 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.

1.9.3.364 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the North Channel SAC as a result of underwater sound from vessels and other activities from the Mona Offshore Wind Project alone.

Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC

Bottlenose dolphin

1.9.3.365 On the basis of the rationale outlined in paragraphs 1.9.3.289 and 1.9.3.290 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.

1.9.3.366 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

1.9.3.367 On the basis of the rationale outlined in paragraphs 1.9.3.292 and1.9.3.293 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.

1.9.3.368 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

1.9.3.369 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in turn below in Table 1.155. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.155: Conclusions against the conservation objectives of the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC for underwater sound generated from vessels and other non-piling 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, underwater sound from vessels 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, underwater sound from vessels 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 underwater sound 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 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.

1.9.3.370 Therefore, it can be concluded 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 vessels and other activities from the Mona Offshore Wind Project alone.

Strangford Lough SAC

Harbour seal

1.9.3.371 On the basis of the rationale outlined in paragraphs 1.9.3.297 and 1.9.3.298 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.

1.9.3.372 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

1.9.3.373 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in turn below in Table 1.156. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.156: Conclusions against the conservation objectives of the Strangford Lough SAC for underwater sound generated from vessels and other non-piling 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, underwater sound from vessels 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, underwater sound from vessels 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 vessels and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from vessels 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.

1.9.3.374 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Strangford Lough SAC as a result of underwater sound from vessels and other activities from the Mona Offshore Wind Project alone.

Murlough SAC

Harbour seal

1.9.3.375 Underwater sound from vessels and other activities on harbour seal features of the Murlough SAC are predicted to be similar to those associated with the Strangford Lough SAC (110km from Mona Array Area and 126km from Mona Cable Corridor) outlined in paragraph 1.9.4.350 due to the proximity of the locations. As the Murlough SAC (114km from Mona Array Area and 128km from Mona Cable Corridor) 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.

1.9.3.376 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

1.9.3.377 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 1.9.2) is discussed in turn below in Table 1.156. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.157: Conclusions against the conservation objectives of the Murlough SAC for underwater sound generated from vessels and other non-piling 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, underwater sound from vessels 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, underwater sound from vessels 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 vessels and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from vessels 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.

1.9.3.378 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Murlough SAC as a result of underwater sound from vessels and other activities from the Mona Offshore Wind Project alone.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.9.3.379 Underwater sound from vessels 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.365 to 1.9.3.366, due to the proximity of the locations. As the Cardigan Bay/Bae Ceredigion SAC (163km from Mona Array Area and 162km from Mona Cable Corridor) 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.

1.9.3.380 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

1.9.3.381 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in turn below in Table 1.158. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.158: 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 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, underwater sound from vessels 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, underwater sound from vessels 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 underwater sound 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 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.

1.9.3.382 Therefore, 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 from the Mona Offshore Wind Project alone.

The Maidens SAC

Grey seal

1.9.3.383 Underwater sound from vessels 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.367 to 1.9.3.368, due to the proximity of the locations. As the Maidens SAC (164km from Mona Array Area and 181km from Mona Cable Corridor) 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.

1.9.3.384 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

1.9.3.385 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in turn below in Table 1.159. Where the justifications and supporting

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

Table 1.159: Conclusions against the conservation objectives of The Maidens SAC for underwater sound generated from vessels and other non-piling 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, underwater sound from vessels 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, underwater sound from vessels 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 underwater sound from vessels and other activities to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from vessels 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.

1.9.3.386 Therefore, it can be concluded 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

1.9.3.387 Underwater sound from vessels 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.367 to 1.9.3.368 due to the proximity of the locations. As the Pembrokeshire Marine/Sir Benfro Forol SAC (211km from Mona Array Area and 219km from Mona Cable Corridor) 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.

1.9.3.388 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

1.9.3.389 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 vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in turn below in Table 1.160.

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

Table 1.160: Conclusions against the conservation objectives of Pembrokeshire Marine/Sir Benfro Forol SAC for underwater sound generated from vessels and other non-piling 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, underwater sound from vessels 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, underwater sound from vessels 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 underwater sound 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 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.

1.9.3.390 Therefore, it can be concluded 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 vessels and other activities from the Mona Offshore Wind Project alone.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

Harbour porpoise

1.9.3.391 Underwater sound from vessels and other activities on harbour purpoise 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 (22km from Mona Array Area and 17km from Mona Cable Corridor) outlined in paragraphs 1.9.3.357 to 1.9.3.358, due to the proximity of the locations. As the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (275km from Mona Array Area and 275km from Mona Cable Corridor) 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.

1.9.3.392 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

1.9.3.393 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 1.9.2) 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 Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for underwater sound generated from vessels and other non-piling 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, 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. 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.

1.9.3.394 Therefore, it can be concluded 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

1.9.3.395 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.367 to 1.9.3.368, due to the proximity of the locations. As the Lundy SAC (309km from Mona Array Area and 308km from Mona Cable Corridor) 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.

1.9.3.396 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

1.9.3.397 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 1.9.2) 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 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.

1.9.3.398 Therefore, it can be concluded 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

1.9.3.399 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 (94km from Mona Array Area and 93km from Mona Cable Corridor) outlined in paragraphs 1.9.3.367 to 1.9.3.368, due to the proximity of the locations. As the Isles of Scilly Complex SAC (439km from Mona Array Area and 438km from Mona Cable Corridor) 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.

1.9.3.400 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

1.9.3.401 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 1.9.2) 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 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.

1.9.3.402 Therefore, it can be concluded 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

1.9.3.403 As outlined in paragraphs 1.9.1.3 to 1.9.1.8, 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 1.9.3.357 to 0 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.9.3.404 to 1.9.3.426.

West Wales Marine/Gorllewin Cymru Forol SAC

1.9.3.404 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 1.9.3.357 to 1.9.3.364), 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

Grey seal

1.9.3.405 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.406 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.407 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.408 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.409 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.410 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 1.9.3.357 to 1.9.3.364), 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 SCIas 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

1.9.3.411 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.412 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.413 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 1.9.3.357 to 1.9.3.364), it can be concluded that there is no risk of an adverse effect on the integrity of the Côte de Granit rose-Sept-Iles SCIas 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

1.9.3.414 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.415 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.416 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.417 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.418 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.419 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.420 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.421 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.422 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.423 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.424 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.425 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 1.9.3.357 to 1.9.3.364), 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

1.9.3.426 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 1.9.3.357 to 1.9.3.364), 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 prey availability

1.9.3.427 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 Boundary. 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).

1.9.3.428 The HRA Stage 1 Screening Report 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 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 prey availability to 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.

1.9.3.429 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).

1.9.3.430 The MDS considered for the assessment of potential impacts on Annex marine mammal features from changes in prey availability is presented in Table 1.164.

Table 1.164: MDS considered for the assessment of potential impacts on marine mammals from changes in prey availability during the construction phase.

Potential impact	MDS	Justification
Construction phase	• As described in volume 2, chapter 8: Fish and shellfish ecology of the PEIR for: – Temporary habitat loss/disturbance – Long term habitat loss/disturbance – Increased suspended sediment concentrations and associated sediment deposition – Injury and/or disturbance to fish and shellfish from underwater sound and vibration.	As described in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.

Measures adopted as part of the Mona Offshore Wind Project

1.9.3.431 The measures adopted as part of the Mona Offshore Wind Project that are relevant to effects from changes in prey availablity are outlined in Table 1.165.

Table 1.165: 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 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 EMP, including Marine Pollution Contingency Plan (MPCP).	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 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.	Proposed to be secured through a condition in the marine licence(s).
Development of, and adherence to, a Decommissioning Plan.	The aim of this plan is to adhere to the existing UK and international 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.	Requirement for a decommissioning plan will be secured as a requirement of the DCO.

Construction phase

Information to support assessment

1.9.3.432 As outlined in the volume 2, chapter 9: Marine Mammals of the PEIR 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.

1.9.3.433 Marine mammals exploit a range of different prey items and can forage widely and change prey sources, sometimes covering extensive distances. Given that the 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 50km. 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 able to tolerate the effect without any impact on reproduction and survival rates and would be able to return to previous activities once the impact had ceased.

1.9.3.434 Potential impacts on the marine mammal prey species outlined above during the construction and decommissioning phase have been assessed in volume 2, chapter 8: Fish and shellfish ecology of the PEIR 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.

1.9.3.435 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 and habitat loss/disturbance to affect up to 131,068,792m^2 of seabed during the construction phase, although only a small proportion of this will be impacted at any one time.

1.9.3.436 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 8: Fish and shellfish ecology of the PEIR, 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.

1.9.3.437 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.

1.9.3.438 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. However, volume 2, chapter 8: Fish and shellfish ecology of the PEIR concluded that for all species, the impact

would be minor adverse, including herring due to the small overlap in spawning habitats and modelling based on peak spawning periods for herring (see volume 2, chapter 8: Fish and shellfish ecology of the PEIR).

1.9.3.439 Other 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 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.

1.9.3.440 No 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 8: Fish and shellfish ecology of the PEIR). Therefore, changes in prey availability on 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

1.9.3.441 The 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 1.9.3.433), 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.

1.9.3.442 As outlined in paragraph 1.9.3.279, no 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 8: Fish and shellfish ecology of the PEIR).

1.9.3.443 Therefore, the impact is not predicted to result in adverse effects (i.e. disruption to foraging) for harbour porpoises.

Conclusions

1.9.3.444 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 prey availability. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in turn below in Table 1.166. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.166: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for changes in 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 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 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 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 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 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.

1.9.3.445 Therefore, it can be concluded 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 prey availability from the Mona Offshore Wind Project alone.

1.9.4 Assessment of adverse effects in-combination

1.9.4.1 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 1.167 and shown in Figure 1.13.

1.9.4.2 As outlined in the HRA Stage 1 Screening Report, 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.

1.9.4.3 On this basis, the potential impacts identified for assessment as part of the volume 2, chapter 9: Marine mammals of the PEIR, 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 prey availability.

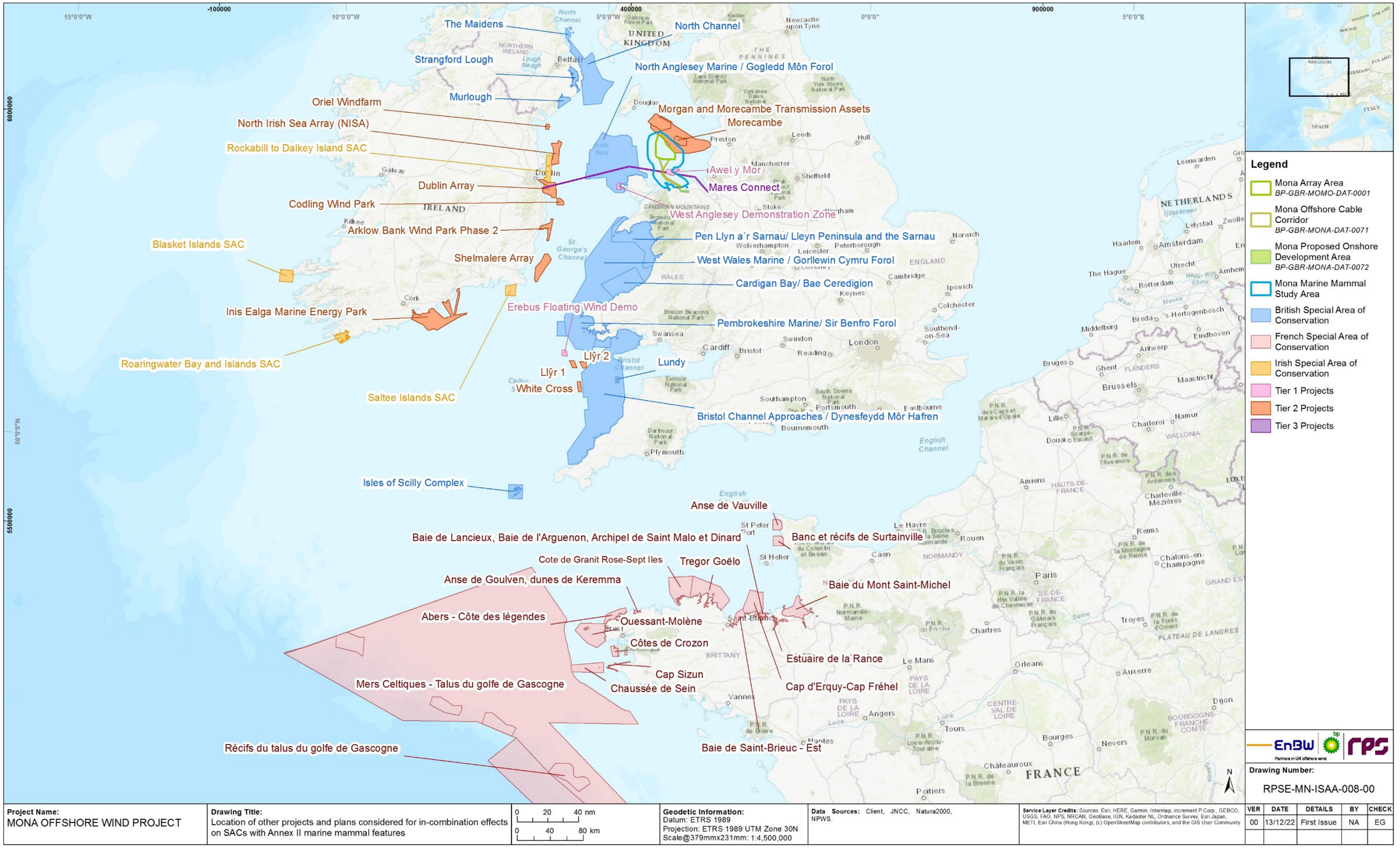


Figure 1.13: Location of other projects and plans considered for in-combination effects on SACs with Annex II marine mammal features[46].

[46] 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 1.167: List of other projects and plans with potential for in-combination effects on Annex II marine mammal features.

Plan/project	Status	Plan/project	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of installation (I)/operation (O)	Spatial overlap	Temporal overlap
Awel y Môr Offshore Wind Farm	Application Submitted	Awel y Môr Offshore Wind Farm	Up to 500MW (48 to 91 wind turbines)	Tier 1	12.2	3.6	I: 2026 to 2030 O: 2030 to 2055	Yes	Yes
West Anglesey Demonstration Zone tidal site (Morlais)	Permitted but not yet implemented	West Anglesey Demonstration Zone tidal site (Morlais)	Tidal Demonstration Zone	Tier 1	53.7	50.6	I: 2021 to 2023 O: 2024 to 2061	No	Yes
Project Erebus	Submitted but not yet determined	Project Erebus	Floating Demonstration Projects	Tier 1	258.9	240.2	I: 2025 O: 2026 to 2051	No	Yes
Morgan Generation Assets	Pre-application	Morgan Generation Assets	1.5 GW (Up to 107 wind turbines)	Tier 2	5.52	32.93	I: 2026 to 2029 O: 2030 to 2065	No	Yes
Morecambe Offshore Wind Farm Generation Assets	Pre-application	Morecambe Offshore Wind Farm Generation Assets	Offshore Wind Farm	Tier 2	8.9	21.5	I: 2026 to 2028 O: 2029 to 2089	No	N/A
Morecambe Offshore Wind Farm Generation Assets	Pre-application	Morecambe Offshore Wind Farm Generation Assets	Offshore Wind Farm	Tier 2	8.9	21.5	I: 2026 to 2028 O: 2029 to 2089	No	N/A
Morgan and Morecambe Transmission Assets	Pre-application	Transmission Assets	Morgan and Morecambe Transmission Assets	Tier 2	8.92	21.53	I: 2026 to 2029 O: 2029 to 2065	No	Yes
North Irish Sea Array	Pre-application	North Irish Sea Array	Offshore Wind Farm	Tier 2	112.7	118.6	I: 2024 to 2026 O: 2027 to 2059	No	Yes
Codling Wind Park	Pre-application	Codling Wind Park	Offshore Wind Farm	Tier 2	125.1	123.6	I: 2025 to 2027 O: 2028 to 2063	No	Yes
Dublin Array	Pre-application	Dublin Array	Offshore Wind Farm	Tier 2	126.1	129	I: 2025 to 2026 O: 2027 to 2062	No	Yes
Oriel Offshore Wind Farm	Pre-application	Oriel Offshore Wind Farm	Offshore Wind Farm	Tier 2	130.4	138.1	Unknown	No	Yes
Arklow Bank Wind Park Phase 2	Pre-application	Arklow Bank Wind Park Phase 2	Offshore Wind Farm	Tier 2	146.7	142.8	Unknown	No	N/A
Shelmalere Offshore Wind Farm	Pre-application	Shelmalere Offshore Wind Farm	12 -24MW (Up to 40 wind turbines)	Tier 2	164.6	160.4	I: 2028 to 2029 O:2030 to 2065	No	Yes
Llŷr 2	Pre-application	Llŷr 2	Floating Demonstration Project	Tier 2	263	240	I: 2024 to 2025 O: 2026 to 2051	No	Yes
Llŷr 1	Pre-application	Llŷr 1	Floating Demonstration Project	Tier 2	267	245	I: 2024 to 2025 O: 2026 to 2051	No	Yes
White Cross	Pre-application	White Cross	Test and Demonstration Floating Wind Farm	Tier 2	287.6	264.0	I: 2025 to 2026 O: 2026 to Unknown	No	Yes

Plan/project	Status	Plan/project	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of installation (I)/operation (O)	Spatial overlap	Temporal overlap
Inis Ealga Marine Energy Park	Pre-application	Inis Ealga Marine Energy Park	Offshore Wind Farm	Tier 2	288.3	282.7	I: 2028 to 2029 O: 2030 to Unknown	No	Yes
MaresConnect – Wales-Ireland Interconnector Cable	Pre-application	MaresConnect – Wales-Ireland Interconnector Cable	A proposed subsea and underground electricity interconnector system linking the existing electricity grids in Ireland and Great Britain.	Tier 3	14.7	0.0	I: 2025 O: 2027 to 2037	Yes	Yes

In-combination injury and disturbance from underwater sound generated during piling

1.9.4.4 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 1.167 and shown in Figure 1.13.

1.9.4.5 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. Therefore, there is 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.

Construction phase

Tier 1

1.9.4.6 The construction of Mona Offshore Wind Project, together with construction of Tier 1 projects identified in Figure 1.13 and Table 1.167 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 and Project Erebus.

1.9.4.7 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. 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.

1.9.4.8 There is potential for a cumulative 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 74 days over the piling phase between 2027 and 2028. 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.

1.9.4.9 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 cumulative 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.

Harbour porpoise

1.9.4.10 As outlined in paragraph 1.9.3.26, 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. As outlined in section 1.9.3 the use of a 26km EDR rules out potential disturbance from in-combination effects to harbour porpoise features of all SACs screened into the ISAA, except for the North Anglesey Marine/Gogledd Môn Forol SAC (which is located 22km from the Mona Array Area). All other SACs are located in excess of 26km 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.

1.9.4.11 Figure 1.14 shows the potential overlap between the 26km EDR for the relevant projects considered in the in-combination assessment. Awel y Môr Offshore Wind Farm array is located 21km from the North Anglesey Marine/Gogledd Môn Forol SAC at its nearest point and is the only project therefore considered further. All other projects screened into the in-combination assessment are located out with the 26km EDR used for the assessment and therefore will not contribute to an in-combination effect on Annex II harbour porpoise features of the North Anglesey Marine/Gogledd Môn Forol SAC.

1.9.4.12 As outlined in paragraph 1.9.3.27, the assessment for the Mona Offshore wind Project alone considered piling at the closest location within the Mona Array Area to the North Anglesey Marine/Gogledd Môn Forol SAC. For piling occurring at this location the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC would be 85.03km^2 which equates to 2.6% of the relevant area of the SAC (for a single piling activity on any given day). This would therefore be well within the daily 20% disturbance threshold as outlined in Table 1.104. As this is the closest piling location, disturbance associated with all other piling locations within the Mona Array Area would be reduced.

1.9.4.13 In terms of disturbance across the site averaged over the season (summer, 183 days) a daily footprint of 85.03km^2 over 74 days of piling across the construction phase would result in an average of 1.06% of the relevant area of the SAC being affected over the season. This would therefore fall well within the 10% threshold of the relevant area of the site over the season.

1.9.4.14 At the Awel y Môr Offshore Wind Farm, the Report to Inform Appropriate Assessment (RIAA), concluded that the footprint of disturbance (based on an EDR of 26km 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 27.3km^2 within the total North Anglesey Marine/Gogledd Môn Forol SAC area of 3,249km^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 26km), the

contribution to the 10% seasonal threshold would be at most 0.84% and therefore well within the 10% threshold.

1.9.4.15 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. As outlined in paragraph 1.9.4.11 and 1.9.4.14 the disturbance footprints associated with both projects would result in potential disturbance across an area equating to 3.44% 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.

Bottlenose dolphin

1.9.4.16 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 9: Marine mammals of the PEIR.

1.9.4.17 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 (Blue Gem, 2020).

1.9.4.18 As outlined in Volume 2, chapter 9: Marine mammals of the PEIR, the in-combination assessment therefore assumes there would be piling at Project Erebus in 2025 affecting 310 bottlenose dolphin (noting that the Erebus project is located within the Offshore Channel, Celtic Sea and South West England MU), followed by piling at Mona Offshore Wind Project in 2027 affecting up to 17 bottlenose dolphin, and subsequently piling at Awel y Môr and Mona Offshore Wind Project in 2028 (affecting 17 and 23 bottlenose dolphin respectively) which may coincide and affect up to 40 bottlenose dolphin (13.6% of the Irish Sea MU in total), see Table 1.168. 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.

Table 1.168: 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	70	Monopile 5,500kJ Concurrent	35-70 days	24 months	17	0.035 within 6km coastal zone	5.69 (Irish Sea MU)
Awel y Môr Offshore Wind Farm	50	Monopile, 5,000kJ	201 days	12 months	23	0.035 for the 20m depth contour 0.008 offshore	7.9 (Irish Sea MU)
Project Erebus	35	Pin-pile, 800kJ	18 days	8 months	310	0.063 (array area) 0.3743	2.8 (Offshore Channel and Southwest England MU)

Grey seal

1.9.4.19 Table 1.169 provides information detailing the duration of piling associated with Tier 1 projects considered in the in-combination assessment for grey seal.

1.9.4.20 As outlined in volume 2, chapter 9: Marine mammals of the PEIR, the in-combination assessment therefore assumes there would be piling at Project Erebus in 2025 affecting 18 grey seal, followed by piling at Mona Offshore Wind Project in 2027 affecting 92 grey seal, and subsequently piling at Awel y Môr and Mona Offshore Wind Project in 2028 which may coincide and affect up to 173 grey seal (i.e. 81 individuals from Awel y Môr and 92 from the Mona Offshore Wind Project).

Table 1.169: Numbers of grey seal numbers 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 (animal per km^2)	% of reference population
Mona Offshore Wind Project	70	Monopile 5,500kJ Concurrent	35	24 months	92	N/A – Grid cell specific	0.68% of the Grey Seal Reference Population 0.15% of the OSPAR Region III population
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)

Tier 2

1.9.4.21 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: Shelmalere Offshore Wind Farm, Morgan Generation Assets, Oriel Offshore Wind Farm, North Irish Sea Array, Codling Wind Park, Dublin Array, Inis Ealga Marine Energy Park, Llŷr Projects (Llŷr 1/Llŷr 2), White Cross, Arklow Bank Wind Park Phase 2, Morecambe Offshore Wind Farm Generation Assets and the Morgan and Morecambe Transmission Assets. This may lead to in-combination disturbance to Annex II marine mammal features from piling.

1.9.4.22 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, except Llŷr 1/Llŷr 2. 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 and the Morecambe Offshore Wind Farm Generation Assets, 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.

1.9.4.23 The number of animals potentially disturbed during piling at Morgan Generation Assets is presented in Table 1.170. Cumulatively, during piling at Mona Offshore Wind Project and Morgan Generation assets, up to 1,957 harbour porpoise (3.13% of the MU population), 33 bottlenose dolphin (10.97% of the MU population), 141 grey seal (1.03% of the grey seal reference population/0.23% of the OSPAR III region) and up to two harbour seal may be disturbed (0.15% of the reference population) (see paragraph 1.9.3.17 to 1.9.3.23 for numbers of animals disturbed during piling at the Mona Offshore Wind Project).

Table 1.170: The maximum number of animals predicted to be disturbed during concurrent piling of monopiles at Morgan Generation Assets.

Species	Number of Animals	% Reference Population (MU)[1]
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%

1.9.4.24 In temporal terms, the first construction phases are anticipated to start in 2024, for the North Irish Sea Array and Llŷr projects. The construction of some of the cumulative projects will last until 2029, including the Morgan Generation Assets, Shelmalere Offshore Wind Farm, Morgan and Morecambe Transmission Assets and Inis Ealga Marine Energy Park. This timescale constitutes a total of six 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 9.1: Marine mammal technical report of the PEIR 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.

1.9.4.25 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 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 9: Marine mammals of the PEIR). However, where there is a potential for simultaneous piling to take place, it may potentially result in a larger area of strong disturbance (160dBre 1µPa) compared to piling at the Mona Offshore Wind Project alone.

1.9.4.26 In the context of the wider habitat available within the Irish Sea and wider Celtic Sea regional marine mammal study area, it is anticipated that it will not result in a long-term population-level effect on harbour porpoise, grey seal or harbour seal. The cumulative piling at Tier 2 projects could however lead to a long-term population-level effect on bottlenose dolphin due to further contribution to the impacts on the declining population of bottlenose dolphins within the Irish Sea MU (see paragraph 1.9.2.22). It must however be noted there was no noticeable difference in the iPCoD model with the addition of the Tier 2 project (Morgan Generation Assets) to the Tier 1 cumulative scenario for Mona Offshore Wind Project (further described in volume 2, Chapter 9: Marine Mammals of the PEIR). Nevertheless, no measurable change in the context of the wider combined bottlenose dolphin population of the Offshore Channel and Southwest England MU plus the Irish Sea MU is anticipated.

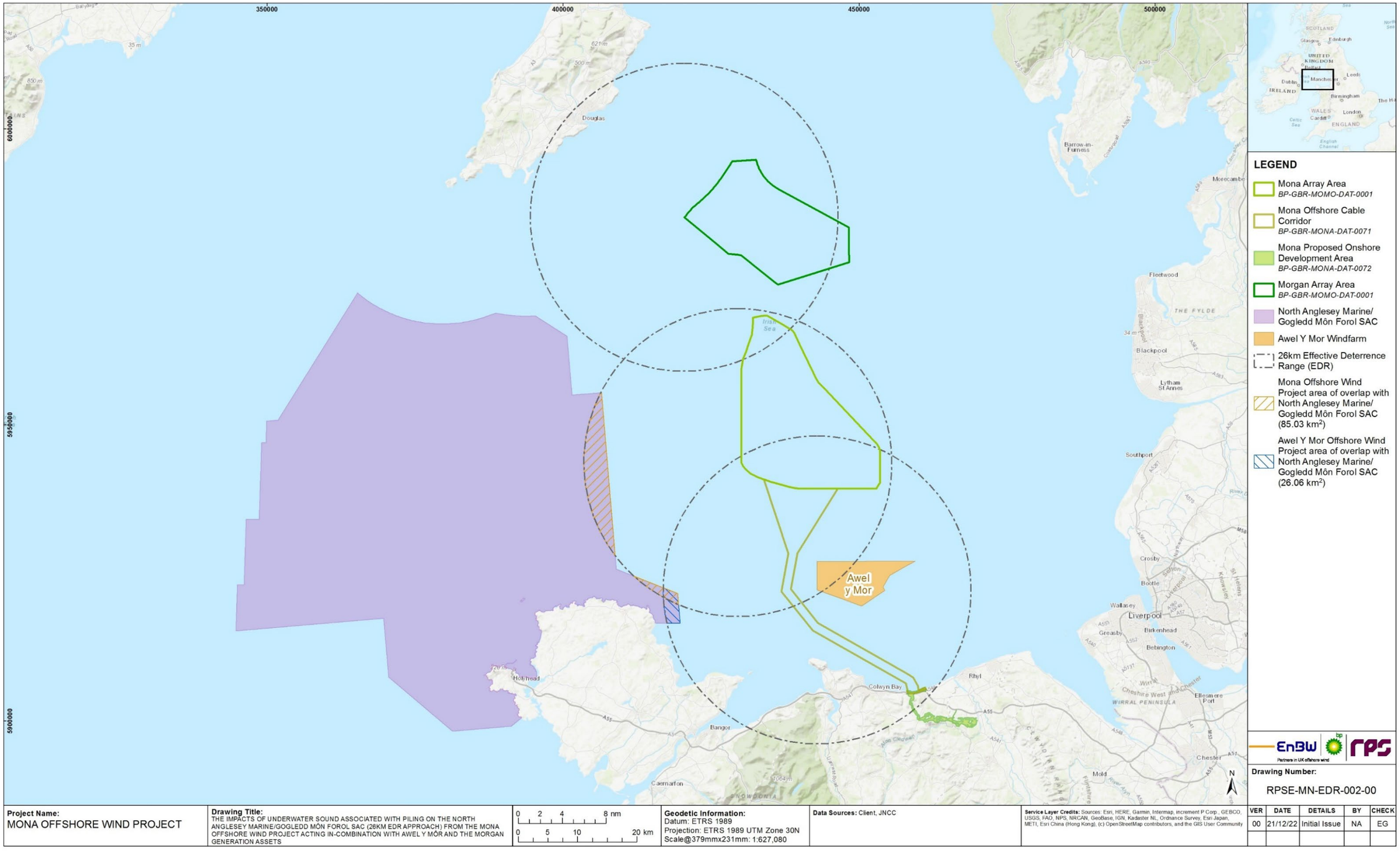


Figure 1.14: Maximum spatial overlap of underwater sound impacts associated with piling at the Mona Offshore Wind Project and other relevant projects on the North Anglesey Marine/Gogledd Môn Forol SAC based on the 26km EDR approach.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

Conclusions

1.9.4.27 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 1.9.2) 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 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 1.9.4.10 to 1.9.4.15 the maximum area of disturbance within the North Anglesey Marine/Gogledd Môn Forol SAC resulting from the projects considered within the in-combination assessment (Mona Offshore Wind Project and Awel y Môr) would be 2.84% (on any given day) which does not exceed either of the 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 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 PEIR), 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.

1.9.4.28 Therefore, it can be concluded 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

1.9.4.29 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 1.9.2) is discussed in turn below in Table 1.172. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.172: 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 1.9.4.10 to 1.9.4.14 the 26km EDR for the Mona Offshore Wind Project does not overlap with the North Channel SAC (located 80km 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 9: Fish and shellfish ecology of the PEIR), 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.

1.9.4.30 Therefore, it can be concluded 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

1.9.4.31 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.

1.9.4.32 As outlined in paragraph 1.9.4.16 to 1.9.4.18, although likely to be an over estimate given the highly precautionary densities used, piling at Project Erebus in 2025 could affect 310 bottlenose dolphin, followed by piling at Mona Offshore Wind Project in 2027 which could affect 17 bottlenose dolphin, and subsequently piling at Awel y Môr and the Mona Offshore Wind Project in 2028 which may coincide and affect up to 40 bottlenose dolphin from both projects (13.6% of the Irish Sea MU in total). During piling at the Mona Offshore Wind Project and Morgan Generation assets, up to 22 bottlenose dolphin (10.97% of the MU population) could be disturbed as a result of both projects.

1.9.4.33 Volume 2, chapter 9: Marine mammals of the PEIR 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, 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.

1.9.4.34 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.

1.9.4.35 As reported in Lohrengel *et al.* (2018) there has been an overall increase in the population size between 2001-2007 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).

1.9.4.36 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 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 1.9.4.8, 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.

Grey seal

1.9.4.37 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 92 grey seal, and subsequently piling at Awel y Môr and Mona Offshore Wind Project in 2028 which may coincide and affect up to 173 grey seal in total from the three projects. During piling at the Mona Offshore Wind Project and the Morgan Generation Assets, up to 141 grey seal (1.03% of the grey seal reference population/0.23% of the OSPAR III region) could be disturbed as a result of both projects. 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.

1.9.4.38 Volume 2, chapter 9: Marine mammals of the PEIR 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 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 effects on this species.

Conclusions

1.9.4.39 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 1.9.2) is discussed in turn below in Table 1.173. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.173: 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 1.9.4.37 to 1.9.4.38, 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 448km 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. 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 paragraph 1.9.4.37 to 1.9.4.38, 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. 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 8: Fish and shellfish ecology of the PEIR), 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.

1.9.4.40 On the basis of the preliminary assessments undertaken to date it is considered unlikely that there will be 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 from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects. It is not, however, possible to conclude this definitively at this stage (i.e. beyond reasonable scientific doubt) until further assessment work, on the population level effects, is complete. The final conclusion of potential adverse effect on integrity is, therefore, deferred to the assessments which will be presented in the ISAA submitted with the application for consent.

Strangford Lough SAC

Harbour seal

1.9.4.41 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.

1.9.4.42 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 0.15% of the reference population. Harbour seal also have a large foraging range (up 273km 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

1.9.4.43 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 1.9.2) is discussed in turn below in Table 1.174. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.174: 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 273km 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.

1.9.4.44 Therefore, it can be concluded 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

1.9.4.45 The Murlough SAC is located at an increased distance to the Mona Offshore Wind Project (114km from the Mona Array Area) than the Strangford Lough SAC, assessed in paragraphs 1.9.4.41 to 1.9.4.44. 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

1.9.4.46 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 1.9.2) is discussed in turn below in 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 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 273km 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.

1.9.4.47 Therefore, it can be concluded 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

1.9.4.48 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 1.9.2) is discussed in Table 1.176 below.

Table 1.176: 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. 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, 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 8: Fish and shellfish ecology of the PEIR), 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.

1.9.4.49 On the basis of the preliminary assessments undertaken to date it is considered unlikely that there will be an adverse effect on the integrity of the 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. It is not, however, possible to conclude this definitively at this stage (i.e. beyond reasonable scientific doubt) until further assessment work, on the population level effects, is complete. The final conclusion of potential adverse effect on integrity is, therefore, deferred to the assessments which will be presented in the ISAA submitted with the application for consent.

The Maidens SAC

Grey seal

1.9.4.50 The Maidens SAC is located at an increased distance to the Mona Offshore Wind Project (165km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.4.37 to 1.9.4.40. 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

1.9.4.51 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 1.9.2) is discussed in turn below in Table 1.177.

Table 1.177: 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 1.9.4.18 to 1.9.4.19, 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 448km 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 1.9.4.18 to 1.9.4.19, 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.

Conservation objectives	Conclusion
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.

1.9.4.52 Therefore, it can be concluded 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

1.9.4.53 The Pembrokeshire Marine/Sir Benfro Forol SAC is located at an increased distance to the Mona Offshore Wind Project (212km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.4.37 to 1.9.4.40. 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

1.9.4.54 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 1.9.2) is discussed in turn below in Table 1.178.

Table 1.178: 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 1.9.4.18 to 1.9.4.19, 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 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 8: Fish and shellfish ecology of the PEIR), 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.

1.9.4.55 Therefore, it can be concluded 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

1.9.4.56 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 1.9.2) is discussed in turn below 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 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 1.9.4.10 to 1.9.4.15 the 26km EDR for the Mona Offshore Wind Project does not overlap with the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC (located 276km 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.

Conservation objectives	Conclusion
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 8: Fish and shellfish ecology of the PEIR), 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.

1.9.4.57 Therefore, it can be concluded 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

1.9.4.58 The Lundy SAC is located at an increased distance to the Mona Offshore Wind Project (309km from the Mona Array Area) than the Pen Llyn a`r Sarnau/Llŷn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.4.37 to 1.9.4.40. 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

1.9.4.59 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 1.9.2) is discussed in turn below Table 1.180. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.180: 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 [are maintained or restored]	As outlined in paragraph 1.9.4.37 to 1.9.4.38, 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 448km 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 1.9.4.37 to 1.9.4.38, 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.

1.9.4.60 Therefore, it can be concluded 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

1.9.4.61 The Isles of Scilly Complex SAC is located at an increased distance to the Mona Offshore Wind Project (439km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.4.37 to 1.9.4.40. 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

1.9.4.62 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 1.9.2) 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 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 1.9.4.37 to 1.9.4.38, 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 448km 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 1.9.4.37 to 1.9.4.38, 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.

1.9.4.63 Therefore, it can be concluded 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

1.9.4.64 As outlined in paragraphs 1.9.1.3 to 1.9.1.8, 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 1.9.4.27 to 1.9.4.63 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.9.4.65 to 1.9.4.87.

West Wales Marine/Gorllewin Cymru Forol SAC

1.9.4.65 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 1.9.4.27 to 1.9.4.30), 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

Grey seal

1.9.4.66 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 1.9.4.37 to 1.9.4.40), 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

1.9.4.67 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 1.9.4.37 to 1.9.4.40), 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

1.9.4.68 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.69 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.70 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.71 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.72 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.73 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.74 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.75 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.76 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.77 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.78 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.79 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.80 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.81 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.82 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.83 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.84 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.85 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.86 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.87 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 1.9.4.27 to 1.9.4.30), 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

1.9.4.88 There is potential for injury and/or disturbance (presented as TTS/moving away response) 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 Figure 1.10.

1.9.4.89 As presented in volume 2, chapter 9: Marine mammals of the PEIR, 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 the moving away response in line with recommendation from Southall *et al.* (2007).

1.9.4.90 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 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

1.9.4.91 Awel y Môr is located 3.6km from the Mona Offshore Cable Corridor and is located 12.2km 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 9: Marine mammals of the PEIR.

1.9.4.92 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 9: Marine mammals of the PEIR and Table 1.182. 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).

1.9.4.93 The Awel y Môr assessment presented results for various disturbance thresholds, including a 26km EDR for high order detonations, 5km EDR for low order and TTS-onset thresholds for high-order detonations.

1.9.4.94 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 (16km 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.

1.9.4.95 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 9: Marine mammals of the PEIR.

1.9.4.96 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 2kg NEQ, which could result in PTS in up to five harbour porpoise. 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 1.182. The Environmental Statement for Project Erebus used a EDR of 5km for low order clearance and 26km for high-order clearance. Project Erebus used TTS-onset as a proxy for disturbance, and maximum predicted TTS-onset impact range was 20km 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).

1.9.4.97 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 9: Marine mammals of the PEIR) 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.

1.9.4.98 The maximum number of animals potentially affected by PTS (harbour porpoise) resulting from the tier 1 projects is 314 animals (Table 1.182). However, as outlined in paragraph 1.9.4.96 this is using modelled high-order UXO clearance for Project Erebus which is very unlikely to occur in practice. 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 1.182: 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
Mona Offshore Wind Project	Harbour porpoise	907	PTS-ONSET SPLPEAK (DB RE 1µPA)	15,370	72
	Bottlenose dolphin			890	<1
	Grey seal			3,015	6
Awel y Môr	Harbour porpoise	164	PTS-ONSET SPLPEAK	8,600	30
	Bottlenose dolphin			500	<1
			(DB RE 1µPA)		<1
	Grey seal			1,600	3
Project Erebus	Harbour porpoise	525	PTS-ONSET SPLPEAK (DB RE 1µPA)	13,000	212
	Bottlenose dolphin			730	<1
	Grey seal			2,500	1

1.9.4.99 Production of underwater sound during detonation of UXOs from the tier 1 projects have the potential to cause TTS (moving away response) 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 1.183. Since TTS is a recoverable injury with a temporary loss in hearing, 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 TTS (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 1.183: Number of animals with the potential to experience onset TTS 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	TTS SPL_{pk}	28,230	245
	Bottlenose dolphin			1,635	<1
	Grey seal		SEL	6,470	26
Awel y Môr	Harbour porpoise	164	TTS onset impact ranges SPL_{pk}	1,600	804
	Bottlenose dolphin			920	<1
	Grey seal			310	13
Project Erebus	Harbour porpoise	525	TTS SEL	4,000	20
	Bottlenose dolphin			530	0
	Grey seal			20,000	52

Tier 2

1.9.4.100 For tier 2 projects, except Morgan Generation Assets, beyond EIA scoping report 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 licenses) to avoid injury; but at this stage a more detailed assessment cannot be presented.

1.9.4.101 The EIA Scoping Report for the Morgan Generation Assets (Morgan Offshore Wind Ltd, 2022b) identified PTS and disturbance (TTS/moving away) to marine mammals resulting from underwater sound during UXO clearance as a potential impact during the construction phase of the project. A range of UXO sizes were assessed, from 25kg up to 907kg with 130kg the most likely maximum. Subsequently, the PEIR predicted the largest impact ranges as a result of high order detonation of 908kg UXO size for harbour porpoise of up to 15km and 28km for PTS and TTS, respectively. Numbers of animals potentially impacted are presented in Table 1.184. Construction is expected to be from 2026 to 2030 and therefore may have fouryears of overlap with Mona Offshore Wind Project. Impacts including PTS and TTS injury 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 the Morgan Generation Assets.

Table 1.184: Number of animals with the potential to experience onset PTS/TTS during UXO clearance at Morgan Generation Assets.

Species	Maximum charge size leading to highest impact (kg)	Metric	Maximum impact range (m)	Estimated number of animals within impact area
PTS				
Harbour porpoise	907	SPL_{pk}	15,370	184
Bottlenose dolphin			890	<1
Grey seal			3,015	2
Harbour seal				<1
TTS				
Harbour porpoise	907	SPL_{pk}	28,230	623
Bottlenose dolphin			1,635	<1
Grey seal		SPL_{pk}	5,550	4
Harbour seal				<1

1.9.4.102 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 means minimal spatial overlap in UXO PTS and TTS ranges and limited potential for in-combination effects.

1.9.4.103 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 mean minimal spatial overlap in UXO PTS and TTS ranges, and limited potential for in-combination effects.

1.9.4.104 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 means likely minimal spatial overlap in UXO PTS and TTS ranges and limited potential for in-combination effects.

1.9.4.105 White Cross EIA Scoping Report includes clearance of unexploded ordnance at the wind project site and along the cable route to be scoped into the EIA (White Cross, 2020). Potential mitigation measures are to be considered such as Noise Abatement Systems (NAS) and low-order detonations for UXO. White Cross construction is planned for mid-year 2024 and it is unlikely to overlap with UXO clearance for Mona Offshore Wind Project. Therefore, there is limited potential for in-combination effects with this project.

1.9.4.106 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 on the east of Ireland (approximately 123km from Mona Offshore Wind Project) means there is limited potential for in-combination effects with Codling Wind Park.

1.9.4.107 Morgan and Morecambe Transmission Assets EIA Scoping Report details that UXO clearance will be assessed further in the EIA. Impacts including PTS and TTS ranges are expected to be similar to those from Mona Offshore Wind Project given the local proximity, and assuming construction timeframes overlap the potential for an in-combination effect with the Morgan and Morecambe Transmission Assets is possible.

1.9.4.108 For Morecambe Offshore Wind Farm Generation Assets, the EIA Scoping Report states underwater sound modelling will also be undertaken for the clearance of UXO. No publicly available information was available, at the time of writing, which quantifies the UXO clearance activities for the Morecambe Offshore Wind Farm Generation Assets. UXO impacts are likely to be similar to those from Mona Offshore Wind Project and given the local proximity and potential for overlap in construction timeframes the potential for an in-combination effect with Morecombe Offshore Wind Farm Generation Assets is possible.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.9.4.109 Volume 2, chapter 9: Marine mammals of the PEIR 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.

Conclusions

1.9.4.110 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 1.9.2) is discussed in turn below 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 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 1.101:) 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. Whilst some ecological functions could be inhibited in the short-term due to TTS, these are reversible on recovery of the animals 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.
There is no significant disturbance of the species	Given the distance from the North Anglesey Marine/Gogledd Môn Forol SAC (23km), the PTS and/or TTS range of impact 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 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. 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 paragraphs 1.9.3.427 to 1.9.3.445). 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.

1.9.4.111 Therefore, it can be concluded 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

1.9.4.112 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 1.9.2) is discussed in turn below 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 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 1.101:) 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. 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 (80km), the PTS and/or TTS range of impact 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 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. 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 1.8.4). 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.

1.9.4.113 Therefore, it can be concluded 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

1.9.4.114 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 1.9.2) 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 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.	Assuming standard industry measures (e.g. the measures adopted a part of the Mona Offshore Wind Project, as outlined in Table 1.101:) are applied for each project, it is anticipated that bottlenose dolphin and 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 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 (94km), the PTS and/or TTS 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.
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 paragraphs 1.9.3.427 to 1.9.3.445). 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.

1.9.4.115 Therefore, it can be concluded 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

1.9.4.116 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 these projects cannot act in-combination with Mona and in-combination effects associated with Awel y Môr and Project Erebus will not lead to in-combination effects on harbour seal features of the SAC. There may be the potential for in-combination effects on harbour seal with the Morgan Generation 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 with and full recovery of the animal's hearing is anticipated therefore long-term effects on the individual are not expected to occur.

1.9.4.117 As outlined in paragraphs 1.9.4.91 to 1.9.4.98, 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 the Morecambe Generation 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 porpoise.

Conclusions

1.9.4.118 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 1.9.2) 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 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 Transmission Assets and Morecombe 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 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.

1.9.4.119 Therefore, it can be concluded 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

1.9.4.120 The Murlough SAC is located at an increased distance to the Mona Offshore Wind Project (114km from the Mona Array Area) than the Strangford Lough SAC, assessed in paragraphs 1.9.4.115 to 1.9.4.119. 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

1.9.4.121 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 1.9.2) 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 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 Transmission Assets and Morecombe 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 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

Conservation objectives	Conclusion
	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.

1.9.4.122 Therefore, it can be concluded 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

1.9.4.123 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 1.9.2) is discussed in turn below in Table 1.190.

Table 1.190: 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.	Assuming standard industry measures (e.g. the measures adopted a part of the Mona Offshore Wind Project, as outlined in Table 1.101:) are 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 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 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 (163km), 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 1.8.4). 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.

1.9.4.124 Therefore, 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 the Mona Offshore Wind Project in-combination with other plans/projects.

The Maidens SAC

Grey seal

1.9.4.125 The Maidens SAC is located at an increased distance to the Mona Offshore Wind Project (165km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.4.114 to 1.9.4.119. 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

1.9.4.126 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 1.9.2) 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 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**	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. with the Mona Offshore Wind Project in-combination with other projects 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

Conservation objectives	Conclusion
	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.

1.9.4.127 Therefore, it can be concluded 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

1.9.4.128 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 1.9.2) is discussed in turn below in Table 1.192.

Table 1.192: 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.	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 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 (212km), 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 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 1.8.4). 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.

1.9.4.129 Therefore, it can be concluded 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

1.9.4.130 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 1.9.2) is discussed in turn below Table 1.193.

Table 1.193: 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 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 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	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 and the disturbance thresholds outlined in Table 1.104 will not be exceeded. 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 1.8.4). 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.

1.9.4.131 Therefore, it can be concluded 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

1.9.4.132 The Lundy SAC is located at an increased distance to the Mona Offshore Wind Project (309km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.4.114 to 1.9.4.115. 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

1.9.4.133 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 1.9.2) 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 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 (309km), 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.

1.9.4.134 Therefore, it can be concluded 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

1.9.4.135 The Isles of Scilly Complex SAC is located at an increased distance to the Mona Offshore Wind Project (439km from the Mona Array Area) than the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC, assessed in paragraphs 1.9.4.114 to 1.9.4.115. 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

1.9.4.136 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 1.9.2) 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 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]	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 Isles of Scilly Complex SAC (309km), 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.

1.9.4.137 Therefore, it can be concluded 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

1.9.4.138 As outlined in paragraphs 1.9.1.3 to 1.9.1.8, 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 1.9.4.109 to 1.9.4.137 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.9.4.139 to 1.9.4.161.

West Wales Marine/Gorllewin Cymru Forol SAC

1.9.4.139 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 1.9.4.109 to 1.9.4.111), 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

Grey seal

1.9.4.140 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 1.9.4.114 to 1.9.4.115), 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

1.9.4.141 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 1.9.4.114 to 1.9.4.115), 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

1.9.4.142 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.143 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.144 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.145 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 1.9.4.109 to 1.9.4.111), 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 SCIas 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

1.9.4.146 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.147 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.148 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.149 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.150 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.151 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.152 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.153 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.154 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.155 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.156 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.157 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.158 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.159 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.160 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 1.9.4.109 to 1.9.4.111), 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

1.9.4.161 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 1.9.4.109 to 1.9.4.111), 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 surveys

1.9.4.162 There is potential for injury and disturbance from underwater sound from pre-construction site 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 1.33 have assessed pre-construction site investigation surveys as an effect pathway and are therefore scoped out of the in-combination effects assessment.

1.9.4.163 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 1.9.3.180 to 1.9.3.191 and volume 2, chapter 9: Marine mammals of the PEIR). 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 2

1.9.4.164 The construction phases of the Morgan Generation Assets and the Morecambe Offshore Wind Farm will temporally and spatially overlap with the Mona Offshore Wind Project in terms of construction sound from pre-construction site surveys. 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 Generation Assets both the EIA Scoping Report (Morgan Offshore Wind Ltd, 2022) and PEIR are available. The PEIR predicted most of the disturbance ranges within 100s of meters with the greatest distance over which the disturbance can occur out to approximately 55km during vibro-coring.

1.9.4.165 Based on the distance from the Mona Offshore Wind Project to the Morgan Generation Assets and Morecambe Offshore Wind Project, 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.

1.9.4.166 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.

1.9.4.167 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.

North Anglesey Marine/Gogledd Môn Forol SAC

Harbour porpoise

1.9.4.168 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 an MMMP which will further

reduce the potential for in-combination sound effects from pre-construction site surveys.

Conclusions

1.9.4.169 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 1.9.2) 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 the North Anglesey Marine/Gogledd Môn Forol SAC for in-combination underwater sound from pre-construction site 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 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 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 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 surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, underwater sound from pre-construction site 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.

1.9.4.170 Therefore, it can be concluded 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 surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

North Channel SAC

Harbour porpoise

1.9.4.171 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

1.9.4.172 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 surveys. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) 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 the North Channel SAC for in-combination underwater sound from pre-construction site 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 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 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 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 surveys to result in adverse effects on the habitats of harbour porpoise. Therefore, underwater sound from pre-construction site 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.

1.9.4.173 Therefore, it can be concluded 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 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

1.9.4.174 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

1.9.4.175 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 1.9.2) 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 the Pen Llŷn a'r Sarnau/Lleyn Peninsula and the Sarnau SAC for in-combination underwater sound from pre-construction site 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 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 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 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 surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site 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.

1.9.4.176 Therefore, it can be concluded 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 surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Strangford Lough SAC

Harbour seal

1.9.4.177 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

1.9.4.178 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 1.9.2) 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 the Strangford Lough SAC for in-combination underwater sound from pre-construction site 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 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 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 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 surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site 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.

1.9.4.179 Therefore, it can be concluded 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 surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Murlough SAC

Harbour seal

1.9.4.180 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

1.9.4.181 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 1.9.2) 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 the Murlough SAC for in-combination underwater sound from pre-construction site 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 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 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 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 surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site 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.

1.9.4.182 Therefore, it can be concluded 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 surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Bottlenose dolphin

1.9.4.183 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

1.9.4.184 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 1.9.2) 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 the Cardigan Bay/Bae Ceredigion SAC for in-combination underwater sound from pre-construction site 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 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 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 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 surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site 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.

1.9.4.185 Therefore, 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 impacts from pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

The Maidens SAC

Grey seal

1.9.4.186 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

1.9.4.187 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 1.9.2) 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 The Maidens SAC for in-combination underwater sound from pre-construction site 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 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 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 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 surveys to result in adverse effects on the physical features used by harbour seal within the site. Therefore, underwater sound from pre-construction site 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.

1.9.4.188 Therefore, it can be concluded 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 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

1.9.4.189 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

1.9.4.190 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 1.9.2) 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 Pembrokeshire Marine/Sir Benfro Forol SAC for in-combination underwater sound from pre-construction site 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 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 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 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 surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site 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.

1.9.4.191 Therefore, it can be concluded 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 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

1.9.4.192 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

1.9.4.193 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 1.9.2) 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 Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC for in-combination underwater sound from pre-construction site 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 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 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 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 surveys to result in adverse effects on the habitats of the qualifying species. Therefore, underwater sound from pre-construction site 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.

1.9.4.194 Therefore, it can be concluded 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 surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Lundy SAC

Grey seal

1.9.4.195 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

1.9.4.196 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 1.9.2) is discussed in turn below in Table 1.205. 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 Lundy SAC for in-combination underwater sound from pre-construction site 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 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 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 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 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 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 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.

1.9.4.197 Therefore, it can be concluded 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 surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Isles of Scilly Complex SAC

Grey seal

1.9.4.198 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

1.9.4.199 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 1.9.2) is discussed in turn below in Table 1.206. 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 Isles of Scilly Complex SAC for in-combination underwater sound from pre-construction site 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 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 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 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 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 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 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.

1.9.4.200 Therefore, it can be concluded 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 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

1.9.4.201 As outlined in paragraphs 1.9.1.3 to 1.9.1.8, 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 1.9.4.109 to 1.9.4.200 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.9.4.202 to 1.9.4.224.

West Wales Marine/Gorllewin Cymru Forol SAC

1.9.4.202 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cardigan Bay/Bae Ceredigion SAC

Grey seal

1.9.4.203 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 1.9.4.174 to 1.9.4.176), 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 surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Saltee Islands SAC

1.9.4.204 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 1.9.4.174 to 1.9.4.176), 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 surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Rockabill to Dalkey Island SAC

1.9.4.205 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Roaringwater Bay and Islands SAC

1.9.4.206 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Blasket Islands SAC

1.9.4.207 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 1.9.4.168 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 pre-construction site 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

1.9.4.208 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Abers - Côte des legends SCI

1.9.4.209 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Ouessant-Molène SCI

1.9.4.210 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côte de Granit rose-Sept-Iles SCI

1.9.4.211 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 1.9.4.168 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 SCIas a result of underwater sound from pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Goulven, dunes de Keremma SCI

1.9.4.212 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Tregor Goëlo SCI

1.9.4.213 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côtes de Crozon SCI

1.9.4.214 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Chaussée de Sein SCI

1.9.4.215 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap Sizun SCI

1.9.4.216 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 1.9.4.168 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 pre-construction site 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

1.9.4.217 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Vauville SCI

1.9.4.218 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap d'Erquy-Cap Fréhel SCI

1.9.4.219 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie de Saint-Brieuc – Est SCI

1.9.4.220 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Banc et récifs de Surtainville SCI

1.9.4.221 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 1.9.4.168 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 pre-construction site 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

1.9.4.222 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Estuaire de la Rance SCI

1.9.4.223 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 1.9.4.168 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 pre-construction site surveys with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Baie du Mont Saint-Michel SCI

1.9.4.224 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 1.9.4.168 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 pre-construction site surveys 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 vessels and other (non-piling) sound producing activities

1.9.4.225 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 1.167.

1.9.4.226 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 (<10m) from the source. The assessment for Mona Offshore Wind Project alone (paragraphs 1.9.3.266 to 1.9.3.279) 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

1.9.4.227 Awel y Môr Offshore Wind Farm is located approximately 3.6km from the Mona Offshore Cable Corridor. 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 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 4km from construction vessels. The assessment also identified localised behavioural disturbance ranges for harbour porpoise and grey seal with avoidance reported up to 5km 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. Similarly, minke whale presence is negatively correlated with construction related activities, including dredging.

1.9.4.228 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.

1.9.4.229 The Environmental Statement for the West Anglesey Demonstration Zone tidal site (Royal Haskoning DHV, 2019), which is located 53.7km 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.

1.9.4.230 The Project Erebus site is located 258.9km from the Mona Array Area and comprises up to 10 floating wind turbines over a maximum area of 32km^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).

1.9.4.231 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 22km 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.

1.9.4.232 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 habituation to sound from vessels.

1.9.4.233 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 6.5km) and therefore the extent of effect will be local. However, where vessels may disturb animals over ranges of 22km, 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 PEIR).

1.9.4.234 The cumulative effect 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

1.9.4.235 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 Morgan Generation Assets, Morgan and Morecambe Transmission Assets, Shelmalere Offshore Wind Farm and Inis Ealga Marine Energy Park, the operations and maintenance phase of the Llŷr Projects (Llŷr 1 and Llŷr 2), and both the construction and operations and maintenance phases of the North Irish Sea Array, Codling Wind Park, Dublin Array and White Cross, Oriel Offshore Wind Farm, Morecambe Offshore Wind Farm Generation Assets, Arklow Bank Wind Park Phase 2 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 Oriel Offshore Wind Farm, Morecambe Offshore Wind Farm Generation Assets, Arklow Bank Wind Park Phase 2 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.

1.9.4.236 Cable laying activities assessed for the Morgan Generation Assets alone have the potential to disturb marine mammals out to 13km. The maximum range over which potential disturbance may occur for the Morgan Generation Assets alone was predicted out to 18km as a result of sandwave clearance vessel, installation vessel, construction vessel, rock placement vessel and cable 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 (bp and EnBw, 2022).

1.9.4.237 Given that EIA Scoping Reports do not provide detailed information about numbers of vessels involved, it is not possible to undertake full, quantitative assessment including the other projects for this impact.

1.9.4.238 The range of effects for remaining Tier 2 project is predicted to be localised to within each project boundary. For some of the Tier 2 projects (including Shelmalere Offshore Wind Farm, North Irish Sea Array, Codling Wind Park, Dublin Array, the Llŷr Projects and Inis Ealga Marine Energy Park), the distances from the Mona Offshore Wind Project are greater than 100km and there is no potential for overlap in the behavioural ZOI. Other projects, including Morgan Generation Assets, Transmission Assets, Morecambe Offshore Wind Farm Generation Asset are located in 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 will likely follow existing shipping routes to/from port.

1.9.4.239 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 cumulative number of vessels for Tier 1 projects represents an increase compared to the average vessel traffic (see paragraph 1.9.4.232). 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.

1.9.4.240 Cumulatively, construction activities could lead to a larger area of disturbance to marine mammals at any one time across the Irish and Celtic seas compared to the Mona Offshore Wind project alone assuming that projects were to conduct construction activities over similar time periods. Vessels such as boulder clearance, jack-up rigs, tug/anchor handlers and guard vessels will have smaller disturbance ranges (between 1 to 4km) and therefore the extent of effect will be local. However, where vessels may disturb animals over ranges of 13 to 18km, it represents a larger proportion of the Irish and Celtic Seas and may potentially affect animals over regional scales (noting that these ranges are highly conservative and that in reality these ranges are expected to be much lower). 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 study area, the scale of the disturbance effects (which would be localised) is considered to be small.

1.9.4.241 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

1.9.4.242 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 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

1.9.4.243 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 1.9.2) is discussed in turn below in Table 1.207. 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 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.

1.9.4.244 Therefore, it can be concluded 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

1.9.4.245 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 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 Codes of Conduct and MMMP which will further reduce the potential for in-combination sound effects from vessel use and other activities.

Conclusions

1.9.4.246 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 1.9.2) is discussed in turn below in Table 1.208. 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 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.

1.9.4.247 Therefore, it can be concluded 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

1.9.4.248 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 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

1.9.4.249 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 in-combination underwater sound from vessels and other activities. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in turn below in Table 1.209. 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 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.

1.9.4.250 Therefore, it can be concluded 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

1.9.4.251 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 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

1.9.4.252 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 1.9.2) is discussed in turn below in Table 1.210. 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 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.

Conservation objectives	Conclusion
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.

1.9.4.253 Therefore, it can be concluded 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

1.9.4.254 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 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

1.9.4.255 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 1.9.2) 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 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.

1.9.4.256 Therefore, it can be concluded 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

1.9.4.257 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 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

1.9.4.258 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 1.9.2) is discussed in turn below in Table 1.212. 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 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.

1.9.4.259 Therefore, 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 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

1.9.4.260 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 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

1.9.4.261 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 1.9.2) is discussed in turn below in Table 1.213. 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 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.

1.9.4.262 Therefore, it can be concluded 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

1.9.4.263 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 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

1.9.4.264 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 1.9.2) is discussed in turn below in Table 1.214. 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 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

1.9.4.265 Therefore, it can be concluded 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

1.9.4.266 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 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.

1.9.4.267 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 1.9.2) 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 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

1.9.4.268 Therefore, it can be concluded 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

1.9.4.269 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 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.

1.9.4.270 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 1.9.2) is discussed in Table 1.216 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 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] **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.

1.9.4.271 Therefore, it can be concluded 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

1.9.4.272 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 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.

1.9.4.273 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 1.9.2) 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 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]** **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] **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.

1.9.4.274 Therefore, it can be concluded 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

1.9.4.275 As outlined in paragraphs 1.9.1.3 to 1.9.1.8, 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 1.9.4.242 to 1.9.4.274 are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.9.4.276 to 1.9.4.298.

West Wales Marine/Gorllewin Cymru Forol SAC

1.9.4.276 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 1.9.4.243 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 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

1.9.4.277 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 1.9.4.248 to 1.9.4.250), 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

1.9.4.278 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 1.9.4.248 to 1.9.4.250), 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

1.9.4.279 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 1.9.4.243 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 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

1.9.4.280 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 1.9.4.243 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 vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Blasket Islands SAC

1.9.4.281 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 1.9.4.243 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 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

1.9.4.282 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 1.9.4.243 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 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

1.9.4.283 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 1.9.4.243 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 vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Ouessant-Molène SCI

1.9.4.284 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 1.9.4.243 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 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

1.9.4.285 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 1.9.4.243 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 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

1.9.4.286 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 1.9.4.243 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 vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Tregor Goëlo SCI

1.9.4.287 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 1.9.4.243 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 vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Côtes de Crozon SCI

1.9.4.288 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 1.9.4.243 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 vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Chaussée de Sein SCI

1.9.4.289 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 1.9.4.243 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 vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Cap Sizun SCI

1.9.4.290 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 1.9.4.243 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 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

1.9.4.291 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 1.9.4.243 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 vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Anse de Vauville SCI

1.9.4.292 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 1.9.4.243 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 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

1.9.4.293 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 1.9.4.243 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 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

1.9.4.294 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 1.9.4.243 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 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

1.9.4.295 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 1.9.4.243 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 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

1.9.4.296 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 1.9.4.243 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 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

1.9.4.297 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 1.9.4.243 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 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

1.9.4.298 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 1.9.4.243 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 vessels and other activities with respect to construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Operations and maintenance phase

1.9.4.299 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 1.167.

1.9.4.300 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 (<10m) from the source. The assessment for Mona Offshore Wind Project alone (paragraphs 1.9.3.266 to 1.9.3.279 and 1.9.3.354 to 1.9.3.426) 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

1.9.4.301 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 Floating Wind Farm Demonstration Projects may lead to cumulative disturbance to marine mammals from vessel use and other (non-piling) sound producing activities.

1.9.4.302 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.

1.9.4.303 West Anglesey Demonstration Zone tidal site is located 53.7km 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 (Royal Haskoning DHV, 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 530m and 580m, respectively.

1.9.4.304 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).

1.9.4.305 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.

1.9.4.306 Therefore, cumulatively 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 habituation to vessel sounds.

1.9.4.307 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 a the life time of the Mona Offshore Wind Project. The cumulative number of vessels presented in paragraphs 1.9.4.302 to 1.9.4.305 will be lower for the operations and maintenance phase compared to construction phase (see paragraphs 1.9.4.225 to 1.9.4.241) 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

1.9.4.308 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. Morgan Generation Assets, Shelmalere Offshore Wind Farm, North Irish Sea Array, Codling Wind Park, Dublin Array, Llŷr Projects, Inis Ealga Marine Energy Park and White Cross) 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 Oriel Offshore Wind Farm, Morecambe Offshore Wind Farm Generation Assets, Arklow Bank Wind Park Phase 2 and Morgan and Morecambe 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.

1.9.4.309 Given that EIA Scoping Reports for the projects outlined in paragraph 1.9.4.308 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.

1.9.4.310 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, cumulatively it could be expected that the total number of vessel movements will exceed the average traffic levels.

1.9.4.311 Qualitatively, the impact would lead to a larger area of disturbance within the regional marine mammals study area (see paragraph 1.9.4.306) 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.

1.9.4.312 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.

North Anglesey Marine/Gogledd Môn Forol SAC

1.9.4.313 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 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.

1.9.4.314 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 1.9.2) 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 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.

1.9.4.315 Therefore, it can be concluded 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

1.9.4.316 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 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.

1.9.4.317 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 1.9.2) is discussed in Table 1.219 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.219: 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.

1.9.4.318 Therefore, it can be concluded 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

1.9.4.319 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 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.

1.9.4.320 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 1.9.2) is discussed in Table 1.220 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.220: 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.

1.9.4.321 Therefore, it can be concluded 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

1.9.4.322 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 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.

1.9.4.323 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 1.9.2) is discussed in turn below in Table 1.221. Where the justifications and

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

Table 1.221: 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.

1.9.4.324 Therefore, it can be concluded 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

1.9.4.325 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 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.

1.9.4.326 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 1.9.2) is discussed in Table 1.222 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.222: 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.

1.9.4.327 Therefore, it can be concluded 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

1.9.4.328 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 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.

1.9.4.329 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 1.9.2) is discussed in Table 1.223 below. Where the justifications and

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

Table 1.223: 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.

1.9.4.330 Therefore, 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 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

1.9.4.331 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 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.

1.9.4.332 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 1.9.2) are discussed in Table 1.224 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.224: 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.

1.9.4.333 Therefore, it can be concluded 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

1.9.4.334 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 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.

1.9.4.335 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 1.9.2) is discussed in Table 1.225 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.225: 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.

1.9.4.336 Therefore, it can be concluded 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

1.9.4.337 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 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.

1.9.4.338 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 1.9.2) is discussed in Table 1.226 turn below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.226: 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.

1.9.4.339 Therefore, it can be concluded 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

1.9.4.340 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 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.

1.9.4.341 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 1.9.2) is discussed in Table 1.227 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.227: 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.

1.9.4.342 Therefore, it can be concluded 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

1.9.4.343 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 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.

1.9.4.344 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 1.9.2) is discussed in Table 1.228 below. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.228: 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.

1.9.4.345 Therefore, it can be concluded 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

1.9.4.346 As outlined in paragraphs 1.9.1.3 to 1.9.1.8, 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 1.9.4.299 to 1.9.4.345are, therefore, deemed to be applicable for the remaining sites presented below in paragraphs 1.9.4.347 to 1.9.4.369.

West Wales Marine/Gorllewin Cymru Forol SAC

1.9.4.347 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.348 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 1.9.4.319 to 1.9.4.321), 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

1.9.4.349 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 1.9.4.319 to 1.9.4.321), 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

1.9.4.350 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.351 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.352 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.353 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.354 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.355 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.356 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.357 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.358 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.359 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.360 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.361 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.362 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.363 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.364 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.365 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.366 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.367 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.368 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 1.9.4.313 to 1.9.4.318), 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

1.9.4.369 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 1.9.4.313 to 1.9.4.318), 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 prey availability

1.9.4.370 There is the potential for changes in 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 1.167. Only the North Anglesey Marine/Gogledd Môn Forol SAC has been assessed within this section, as LSE from changes in prey availability was ruled out for all other European sites with Annex II marine mammal features.

1.9.4.371 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 PEIR.

1.9.4.372 Information regarding foraging behaviour of Annex II marine mammal species and their responses to changes of prey availabilities is discussed in paragraphs 1.9.3.427 to 1.9.3.440. 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

1.9.4.373 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 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.

1.9.4.374 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.

1.9.4.375 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 PEIR) including the Mona Offshore Wind Project, was estimated at a maximum of 157.58km^2. The temporary habitat loss on fish and shellfish has been assessed to be unlikely to result in changes in prey availability in marine mammals.

1.9.4.376 The planned construction of the Awel y Môr Offshore Wind Farm alongside Mona Offshore Wind Project will introduce up to 4km^2 (1.6km^2 and 2,36km^2 respectively) of permanent hard structures which will act to represent a combined long term habitat loss impact. 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.

1.9.4.377 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 mortality for group 2 (salmonids and some Scombridae) and 3 (gadoids and eels) fish may occur out to 100m and 8,000m, from the array area respectively. However, sound modelling with inclusion of moving away response, significantly reduced mortality distances to less than 100m 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. Given that the in-combination impact will be taking place at distance from herring spawning grounds and due to the short term, intermittent nature of the impact, significant in-combination effects are not predicted to any of fish and shellfish species. 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.

1.9.4.378 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 PEIR, 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 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.

1.9.4.379 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.

Tier 2

1.9.4.380 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 prey availability as a result of changes to the fish and shellfish communities.

1.9.4.381 Potential cumulative 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.

1.9.4.382 The temporary habitat disturbance and long term habitat loss predicted to result from the Morgan Generation Assets during construction phase is up to 85.54km^2 and 1.52km^2, respectively (Morgan Offshore Wind Project Ltd, 2023). The area available for colonisation for Morgan Generation Assets was estimated at up to 1.99km^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.

1.9.4.383 No detailed information was available for the extent of temporary or long-term habitat loss, underwater sound, increased SSC and colonisation of hard structures associated with the Morecambe Offshore Windfarm Generation Assets and Transmission Assets. Therefore, it is not possible to undertake full, quantitative assessment for these impacts and a summary of qualitative assessment is provided below.

1.9.4.384 For Morecambe Offshore Windfarm Generation Assets and Morgan and Morecambe 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. 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.

1.9.4.385 As assessed for tier 1 projects in paragraph 1.9.4.373 to 1.9.4.379, 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

1.9.4.386 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 prey availability as a result of changes to the fish and shellfish communities.

1.9.4.387 Potential cumulative 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.

1.9.4.388 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 cumulative effects on marine mammal prey species.

1.9.4.389 These localised and temporary changes in 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

1.9.4.390 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 prey availability. An assessment of the impact against each relevant conservation objective (as presented in section 1.9.2) is discussed in Table 1.229 below.

Table 1.229: Conclusions against the conservation objectives of the North Anglesey Marine/Gogledd Môn Forol SAC for in-combination changes in 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 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,

Conservation objective	Conclusion
	changes in 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 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 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.

1.9.4.391 Therefore, it can be concluded 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 prey availability from the Mona Offshore Wind Project in-combination with other plans/projects.

1.10 Assessment of potential Adverse Effect on Integrity: Offshore ornithology

1.10.1.1 The HRA Stage 1 Screening Report identified the potential for LSEs on the eight European sites and designated offshore ornithological features listed in Table 1.230 and shown in Figure 1.15.

Table 1.230: European sites and relevant marine ornithological features for which the potential for LSE could not be ruled out and therefore considered in the Appropriate Assessment.

SPA	Marine ornithological features
Liverpool Bay/Bae Lerpwl SPA	Non – breeding red-throated diver Non – breeding little gull Non – breeding common scoter Breeding little tern Breeding common tern Non – breeding waterbird assemblage
Irish Sea Front SPA	Breeding Manx shearwater
Ribble and Alt Estuaries SPA	Breeding lesser black-backed gull
Morecambe Bay and Duddon Estuary SPA	Non - breeding and breeding lesser black-backed gull Breeding herring gull
Lambay Island SPA	Breeding common guillemot
Grassholm SPA	Breeding northern gannet
Ailsa Craig SPA	Breeding northern gannet
Ireland's Eye SPA	Breeding common guillemot

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

- During the construction and decommissioning phases
  - Temporary habitat loss/disturbance and increased SSC (Mona Offshore Cable Corridor only and for the Liverpool Bay/Bae Lerpwl SPA only)
  - Disturbance and displacement from airborne sound and presence of vessels and infrastructure
  - Changes in prey availability (construction only)
  - Accidental pollution (Mona Offshore Cable Corridor only and for the Liverpool Bay/Bae Lerpwl SPA only)
  - In-combination effects
- During the operations and maintenance phase
  - Changes in prey availability
  - Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only)
  - Collison risk (in-combination effect only)

1.10.1.3 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 1.11).

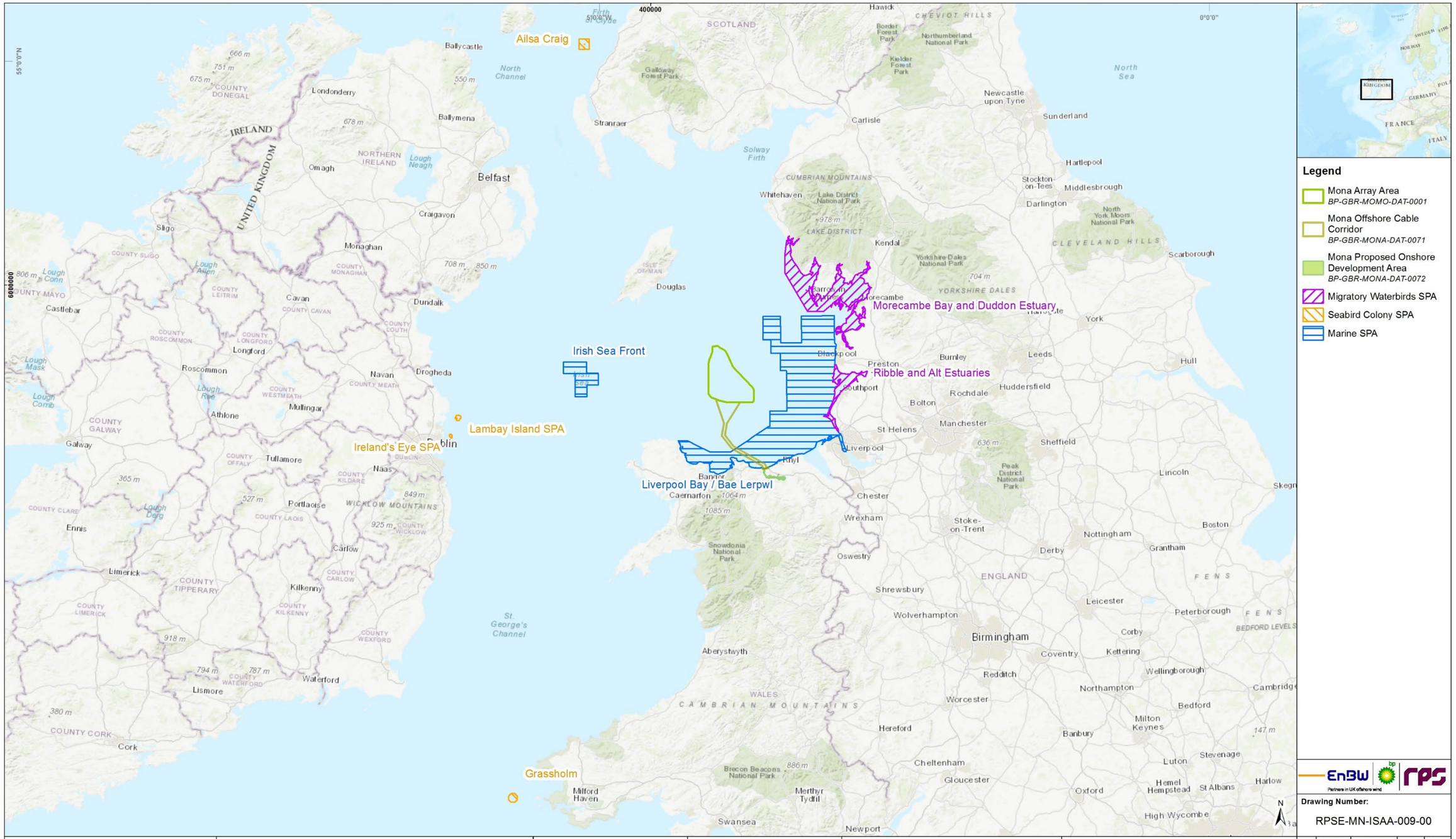


Figure 1.15: Locations of the European sites designated for marine ornithological features for which an Appropriate Assessment is required.

1.10.2 Baseline Information

1.10.2.1 Baseline information on the marine ornithological 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, and supported by 24-month site-specific aerial survey data full details of which are presented within volume 2, chapter 6: Offshore ornithology of the PEIR.

Liverpool Bay/Bae Lerpwl SPA

Site description

1.10.2.2 The Liverpool Bay/Bae Lerpwl SPA is situated in the east of the Irish Sea, bordering the northwest of England and the north of Wales, and running as a broad arc from Morecambe Bay to the east coast of Anglesey. The SPA is located 10km from the Mona Array Area and overlaps the Mona Offshore Cable Corridor. The seabed of Liverpool Bay/Bae Lerpwl SPA contains a wide range of mobile sediments. Sand is the most common substrate, with a concentrated area of gravelly sand located off the Mersey Estuary.

1.10.2.3 The Liverpool Bay/Bae Lerpwl SPA was designated by the UK Government to meet obligations set out in the Birds Directive (2009/147/EC) and is protected by The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended).

1.10.2.4 It covers an area of approximately 2,528km^2, designated for the protection of red-throated diver, common scoter, and little gull during the non-breeding season, as well as a waterbird assemblage, and foraging areas for little tern and common tern breeding within coastal SPAs.

Feature accounts

Red-throated diver

1.10.2.5 Red throated diver *Gavia stellata* are listed as a Schedule 1 species under The Wildlife and Countryside Act. Red-throated diver are also listed on Annex I of the Wild Birds Directive. The SPA protects the third largest aggregation of red-throated diver in the UK during the non-breeding season, with 6.89% of the UK population, with a classified red-throated diver population of 1,171 individuals. Webb *et al.* (2006) and Lawson *et al.* (2016) have found large concentrations of red-throated diver along the north Wales coast.

1.10.2.6 The latest densities of red-throated diver in the Liverpool Bay/Bae Lerpwl SPA were derived from wintering aerial surveys carried out between 2004 and 2011 (Lawson *et al*. 2016; Figure 1.16). Densities in the area crossed by the Mona Offshore Cable Corridor vary between zero and 1.15 birds per^2, with highest densities occurring along the shoreline.

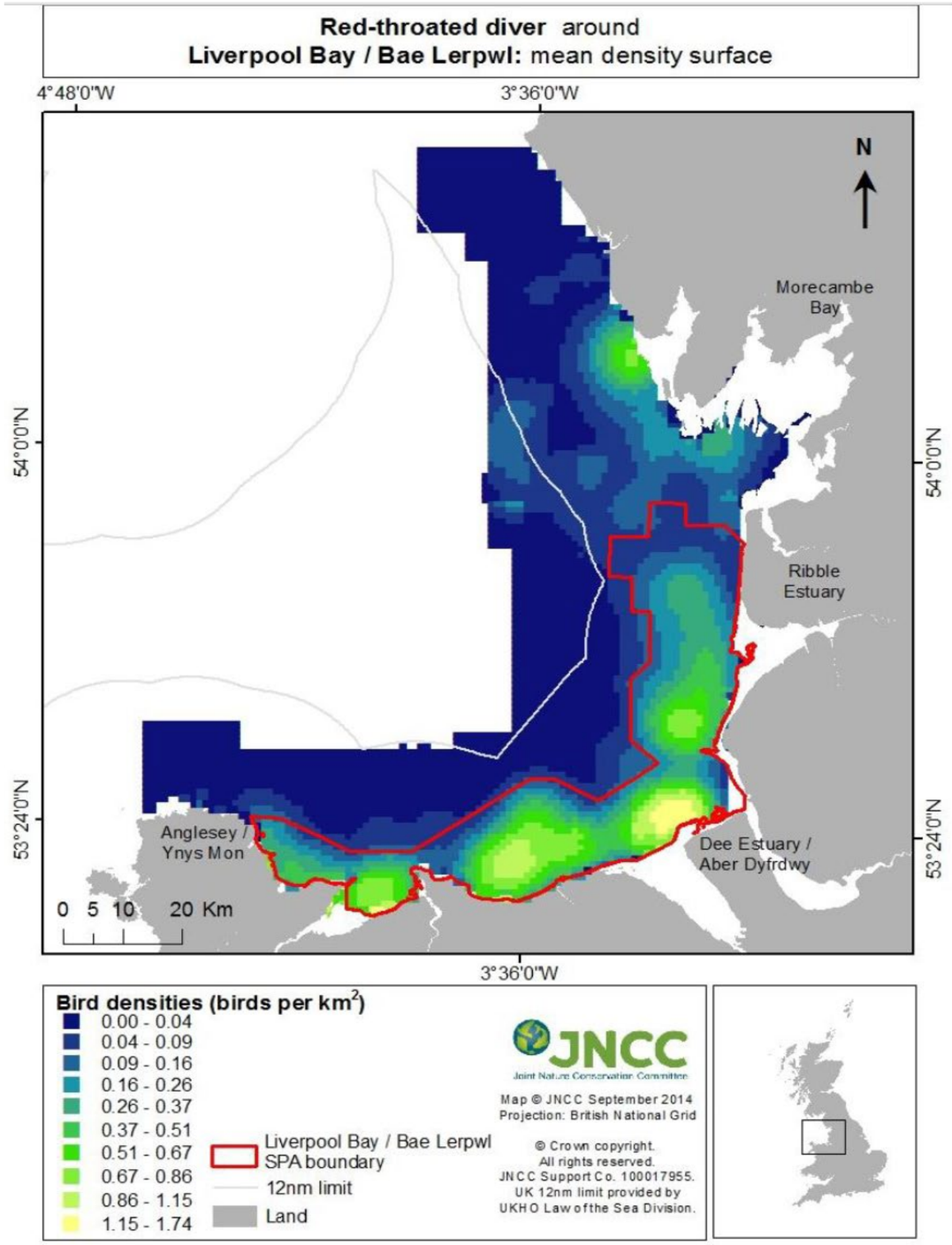


Figure 1.16: Red-throated diver densities in Liverpool Bay/Bae Lerpwl SPA from five years of winter aerial survey data recorded between 2005 and 2011 (Lawson *et al*. 2016).

Little gull

1.10.2.7 The SPA protects the largest marine aggregation of little gull in the UK during the non-breeding season. Little gull is listed on Annex I of the Wild Birds Directive.

1.10.2.8 A mean peak population estimate of 319 individuals was produced from Lawson *et al*. (2016). Observations of little gull were consistently recorded at a well-defined location in the Liverpool Bay/Bae Lerpwl SPA and the species was distributed close to the 12nm limit as shown in Figure 1.17 (Lawson *et al*., 2016).

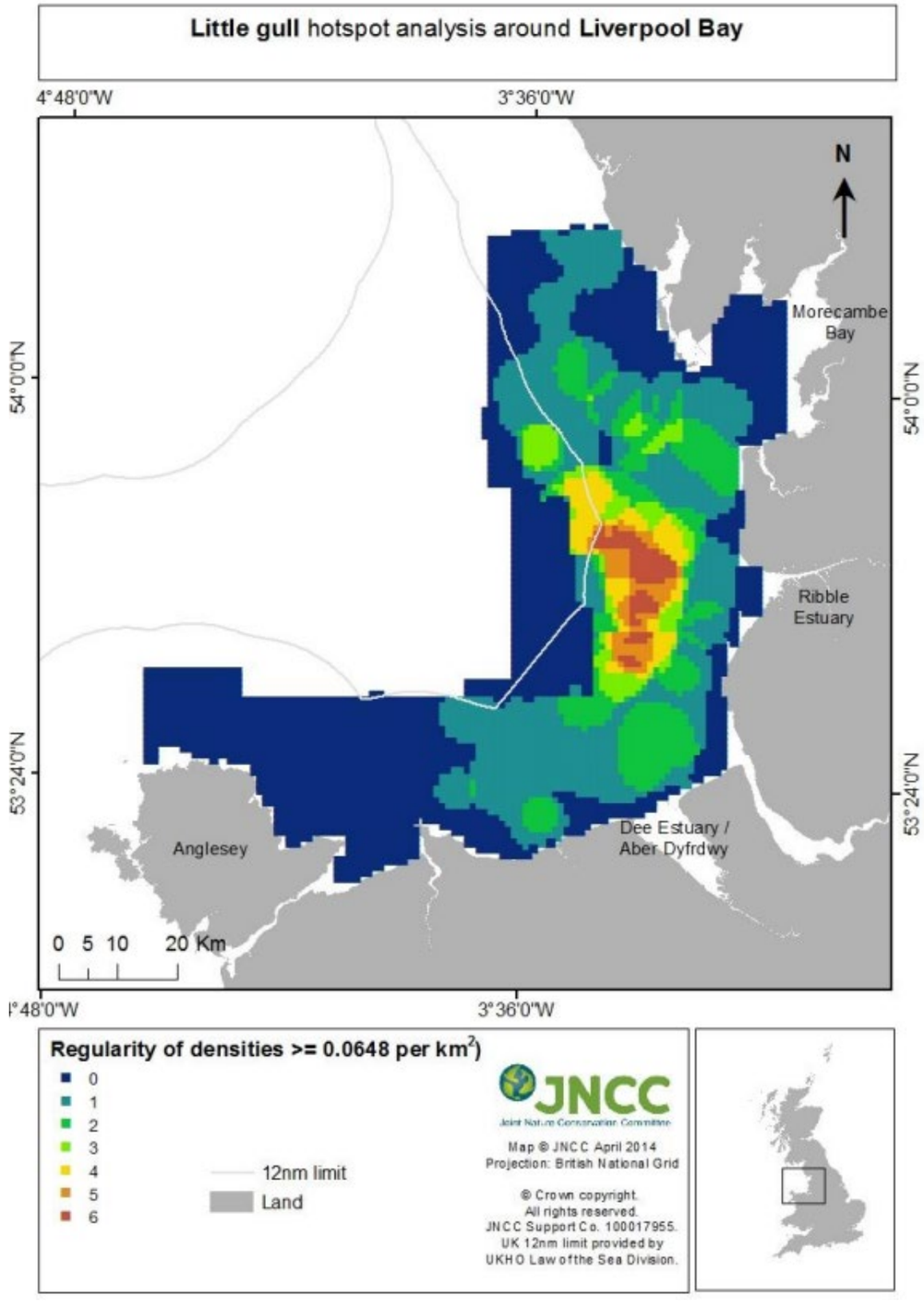


Figure 1.17: Little gull densities in Liverpool Bay/Bae Lerpwl SPA from five years of winter aerial survey data recorded between 2005 and 2011 (Lawson *et al*. 2016).

Common scoter

1.10.2.9 Common scoter is a red-listed species in the UK due to severe declines in their long-term breeding population and range, being a rare breeder, and supporting an important non-breeding population. The species is a regularly occurring migratory species under the Wild Birds Directive (not listed in Annex I). The SPA protects the largest aggregation of common scoter in the UK and it supports 10.31% of the northwest European population, with a classified common scoter population of 56,679 individuals.

1.10.2.10 Webb *et al*. (2006) and Lawson *et al.* (2016) found concentrations of common scoter along the north Wales coast. The nearshore waters between the Dee Estuary and Colwyn Bay were a stronghold for the species within the Liverpool Bay/Bae Lerpwl SPA (Lawson *et al*, 2016) (Figure 1.18).

1.10.2.11 Kaiser *et al*. (2006) collected data on the distribution and behaviour of common scoter in Liverpool Bay/Bae Lerpwl SPA and found concentrations in the nearshore waters off the north Wales coast. Kaiser *et al*. (2006) also used bathymetry to model the seafloor and collected data on prey distribution. The authors found that the north Wales seafloor falls away relatively steeply and that the highest prey densities along this coastline were located at a depth of 7.88m. Common scoter were most frequently found in water between 7 – 15m deep and it is widely accepted that common scoter forage in water less that 20m deep.

1.10.2.12 Densities of common scoter in the Liverpool Bay/Bae Lerpwl SPA are shown in Lawson *et al*. (2016) and Figure 1.18. The densities in the area crossed by the Mona Offshore Cable Corridor varied between zero and 138.23 birds per km^2, with the highest densities occurring along the shoreline.

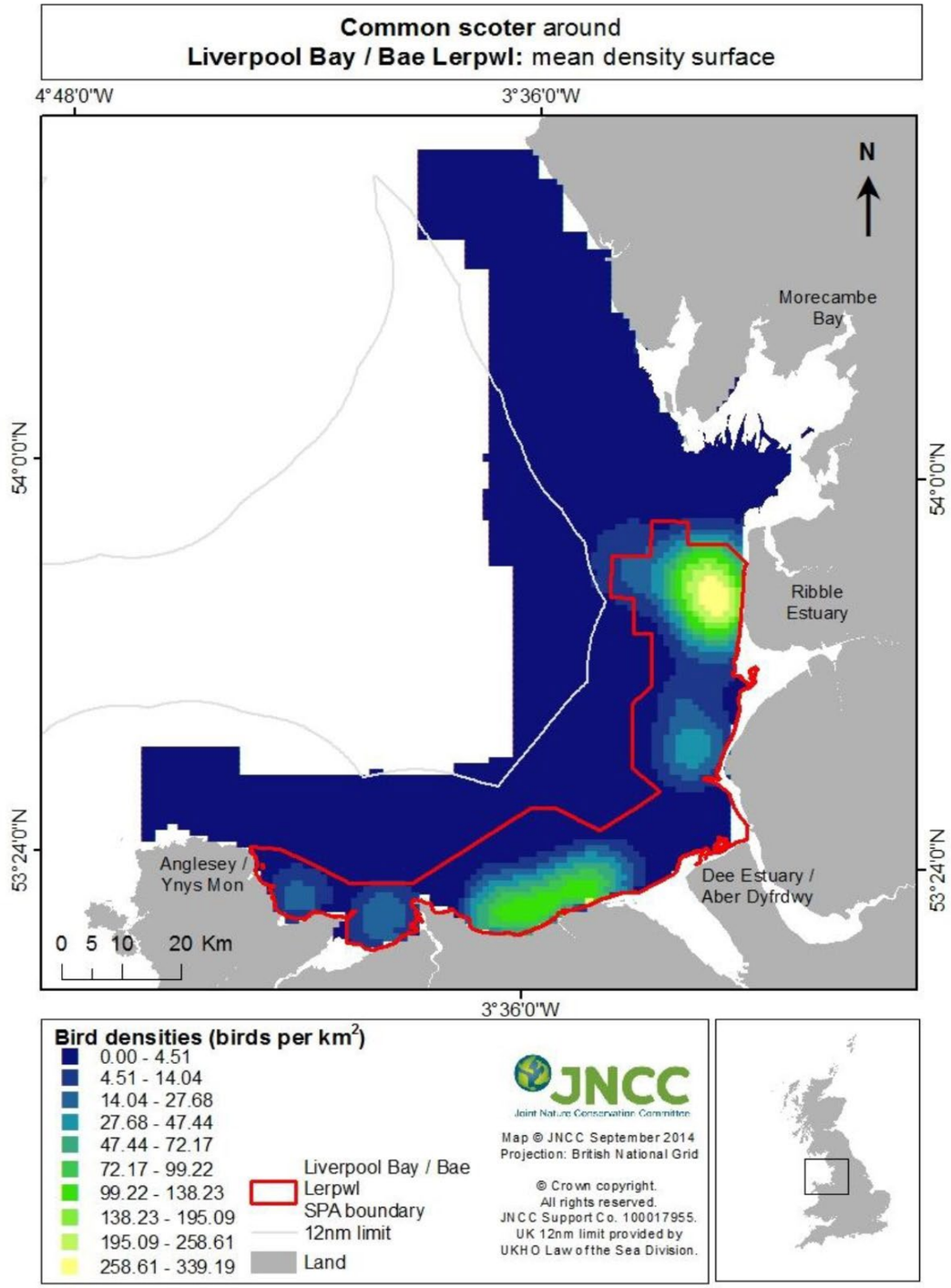


Figure 1.18: Common scoter densities in Liverpool Bay/Bae Lerpwl SPA from five years of winter aerial survey data recorded between 2005 and 2011 (Lawson *et al.*, 2016).

Little tern

1.10.2.13 Little tern is the smallest species of tern breeding in the UK, nesting exclusively on the coast in well-camouflaged shallow scrapes on beaches, spits or inshore islets (Mitchell *et al.,* 2004). The SPA supports foraging areas for nearly 7% of the UK population of little tern. Little tern is listed on Annex I of the Wild Birds Directive.

1.10.2.14 Little tern forage close to their breeding site (Woodward *et al*., 2019), and therefore require shallow, sheltered feeding areas close their breeding site. The species feed on a variety of small fish and invertebrates.

1.10.2.15 The coastal area of Gronant in Denbighshire and the Point Ayre on the Dee Estuary supported a combined total of 175 pairs in 2021. During the breeding season, these birds are likely to use the very nearshore areas of the Liverpool Bay/Bae Lerpwl SPA to forage.

Common tern

1.10.2.16 The SPA also supports nearly 2% of the UK population of common tern. The species is listed on Annex I of the Wild Birds Directive. There is a common tern colony at Shotton Lagoons reserve within the Dee Estuary SPA. During the breeding season, individuals from Shotton Lagoons are likely to forage in the inshore waters of the Liverpool Bay/Bae Lerpwl SPA that are located in close vicinity of the Dee Estuary. For a seabird species, common tern has a small foraging range, with a mean-maximum foraging range of 18.0km±8.9km (Woodward *et al*., 2019).

Waterbird assemblage

1.10.2.17 The main components of the assemblage include all the non-breeding qualifying features listed above, as well as an additional two species present in numbers exceeding 1% of the UK total: red-breasted merganser *Mergus serrator* and great cormorant *Phalacrocorax carbo*. Only red-breasted merganser and great cormorant have been assessed within the assessments below.

Conservation objectives

1.10.2.18 A Conservation Advice Package (CAP) for the Liverpool Bay/Bae Lerpwl SPA was released on the 24 January 2023 (Natural England, NRW and JNCC, 2022)[47]. The CAP contains revised conservation objectives for each feature of the site, site-specific clarifications and advice in order for the conservation objectives to be achieved, and advice on management requirements to achieve the conservation objectives. However, due to the limited timeframe between the release date of this CAP and the submission date of this HRA Stage 2 ISAA report, the Appropriate Assessment has been undertaken against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA released in 2019 (Natural England, 2019a) (see paragraph 1.10.2.19). Whilst it is considered that the conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA ((Natural England, NRW and JNCC, 2022)[39]), these will be fully reviewed and considered in the HRA Stage 2 ISAA report submitted with the application for consent.

1.10.2.19 The conservation objectives, for the protected features of the SPA (as outlined in Natural England, 2019d)[48] are to ensure that subject to natural change, the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features
- The distribution of the qualifying features within the site.

Ribble and Alt Estuaries SPA

Site description

1.10.2.20 The Ribble and Alt Estuaries SPA lies on the coast of Lancashire and Sefton in the northwest of England. The SPA is located 37km from the Mona Array Area and 39km from the Mona Offshore Cable Corridor. It is comprised of two estuaries, of which the Ribble estuary is the larger of the two. Together with an extensive area of sandy foreshore along the Sefton Coast, it forms part of the chain of UK west coast SPAs that fringe the Irish Sea. The site consists of extensive areas of sand and mudflats and, particularly in the Ribble, large areas of saltmarsh.

1.10.2.21 The site supports internationally important populations of waterbirds in winter, including swans, geese, ducks and waders. It is also of major importance during migration periods, especially for wader populations moving along the west coast of Britain. The larger expanses of saltmarsh and areas of coastal grazing marsh support breeding birds, including large concentrations of gulls and terns. These seabirds feed both offshore and inland, outside the SPA.

1.10.2.22 The Ribble and Alt Estuary SPA is designated for the protection of the following marine ornithological features: great cormorant *Phalacrocorax carbo*, lesser black-backed gull, common tern, and seabird assemblage (including common scoter).

1.10.2.23 After the LSE screening, only lesser black-backed gull was screened in for further assessment in the HRA stage 2 due to impacts on other features being none to negligible as highlighted in the volume 2, chapter 10: Offshore Ornithology of the PEIR. Furthermore, this species is the only individual qualifying feature that is within foraging range of the Mona Offshore Wind Project.

Feature accounts

Lesser black-backed gull

1.10.2.24 Lesser black-backed gull is listed as a regularly occurring migratory species under the Wild Bird Directives. The Ribble Estuary supported a population of 4,100 Apparently Occupied Nests (AONs) of lesser black-backed gulls during Seabird 2000 in 1998-

[47] http://publications.naturalengland.org.uk/publication/3236717

[48] http://publications.naturalengland.org.uk/publication/5089733892898816

2002 (Mitchell *et al*., 2004) and a latest estimate of 4,489 AONs was produced in 2021 (JNCC, 2022).

1.10.2.25 Despite this SPA being only 61km from the centre of the Mona Array Area, lesser black-backed gull were rarely observed within the Mona Array Area. A tagging study of lesser black-backed gull in the Ribble and Alt estuaries showed that most of their foraging trips during the breeding season were inland trips, with only occasional marine trips (Scragg *et al.,* 2016).

Conservation objectives

1.10.2.26 The conservation objectives for the protected features of the SPA (as outlined in Natural England, 2019e)[49] are to ensure that subject to natural change, the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features,
- The distribution of the qualifying features within the site.

Morecambe Bay and Duddon Estuary SPA

Site description

1.10.2.27 The Morecambe Bay and Duddon Estuary SPA extends between Rossall Point in Lancashire and Drigg Dunes in Cumbria. The SPA is located 47km from the Mona Array Area and 59km from the Mona Offshore Cable Corridor. Morecambe Bay is the second largest embayment in Britain after the Wash, at over 310km^2, and has four estuaries – the Wyre, Lune, Kent and Leven. It contains the largest continuous area of intertidal mudflats and sandflats in the UK. Morecambe Bay supports a wide range of other habitats including large areas of saltmarsh and transitional habitats as well as sand dune systems and coastal lagoons. The Duddon and Ravenglass Estuaries support saltmarsh, intertidal mud and sand communities and sand dune systems with small areas of stony reef.

1.10.2.28 The Morecambe Bay and Duddon Estuary SPA is designated for the protection of the following marine ornithological features: Mediterranean gull *Larus melanocephalus*, lesser black-backed gull, herring gull, sandwich tern *Sterna sandvicensis*, common tern *Sterna hirundo*, little tern *Sterna albifrons*, and seabird assemblage (including black-headed gull *Larus ridibundus*, great black-backed gull *Larus marinus*, and arctic tern *Sterna paradisaea*).

1.10.2.29 After the LSE screening (HRA Stage 1 Screening Report), only lesser black-backed gull and herring gull were screened in for further assessment in the HRA Stage 2 ISAA due to impacts on other features being none to negligible as highlighted in the volume 2, chapter 10: Offshore Ornithology of the PEIR. Furthermore, these species are the only individual qualifying features that are within foraging range of the Mona offshore wind farm.

Feature accounts

Lesser black-backed gull

1.10.2.30 Lesser black-backed gull is listed as a regularly occurring migratory species under the Wild Birds Directive. Colony counts during the 2011 – 2015 breeding season indicated that the Morecambe and Duddon Estuary SPA supported 9,720 individuals, 2.7% of biogeographic population (Seabird monitoring programme database 2011 – 2015, (JNCC, 2022). However, the population has declined in recent years due to mammal predation on the South Walney Nature Reserve near Barrow – a stronghold for the species in the Morecambe and Duddon Estuary SPA. For the first time since 2015 chicks have fledged at the South Walney Nature Reserve in 2021. The latest estimate is of 413 AONs for the Morecambe and Duddon Estuary SPA (JNCC, 2022).

European herring gull

1.10.2.31 The population of European herring gull has declined since the SPA citation value of 20,000 individuals in 1991 (1.0% of biogeographic population). Similarly to lesser black-backed gull, the population has declined due to mammal predation on the South Walney Nature Reserve near Barrow – a stronghold for the species in the Morecambe and Duddon Estuary SPA. For the first time since 2015 chicks have fledged at the South Walney Nature Reserve in 2021. The latest estimate is of 450 AONs for the Morecambe and Duddon Estuary SPA (SMP, 2022).

Conservation objectives

1.10.2.32 The conservation objectives for the protected features of the SPA (as outlined in Natural England, 2018c)[50] are to ensure that subject to natural change, the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features
- The distribution of the qualifying features within the site.

Irish Sea Front SPA

Site description

1.10.2.33 The Irish Sea Front SPA is an area of the Irish Sea between Anglesey and the Isle of Man; it covers an area 180km^2. The area is an SPA for Manx shearwater and is located 57km from the Mona Array Area and 61km from the Mona Offshore Cable Corridor.

[49] http://publications.naturalengland.org.uk/publication/4868920422957056

[50] http://publications.naturalengland.org.uk/publication/6242841537806336

1.10.2.34 This site is located over part of a large tidal front which forms in the spring every year. This tidal front creates an area of very productive sea, with high concentrations of zooplankton leading to large numbers of prey species contributing to the site's importance.

Feature accounts

Manx shearwater

1.10.2.35 The Irish Sea Front SPA is the third largest marine aggregation of breeding Manx shearwater identified in the UK. Data from the extensive European Seabirds at Sea (ESAS) database suggest that more than 12,000 Manx shearwater could be present in the area (Kober *et al.,* 2010 and Kober *et al*., 2012).

1.10.2.36 Tracking studies indicate that Manx shearwaters from at least three different colonies around the Irish Sea (Northern Ireland, Wales and Devon) are likely to use the Irish Sea Front SPA for foraging during the breeding season (Dean *et al.*, 2010, 2012).

Conservation objectives

1.10.2.37 The conservation objectives for the protected features of the SPA (as outlined in JNCC, 2016)[51] are to avoid significant deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long term and makes an appropriate contribution to achieving the aims of the Birds Directive for each of the qualifying species. This contribution would be achieved through delivering the following objectives for the sites qualifying feature:

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

Lambay Island SPA

Site description

1.10.2.38 Lambay Island lies approximately 4km off the north County Dublin coastline and is separated from it by a channel of 10-13m in depth. The SPA is located 129km from the Mona Array Area and 133km from the Mona Offshore Cable Corridor. Lambay Island SPA is internationally important for its breeding seabirds and is of particular note for the diversity of these, with 12 species breeding regularly. As such, the site is an SPA under the E.U. Birds Directive, of special conservation interest for the following species: Northern fulmar *Fulmarus glacialis*, great cormorant, European shag *Gulosus aristotelis*, greylag goose *Anser anser*, lesser black-backed gull, European herring gull, black-legged kittiwake, common guillemot, razorbill *Alca torda* and Atlantic puffin *Fratercula arctica*. The site is also of special conservation interest for holding an assemblage of over 20,000 breeding seabirds.

1.10.2.39 After the LSE screening (HRA Stage 1 Screening Report), only common guillemot was screened in for further assessment in the HRA stage 2 due to impacts on other features being none to negligible as highlighted in the volume 2, chapter 10: Offshore Ornithology of the PEIR.

Feature accounts

Common guillemot

1.10.2.40 The species is the most numerous breeding bird at the Lambay Island SPA, which is the largest colony in Ireland. The breeding population has remained relatively stable (-1%) since seabird 2000 (JNCC, 2020). The latest count in 2015 produced an estimate of 59,983 breeding individuals at the Lambay Island SPA (JNCC, 2022).

Conservation objectives

1.10.2.41 The conservation objectives for the protected features of the SPA are to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

1.10.2.42 The favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Ireland's Eye SPA

Site description

1.10.2.43 Ireland's Eye is an uninhabited island located about 1.5km north of Howth in Co. Dublin. The SPA is located 135km from the Mona Array Area and 138km from the Mona Offshore Cable Corridor. The site encompasses Ireland's Eye, Rowan Rocks, Thulla, Thulla Rocks, Carrageen Bay and a seaward extension of 200m in the west and 500m to the north and east. The site is an SPA under the Wild Birds Directive, of special conservation interest for the following species: great cormorant, European herring gull, black-legged kittiwake, common guillemot and razorbill.

1.10.2.44 After the LSE screening (HRA Stage 1 Screening Report), only common guillemot was screened in for further assessment into HRA stage 2 due to impacts on other features being negligible as highlighted in the volume 2, chapter 10: Offshore Ornithology of the PEIR.

[51] https://data.jncc.gov.uk/data/0032da71-db02-44b5-b4e1-022d77ef7ee3/irish-sea-front-sas-conservation-objectives.pdf

Feature accounts

Common guillemot

1.10.2.45 The latest count in 2015 produced an estimate of 4,410 breeding individuals at the Ireland's Eye SPA (JNCC, 2022).

Conservation objectives

1.10.2.46 The conservation objectives for the protected features of the SPA (as outlined in JNCC, 2016)[52] are to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA. The favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

Ailsa Craig SPA

Site description

1.10.2.47 Ailsa Craig SPA is an island rising to 338m, situated in the outer part of the Firth of Clyde. The SPA is located 167km from the Mona Array Area and 193km from the Mona Offshore Cable Corridor. Cliffs up to 100m encircle the island and provide nesting sites for a variety of seabirds, notably one of the largest northern gannet colonies in the world. The seaward extension extends approximately 2km into the marine environment to include the seabed, water column and surface.

1.10.2.48 The Ailsa Craig SPA is a designated for the protection of the following ornithological features: northern gannet, black-legged kittiwake, herring gull, common guillemot, and waterbird assemblage.

1.10.2.49 The LSE screening (HRA Stage 1 Screening Report) determined that only northern gannet and black-legged kittiwake are within foraging range of this SPA and only northern gannet was screened in for further assessment due to the impact on black-legged kittiwake being negligible as highlighted in the volume 2, chapter 10: Offshore Ornithology of the PEIR.

Feature accounts

Northern gannet

1.10.2.50 The species is a regularly occurring migratory species (not listed in Annex I) at the Ailsa Craig SPA. The breeding population has increased by 22% between the 2003-2004 counts and the latest count carried out in 2014 (JNCC, 2021). There were 33,226 AONs on Ailsa Craig in 2014.

Conservation objectives

1.10.2.51 The conservation objectives for the protected features of the SPA (Marine Scotland, 2022)[53] are to avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and to ensure for the qualifying species that the following are maintained in the long term:

- Population of the species as a viable component of the site
- Distribution of the species within site
- Distribution and extent of habitats supporting the species
- Structure, function and supporting processes of habitats supporting the species
- No significant disturbance of the species.

Grassholm SPA

Site description

1.10.2.52 Grassholm is a small uninhabited island, lying 8 miles offshore, due west of Skomer. The SPA is located 229km from the Mona Array Area and 211km from the Mona Offshore Cable Corridor. Grassholm supports a large breeding population of northern gannet, holding around 9% of the global breeding population (Mitchell *et al*., 2004). It is the third largest gannetry in the UK and Ireland.

Feature accounts

Northern gannet

1.10.2.53 The species is a regularly occurring migratory species (not listed on Annex I). Changes in the size of the Grassholm gannetry have been documented since its foundation around 1820. Since the 1940s, when 6,000 Apparently Occupied Sites (AOS) were estimated, the colony has grown rapidly, with 15,500 AOS estimated by aerial survey in 1964. Since 1984, counts have been made from aerial photographs, varying in quality of resolution and coverage (JNCC, 2020). The most recent survey in 2015 counted 36,011 AOS (JNCC, 2022).

1.10.2.54 A study by Carter *et al* (2016) used tracking data from 160 breeding northern gannets at Grassholm SPA over a period of five years to investigate rafting and foraging behaviour on waters around the colony. Results from 389 foraging trips showed that northern gannets from the Grassholm SPA tended to forage predominantly in the south-western waters, with few core foraging areas also identified in Cardigan Bay (Figure 1.19).

[52] https://data.jncc.gov.uk/data/0032da71-db02-44b5-b4e1-022d77ef7ee3/irish-sea-front-sas-conservation-objectives.pdf

[53] https://sitelink.nature.scot/site/8463

Conservation objectives

1.10.2.55 The conservation objectives for the protected features of the SPA (as outlined in NRW, 2008)[54] are to be in a favourable conservation status, where all of the following conditions are satisfied:

- The population will not fall below 30,000 pairs in three consecutive years
- It will not drop by more than 25% of the previous year's figures in any one year
- There will be no decline in this population significantly greater than any decline in the North Atlantic population as a whole.

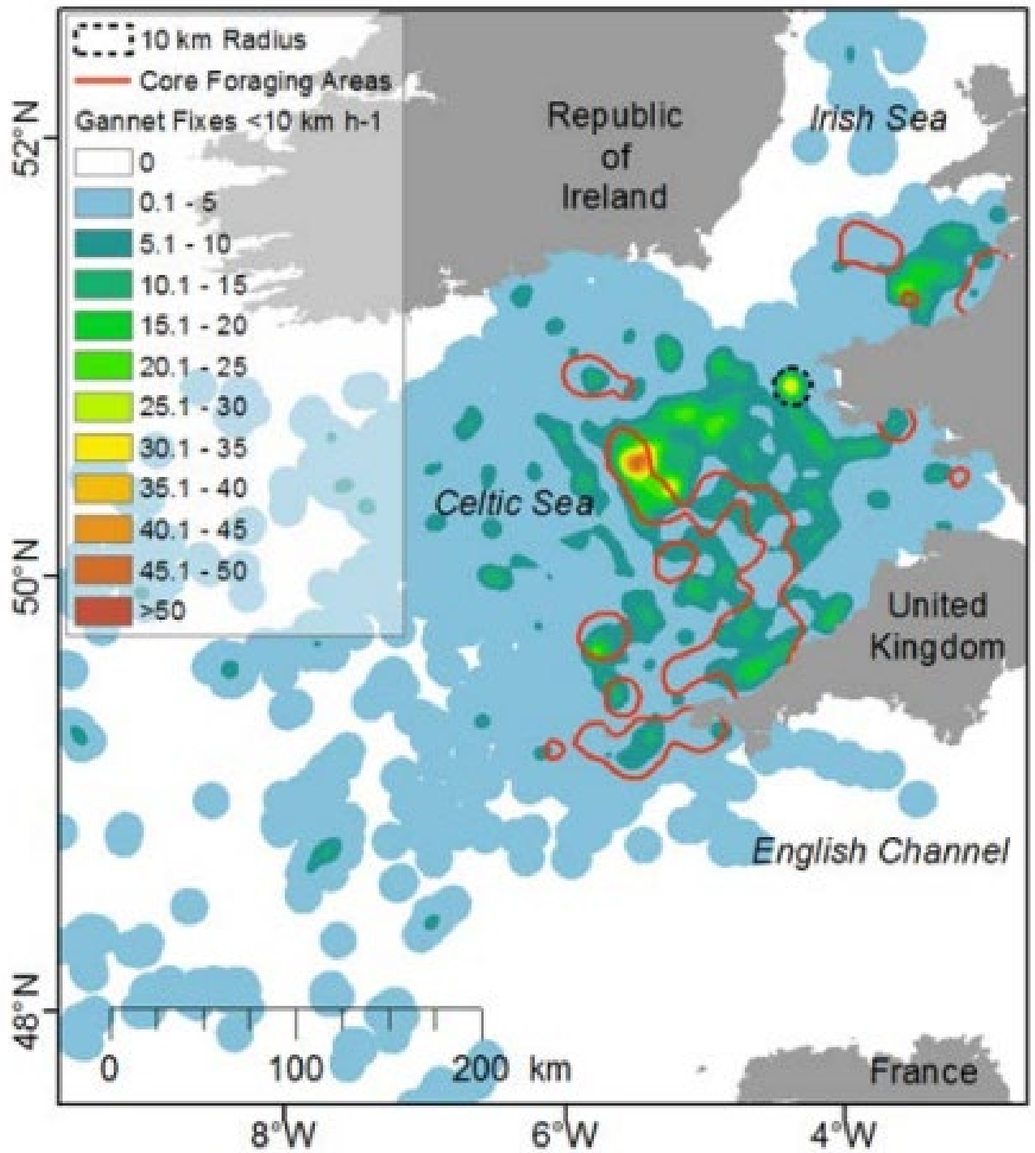


Figure 1.19: Kernel density estimate of GPS location fixes of birds travelling <10km h-1 together (rafting was defined as two or more consecutive GPS fixes below a speed threshold of 10km h−1) with core foraging areas (red lines) calculated from 50% kernel cores of northern gannet dives. Kernel smoothing parameter (h) = 10km, cell size = 200 m. Colour palette indicates number of GPS fixes per unit area (Carter *et al.*, 2016).

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

1.10.3 Assessment of adverse impacts alone

Temporary habitat loss/disturbance and increased SSCs

1.10.3.1 Seabirds may be indirectly disturbed and displaced during the construction phase as a result of direct impacts on habitat and increased SSCs, which may result in the loss of a food resource to birds in the Mona Array Area and along the Mona Offshore Cable Corridor.

1.10.3.2 There is potential for temporary, direct habitat loss and disturbance as a result of site preparation activities in advance of installation activities, cable installation activities (including UXO detonation, pre-cabling seabed clearance, anchor placements and decommissioning activities such as export cable removal.

1.10.3.3 There is also the potential for temporary, direct habitat loss/disturbance and increased SSC during the operations and maintenance phase of the Mona Offshore Wind Project. This may occur if reburial or maintenance of the cable is required.

1.10.3.4 This impact will be spatially restricted to within the Mona Offshore Cable Corridor only due to the spatial overlap between the Liverpool Bay/Bae Lerpwl SPA and the Mona Offshore Cable Corridor.

1.10.3.5 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 temporary habitat loss/disturbance and increased SSC. This relates to the following designated site and relevant marine ornithological features:

- Liverpool Bay/Bae Lerpwl SPA:
  - Red-throated diver
  - Little gull
  - Common scoter
  - Little tern
  - Common tern
  - Waterbird assemblage (red-breasted merganser and great cormorant in addition to species listed above).

1.10.3.6 The MDS considered within this assessment is shown in Table 1.231.

Table 1.231: MDS considered for the assessment of potential impacts on marine ornithological features from temporary habitat loss/disturbance and increased SSCs during the construction, operations and maintenance and decommissioning phases.

Potential impact	MDS	Justification
Construction phase	• As described in Table 1.44 for Annex II diadromous fish for increased SSC and associated sediment deposition. • Up to 28,368,000m^2 habitat disturbance from installation of up to 360km of buried Mona offshore export cables (most of which will occur outside the Liverpool Bay SPA).	As described in Table 1.44 for increased SSC effects on Annex II diadromous fish. Maximum footprint of seabed within the Mona Offshore Cable Corridor which would be affected during the construction, phase.
Operations and mainenance phase	• As described in Table 1.44 for Annex II diadromous fish for increased SSC and sediment deposition. • Up to 6,580,000m^2 habitat disturbance from repair/reburial of offshore export cables (most of which will occur outside the Liverpool Bay SPA).	As described in Table 1.44 for increased SSC effects on Annex II diadromous fish. The greatest foreseeable number of cable reburial and repair events is considered in the MDS for sediment dispersion and habitat disturbance.
Decommissioning phase	• As described in Table 1.44 for Annex II diadromous fish for increased suspended sediment concentrations. • Removal of 360km of offshore export cables (most habitat disturbance will occur outside the Liverpool Bay SPA).	As described in Table 1.44 for increased SSC effects on Annex II diadromous fish. The MDS assumes the removal of all cables. Parameters for habitat disturbance associated with decommissioning will be significantly lower than for the construction phase as sandwave clearance and pre-lay preparation will not be required in advance of cable removal.

Measures adopted as part of the Mona Offshore Wind Project

1.10.3.7 Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of temporary habitat loss and disturbance on Annex I habitats are outlined in Table 1.7. Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of potential impacts on ornithological features from temporary habitat loss/disturbance during construction and decommissioning are presented in Table 1.232. There are no measures adopted as part of the Mona Offshore Wind Project which are relevant to impacts on ornithological features from increases in SSC and sediment deposition.

Table 1.232: Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for marine ornithological features from temporary habitat loss/disturbance and increased SSCs.

Measure	Justification	How the measure will be secured
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
EMP	Implementation of an EMP including a MPCP which will include planning for accidental spills, address all potential contaminant releases and include key emergency details.	Proposed to be secured through a condition in the marine licence(s).

Construction and decommissioning phase

Liverpool Bay/Bae Lerpwl SPA

Red-throated diver

1.10.3.8 Red-throated diver is a non-breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for construction/decommissioning activities associated with the construction and decommissioning of the Mona Offshore Cable Corridor.

1.10.3.9 Red-throated diver may be indirectly disturbed and displaced during the construction and decommissioning phase as a result of direct impacts on habitat and increased SSCs, which may result in the loss of a food resource to birds along the Mona Offshore Cable Corridor. As a result, displaced red-throated diver may move to areas already occupied by other birds and thus face higher intra/inter-specific competition due to a higher density of individuals competing for the same resource. Alternatively, displaced birds may be forced to move into areas of lower quality (e.g. areas of lower prey availability). The increase in SSCs may lead to a short-term avoidance of affected areas that support fish and shellfish species which are susceptible to respond to increase SSCs. However, many fish and shellfish species are considered to be tolerant of turbid environments and regularly experience changes in the SSC due to the natural variability in the Irish Sea.

1.10.3.10 The impact is predicted to be of local spatial extent, short term duration, intermittent and highly reversible. The MDS predicts up to 28,368,000m^2 disturbance from installation of up to 360km of buried Mona offshore export cables (including pre-lay preparation (i.e. boulder and debris clearance) and assuming 100% of all cables are buried; see Table 1.231); it should also be noted that the majority of this footprint will occur outside the boundary of the SPA. As red-throated diver are widely distributed in the inshore areas of the Liverpool Bay/Bae Lerpwl SPA and show a high degree of flexibility in habitat use (Wade *et al*., 2016), the loss/disturbance of habitat is considered to be inconsequential in context of the habitats available to support the qualifying feature in the Liverpool Bay/Bae Lerpwl SPA.

Little gull

1.10.3.11 Little gull is a non-breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for construction/decommissioning activities associated with the Mona Offshore Cable Corridor. The Liverpool Bay/Bae Lerpwl SPA supports a small population (319 birds) within a well-defined location in the Liverpool Bay/Bae Lerpwl close to the 12nm limit (Lawson *et al*., 2016). There is no evidence that little gull are sensitive to temporary habitat loss/disturbance and increased SSCs.

1.10.3.12 The Mona Offshore Cable Corridor is located outside key wintering areas in Liverpool Bay/Bae Lerpwl (Lawson *et al*., 2016) therefore, there is no indication that temporary habitat loss/disturbance and increased SSCs will impact little gull.

Common scoter

1.10.3.13 Common scoter is a non-breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for construction/decommissioning activities associated with the Mona Offshore Cable Corridor.

1.10.3.14 Common scoter may be indirectly disturbed and displaced during the construction and decommissioning phase as a result of direct impacts on habitat and increased SSCs, which may result in the loss of a food resource to birds along the Mona Offshore Cable Corridor. Such disturbance and resulting displacement could ultimately affect population size in the Liverpool Bay/Bae Lerpwl SPA. Additionally, the increase in SSCs may lead to a short-term avoidance of affected areas that support fish and shellfish species which are susceptible to respond increase SSCs. However, many fish and shellfish species are considered to be tolerant of turbid environments and regularly experience changes in the SSC due to the natural variability in the Irish Sea.

1.10.3.15 The MDS predicts up to 28,368,000m^2 disturbance from installation of up to 360km of buried export cables within the Mona Offshore Cable Corridor (including pre-lay preparation (i.e. boulder and debris clearance) and assuming 100% of all cables are buried; Table 1.231); noting that most of this will occur outside the boundary of this SPA. One of the highest concentrations of common scoter in Liverpool Bay/Bae Lerpwl SPA is located on the nearshore waters between the Dee Estuary and Colwyn Bay (Lawson *et al*., 2016). Although the Mona Offshore Cable Corridor intersects this area, common scoter showed a high degree of flexibility in habitat use (Wade *et al*., 2016) and the loss/disturbance of habitat is considered to be inconsequential in context of the habitats available to support the qualifying feature in the Liverpool Bay/Bae Lerpwl SPA. Therefore, the impact of temporary habitat loss/disturbance and increased SSCs is predicted to be of local spatial extent, short term duration, intermittent and highly reversible.

Little tern

1.10.3.16 Little tern is a breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for construction/decommissioning activities associated with the Mona Offshore Cable Corridor. Although the colonies are located at the mouth of the Dee Estuary SPA (Gronant Beach and Pont of Ayre), the species forage in the inshore waters of the Liverpool Bay/Bae Lerpwl SPA close to the colonies. The maximum foraging range from the colony is 5km with of a mean of 2.1km, based on individuals from a single colony (Woodward *et al*., 2019). The Mona Offshore Cable Corridor is located outside the foraging range of little tern breeding on the Dee Estuary, therefore, there is no indication that temporary habitat loss/disturbance and increased SSCs will impact the species.

Common tern

1.10.3.17 Common tern is a breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for temporary habitat loss/disturbance and increased SSCs due to activities associated with the construction and decommissioning of the Mona Offshore Cable Corridor. Although the nearest colony is located at Shotton Lagoons reserve within the Dee Estuary SPA, the species forage in the inshore waters of the Liverpool Bay/Bae Lerpwl SPA. As the Mona Offshore Cable Corridor is located outside the foraging range of common tern breeding on the Dee Estuary (mean max 18.0km±8.9km (Woodward *et al.,* 2019)), there is no indication that temporary habitat loss/disturbance and increased SSCs will impact species.

Waterbird assemblage

1.10.3.18 In addition to the qualifying species assessed above, great cormorant and red-breasted merganser are part of the waterbird assemblage of the Liverpool Bay/Bae Lerpwl SPA. Great cormorant and red-breasted merganser occur in numbers that exceed 1% of their respective UK populations in Liverpool Bay, with 826 and 160

individuals respectively (Lawson *et al*., 2016). Both species have a very near-shore distribution in Liverpool Bay, with little overlap with the Mona Offshore Cable Corridor. As such, the local spatial extent, short term duration, intermittent nature of cable installation is deemed to have little impact on these qualifying species.

Conclusions

1.10.3.19 Adverse effects on the qualifying seabird features of the Liverpool Bay/Bae Lerpwl SPA which undermine the conservation objectives of the SPA will not occur as a result of temporary habitat loss/disturbance and increased SSC during construction and decommissioning activities. Potential effects from this activity on the relevant conservation objectives (as presented in paragraph 1.10.2.19) are discussed in turn below in Table 1.233.

Table 1.233: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for temporary habitat loss/disturbance and increased SSC during the construction and decommissioning phase.

Conservation objective	Conclusion
The extent and distribution of the habitats of the qualifying features [are maintained or restored]	The impact of offshore export cable installation is temporary, short-term, and reversible, affecting only a small fraction of suitable habitat for qualifying ornithological features. Most suitable habitat within the SPA will remain unaffected, and qualifying features are assessed to be flexible in their habitat use. Therefore, temporary habitat loss/disturbance and increased SSC during the construction and decommissioning phases will not prevent the extent and distribution of the habitats of the qualifying features from being maintained or restored.
The structure and function of the habitats of the qualifying features [are maintained or restored]	The small fraction of habitats affected by cable installation are expected to fully recover or retain their function for the ornithological features. Therefore, temporary habitat loss/disturbance and increased SSC during the construction and decommissioning phases will not prevent the structure and function of the habitats of the qualifying features from being maintained or restored.
The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]	Temporary habitat loss/disturbance as a result of cable installation associated activities will be temporary, local, short-term and reversible. Therefore, temporary habitat loss/disturbance and increased SSC during the construction and decommissioning phases will not prevent the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	Temporary habitat loss/disturbance as a result of cable installation associated activities will be temporary, local, short-term and reversible. Qualifying ornithological features, in particular red-throated diver and common scoter are expected to temporarily move to unaffected areas of the SPA but are not expected to experience losses in population numbers. Therefore, temporary habitat loss/disturbance and increased SSC during the construction and decommissioning phases will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	Temporary habitat loss/disturbance as a result of cable installation associated activities will be temporary, local, short-term and reversible. The qualifying features, in particular red-throated diver and common scoter are expected to temporarily move to unaffected areas of the SPA but are expected to return once construction activities cease. Therefore, temporary habitat loss/disturbance and increased SSC during the construction and decommissioning phases will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.3.20 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA as a result of temporary habitat loss/disturbance and increased SSC with respect to the construction and decommissioning of the Mona Offshore Wind Project alone. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Operations and maintenance phase

Liverpool Bay/Bae Lerpwl SPA

Red-throated diver

1.10.3.21 Red-throated diver is a non-breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for operations and maintenance activities associated with the Mona Offshore Cable.

1.10.3.22 Red-throated diver may be indirectly disturbed and displaced during the operations and maintenance phase as a result of direct impacts on habitat loss/disturbance and increased SSCs, which may result in the loss of a food resource to birds along the Mona Offshore Cable Corridor. As a result, displaced red-throated diver may move to areas already occupied by other birds and thus face higher intra/inter-specific competition due to a higher density of individuals competing for the same resource. Alternatively, displaced birds may be forced to move into areas of lower quality (e.g. areas of lower prey availability). The increase in SSCs may lead to a short-term avoidance of affected areas that support fish and shellfish species which are susceptible to respond to increase SSCs. However, many fish and shellfish species are considered to be tolerant of turbid environments and regularly experience changes in the SSC due to the natural variability in the Irish Sea.

1.10.3.23 In the absence of quantitative information available, the magnitude is considered qualitatively for red-throated diver. The impact is predicted to be of local spatial extent, short term duration, intermittent and highly reversible. The MDS predicts up to 14,380,000m^2 disturbance from cable reburial events and repairs. As red-throated diver are widely distributed in the inshore areas of the Liverpool Bay/Bae Lerpwl SPA and show a high degree of flexibility in habitat use (Wade *et al*., 2016), the loss/disturbance of habitat is considered to be inconsequential in context of the

habitats available to support the qualifying feature in the Liverpool Bay/Bae Lerpwl SPA.

1.10.3.24 With regard to the conservation objectives for the SPA, there is therefore no indication that temporary habitat loss/disturbance and increase SSCs will lead to a reduction in distribution and extent of habitats of the qualifying species and the population and distribution of qualifying species will not be adversely affected.

Little gull

1.10.3.25 Little gull is a non-breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for operations and maintenance activities associated with the cable reburial events and repairs. The SPA supports a small population (319 birds) with concentrations observed close to the 12nm limit (Lawson *et al*., 2016) and outside the Mona Offshore Cable Corridor.

1.10.3.26 There is no apparent evidence that little gull are sensitive to temporary habitat loss/disturbance and increased SSCs (MMO, 2018). Therefore, there is no indication that temporary habitat loss/disturbance and increase SSCs will impact little gull.

Common scoter

1.10.3.27 Common scoter is a non-breeding feature of the Liverpool Bay SPA and was screened into the assessment as LSE could not be ruled out for operations and maintenance activities associated with the cable installation/removal.

1.10.3.28 Common scoter may be indirectly disturbed and displaced during the operations and maintenance phase as a result of direct impacts on habitat and increased SSCs, which may result in the loss of a food resource to birds along the Mona Offshore Cable Corridor. Such disturbance and resulting displacement could ultimately affect population size in the Liverpool Bay/Bae Lerpwl SPA. Additionally, the increase in SSCs may lead to a short-term avoidance of affected areas that support fish and shellfish species which are susceptible to respond increase SSCs. However, many fish and shellfish species are considered to be tolerant of turbid environments and regularly experience changes in the SSC due to the natural variability in the Irish Sea.

1.10.3.29 In the absence of quantitative information available, the magnitude is considered qualitatively for common scoters. The MDS predicts up to 14,380,000m^2 disturbance from cable reburial events and repairs (noting that this is for all cable repair and reburial events across the entire Mona Offshore Cable Corridor and is not specific to the Liverpool Bay/Bae Lerpwl SPA. Disturbance within the Liverpool Bay/Bae Lerpwl SPA is expected to be much lower). One of the highest concentrations of common scoter in Liverpool Bay/Bae Lerpwl SPA is located on the nearshore waters between the Dee Estuary and Colwyn Bay (Lawson *et al*., 2016). Although the Mona Offshore Cable Corridor intersects this area, common scoter showed a high degree of flexibility in habitat use (Wade *et al*., 2016) and the loss/disturbance of habitat is considered to be inconsequential in context of the habitats available to support the qualifying feature in the Liverpool Bay/Bae Lerpwl SPA. Therefore, the impact of temporary habitat loss/disturbance and increased SSCs is predicted to be of local spatial extent, short term duration, intermittent and highly reversible.

Little tern

1.10.3.30 Little tern is a breeding feature of the Liverpool Bay/Bae Lerpwl SPA and as LSE could not be ruled out for operations and maintenance activities associated with the cable installation/removal. Although the colonies are located in the Dee Estuary SPA, the species forage in the inshore waters of the Liverpool Bay/Bae Lerpwl SPA close their colonies. The maximum foraging range from the colony is 5km with of a mean of 2.1km, based on individuals from a single colony (Woodward *et al*., 2019). Because the Mona Offshore Cable Corridor is located outside the foraging range of little tern breeding on Dee Estuary, there is no indication that temporary habitat loss/disturbance will lead to a reduction in distribution and extent of habitats of little terns and the population and distribution of common scoters will not be adversely affected.

Common tern

1.10.3.31 Common tern is a breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment due to the potential for temporary habitat loss/disturbance and increased SSCs due to activities associated with cable reburial events and repairs. Although the nearest colony is located at Shotton Lagoons reserve within the Dee Estuary SPA, the species forage in the inshore waters of the Liverpool Bay/Bae Lerpwl SPA. As the Mona Offshore Cable Corridor is located outside the foraging range of common tern breeding on the Dee Estuary (mean max 18.0km±8.9km (Woodward *et al.,* 2019)), there is no indication that temporary habitat loss/disturbance will lead to a reduction in distribution and extent of habitats of common tern and the population and distribution of common tern will not be adversely affected.

Waterbird assemblage

1.10.3.32 In addition to the qualifying species assessed above, great cormorant and red-breasted merganser are part of the waterbird assemblage in Liverpool Bay. Great cormorant and red-breasted merganser occur in numbers that exceed 1% of their respective UK populations in Liverpool Bay, with 826 and 160 individuals respectively (Lawson *et al*., 2016). Both species have a very near-shore distribution in Liverpool Bay, with little overlap with the Mona Offshore Cable Corridor. As such, the local spatial extent, short term duration, intermittent nature of activities associated with cable reburial events and repairs is deemed to have little impact on these qualifying species.

1.10.3.33 With regard to the conservation objectives for the SPA, there is therefore no indication that temporary habitat loss and increased SSCs will lead to a reduction in the population and distribution of red-breasted merganser and great cormorant. As such, these qualifying species will not be adversely affected.

Conclusions

1.10.3.34 Adverse effects on the qualifying seabird features of the Liverpool Bay/Bae Lerpwl SPA which undermine the conservation objectives of the SPA will not occur as a result of temporary habitat disturbance during operations and maintenance activities. Potential effects from this activity on the relevant conservation objectives are discussed in turn below in Table 1.234.

Table 1.234: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for temporary habitat loss/disturbance and increased SSC during the operations and maintenance phase.

Conservation objective	Conclusion
The extent and distribution of the habitats of the qualifying features [are maintained or restored]	The impact of Mona offshore export cable reburial events and repairs is temporary, short-term, and reversible, affecting only a small fraction of suitable habitat for qualifying ornithological features. Most suitable habitat within the SPA will remain unaffected, and qualifying features are assessed to be flexible in their habitat use. Therefore, temporary habitat loss/disturbance and increased SSC during the operations and maintenance phase will not prevent the extent and distribution of the habitats of the qualifying features from being maintained or restored.
The structure and function of the habitats of the qualifying features [are maintained or restored]	The habitats affected by cable reburial events and repairs are expected to fully recover or retain their function for the ornithological features. Therefore, temporary habitat loss/disturbance and increased SSC during the operations and maintenance phase will not prevent the structure and function of the habitats of the qualifying features from being maintained or restored.
The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]	Temporary habitat loss/disturbance as a result of cable reburial events and repairs will be temporary, local, short-term and reversible. Therefore, temporary habitat loss/disturbance and increased SSC during the operations and maintenance phase will not prevent the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	Temporary habitat loss/disturbance as a result of cable reburial events and repairs will be temporary, local, short-term and reversible. Qualifying ornithological features, in particular red-throated diver and common scoter are expected to temporarily move to unaffected areas of the SPA, but are not expected to experience losses in population numbers. Therefore, temporary habitat loss/disturbance and increased SSC during the operations and maintenance phase will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	Temporary habitat loss/disturbance as a result of cable installation associated activities will be temporary, local, short-term and reversible. The qualifying features, in particular red-throated diver and common scoter are expected to temporarily move to unaffected areas of the SPA, but are expected to return once construction activities cease. Therefore, temporary habitat loss/disturbance and increased SSC during the operations and maintenance phase will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.3.35 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA as a result of temporary habitat loss/disturbance and increased SSC with respect to the operations and maintenance of the Mona Offshore Wind Project alone. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Disturbance and displacement from airborne sound and presence of vessels and infrastructure

1.10.3.36 Airborne sound, the presence of vessels, construction and decommissioning works and operations and maintenance works may disturb seabirds from offshore foraging or non-foraging areas (e.g. rafting, moulting) in the short-term, causing changes in behaviour or displacement from the affected areas. Temporary disturbance/displacement may lead to a reduction in foraging opportunities or increased energy expenditure, resulting in decreased survival rates or productivity in the population.

1.10.3.37 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 temporary habitat loss and disturbance. This relates to the following designated site and relevant marine ornithological features:

- Liverpool Bay/Bae Lerpwl SPA:
  - Red-throated diver
  - Little gull
  - Common scoter
  - Little tern
  - Common tern
  - Waterbird assemblage (red-breasted merganser and great cormorant in addition to species listed above).

1.10.3.38 The MDS considered within this assessment is shown in Table 1.235.

Table 1.235: MDS considered for the assessment of potential impacts on marine ornithological features from disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the construction, operations and maintenance and decommissioning phases.

Potential impact	Maximum design scenario	Justification
Construction phase	Installation offhore export cables within the Mona Offshore Cable Corridor: • Burial of up to 360km of offshore export cable via ploughing, trenching and jetting; cable burial and rock dumping. • Up to 1,983 installation vessel movements (return trips) during construction (535 main installation and support vessels, 76 tug/anchor handlers, 48 cable lay installation and support vessels, 18 guard vessel, 34 survey vessels, 43 seabed preparation vessels, 1,165 CTVs, 42 scour protection installation vessels and 22 cable protection installation vessels). • Up to a total of 91 construction vessels on site at any one time. • Up to 1,185 helicopter movements by up to 8 helicopters on site at any one time. • Maximum offshore construction duration of up to four years.	Represents the maximum density of wind turbines and structures across the maximum Mona Array Area and the Mona Offshore Cable Corridor that would cause greatest extent of disturbance and displacement to birds or the greatest duration of impact. Represents the maximum number of vessel and helicopter movements that would cause greatest visual and sound disturbance and displacement to birds from the Mona Array Area and the Mona Offshore Cable Corridor.
Operations and maintenance phase	Disturbance and displacement from presence of operational wind turbines and associated operations and maintenance activity, including increased vessel, helicopter and inspection drone activity: • Presence of up to 107 operating turbines and four OSPs occupying the Mona Array Area of up to 450km^2 • Minimum spacing of 875m between wind turbines • Up to 2,351 operations and maintenance vessel movements (return trips) each year • Up to a total of 21 operations and maintenance vessels on site at any one time • Up to 730 helicopter movements by up to 8 helicopters on site at any one time • Up to 214 inspection drones return trips per year (operated from vessel, two inspections per wind turbine per year as a maximum). • Operational lifetime of up to 35 years.	Represents the maximum density of wind turbines and structures across the maximum Mona Array Area and the Mona Offshore Cable Corridor that would cause greatest extent of disturbance and displacement to birds or the greatest duration of impact. Represents the maximum number of vessel and helicopter movements that would cause greatest visual and sound disturbance and displacement to birds from the Mona Array Area and the Mona Offshore Cable Corridor.
Decommissioning phase	• Vessels used for a range of decommissioning activities such as removal of offshore export cables • Sound from vessels assumed to be as per vessel activity described for construction phase above.	Represents the maximum density of wind turbines and structures across the maximum Mona Array Area and the Mona Offshore Cable Corridor that would cause greatest extent of disturbance and displacement to birds or the greatest duration of impact. Represents the maximum number of vessel and helicopter movements that would cause greatest visual and sound disturbance and displacement to birds from the Mona Array Area and the Mona Offshore Cable Corridor.

Measures adopted as part of the Mona Offshore Wind Project

1.10.3.39 Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of potential impacts on ornithological features from disturbance and displacement from airborne sound, and presence of vessels and infrastructure during construction and decommissioning are presented in Table 1.236.

Table 1.236: Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for marine ornithological features from airborne sound and presence of vessels and infrastructure.

Measure	Justification	How the measure will be secured
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
An EMP that will include measures to minimise disturbance to rafting birds from transiting vessels.	The development of and adherence to an EMP which will include measures to minimise disturbance to seabirds, in particular red-throated diver and common scoter.	Proposed to be secured through a condition in the marine licence(s).
EMP	Implementation of an EMP including a MPCP which will include planning for accidental spills, address all potential contaminant releases and include key emergency details.	Proposed to be secured through a condition in the marine licence(s).

Construction and decommissioning phase

Liverpool Bay/Bae Lerpwl SPA

Red-throated diver

1.10.3.40 Red-throated diver is a non-breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for disturbance and displacement from airborne sound, and presence of vessels and infrastructure.

1.10.3.41 Of the UK seabird species, red-throated diver has the highest vulnerability score to disturbance and displacement caused by offshore wind farms (Wade *et al.,* 2016). More specifically, the species has a score of 5 (out of 5) for displacement due to vessels (Wade *et al*., 2016).

1.10.3.42 Red-throated diver may be disturbed and displaced as the result of the presence of vessels/infrastructure and airborne sound associated with the Mona offshore Cable Corridor during the construction and decommissioning phases.

1.10.3.43 As a result, displaced red-throated diver may move to areas already occupied by other birds and thus face higher intra/inter-specific competition due to a higher density of individuals competing for the same resource. Alternatively, displaced birds may be forced to move into areas of lower quality (e.g. areas of lower prey availability).

1.10.3.44 Although the species is highly sensitive to vessel movement, the species shows a high level of flexibility in habitat use (Wade *et al.*, 2016). Webb *et al.* (2006) and Lawson *et al.* (2016) have identified important aggregations of red-throated diver off the coast of north Wales which overlapped with the Mona Offshore Cable Corridor.

1.10.3.45 Mortality caused by displacement from cable installation has been quantified with precautionary parameters. Vessel activity is not expected to cause the same magnitude of displacement as permanent structures. A conservative buffer of 2km around the Mona Offshore Cable Corridor has been assumed, as red-throated divers have been shown to fly away from approaching vessels at a distance over 1km (Garthe and Hüppop 2004, Schwemmer *et al.,* 2011). Conservatively, all red-throated divers are assumed to be displaced by this activity (displacement rate of 100%). The evidence for the impacts of mortality currently do not support that displacement causes increased mortality among red-throated diver (Dierschke *et al.*, 2017; MacArthur Green, 2019). Nevertheless, a precautionary 0.5% mortality from displacement has been assumed (GoBe, 2022).

1.10.3.46 The overlap between the Mona Offshore Cable Corridor plus a 2km buffer and the Liverpool Bay SPA is 103.1km^2 (see volume 2, chapter 10: Offshore ornithology of the PEIR). The total area of the Liverpool Bay SPA is 2,528km^2, which equates to an overlap of 4.1%. Within this area of overlap, there will be vessels intermittently laying the offshore export cables, which will occur in only part of this area at any one time. A conservative assumption is that the maximum displacement zone at any given time will be along a 4km stretch of the entire overlap (2km either side of vessels, ignoring the ship's length), which has a width of 4km, leading to an area of 4*4 = 16km^2. Peak densities of red-throated divers were between 0.86 and 1.15 birds per km^2 in Colwyn Bay, meaning up to 18.4 birds could be displaced in this zone. If 0.5% of displaced birds experience mortality, this leads to an estimated 0.09 annual red-throated diver increase in baseline mortality.

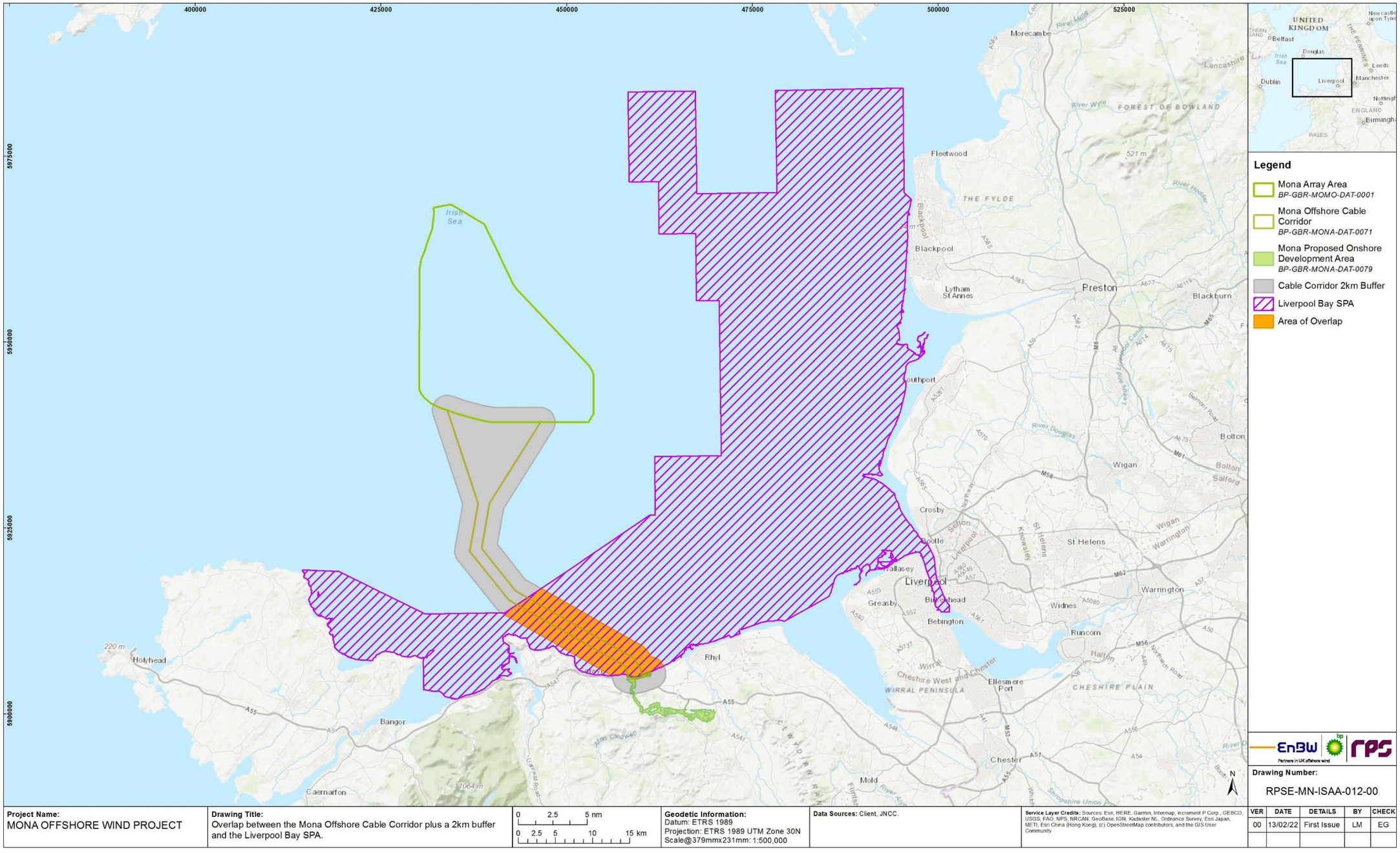


Figure 1.20: The Liverpool Bay/Bae Lerpwl SPA (dark green), Mona Offshore Cable Corridor (dark grey), 2km buffer (light grey), and overlap (orange and yellow).

1.10.3.47 Using an adult mortality of 0.160 and an immature mortality of 0.600 and 0.620 of first- and second-year birds respectively (Horswill and Robinson, 2015), a population model gave an average mortality estimate of 0.233. With a non-breeding population of 1,171 (Lawson *et al*., 2016) this would lead to a baseline mortality rate of 261.1 individuals annually. The increase in baseline mortality using the conservative estimates presented then equates to 0.09 /261.1 = 0.03% for the Mona Offshore Cable Corridor alone. This is well below a 1% increase in baseline mortality and therefore is expected to be within the natural variability for this SPA.

1.10.3.48 Thus, the local spatial extent, short term duration, intermittent nature of vessel activities associated with the installation of the export cable is deemed to have little impact on red-throated divers.

Little gull

1.10.3.49 Little gull is a non-breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for potential disturbance and displacement from airborne sound and presence of vessels and infrastructure.

1.10.3.50 However, there is little evidence that little gull are sensitive to disturbance and displacement from airborne sound and presence of vessels and infrastructure (MMO, 2018). It is therefore not expected that there will be an appreciable effect of this on little gull.

Common scoter

1.10.3.51 Common scoter is a non-breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for disturbance and displacement from airborne sound and presence of vessels and infrastructure.

1.10.3.52 Common scoter are very vulnerable to disturbance and displacement caused by offshore wind farms. The species has a vulnerability score of 5 (out of 5) for displacement due to vessel (Wade *et al*., 2016).

1.10.3.53 Common scoter may be disturbed and displaced as the result of the presence of vessels and infrastructure and airborne sound associated with cable trenching within the Mona Offshore Cable during the construction and decommissioning phases.

1.10.3.54 As a result, displaced common scoter may move to areas already occupied by other birds and thus face higher intra/inter-specific competition due to a higher density of individuals competing for the same resource. Alternatively, displaced birds may be forced to move into areas of lower quality (e.g. areas of lower prey availability). Such disturbance and resulting displacement could ultimately affect distribution and population size within the Liverpool Bay/Bae Lerpwl SPA.

1.10.3.55 Although the species is highly sensitive to vessel movement, the species shows a high level of flexibility in habitat use (Wade *et al.*, 2016). One of the highest concentrations of common scoter in Liverpool Bay is located on the nearshore waters between the Dee Estuary and Colwyn Bay (Lawson *et al*., 2016). Although the Mona Offshore Cable Corridor intersects this area of importance for common scoter, the species shows a high degree of flexibility in habitat use (Wade *et al*., 2016).

1.10.3.56 To assess the potential impacts of displacement during cable corridor construction the same method, as described in paragraph 1.10.2.35 for red-throated diver, has been implemented. A precautionary 100% displacement, 0.5% mortality rate, and a 16km^2 zone of displacement was thus also implemented for common scoter. Peak densities in Colwyn Bay ranged from 99.2 to 138.2 scoters per km^2 (Figure 1.18). This means up to 2,211 scoters may be subject to displacement. Assuming a mortality of 0.5% this leads to an estimate of up to 11.05 increase in baseline common scoter mortality.

1.10.3.57 Based on an adult mortality of 0.217 and an immature mortality of 0.251 (Horswill and Robinson 2015), a population model calculated the average mortality for common scoters to be 0.238. In a population of 56,679 scoters (Lawson *et al.,* 2016), the background mortality using this number is 13,490 birds. A precautionary 11 additional mortalities arising from the construction of the Mona Offshore Cable Corridor alone would increase the baseline mortality by 0.08%. This is well below a 1% increase in baseline mortality and therefore is expected to be within the natural variability for this SPA.

1.10.3.58 Thus, the local spatial extent, short term duration, intermittent nature of vessel activities associated with the construction/decommissioning of Mona Offshore Cables is deemed to have little impact on common scoter.

Little tern

1.10.3.59 Little tern is a breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for potential disturbance and displacement from airborne sound and presence of vessels and infrastructure.

1.10.3.60 Little tern is deemed to be overall of low vulnerability to disturbance and displacement caused by offshore wind farms (Wade *et al*., 2016). More specifically the species has a vulnerability score of 2 (out of 5) for displacement due to vessel (Wade *et al*., 2016).

1.10.3.61 Although the colonies are located in the Dee Estuary SPA, the species forage in the inshore waters of the Liverpool Bay/Bae Lerpwl SPA close to the colonies. Indeed, according to Woodward *et al*., (2019), the maximum foraging range from the colony is 5km with of a mean of 2.1km.

1.10.3.62 The Mona Offshore Cable Corridor is located outside the foraging range of little tern breeding at the mouth of the Dee Estuary. There is therefore no indication that disturbance and displacement from airborne sound, underwater sound, and presence of vessels and infrastructure will impact little tern.

Common tern

1.10.3.63 Common tern is a breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment as LSE could not be ruled out for potential disturbance and displacement from airborne sound and presence of vessels and infrastructure.

1.10.3.64 Although the nearest colony for common tern is located at Shotton Lagoons reserve within the Dee Estuary SPA, the species forage in the inshore waters of the Liverpool Bay/Bae Lerpwl SPA. As the Mona Offshore Cable Corridor is located outside the foraging range of common tern breeding on the Dee Estuary (mean max 18.0km±8.9km (Woodward *et al.,* 2019)). There is therefore no indication that disturbance and displacement from airborne sound, underwater sound, and presence of vessels and infrastructure will impact common tern.

Waterbird assemblage

1.10.3.65 In addition to the qualifying species assessed above, great cormorant and red-breasted merganser are part of the waterbird assemblage in the Liverpool Bay/Bae Lerpwl SPA. Great cormorant and red-breasted merganser occur in numbers that

exceed 1% of their respective UK populations in Liverpool Bay/Bae Lerpwl SPA, with 826 and 160 individuals respectively (Lawson *et al*., 2016). Both species have a very near-shore distribution in the Liverpool Bay/Bae Lerpwl SPA, with little overlap with the Mona Offshore Cable Corridor. As such, the local spatial extent, short term duration, intermittent nature of vessel activities associated with the Mona Offshore Cable is deemed to have little impact on these qualifying species.

Conclusions

1.10.3.66 Adverse effects on the qualifying seabird features of the Liverpool Bay/Bae Lerpwl SPA which undermine the conservation objectives of the SPA will not occur as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure during construction and decommissioning activities. Potential effects from this activity on the relevant conservation objectives (as presented in paragraph 1.10.2.19) are discussed in turn below in Table 1.237. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.237: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for disturbance and displacement from airborne sound and presence of vessels and infrastructure during the construction and decommissioning phase.

Conservation objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	There is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats. Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the construction and decommissioning phases will not prevent the extent and distribution, structure and function or the supporting processes of the habitats of the qualifying features from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	Displacement of common scoter and red-throated diver are expected to occur as a result of vessel traffic associated with cable construction. The effect is expected to be temporary, local, short-term, and reversible. The precautionary impact on the population of both these ornithological features has been assessed to be within natural variability for these species in this SPA. Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the construction and decommissioning phases will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	Displacement of common scoter and red-throated diver are expected to occur as a result of vessel traffic associated with cable construction. The effect is expected to be temporary, local, short-term, and reversible. Although the distribution of these features will be temporarily affected in a small percentage of the entire SPA, it is expected that once construction activities cease, the affected areas will be quickly repopulated. Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the construction and decommissioning phases will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.3.67 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA as a result of disturbance and displacement from airborne sound, underwater sound and presence of vessels and infrastructure with respect to the construction and decommissioning of the Mona Offshore Wind Project alone. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Operations and maintenance phase

Liverpool Bay/Bae Lerpwl SPA

Red-throated diver

1.10.3.68 Red-throated diver is a non-breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment due to disturbance and displacement from airborne sound and presence of vessels and infrastructure.

1.10.3.69 Of the UK seabird species, red-throated diver has the highest vulnerability score to disturbance and displacement caused by offshore wind farms (Wade *et al.,* 2016). More specifically, the species has a score of 5 (out of 5) for displacement due to vessel (Wade *et al*., 2016).

1.10.3.70 Red-throated diver may be disturbed and displaced as the result of the presence of vessels/infrastructure and airborne sound associated with the Mona offshore export cable reburial events and repairs during the operations and maintenance phases.

1.10.3.71 As a result, displaced red throated diver may move to areas already occupied by other birds and thus face higher intra/inter-specific competition due to a higher density of individuals competing for the same resource. Alternatively, displaced birds may be forced to move into areas of lower quality (e.g. areas of lower prey availability).

1.10.3.72 Although the species is highly sensitive to vessel movement, the species shows a high level of flexibility in habitat use (Wade *et al.*, 2016). Webb *et al.* (2006) and Lawson *et al.* (2016) have identified important aggregations of red-throated diver off the coast of north Wales which overlapped with the Mona Offshore Cable Corridor (Figure 1.16).

1.10.3.73 To assess the potential impacts of displacement of cable reburial and repair during the operations and maintenance phase, the same method was implemented as during the construction phase (1.10.3.45). To scale the effects compared to the construction phase, the total amount of habitat expected to be affected in each MDS was used. During the construction phase, up to 28,368,000m^2 of habitat was predicted to be disturbed by Mona offshore export cable installation (including pre-lay preparation (i.e. boulder and debris clearance)). For the operations and maintenance phase the MDS predicted up to 6,580,000m^2 of habitat to be disturbed by subtidal export cable repairs and reburials within the Mona Offshore Cable Corridor (see Table 1.231). Using these numbers, the mortality rate was scaled to reflect lower disturbance during the operations and maintenance phase than during the construction phase, leading to a precautionary 0.25% mortality from displacement during operations and maintenance activities. Other parameters were left the same: 100% displacement in a 16km^2 zone.

1.10.3.74 Peak densities of red-throated divers were between 0.86 and 1.15 birds per km^2 (Figure 1.16) in Colwyn Bay, meaning up to 18.4 birds could be displaced in this zone (16km^2 * 1.15). If 0.25% of displaced birds experience mortality, this leads to an estimated 0.05 annual red-throated diver increase in baseline mortality.

1.10.3.75 Using an adult mortality of 0.160 and an immature mortality of 0.600 and 0.620 of first- and second-year birds respectively (Horswill and Robinson, 2015), a population model gave an average mortality estimate of 0.233. With a non-breeding population of 1,171 (Lawson *et al*., 2016) this would lead to a baseline mortality rate of 261.1 individuals annually. The increase in baseline mortality using the conservative estimates presented then equates to 0.05 /261.1 = 0.019%. This is well below a 1% increase in baseline mortality and therefore is expected to be within the natural variability for this SPA.

1.10.3.76 Thus, the local spatial extent, short term duration, intermittent nature of vessel activities associated with the Mona offshore export cable reburial events and repairs is deemed to have little impact on red-throated divers.

1.10.3.77 With regard to the conservation objectives for the SPA, there is therefore no indication that temporary disturbance/displacement will lead to a reduction in the population and distribution of red-throated diver. Thus, the species will not be adversely affected.

Little gull

1.10.3.78 Little gull is a non-breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment due to potential disturbance and displacement from airborne sound and presence of operations and maintenance vessels and infrastructure.

1.10.3.79 There is no evidence that little gull are sensitive to disturbance and displacement from airborne sound and presence of vessels and infrastructure (MMO, 2018), with Humphreys *et al*. (2015) stating they have a low displacement score.

1.10.3.80 As such, there is no indication that temporary disturbance/displacement will lead to a reduction in the population and distribution of little gull. As such, this qualifying species will not be adversely affected.

Common scoter

1.10.3.81 Common scoter is a non-breeding feature of the Liverpool Bay SPA and was screened into the assessment due to disturbance and displacement from airborne sound and presence of vessels and infrastructure.

1.10.3.82 Common scoter are very vulnerable to disturbance and displacement caused by offshore wind farms. The species has a vulnerability score of 5 (out of 5) for displacement due to vessel (Wade *et al*., 2016).

1.10.3.83 Common scoter may be disturbed and displaced as the result of the presence of vessels and infrastructure and airborne sound associated with the Mona offshore export cable reburial events and repairs during the operations and maintenance phases.

1.10.3.84 As a result, displaced common scoter may move to areas already occupied by other birds and thus face higher intra/inter-specific competition due to a higher density of individuals competing for the same resource. Alternatively, displaced birds may be forced to move into areas of lower quality (e.g. areas of lower prey availability). Such disturbance and resulting displacement could ultimately affect distribution and population size within the Liverpool Bay/Bae Lerpwl SPA.

1.10.3.85 Although the species is highly sensitive to vessel movement, the species shows a high level of flexibility in habitat use (Wade *et al.*, 2016). One of the highest concentrations of common scoter in Liverpool Bay is located on the nearshore waters between the Dee Estuary and Colwyn Bay (Lawson *et al*., 2016). Although the Mona offshore export cable intersects this area of importance for common scoter, the species shows a high degree of flexibility in habitat use (Wade *et al*., 2016).

1.10.3.86 To assess the potential impacts of displacement of cable reburial and repair during the operations and maintenance phase, the same method was implemented as during the construction phase (see paragraph 1.10.3.45). To scale the effects compared to the construction phase, the total amount of habitat expected to be affected in each MDS was used. During the construction phase, up to 28,368,000m^2 of habitat was predicted to be disturbed by Mona offshore export cable installation. For the operations and maintenance phase the MDS predicted up to 6,580,000m^2 of habitat to be disturbed by subtidal offshore export cable repairs and reburials within the Mona Offshore Cable Corridor (see Table 1.231). Using these numbers, the mortality rate was scaled to reflect lower disturbance during the operations and maintenance phase than during the construction phase, leading to a precautionary 0.25% mortality from displacement during operation and maintenance. Other parameters were left the same: 100% displacement in a 16km^2 zone.

1.10.3.87 Peak densities of common scoter were between 99.2 to 138.2 scoters per km^2 (Figure 1.18). This means up to 2,212 scoters may be subject to displacement. Assuming a mortality of 0.25% this leads to an estimated 5.5 increase in baseline common scoter mortality.

1.10.3.88 Based on an adult mortality of 0.217 and an immature mortality of 0.251 (Horswill and Robinson, 2015), a population model calculated the average mortality for common scoters to be 0.238. In a population of 56,679 scoters (Lawson *et al.,* 2016), the background mortality using this number is 13,490 birds. A precautionary 5.5 additional mortalities would increase the baseline mortality by 0.041%. This is well below a 1% increase in baseline mortality and therefore is expected to be within the natural variability for this SPA.

1.10.3.89 As such, the local spatial extent, short term duration, intermittent nature of vessel activities associated with the Mona offshore export cable reburial events and repairs is deemed to have little impact on common scoter.

1.10.3.90 With regard to the conservation objectives for the SPA, there is therefore no indication that temporary disturbance/displacement will lead to a reduction in the population and distribution of common scoter. As such, this qualifying species will not be adversely affected.

Little tern

1.10.3.91 Little tern is a breeding feature of the Liverpool Bay SPA and was screened into the assessment due to potential disturbance and displacement from airborne sound and presence of operations and maintenance vessels and infrastructure.

1.10.3.92 Little tern is deemed to be overall of low vulnerability to disturbance and displacement caused by offshore wind farms (Wade *et al*., 2016). More specifically the species has a vulnerability score of 2 (out of 5) for displacement due to vessels (Wade *et al*., 2016).

1.10.3.93 Although the colonies are located in the Dee Estuary SPA, the species forage in the inshore waters of the Liverpool Bay SPA close to the colonies. Indeed, according to Woodward *et al*., (2019), the maximum foraging range from the colony is 5km with of a mean of 2.1km.

1.10.3.94 The Mona Offshore Cable Corridor is located outside the foraging range of little tern breeding on Dee Estuary. There is therefore no indication that disturbance/displacement will lead to a reduction in the population and distribution of little tern. As such, this qualifying species will not be adversely affected.

Common tern

1.10.3.95 Common tern is a breeding feature of the Liverpool Bay/Bae Lerpwl SPA and was screened into the assessment due to potential disturbance and displacement from airborne sound and presence of operations and maintenance vessels and infrastructure.

1.10.3.96 Although the nearest colony is located at Shotton Lagoons reserve within the Dee Estuary SPA, the species forage in the inshore waters of the Liverpool Bay/Bae Lerpwl SPA. As the Mona Offshore Cable Corridor is located outside the foraging range of common tern breeding on the Dee Estuary (mean max 18.0km±8.9km (Woodward *et al.,* 2019)). There is therefore no indication that temporary habitat loss/disturbance will lead to a reduction in the population size and distribution of common tern. As such, this qualifying species will not be adversely affected.

Waterbird assemblage

1.10.3.97 In addition to the qualifying species assessed above, great cormorant and red-breasted merganser are part of the waterbird assemblage in Liverpool Bay. Great cormorant and red-breasted merganser occur in numbers that exceed 1% of their respective UK populations in Liverpool bay, with 826 and 160 individuals respectively (Lawson *et al*., 2016). Both species have a very near-shore distribution in Liverpool Bay, with little overlap with the Mona Offshore Cable Corridor. As such, the local spatial extent, short term duration, intermittent nature of vessel activities associated with the Mona offshore export cable reburial events and repairs is deemed to have little impact on these qualifying species.

1.10.3.98 With regard to the conservation objectives for the SPA, there is therefore no indication that temporary disturbance/displacement will lead to a reduction in the population and distribution of red-breasted merganser and great cormorant. As such, these qualifying species will not be adversely affected.

Conclusions

1.10.3.99 Adverse effects on the qualifying seabird features of the Liverpool Bay/Bae Lerpwl SPA which undermine the conservation objectives of the SPA will not occur as a result of temporary disturbance during operations and maintenance activities. Potential effects from this activity on the relevant conservation objectives (as presented in paragraph 1.10.2.19) are discussed in turn below in Table 1.238. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.238: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operations and maintenance phase.

Conservation objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	There is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats. Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operations and maintenance phase will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	Displacement of common scoter and red-throated diver are expected to occur as a result of vessel traffic associated with cable construction. The effect is expected to be temporary, local, short-term, and reversible. The precautionary impact on the population of both these ornithological features has been assessed to be within natural variability for these species in this SPA. Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operations and maintenance phase will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	Displacement of common scoter and red-throated diver are expected to occur as a result of vessel traffic associated with cable construction. The effect is expected to be temporary, local, short-term, and reversible. Although the distribution of these features will be temporarily affected in a small percentage of the entire SPA, it is expected that once construction activities cease, the affected areas will be quickly repopulated. Therefore, disturbance and displacement from airborne sound and presence of vessels and infrastructure during the operations and maintenance phase will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.3.100 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to the operations and maintenance of the Mona Offshore Wind Project alone. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Changes in prey availability

1.10.3.101 There is the potential for changes in prey (e.g. fish species) abundance and distribution to arise as a result of construction activities which physically disturb the seabed, which potentially result in increased SSC, and in particular piling related underwater sound. Reduction or disruption to prey availability to seabirds may cause

displacement from foraging grounds in the area or reduced energy intake, affecting survival rates or productivity in the population in the short-term.

1.10.3.102 The assessment of LSE during the HRA screening process identified that during construction, LSE could not be ruled out for the potential impact of changes in prey availability. This relates to the following designated site and relevant marine ornithological features:

- Liverpool Bay/Bae Lerpwl SPA:
  - Red-throated diver
  - Little gull
  - Common scoter
  - Little tern
  - Common tern
  - Waterbird assemblage (red-breasted merganser and great cormorant in addition to species listed above).
- Irish Sea Front SPA
  - Manx shearwater
- Ribble and Alt Estuaries SPA
  - Lesser black-backed gull
- Morecambe and Duddon Estuary
  - Lesser black-backed gull
  - European Herring gull

1.10.3.103 The MDS considered within this assessment is shown in Table 1.239.

Table 1.239: MDS considered for the assessment of potential impacts on marine ornithological features from changes in prey availability during the construction phase.

Potential impact	Maximum design scenario	Justification
Changes in prey availability	**Construction phase** As described in volume 2, chapter 8: Fish and shellfish ecology of the PEIR for: • Injury and/or disturbance to fish and shellfish from underwater sound and vibration and increased SSC	As described in volume 2, chapter 8: Fish and shellfish ecology of the PEIR.

Measures adopted as part of the Mona Offshore Wind Project

1.10.3.104 Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of potential impacts on offshore ornithological features from changes in prey availability during construction are presented in Table 1.240.

Table 1.240: Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for offshore ornithological features from changes in prey availability.

Measure	Justification	How the measure will be secured
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
EMP that will include provisions for vessels and vessel transit corridors	The development of and adherence to a EMP, which will include measures to minimise disturbance to rafting seabirds.	Proposed to be secured through a condition in the marine licence(s).
EMP	Implementation of an EMP including a MPCP which will include planning for accidental spills, address all potential contaminant releases and include key emergency details.	Proposed to be secured through a condition in the marine licence(s).

Construction phase

Liverpool Bay/Bae Lerpwl SPA

Red-throated diver

1.10.3.105 During the non-breeding season, red-throated diver are primarily fish-eaters. Although they feed predominantly on small fish such as herring *Clupea harengus*, sprats *Sprattus sprattus* and sandeels *Ammodytes marinus*, they can switch to alternative small prey, depending on the species of fish available, e.g. cod *Gadus morhua* and flounder *Platichthys flesus* (Cramp and Simmons, 1977; Guse *et al*., 2009; Dierschke *et al*., 2017). Herring and sandeel are sensitive to offshore wind development (including underwater sound) and there is the potential for the abundance and distribution of these prey species to be affected during installation of the Mona Offshore Cable and piling activities. In the absence of quantitative information available, the magnitude of the impact is considered qualitatively for red-throated diver.

1.10.3.106 Local displacement of prey species is expected to arise primarily due to underwater sound from piling operations at the within the Mona Array Area. This might potentially lead to localised displacement of red-throated diver in inshore areas where effects of underwater sound and seabed disturbance (e.g. during cabling) extends into areas of importance for red-throated diver in Liverpool Bay. The underwater sound assessment and contours presented in volume 2, chapter 8: Fish and shellfish ecology of the PEIR did not predict that the level of sound would affect fish within the areas of highest usage by red-throated diver. Webb *et al*. (2006) and Lawson *et al.* (2016) have identified important aggregations of red-throated diver off the coast of north Wales which overlapped with the Mona Offshore Cable Corridor. However, as the footprint of the cable laying is small and the operation slow moving, it is assumed that prey species will be subjected to only a brief period of impact. As a result, it is anticipated that prey species will return to the area. As such, the local spatial extent, short term duration, intermittent nature of underwater sound associated with the Mona Offshore Cable Corridor, associated vessel activity and piling activities within the Mona Array Area will not adversely affect the red-throated diver qualifying feature.

Little gull

1.10.3.107 During the non-breeding season the diet of little gulls consist of small fish and marine invertebrates. The Liverpool Bay/Bae Lerpwl SPA supports a small population (319 birds) with the main concentration close to the 12nm limit and outside the Mona Offshore Cable Corridor (Lawson *et al*., 2016). There is no indication that temporary indirect impacts from underwater sound or increase in SSC will lead to a reduction in prey availability, given the diverse range of prey targeted by little gull.

1.10.3.108 Piling activities during the construction at the Mona Array Area are likely to generate underwater sound. The main aggregations of little gull occur within the zone of influence of underwater sound on fish species, therefore the piling activities might impact the prey species. However, within the assessment of fish species, it was concluded that the temporary nature of the piling activities would not lead to any long term impact on prey species. Therefore, piling within the Mona Array Area is not anticipated to impact the population of little gull within Liverpool Bay/Bae Lerpwl SPA.

1.10.3.109 The Mona Offshore Cable Corridor does not overlap with significant aggregations of little gull in the Liverpool Bay/Bae Lerpwl SPA (Lawson *et al*., 2016), it is anticipated that underwater sound associated with the Mona Offshore Cable Corridor, associated vessel activity will not adversely effect little gull qualifying features due to the local spatial extent, short term duration, intermittent nature of the work.

Common scoter

1.10.3.110 Common scoter feed by diving to seabed to exploit prey species that live upon or within the upper few centimetres of the substratum. The diet of common scoter is thought to comprise mainly bivalve molluscs with crabs, small fishes and gastropods also incorporated but less frequently (Stott and Olson, 1973; Bourne, 1984; Ferns, 1984; Stempniewicz, 1986; Vaitkus and Bubinas, 2001; Kaiser *et al*., 2006). In Liverpool Bay, the highest numbers of common scoter coincided with sites that had a high abundance and biomass of bivalve prey species (Kaiser *et al*., 2006).

1.10.3.111 One of the highest concentrations of common scoter in the Liverpool Bay/Bae Lerpwl SPA is located in the nearshore waters between the Dee Estuary and Colwyn Bay (Lawson *et al.,* 2016). Although the Mona Offshore Cable Corridor intersects this area of importance for common scoter, impact from underwater sound affecting prey species is predicted to be negligible. There is no indication that bivalve molluscs, the main prey items of common scoter, are sensitive to underwater sound.

Little tern

1.10.3.112 Although the little tern colonies are located in the Dee Estuary SPA, the species forage in the inshore waters of the Liverpool Bay SPA close to the colonies. According to Woodward *et al*., (2019), the maximum foraging range from the colony is 5km with of a mean of 2.1km. Specific data collected at the Dee Estuary colony indicated a mean maximum range of 1.8km from the colony (Parsons *et al*., 2015).

1.10.3.113 The Mona Offshore Cable Corridor and the zone of influence for piling sound from the Mona Array Area are located outside the mean maximum foraging range of little tern breeding from the Dee Estuary SPA. There is therefore no indication that indirect impacts from underwater sound affecting prey species will impact little tern.

Common tern

1.10.3.114 As the Mona Offshore Cable Corridor is located outside the foraging range of common tern breeding on the Dee Estuary (mean max 18.0km ± 8.9km (Woodward *et al.,* 2019)).

1.10.3.115 The Mona Offshore Cable Corridor and the zone of influence for piling sound from the Mona Array Area are located outside the mean maximum foraging range of common tern breeding from the Dee Estuary SPA. There is therefore no indication that indirect impacts from underwater sound affecting prey species will impact common tern.

Waterbird assemblage

1.10.3.116 In addition to the qualifying species assessed above, great cormorant and red-breasted merganser are part of the waterbird assemblage in Liverpool Bay. Great cormorant and red-breasted merganser occur in numbers that exceed 1% of their respective UK populations in Liverpool Bay, with 826 and 160 individuals respectively (Lawson *et al*., 2016). Both species have a very nearshore distribution in Liverpool Bay, with therefore reduced overlap with the Mona Offshore Cable Corridor. As such, the local spatial extent, short term duration, intermittent nature of vessel activities associated with the Mona Offshore Cable will not result in an adverse impact on these qualifying species.

Conclusions

1.10.3.117 Adverse effects on the qualifying seabird features of the Liverpool Bay/Bae Lerpwl SPA which undermine the conservation objectives of the SPA will not occur as a result of changes in prey availability. Potential effects from this activity on the relevant conservation objectives (as presented in paragraph 1.10.2.19) are discussed in turn below in Table 1.241.

Table 1.241: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for changes in prey availability during the construction phase.

Conservation objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored]	The impact of the Mona Offshore Cable installation will be temporary, short-term, and reversible, affecting only a small fraction of suitable habitat and prey species for qualifying ornithological features. Prey species are expected to quickly recolonise suitable habitat and recover to pre-construction levels. Therefore, changes in prey availability during the construction phase will not prevent the extent and distribution of the habitats of the qualifying features from being maintained or restored.
The structure and function of the habitats of the qualifying features [are maintained or restored]	The impact of the Mona Offshore Cable installation will be temporary, short-term, and reversible, affecting only a small fraction of suitable habitat and prey species for qualifying ornithological features. Although structure and function may be temporarily changed by affecting prey species, prey species are expected to quickly recover. Therefore, changes in prey availability during the construction phase will not prevent the structure and function of the habitats of the qualifying features from being maintained or restored.
The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]	There is no pathway linking prey abundance and the supporting processes on which the habitats of the qualifying features rely. Therefore, changes in prey availability during the construction phase will not prevent the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.

Conservation objective	Conclusions
The286tructution of each of the qualifying features [are maintained or restored]	The impact of the Mona offshore export cable installation will be temporary, short-term, and reversible, affecting only a small fraction of suitable habitat and prey species for qualifying ornithological features. However, the magnitude of the impact on prey distributions is not expected to have an appreciable impact on populations of qualifying ornithological features. Therefore, changes in prey availability during the construction phase will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	The impact of the Mona offshore export cable installation will be temporary, short-term, and reversible, affecting only a small fraction of suitable habitat and prey species for qualifying ornithological features. Although birds may temporarily redistribute in response to a small scale, temporary redistribution of their food resources, changes in prey availability during the construction phase will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.3.118 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA as a result of changes in prey availability with respect to the construction and decommissioning of the Mona Offshore Wind Project alone. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Irish Sea Front SPA

Manx shearwater

1.10.3.119 The underwater sound assessment and contours presented in volume 2, chapter 8: Fish and shellfish ecology of the PEIR indicates that no impact would occur within the Irish Sea Front SPA and therefore no prey species would be impacted with a change in distribution. Therefore, Manx shearwater distribution and usage within the site would not be impacted. Even if prey resources were impacted, Manx Shearwater have a very large foraging range of >1,300km (Woodward *et al.,* 2019), so they are flexible in their habitat use.

Conclusions

1.10.3.120 Adverse effects on the qualifying seabird features of the Irish Sea Front SPA which undermine the conservation objectives of the SPA will not occur as a result of changes in prey availability. Potential effects from this activity on the relevant conservation objectives (as presented in paragraph 0) are discussed in turn below in Table 1.242.

Table 1.242: Conclusions against the conservation objectives of the Irish Sea Front SPA for changes in prey availability during the construction phase.

Conservation objective	Conclusions
Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term	There is no pathway linking underwater sound to mortality, injury and disturbance of the qualifying feature. Therefore, changes in prey availability during the construction phase will not result in significant mortality or injury and disturbance of the qualifying features and the distribution of the species and ability to use the site will be maintained in the long-term.
Maintain the habitats and food resources of the qualifying features in favourable condition	It is unlikely that prey species at the Irish Sea Front SPA will be affected by sound from the construction of the Mona Offshore Wind Project given the sound contour modelling. Moreover, Manx Shearwater are flexible in habitat use with a large foraging range. Therefore, changes in prey availability during the construction phase will not prevent the habitats and food resources of the qualifying features from being maintained at favourable condition.
Ensure access to the site from linked breeding colonies.	There is no pathway linking underwater sound affecting prey and access of Manx shearwater between linked breeding colonies. Therefore, changes in prey availability during the construction phase will not prevent access to the site from linked breeding colonies.

1.10.3.121 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Irish Sea Front SPA as a result of changes in prey availability with respect to the construction and decommissioning of the Mona Offshore Wind Project alone.

Ribble and Alt Estuaries SPA

Lesser black-backed gull

1.10.3.122 Underwater sound produced during piling activities and cable installation in the construction phase may impact upon the availability of prey items. Indeed, underwater sound may cause fish and mobile invertebrates to avoid the construction area. Underwater sound may also affect the physiology and behaviour of fish and mobile invertebrates over a very large (thousands of metres) area due to the ability of sound to propagate further underwater.

1.10.3.123 The lesser black-backed gull is a typical non-specific surface-feeding seabird with a widespread, and patchy distribution in the Mona Offshore Wind Project. Only 55 birds were recorded during the 24 months of surveying. There is potential that birds recorded within the Mona Array Area and Mona Offshore Cable Corridor are associated with the Ribble and Alt Estuaries SPA as there is overlap between the species foraging range and the Mona Offshore Wind Project.

1.10.3.124 Lesser black-backed gull have a large foraging range (127 ± 109km), providing a wide area to forage over. The species is non-specific in its prey requirement and will be able to forage on whichever fish is shoaling at the surface. Because of the lesser black-backed gull distribution and low numbers and foraging behaviour (i.e. non-specific surface feeding), it is anticipated that any changes in prey availability (arising from underwater sound, increased SSC and habitat), if they occur at all, will have little impact on lesser black-backed gull during the construction phase.

Conclusions

1.10.3.125 Adverse effects on the qualifying seabird features of the Ribble and Alt Estuaries SPA which undermine the conservation objectives of the SPA will not occur as a result of changes in prey availability during construction and decommission activities. Potential effects from this activity on the relevant conservation objectives are discussed in turn below in Table 1.243.

Table 1.243: Conclusions against the conservation objectives of the Ribble and Alt Estuaries SPA for changes in prey availability during the construction phase.

Conservation objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored]	The impact of the Mona Offshore Cable installation will be temporary, short-term, and reversible, affecting only a small fraction of suitable habitat and prey species for qualifying ornithological features. Prey species are expected to quickly recolonise suitable habitat and recover to pre-construction levels. Therefore, changes in prey availability during the construction phase will not prevent the extent and distribution of the habitats of the qualifying features from being maintained or restored.
The structure and function of the habitats of the qualifying features [are maintained or restored]	The impact of the Mona Offshore Cable installation will be temporary, short-term, and reversible, affecting only a small fraction of suitable habitat and prey species for qualifying ornithological features. Although structure and function may be temporarily changed by affecting prey species, prey species are expected to quickly recover. Therefore, changes in prey availability during the construction phase will not prevent the structure and function of the habitats of the qualifying features from being maintained or restored.
The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]	There is no pathway linking prey abundance and the supporting processes on which the habitats of the qualifying features rely. Therefore, there is no indication that indirect impacts from affecting prey species will impact the qualifying ornithological features.
The population of each of the qualifying features [are maintained or restored]	The impact of the Mona Offshore Wind Project construction will be temporary, short-term, and reversible, affecting only a small fraction of suitable habitat and prey species for lesser black-backed gull. Although the Mona Offshore Wind Project is within foraging range of lesser black-backed gull from the Ribble and Alt Estuaries SPA, only a small fraction of that population forages that far out at sea. The magnitude of the impact on prey distributions will not have an appreciable impact on populations of lesser black-backed gull. Therefore, changes in prey availability during the construction phase will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	There is no overlap between the Mona Offshore Wind Project and the Ribble and Alt Estuaries SPA. However, prey of the qualifying features may redistribute to a degree in response to underwater sound from construction. Although birds may temporarily use other areas for foraging in response to a small scale, temporary redistribution of their food resources, this will not lead to appreciable impacts on their general distribution within the SPA. Therefore, changes in prey availability during the construction phase will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.3.126 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Ribble and Alt Estuaries SPA as a result of changes in prey availability with respect to the construction and decommissioning of the Mona Offshore Wind Project alone.

Morecambe Bay and Duddon Estuary SPA

Lesser black-backed gull

1.10.3.127 Underwater sound produced during piling activities and cable installation in the construction phase may impact upon the availability of prey items. Underwater sound may cause fish and mobile invertebrates to avoid the construction area. Underwater sound may also affect the physiology and behaviour of fish and mobile invertebrates over a very large (thousands of metres) area due to the ability of sound to propagate further underwater.

1.10.3.128 As outlined in paragraph 1.10.3.123 and 1.10.3.124, The lesser black-backed gull is a typical non-specific surface-feeding seabird with a widespread, and patchy distribution in the Mona Offshore Wind Project. Overall the abundance was deemed “low” with 55 birds recorded during the 24 months of surveying. There is potential that birds recorded within the Mona Array Area and Mona Offshore Cable Corridor are associated with the Morecambe Bay and Duddon Estuary SPA as there is overlap between the species foraging range and the Mona Offshore Wind Project.

1.10.3.129 Lesser black-backed gull have a large foraging range (127 ± 109km), providing a wide area to forage over. The species is non-specific in its prey requirement and will be able to forage on whichever fish is shoaling at the surface. Due to the distribution of lesser black-backed gull, low numbers and foraging behaviour (i.e. non-specific surface feeding) it is anticipated that any changes in prey availability (arising from underwater sound, increased SSC and habitat), if they occur at all, will have little impact on lesser black-backed gull during the construction phase.

Herring gull

1.10.3.130 Underwater sound produced during piling activities and cable installation in the construction phase may impact upon the availability of prey items. Underwater sound may cause fish and mobile invertebrates to avoid the construction area. Underwater sound may also affect the physiology and behaviour of fish and mobile invertebrates over a very large (thousands of m) area due to the ability of sound to propagate further underwater.

1.10.3.131 Herring gull is a typical non-specific surface-feeding seabird with a widespread, and patchy distribution within the Mona Offshore Wind Project Boundary. Only 71 birds were recorded during the 24 months of surveying. There is potential that birds recorded within the Mona Array Area are associated with the Morecambe Bay and Duddon Estuary SPA as there is overlap between the species foraging range and the Mona Offshore Wind Project.

1.10.3.132 Because of the herring gull distribution and low numbers and foraging behaviour (i.e. non-specific surface feeding) it is anticipated that any changes in prey availability (arising from underwater sound, increased SSC and habitat), if they occur at all, will have little impact on lesser black-backed gull during the construction phase.

Conclusions

1.10.3.133 Adverse effects on the qualifying seabird features of the Morecambe Bay and Duddon Estuary SPA which undermine the conservation objectives of the SPA will not occur as a result changes to prey availability during construction and decommissioning activities. Potential effects from this activity on the relevant conservation objectives are discussed in turn in Table 1.244.

Table 1.244: Conclusions against the conservation objectives of the Morecambe Bay and Duddon Estuary SPA for changes in prey availability during the construction phase.

Conservation objective	Conclusions
The extent and distribution of the habitats of the qualifying features is to be maintained or restored	The impact of the Mona Offshore Cable installation will be temporary, short-term, and reversible, affecting only a small fraction of suitable habitat and prey species for qualifying ornithological features. Prey species are expected to quickly recolonise suitable habitat and recover to pre-construction levels. Therefore, changes in prey availability during the construction phase will not prevent the extent and distribution of the habitats of the qualifying features from being maintained or restored.
The structure and function of the habitats of the qualifying features [are maintained or restored]	The impact of the Mona Offshore Cable installation will be temporary, short-term, and reversible, affecting only a small fraction of suitable habitat and prey species for qualifying ornithological features. Although structure and function may be temporarily changed by affecting prey species, prey species are expected to quickly recover. Therefore, changes in prey availability during the construction phase will not prevent the structure and function of the habitats of the qualifying features from being maintained or restored.
The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]	There is no pathway linking prey abundance and the supporting processes on which the habitats of the qualifying features rely. Therefore, changes in prey availability during the construction phase will not prevent the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	There is no overlap between the Mona Offshore Wind Project and the Morecambe Bay and Duddon Estuary SPA. However, prey of the qualifying features may redistribute to a degree in response to underwater sound from construction. Although the Mona Offshore Wind Project is within foraging range of lesser black-backed and herring gull from the Morecambe Bay and Duddon Estuary SPA, only a small fraction of the population forages that far out at sea. Therefore, the magnitude of the impact on prey distributions will not have an appreciable impact on populations of lesser black-backed and herring gull. Therefore, changes in prey availability during the construction phase will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	There is no overlap between the Mona Offshore Wind Project and the Morecambe Bay and Duddon Estuary SPA. However, prey of the qualifying features may redistribute to a degree in response to underwater sound from construction. Although birds may temporarily use other areas for foraging in response to a small scale, temporary redistribution of their food resources, this will not lead to appreciable impacts on their general distribution within the SPA. Therefore, changes in prey availability during the construction phase will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.3.134 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Morecambe Bay and Duddon Estuary SPA as a result of changes in prey availability with respect to the construction and decommissioning of the Mona Offshore Wind Project alone.

Accidental pollution

1.10.3.135 There is a risk of pollution being accidentally released during the construction and operations and maintenance phase of the Mona Offshore Wind Project from sources including vessels/vehicles and equipment/machinery. Seabirds utilising the environment in the vicinity of a pollution incident may be vulnerable to either direct mortality from oil coverage preventing flight for example, or indirectly via a reduction in ability to forage.

1.10.3.136 Species that spend large amounts of time in the water (e.g. divers and pursuit feeders such as auks) or on the sea surface (loafing) (auks) are considered to be more vulnerable to pollution incidents (such as the accidental release of synthetic compounds, fuels or other substances) than surface feeding species such as kittiwake and fulmar.

1.10.3.137 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 accidental pollution. This relates to the following designated site and relevant marine ornithological features:

- Liverpool Bay/Bae Lerpwl SPA:
  - Red-throated diver
  - Little gull
  - Common scoter
  - Little tern
  - Common tern
  - Waterbird assemblage (red-breasted merganser and great cormorant in addition to species listed above).

1.10.3.138 The HRA Stage 1 Screening Report determined that this impact will be spatially restricted to within the boundaries of the Mona Offshore Cable Corridor only, due to the Mona Array Area being located well outside the Liverpool Bay/Bae Lerpwl SPA boundary.

1.10.3.139 An MDS has not been quantified for this impact, but accidental pollution events may include consumables contained within the wind turbines including for example grease, oils, lubricants, diesel and coolants and pollutants which may be accidentally released by construction vessels (e.g. cable installation vessels).

Measures adopted as part of the Mona Offshore Wind Project

1.10.3.140 Measures adopted as part of the Mona Offshore Wind Project which are of relevance to the assessment of potential impacts on ornithological features from accidental pollution during construction are presented in Table 1.245.

Table 1.245: Measures adopted as part of the Mona Offshore Wind Project relevant to the assessment of adverse effect on European sites designated for marine ornithological features from accidental pollution during the construction phase.

Measure	Justification	How the measure will be secured
Tertiary measures: Measures required to meet legislative requirements, or adopted standard industry practice		
Development of, and adherence to, an EMP, including a MPCP.	To ensure that the potential for release of pollutants during construction, operations and maintenance, and decommissioning	Proposed to be secured through a condition in the marine licence(s).

Measure	Justification	How the measure will be secured
	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 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.	

Construction and decommissioning phase

Liverpool Bay/Bae Lerpwl SPA

All species

1.10.3.141 With regard to the Mona Offshore Cable Corridor, the main source of pollution is potential leaks or spills of fuel supply (diesel or oil) from vessels involved in construction activities. The quantities of potentially polluting substances associated with the cables (e.g. lubricants and grout) are limited, and if released would be of insufficient quantities to result in a population level effect.

1.10.3.142 If a spill or leak were to occur (which is considered highly unlikely as would involve a vessel collision or significant damage to a vessel), given that the majority of vessels involved in construction and maintenance activities will be smaller support or guard vessels, the quantities of fuel released are likely to also be limited. Furthermore, in the unlikely event that a pollution incident does occur, it is likely that any released substances will be rapidly diluted, dispersed and broken down by natural hydrodynamic processes.

1.10.3.143 Should a pollution incident occur, the potential for this to have a population level effect is limited due to the low quantities of pollutants that are likely to ever be released. Although the likelihood of an accidental pollution event occurring is very low, with the implementation of measures such as an MPCP and EMP, should an event occur, effects would be temporary, reversible and limited in spatial extent due to procedures and processes put in place therefore minimise the potential effects of any incidents. Adverse effects on marine ornithological features in Liverpool Bay/Bae Lerpwl SPA can therefore be ruled out.

Conclusions

1.10.3.144 Adverse effects on the qualifying ornithological features of the Liverpool Bay/Bae Lerpwl SPA which undermine the conservation objectives of the SPA will not occur as a result of accidental pollution. Potential effects from this impact on the relevant conservation objectives (as presented in section 1.10.2) are discussed in turn below in Table 1.246. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.246: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for accidental pollution during the construction phase.

Conservation objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	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 EMP and MPCP. Should a pollution event occur, effects will be temporary, reversible and limited in spatial extent. Therefore, accidental pollution during the construction phase will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored] **The distribution of the qualifying features within the site [are maintained or restored]**	Accidental pollution is considered very unlikely given the implementation of mitigation measures such as an EMP and MPCP and should an event occur, effects will be temporary, reversible and limited in spatial extent. Therefore, accidental pollution during the construction phase will not prevent the population or distribution of each of the qualifying features from being maintained or restored.

1.10.3.145 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA as a result of accidental pollution with respect to the construction and decommissioning of the Mona Offshore Wind Project alone. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Operations and maintenance phase

Liverpool Bay/Bae Lerpwl SPA

All Species

1.10.3.146 Effects associated with accidental pollution for the ornithological features are considered to be consistent or of lower magnitude than those outlined for the construction phase in paragraph 1.10.3.142.

Conclusions

1.10.3.147 Adverse effects on the qualifying ornithological features of the Liverpool Bay/Bae Lerpwl SPA which undermine the conservation objectives of the SPA will not occur as a result of accidental pollution. Potential effects from this impact on the relevant

conservation objectives are discussed in turn belowin Table 1.247. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.247: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for accidental pollution during the operations and maintenance phase.

Conservation objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	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 EMP including a MPCP. Should a pollution event occur, effects will be temporary, reversible and limited in spatial extent. Therefore, accidental pollution during the operations and maintenance phase will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored] **The distribution of the qualifying features within the site [are maintained or restored]**	Accidental pollution is considered very unlikely given the implementation of mitigation measures such as an EMP including a MPCP and should an event occur, effects will be temporary, reversible and limited in spatial extent. Therefore, accidental pollution during the operations and maintenance phase will not prevent the population or distribution of each of the qualifying features from being maintained or restored.

1.10.3.148 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA as a result of accidental pollution with respect to the operations and maintenanceof the Mona Offshore Wind Project alone. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

1.10.4 Assessment of adverse impacts in-combination

1.10.4.1 The other developments (projects/plans) that could result in-combination effects associated with the Mona Offshore Wind Project on marine ornithological features of the designated sites identified have been summarised in Table 1.248 and are displayed in Figure 1.21.

1.10.4.2 In-combination effects on seabird ornithological receptors with schemes other than offshore wind farms and tidal energy projects are considered to be unlikely due the to the specific impacts (i.e. collision and displacement) generated by turbine arrays in the offshore environment and therefore have not been screened into the in-combination assessment.

1.10.4.3 The screening process for in-combination effects on ornithological features has been based on the species and their associated population designation (i.e. breeding species, over-wintering species and passage species) enabling a zone of influence to be defined in which in-combination effects may occur.

1.10.4.4 The assumption for the in-combination assessment has been that most schemes will be operational when the Mona Offshore Wind Project and Morgan Generation Assets are under construction. There is potential overlap between the construction phase of Mona Offshore Wind Project, Morgan Generation Assets and Awel y Môr. The expected mortality for the schemes will be depicted as the same number when discussing in-combination mortalities during construction and operation, whereas the numbers for the Mona Offshore Wind Project, Morgan Generation Assets and Awel y Môr will differ between those phases.

1.10.4.5 For those breeding seabirds that have been screened into the in-combination assessment, a foraging range approach has been used to determine the potential for in-combination effects on a designated site during the breeding bio-season. Any wind farm and tidal energy project which falls within the mean-maximum foraging range + 1 SD (Woodward *et al*., 2019) for a relevant species from a European site included in the alone assessment above have been included within the in-combination assessment.

1.10.4.6 During the non-breeding bio-season, plans and projects within the biologically defined minimum population scales (BDMPS) region for each species has been considered in-combination with the Mona Offshore Wind Project (see Furness (2015) for further information on BDMPS).

1.10.4.7 For the ornithology in-combination assessment, impacts from Tier 1 and Tier 2 projects have been assessed together.

1.10.4.8 A number of impacts considered for the Mona Offshore Wind Project alone, as set out in section 1.10.3, have not been considered in the in-combination assessment. This is because many of the potential impacts identified and assessed for the Mona Offshore Wind Project alone are relatively localised and temporary in nature and therefore have limited or no potential to interact with similar changes associated with other projects. On this basis, the potential impacts identified for assessment as part of the volume 2, chapter 10: Offshore ornithology of the PEIR, and which have been brought forward for consideration in the in-combination assessment of the ISAA are:

- Disturbance and displacement from airborne sound and presence of vessels and infrastructure for:
  - Red-throated diver, little gull, common scoter, little tern, common tern, waterbird assemblage at Liverpool Bay/Bae Lerpwl SPA during the construction, operations and maintenance and decommissioning phases
  - Common guillemot at Lambay Island SPA and Ireland's Eye SPA during the construction, operations and maintenance and decommissioning phases.
- Prey availability
  - For Liverpool Bay/Bae Lerpwl SPA (red-throated diver, little gull, common scoter, little tern, common tern, waterbird assemblage), Irish Sea Front SPA (Manx shearwater), Ribble and Alt Estuaries SPA (lesser black-backed gull), Morecambe Bay and Duddon Estuary SPA (lesser black-backed gull and herring gull).
- Combined impacts of collision and displacement for:
  - Northern gannet at Ailsa Craig SPA and Grassholm SPA during the operations and maintenance phase.

Table 1.248: List of other projects and plans with potential for in-combination effects on offshore ornithology.

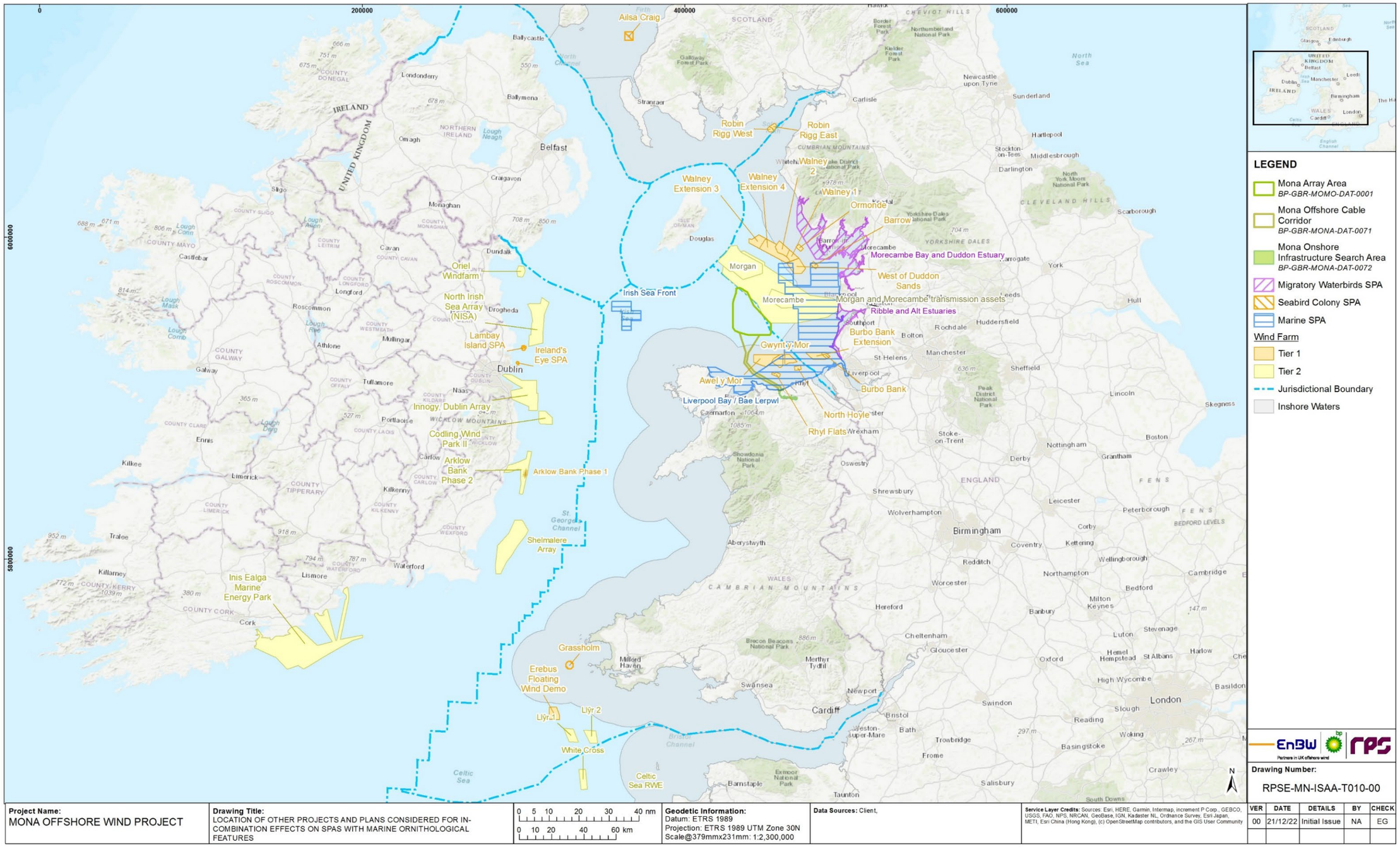
Plan/project	Status	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of installation/operation	Spatial overlap	Temporal overlap	Futher assesment required? (Yes/No)
Awel y Môr Offshore Wind Farm	Submitted application	Greater than 350MW (up to 50 turbines)	Tier 1	12.2	0.0	C: 2026 to 2029 O: 2030 to 2055	Yes	Construction and operational activities for the Mona Offshore Wind Project may overlap with construction and operational activities of Awel y Môr Offshore Wind Farm	Yes
Gwynt y Môr Offshore Wind Farm	Operational	160 3.MW turbines. Hub height 98m. Rotor diameter 107m.	Tier 1	13.8km	9.9km	O: 2015 to 2033	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Gwynt y Môr Offshore Wind Farm	Yes
Rhyl Flats offshore wind farm	Operational	25 3.6MW turbines. Hub height 80m. Rotor diameter 107m.	Tier 1	23.3km	3.8km	O: 2009 to 2027	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Rhyl Flats offshore wind farm	Yes
Burbo Bank Extension offshore wind farm	Operational	30 2MW turbines. Hub height 70m. Rotor diameter 80m.	Tier 1	24.7km	13.6km	O: 2017 to 2045	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Burbo Bank Extension offshore wind farm	Yes
North Hoyle offshore wind farm	Operational	47 7MW turbines. Hub height 111m. Rotor diameter 154m.	Tier 1	27.2km	47.8km	O: 2004 to 2028	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of North Hoyle offshore wind farm	Yes
Walney Extension 4 offshore wind farm	Operational	40 8.25MW turbines. Hub height 113m. Rotor diameter 164m.	Tier 1	27.3km	53.6km	O: 2018 to 2039	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Walney Extension 4 offshore wind farm	Yes

Plan/project	Status	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of installation/operation	Spatial overlap	Temporal overlap	Futher assesment required? (Yes/No)
Walney Extension 3 offshore wind farm	Operational	108 3.6MW turbines. Hub height 90m Rotor diameter 120m.	Tier 1	30.4km	43.9km	O: 2018 to 2039	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Walney Extension 3 offshore wind farm	Yes
West of Duddon Sands offshore wind farm	Operational	51 3.6MW turbines. Hub height 84m. Rotor diameter 107m.	Tier 1	31.0km	51.5km	O: 2014 to 2033	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of West of Duddon Sands offshore wind farm	Yes
Walney 2 offshore wind farm	Operational	51 3.6MW turbines. Hub height 84m. Rotor diameter 107m.	Tier 1	32.8km	49.6km	O: 2012 to 2032	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Walney 2 offshore wind farm	Yes
Walney 1 offshore wind farm	Operational	23 3.6MW turbines. Hub height 78m. Rotor diameters 107m.	Tier 1	34.0km	32.8km	O: 2011 to 2032	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Walney 1 offshore wind farm	Yes
Burbo Bank offshore wind farm	Operational	30 2MW turbines. Hub height 70m. Rotor diameter 80m.	Tier 1	24.7km	13.6km	O: 2007 to 2039	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Burbo Bank offshore wind farm	Yes
Ormonde offshore wind farm	Operational	30 5MW turbines. Hub Height 100m. Rotor diameter 126m.	Tier 1	41.2km	58.0km	O: 2012 to 2036	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Ormonde offshore wind farm	Yes
Barrow offshore wind farm	Operational	30 3MW turbines. Hub height 75m. Rotor diameter 90m.	Tier 1	42.9km	53.9km	O: 2006 to 2028	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Barrow offshore wind farm	Yes

Plan/project	Status	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of installation/operation	Spatial overlap	Temporal overlap	Futher assesment required? (Yes/No)
Robin Rigg offshore wind farm	Operational	58 3MW turbines. Hub height 80m Rotor diameter 90m.	Tier 1	98.6km	126.0km	O: 2010 to 2023	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Robin Rigg offshore wind farm	Yes
Arklow Bank Phase 1 offshore wind farm	Operational	7 3.6MW turbines. Hub height 73.5m. Rotor diameter 124m.	Tier 1	156.1km	150.9km	O: 2004 to 2028	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Arklow Bank Phase 1 offshore wind farm	Yes
Erebus offshore wind farm	Submitted application	100MW capacity.	Tier 1	258.9km	240.2km	C: 2025 O: 2026 to 2051	No	Construction and operational activities for the Mona Offshore Wind Project may overlap with construction and operational activities of Erebus offshore wind farm	Yes
Morgan Generation Assets	Pre-application	Up to 107 wind turbines.	Tier 2	5.52km	32.93km	C: 2026 to 2029 O: 2030 to 2065	No	Construction and operational activities for the Mona Offshore Wind Project may overlap with construction and operational activities of Morgan Generation Assets Offshore Wind Project	Yes
Morecambe generation offshore wind farm	Pre-application	480MW capacity, Area: 497km^2	Tier 2	8.9km	21.5km	C: 2026 to 2028 O: 2029 to 2064	No	Construction and operational activities for the Mona Offshore Wind Project may overlap with construction and operational activities of Morecambe generation offshore wind farm	Yes

Plan/project	Status	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of installation/operation	Spatial overlap	Temporal overlap	Futher assesment required? (Yes/No)
Morgan Generation Assets and Morecambe offshore wind farm transmission assets	Pre-application	n/a	Tier 2	8.92km	21.53km	C: 2026 to 2029 O: 2029 to 2065	No	Construction activities for the Mona Offshore Wind Project may overlap with construction activities of Morgan Generation Assets and Morecambe offshore wind farm transmission assets	Yes
North Irish Sea Array offshore wind farm	Pre-application	500MW capacity.	Tier 2	112.7km	118.6km	unknown	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of North Irish Sea Array offshore wind farm	Yes
Codling Wind Park offshore wind farm	Pre-application	900MW planned capacity, off of the coast Wicklow. Spread over an area of 125km^2	Tier 2	125.1km	123.6km	unknown	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Codling Wind Park offshore wind farm	Yes
Dublin Array offshore wind farm	Pre-application	600MW offshore wind power project. Area of 54km^2.	Tier 2	126.1km	129.0km	unknown	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Dublin Array offshore wind farm	Yes
Oriel offshore wind farm	Pre-application	375MW capacity, spread over 28km^2.	Tier 2	130.4km	138.1km	unknown	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Oriel offshore wind farm	Yes
Arklow Bank Phase 2 offshore wind farm	Pre-application	800MW capacity.	Tier 2	146.7km	142.8km	unknown	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Arklow Bank Phase 2 offshore wind farm	Yes

Plan/project	Status	Details	Tier	Distance from the Mona Array Area	Distance from the Mona Offshore Cable Corridor	Date of installation/operation	Spatial overlap	Temporal overlap	Futher assesment required? (Yes/No)
Shelmalere offshore wind farm	Pre-application	1,000MW capacity.	Tier 2	177.1km	168.9km	unknown	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Shelmalere offshore wind farm	Yes
Llyr 1 offshore wind farm	Pre-application	100MW capacity.	Tier 2	267.0km	245.9km	C: 2024 to 2025 O: 2026 to 2051	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Llyr 1 offshore wind farm	Yes
Llyr 2 offshore wind farm	Pre-application	1,000MW capacity.	Tier 2	263.17km	240.12km	C: 2024 to 2025 O: 2026 to 2051	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Llyr 2 offshore wind farm	Yes
White Cross offshore wind farm	Pre-application	Test and Demonstration Floating Wind Farm	Tier 2	287.7km	264.1km	unknown	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of White Cross offshore wind farm	Yes
Inis Ealga Marine Energy Park offshore wind farm	Pre-application	1,000MW capacity.	Tier 2	302.1km	292.0km	unknown	No	Operational activities for the Mona Offshore Wind Project may overlap with operational activities of Inis Ealga Marine Energy Park offshore wind farm	Yes



Project Name: MONA OFFSHORE WIND PROJECT	**Drawing Title:** LOCATION OF OTHER PROJECTS AND PLANS CONSIDERED FOR IN-COMBINATION EFFECTS ON SPAS WITH MARINE ORNITHOLOGICAL FEATURES	0 5 10 20 30 40 nm 0 10 20 40 60 km	**Geodetic Information:** Datum: ETRS 1989 Projection: ETRS 1989 UTM Zone 30N Scale@379mmx231mm: 1:2,300,000	**Data Sources:** Client,	**Service Layer Credits:** Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community	**Drawing Number:** RPSE-MN-ISAA-T010-00			

VER	DATE	DETAILS	BY	CHECK
00	21/12/22	Initial Issue	NA	EG

Figure 1.21: Location of other projects and plans considered for in-combination effects on SPAs with marine ornithological features[55].

[55] 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

In-combination disturbance and displacement from airborne sound and presence of vessels and infrastructure

1.10.4.9 Airborne sound, the presence of vessels and construction and decommissioning works may disturb seabirds from offshore foraging or non-foraging areas (e.g. rafting, moulting) in the short-term, causing changes in behaviour or displacement from the affected areas. Temporary disturbance/displacement may lead to a reduction in foraging opportunities or increased energy expenditure, resulting in decreased survival rates or productivity in the population.

1.10.4.10 The assessment of LSE during the HRA screening process identified that LSE could not be ruled out for the potential in-combination impacts of disturbance and displacement during construction, operations and maintenance and the decommissioning phase. This relates to the following designated site and relevant marine ornithological features:

- Liverpool Bay/Bae Lerpwl SPA
  - Red-throated diver
  - Little gull
  - Common scoter
  - Little tern
  - Common tern
  - Waterbird assemblage (red-breasted merganser and great cormorant in addition to species listed above).
- Lambay Island SPA
  - Common guillemot
- Ireland's Eye SPA
  - Common guillemot.

Construction/decommissioning phase

Liverpool Bay/Bae Lerpwl SPA

Tier 1 and Tier 2

Red-throated diver

1.10.4.11 Red-throated diver are sensitive to sound and visual impacts from wind farm construction, maintenance traffic and visually from the turbines themselves (Natural England and JNCC, 2010; Joint SNCBs, 2022), leading to disturbance and displacement effects on the species during construction/decommissioning and operations and maintenanceactivities. Additionally, vessel movements during the construction/decommissioning phase within the Mona Array Area have the potential to disturb red-throated divers. However due to the low abundance recorded within the Mona Array Area and the 4km buffer, and due to the distance to the Liverpool Bay/Bae Lerpwl SPA (closest distance 10km), disturbance and displacement from airborne sound and presence of vessels and infrastructure can be discounted for the Mona Array Area.

1.10.4.12 The spatial extent of in-combination effects is defined as the area within the Liverpool Bay/Bae Lerpwl SPA which overlaps with other plans and projects, and for which the species is a designated feature. This includes Gwynt y Môr, Burbo Bank, Burbo Bank Extension, North Hoyle, Rhyl Flats, Awel y Môr offshore wind farms, and the Morgan and Morecambe Transmission Assets and Mona Offshore Cable Corridor. As vessel movements may occur throughout the SPA during construction and decommissioning, impacts to the habitat conservation objectives for the screened in features must be considered for Liverpool Bay/Bae Lerpwl SPA. The vessel movement impacts will be temporary and intermittent; therefore it is not expected that there will be habitat loss or change to habitat quality as a result of vessel movement. Although the species is highly sensitive to vessel movement, the species shows a high level of flexibility in habitat use (Wade *et al.*, 2016). Webb *et al.* (2006) and Lawson *et al.* (2016) have identified important aggregations of red-throated diver off the coast of north Wales which overlap with Mona Offshore Cable Corridor.

1.10.4.13 The expected number of bird mortalities per annum due to displacement from other projects/plan included in the in-combination assessment is given in Table 1.249. Numbers presented within Table 1.249 have been taken from publicly available documents (volume 5, chapter 5.2 Report to Inform Appropriate Assessment Awel y Môr Offshore Wind Farm, with numbers based on other project documents that are now no longer available within the public domain).

1.10.4.14 Effects outside the non-breeding period are unlikely to be significant, as most birds move to their breeding areas, away from Liverpool Bay and so, impacts are only considered during the non-breeding season.

1.10.4.15 The precautionary increase in baseline mortality from the Mona Offshore Cable Corridor alone was 0.09 birds (see paragraph 1.10.3.46 for detailed methodology) based on a displacement rate of 100% and 0.5% mortality.

Table 1.249: Predicted annual mortality rate of red-throated diver resulting from disturbance and displacement from projects considered in-combination during construction/decommissioning.

Plan/project	Predicted Annual Mortality
Awel y Môr	0.7
Burbo Bank Extension	0.3
Burbo Bank	0.11
Gwynt y Môr	0.35
Mona Offshore Cable Corridor	0.09
Morgan and Morecambe transmission assets	Unknown
North Hoyle	0
Rhyl Flats	0.24
Total	**1.79**

1.10.4.16 The in-combination predicted mortality resulting from temporary disturbance/displacement from airborne sound and presence of vessels and infrastructure within the Liverpool Bay/Bae Lerpwl SPA totals 1.79 individuals per

annum, which equates to 0.15% of the Liverpool Bay/Bae Lerpwl SPA citation population (1,171 individuals). The baseline mortality of red-throated divers is 0.233, leading to an annual baseline mortality estimate of 261.1 (see also paragraph 0). On the basis of 1.79 mortality per annum from the in-combination impacts during construction and decommissioning, the increase in baseline mortality is predicted to be 0.69%. There is therefore no indication that temporary disturbance/displacement will lead to a reduction in the population and distribution of red-throated diver from in-combination impacts. The species will therefore not be adversely affected.

Little gull

1.10.4.17 There is no evidence that little gull are sensitive to disturbance and displacement from airborne sound and presence of vessels and infrastructure (MMO, 2018), with Humphreys *et al*. (2015) stating they have a low displacement score.

1.10.4.18 As such, there is no indication that temporary disturbance/displacement will lead to a reduction in the population and distribution of little gull. Thus, this qualifying species will not be adversely affected.

Common scoter

1.10.4.19 Common scoter are sensitive to sound and visual impacts from wind farm construction, maintenance traffic and visually from the turbines themselves (Natural England and JNCC 2010), leading to disturbance and displacement effects on the species during construction/decommissioning activities. during construction/decommissioning and operations and maintenanceactivities. Additionally, vessel movements during the construction/decommissioning phase within the wind farm have the potential to disturb red-throated divers. However due to the low abundance recorded within the Mona Array Area and the 4km buffer, and due to the distance to the Liverpool Bay/Bae Lerpwl SPA (closest distance 10km), disturbance and displacement from airborne sound and presence of vessels and infrastructure can be discounted for the Mona Array Area.

1.10.4.20 The spatial extent of in-combination effects is defined as the area within the Liverpool Bay SPA for which the species is a designated feature, and so this includes Gwynt y Môr, Burbo Bank, Burbo Bank Extension, North Hoyle, Rhyl Flats, Awel y Môr offshore wind farms, and the Morgan and Morecambe Transmission Assets and Mona Offshore Cable corridor. As vessel movement may occur through the SPA during construction and decommissioning, impacts to the habitat conservation objectives for the screened in features must be considered for Liverpool Bay SPA. The vessel movement impacts will be temporary and intermittent, therefore it is not expected that there will be habitat loss or change to habitat quality as a result of vessel movement to and from the site for construction and decommissioning. One of the highest concentrations of common scoter in Liverpool Bay is located on the nearshore waters between the Dee Estuary and Colwyn Bay (Lawson *et al*., 2016).

1.10.4.21 The expected number of scoters displaced from other developments is given in Table 1.250. Effects outside the non-breeding period are unlikely to be significant, as most birds move away from the SPA and so, impacts are only considered during the non-breeding season. Additionally, as the vessels move, it has been assumed that displaced birds return and therefore any individual will be subjected to only a brief period of impact.

1.10.4.22 The precautionary increase in baseline mortality from the Mona Offshore Cable Corridor alone was 11.05 common scoters (see paragraph 1.10.3.45 for detailed methodology and 1.10.3.56 for common scoter assessment) based on a displacement rate of 100% and a mortality of 0.5%.

Table 1.250: Predicted annual mortality rate of common scoter resulting from disturbance and displacement from projects considered in-combination during construction/decommissioning.

Plan/project	Predicted Annual Mortality
Awel y Môr	17.5
Burbo Bank Extension	4
Burbo Bank	0
Gwynt y Môr	0
Mona Offshore Cable Corridor	11.05
Morgan and Morecambe transmission assets	Unknown
North Hoyle	0.1
Rhyl Flats	1.3
Total	**33.95**

1.10.4.23 The in-combination assessment predicted annual mortality within the Liverpool Bay SPA to be 33.95 individuals per annum, which equates to 0.06% of the Liverpool Bay SPA citation population (56,679 individuals). On the basis of 33.95 individuals per annum suffering mortality as a result of displacement and a baseline mortality of 13,490, the percentual increase in baseline mortality is 0.25%. This is well below a 1% increase in baseline mortality and therefore is expected to be within the natural variability for this SPA.

1.10.4.24 During construction and decommissioning, there is therefore no indication that temporary disturbance/displacement will lead to a significant reduction in the population and distribution of common scoter from in-combination impacts during the construction and decommissioning phase due to the small impact. The species will therefore not be adversely affected.

Little tern

1.10.4.25 The Mona Offshore Cable Corridor is located outside the foraging range of little tern breeding in the Dee Estuary SPA. There is therefore no potential for in-combination effects in the Dee Estuary from disturbance/displacement with other plans/projects and the Mona Offshore Wind Project. Therefore there will be no reduction in the population and distribution of little tern and as such, this qualifying species will not be adversely affected.

Common tern

1.10.4.26 The Mona Offshore Cable Corridor is located outside the foraging range of common tern breeding on the Dee Estuary (mean max 18.0km±8.9km (Woodward *et al.,* 2019). There is therefore no potential for in-combination effects in the Dee Estuary from disturbance/displacement with other plans/projects and the Mona Offshore Wind Project. Therefore there will be no reduction in the population and distribution of little tern and as such, this qualifying species will not be adversely affected.

Waterbird assemblage

1.10.4.27 Great cormorant and red-breasted merganser both have a very near-shore distribution in Liverpool Bay, with little overlap with the Mona Offshore Wind Project Mona Offshore Cable Corridor and surrounding wind farms.

1.10.4.28 There is therefore no potential for in-combination effects in the Liverpool Bay from disturbance/displacement with other plans/projects and the Mona Offshore Wind Project. Therefore there will be no reduction in the population and distribution of little tern and as such, this qualifying species will not be adversely affected.

Conclusions

1.10.4.29 Adverse effects on the qualifying features which undermine the conservation objectives of the SPA will not occur as a result of in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure impacts. An assessment of the impact 'disturbance and displacement from airborne sound, and presence of vessels and infrastructure' against each relevant conservation objective (as presented in paragraph 1.10.2.19) is presented below in Table 1.251. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.251: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure impacts during the construction phase

Conservation objective	Conclusion
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	There is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats. Therefore, for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the construction phase will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored] **The distribution of the qualifying features within the site [are maintained or restored]**	Displacement of common scoter and red-throated diver are expected to occur as a result of vessel traffic associated with the Mona Offshore Cable installation. The effect is expected to be temporary, local, short-term, and reversible. The precautionary in-combination impact on the population of both these ornithological features has been assessed to be well within natural variability for this SPA. Therefore, for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the construction phase will not prevent the population or the distribution of each of the qualifying features from being maintained or restored.

1.10.4.30 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to the construction and decommissioning of the Mona Offshore Wind Project in-combination with other plans/projects. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Lambay Island SPA

Tier 1 and Tier 2

Common guillemot

1.10.4.31 The assessment for in-combination disturbance and displacement from airborne sound and presence of vessels and infrastructure for common guillemot during construction/decommissioning is presented within the operations and maintenance section 1.10.4.49 below. This is because the assessment of disturbance and displacement from airborne sound and presence of vessel and infrastructure has not been separated between the two phases. A single annual figure of estimated mortality is presented for all phases of the project.

Ireland's Eye SPA

Tier 1 and Tier 2

Common guillemot

1.10.4.32 The assessment for in-combination disturbance and displacement from airborne sound and presence of vessels and infrastructure for common guillemot during construction/decommissioning is presented within the operations and maintenance section 1.10.4.58 below. This is because the assessment of disturbance and displacement from airborne sound and presence of vessel and infrastructure has not been separated between the two phases. A single annual figure of estimated mortality is presented for all phases of the project.

Operations and maintenance phase

Liverpool Bay/Bae Lerpwl SPA.

Tier 1 and Tier 2

Red-throated diver

1.10.4.33 As vessel movement may occur through the SPA during operation and maintenance, impacts to the habitat conservation objectives for the screened in features must be considered for Liverpool Bay SPA. For the operations and maintenance phase of the Mona Offshore Wind Project, Table 1.252 shows the expected mortality of individuals resulting from disturbance and displacement from each of the wind farm developments that may act in-combination with the Mona Offshore Cable corridor.

1.10.4.34 Effects outside the non-breeding period are unlikely to be significant, as most birds move elsewhere and so, impacts are only considered during the non-breeding season. Additionally, there will be significantly reduced vessel movements compared to the cable construction phase. As the vessels move, it has been assumed that displaced birds return and therefore any individual will be subjected to only a brief period of displacement.

Table 1.252: Predicted mortality rate of red-throated diver resulting from disturbance and displacement from projects considered in-combination during operations and maintenance.

Plan/project	Predicted Mortality
Awel y Môr	1.2
Burbo Bank Extension	0.3
Burbo Bank	0.11
Gwynt y Môr	0.35
Mona Offshore Cable Corridor	0.05
Morgan and Morecambe transmission assets	Unknown
North Hoyle	0
Rhyl Flats	0.24
Total	**2.25**

1.10.4.35 The in-combination predicted annual mortality within the Liverpool Bay SPA totals 2.25 individuals, which equates to 0.19% of the Liverpool Bay SPA citation population (1,171 individuals). On the basis of 2.25 individual mortalities per annum suffering displacement consequent mortality during operations and maintenance with a baseline mortality of 261.1, a 0.86% increase in baseline mortality is expected from in-combination effects; as shown in Table 1.252, the contribution from the Mona Offshore Cable Corridor is minimal, even using the precautionary approach to estimating displacement related mortalities as set out above in paragraph 1.10.3.40 to 1.10.3.48.

1.10.4.36 There is therefore no indication that temporary disturbance/displacement will lead to a reduction in the population and distribution of red-throated diver from in-combination impacts during the operations and maintenancephase. Thus, the species will not be adversely affected.

Little gull

1.10.4.37 There is no evidence that little gull are sensitive to disturbance and displacement from airborne sound and presence of vessels and infrastructure (MMO, 2018).

1.10.4.38 As such, there is no indication that temporary disturbance/displacement will lead to a reduction in the population and distribution of little gull. As such, this qualifying species is not expected to be adversely affected.

Common scoter

1.10.4.39 As vessel movement may occur through the SPA during operation and maintenance, impacts to the habitat conservation objectives for the screened in features must be considered for Liverpool Bay/Bae Lerpwl SPA. For the operations and maintenance phase, Table 1.253 shows the expected mortality of individuals resulting from disturbance and displacement from each of the wind farm developments that may act in-combination with the Mona Offshore Cable Corridor.

1.10.4.40 The expected number of birds displaced from other development is given in Table 1.253. Effects outside the non-breeding period are unlikely to be significant, as most birds move elsewhere and so, impacts are only considered during the non-breeding season. Additionally, there will be significantly reduced vessel movements compared to the cable construction phase. As the vessels move, it has been assumed that displaced birds return and therefore any individual will be subjected to only a brief period of displacement.

Table 1.253: Predicted mortality rate of common scoter resulting from disturbance and displacement from projects considered in-combination during operations and maintenance.

Plan/project	Predicted Mortality
Awel y Môr	0.3
Burbo Bank Extension	4
Burbo Bank	0
Gwynt y Môr	0
Mona Offshore Cable Corridor	5.5
Morgan and Morecambe transmission assets	Unknown
North Hoyle	0.1
Rhyl Flats	1.3
Total	**11.2**

1.10.4.41 The in-combination predicted mortality within the Liverpool Bay/Bae Lerpwl SPA totals 11.2 individuals, which equates to 0.02% of the Liverpool Bay/Bae Lerpwl SPA citation population (56,679 individuals). On the basis of 11.2 individual mortalities per annum suffering displacement consequent mortality during operations and maintenance activities and a baseline mortality of 13,490, a 0.08% increase in baseline mortality is expected from in-combination effects (noting the scenario for estimating displacement related mortalities for Mona Offshore Cable Corridor is precautionary).

1.10.4.42 There is therefore no indication that temporary disturbance/displacement will lead to a reduction in the population and distribution of common scoter from in-combination impacts during the operations and maintenance phase. Thus, the species will not be adversely affected.

Little tern

1.10.4.43 The Mona Offshore Cable Corridor is located outside the foraging range of little tern breeding on Dee Estuary. There is therefore no indication that in-combination disturbance/displacement from the Mona Offshore Wind Project and surrounding wind farms will lead to a reduction in the population and distribution of little tern. As such, this qualifying species will not be adversely affected.

Common tern

1.10.4.44 As the Mona Offshore Cable Corridor is located outside the foraging range of common tern breeding on the Dee Estuary (mean max 18.0km±8.9km (Woodward *et al.,* 2019)). There is therefore no indication that temporary habitat loss/disturbance will

lead to a reduction in the population size and distribution of common tern. As such, this qualifying species will not be adversely affected.

Waterbird assemblage

1.10.4.45 The main components of the assemblage include all of the non-breeding qualifying features listed above (red-throated diver, little gull and common scoter), as well as an additional two species red-breasted merganser and great cormorant. Red-breasted merganser and great cormorant both have a very near-shore distribution in Liverpool Bay, with little overlap with the Mona Offshore Wind Project Mona Offshore Cable Corridor and surrounding wind farms.

1.10.4.46 There is therefore no indication that temporary disturbance/displacement will lead to a reduction in the population and distribution of red-breasted merganser and great cormorant. As such, these qualifying species will not be adversely affected.

Conclusions

1.10.4.47 Adverse effects on the qualifying features which undermine the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA will not occur as a result of in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure impacts. An assessment of the impact 'disturbance and displacement from airborne sound, and presence of vessels and infrastructure' against each relevant conservation objective (as presented in paragraph 1.10.2.19) is presented below in Table 1.254. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.254: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure impacts during the operations and maintenance phase

Conservation objective	Conclusion
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	There is no effect of airborne sound, underwater sound, and presence of vessels on the supporting habitats. Therefore, for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the operations and maintenance phase will not prevent the extent and distribution, structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored] **The distribution of the qualifying features within the site [are maintained or restored]**	Displacement of common scoter and red-throated diver are expected to occur as a result of vessel traffic associated with the Mona Offshore Cable installation. The effect is expected to be temporary, local, short-term, and reversible. The precautionary in-combination impact on the population of both these ornithological features has been assessed to be well within natural variability for this SPA. Therefore, for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the operations and maintenance phase will not prevent the population or the distribution of each of the qualifying features from being maintained or restored.

1.10.4.48 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to the operations and maintenance phase of the Mona Offshore Wind Project in-combination with other plans and projects. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Lambay Island SPA

Tier 1 and Tier 2

Common guillemot

1.10.4.49 Based on the mean-maximum foraging range +1SD of common guillemot (Woodward *et al*., 2019) from Lambay Island SPA, numerous offshore wind farm projects are within range. However, no plans or projects aside from the Mona Offshore Wind Project, Morgan Generation Assets and Awel y Môr Offshore Wind Farm have apportioned impacts to SPAs.

1.10.4.50 There are only a few Tier 1 and Tier 2 projects which are within the mean maximum +1SD foraging range of common guillemot and have produced a publicly available predicted mortality estimate. The majority of projects located within the Liverpool Bay/Irish Sea area either did not apportion impacts to designated sites or used mean-maximum foraging ranges from Thaxter *et al*. (2012) to determine the proportion of impact from their respectable project to relevant SPAs. The mean maximum +1SD foraging ranges used during the Mona Offshore Wind Project assessment are significantly greater than the Thaxter *et al*. (2012) ranges used by older projects. Further, historic projects located within the Liverpool Bay/Irish Sea area therefore did not include the Irish and single Welsh SPAs considered in the Mona Offshore Wind Project alone assessment.

1.10.4.51 Although abundance data is available for a number of plans and projects for guillemot, it would not be appropriate to reassess impacts for these designated sites. Therefore, only impacts from Morgan Generation Assets and Awel y Môr have been considered in-combination with the Mona Offshore Wind Project, shown in Table 1.255.

1.10.4.52 The predicted annual mortality rates presented in Table 1.255 are based on a 50% displacement and 1% mortality rate, with upper and lower limits (30 to 70% displacement, 1 to 10% mortality) presented for projects if available. The 50% displacement and 1% mortality rate values were used as they are in line with values used by other offshore wind farm displacement assessments, with strong evidence used to support a common guillemot displacement rate of 50% within offshore array areas and a 2km buffer (Peschko *et al.*, 2020; Orsted, 2021; APEM, 2022).

Table 1.255: Predicted annual breeding season mortality rate of common guillemot resulting from disturbance and displacement from projects considered in-combination during operations and maintenance.

Plan/project	Predicted Annual Mortality
Awel y Môr	0.6
Mona Offshore Wind Project	3.17 (1.9 to 44.7)
Morgan generation assets	2.33 (1.4 to 31.7)
Other projects	Unknown
Total	**6.1 (3.3 to 76.4)**

1.10.4.53 The potential in-combination total is 6.1 (3.3 to 76.4) breeding adult common guillemot mortalities at Lambay Island SPA per annum during the operations and maintenance phase of the Mona Offshore Wind Project, together with the operation of Morgan Generation Assets and Awel y Môr. The latest count in 2015 produced an estimate of 59,983 breeding individuals at the Lambay Island SPA, which converts to 80,377 adults using a multiplication factor of 1.34 to control for the fact that only 2 out of 3 individuals are visible during the census according to Walsh *et al.* (1995).

1.10.4.54 The natural background mortality rate of adult common guillemot is 0.061 (Horswill and Robinson, 2015), which means 4,903 guillemot from this SAC are expected to experience natural mortality each year. The addition of 6.1 mortalities from in-combination displacement during operations and maintenance then equals an increase in baseline mortality of 0.12%.

1.10.4.55 The potential increase of 6.1 breeding adult common guillemot mortalities per annum would be indistinguishable from natural fluctuations in the population and therefore there would be no potential adverse effects from the operations and maintenance phase of the Mona Offshore Wind Project in-combination with other plans and projects.

Conclusions

1.10.4.56 Adverse effects on the qualifying features which undermine the conservation objectives of the Lambay Island SPA will not occur as a result of in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure impacts. An assessment of the impact ‘disturbance and displacement from airborne sound, and presence of vessels and infrastructure’ against each relevant conservation objective (as presented in section 1.10.2) is presented below in Table 1.256. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.256: Conclusions against the conservation objectives of the Lambay Island SPA for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure impacts during the operations and maintenance phase

Conservation objective	Conclusion
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	There is no pathway linking operations and maintenance of the Mona Offshore Wind Project and the supporting habitats at the Lambay Island SPA. Therefore, for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the operations and maintenance phase will not prevent the extent and distribution, the stre and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	The impact of the Mona Offshore Wind Project operations and maintenance in-combination with other wind farms will affect only a small fraction of the Lambay Island SPA population of common guillemot. Although the Mona Offshore Wind Project is within foraging range of common guillemot from the Lambay Island SPA, only a small fraction of that population forages that far from the colony. The in-combination impact (0.12% increase in baseline mortality) is not expected to have an appreciable impact on population of common guillemot at Lambay Island SPA. Therefore, for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure during operations and maintenance phase will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	There is no overlap between the Mona Offshore Wind Project and the Lambay Island SPA. Therefore, for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the operations and maintenance phase will not prevent the population of each of the qualifying features from being maintained or restored.

1.10.4.57 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Lambay Island SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to the operations and maintenance phase of the Mona Offshore Wind Project in-combination with other plans and projects.

Ireland's Eye

Tier 1 and Tier 2

Common guillemot

1.10.4.58 Based on the mean-maximum foraging range +1SD of common guillemot (Woodward *et al*., 2019) from Ireland's Eye SPA, numerous offshore wind farm projects are within range. However, no plans or projects aside from the Mona Offshore Wind Project, Morgan Generation Assets and Awel y Môr Offshore Wind Farm have apportioned impacts to SPAs.

1.10.4.59 There are only a few Tier 1 and Tier 2 projects which are within the mean maximum foraging range of common guillemot and have produced a publicly available predicted mortality estimate. Therefore, only impacts from Morgan Generation Assets and Awel y Môr have been considered in-combination with the Mona Offshore Wind Project, shown in Table 1.257

1.10.4.60 The predicted annual mortality rates presented in Table 1.257 are based on a 50% displacement and 1% mortality rate, with upper and lower limits (30 to 70% displacement, 1 to 10% mortality) presented for projects if available.

Table 1.257: Predicted annual breeding season mortality rate of common guillemot resulting from disturbance and displacement from projects considered in-combination during construction.

Plan/project	Predicted Annual Mortality
Awel y Môr	0.04
Morgan generation assets	0.15 (0.1 to 2.1)
Mona	0.21 (0.1 to 3.1)
Other projects	Unknown
Total	**0.40 (0.2 to 5.2)**

1.10.4.61 The potential in-combination total is 0.40 (0.2 to 5.2) breeding adult common guillemot mortalities at Ireland's Eye SPA per annum during the operations and maintenance phase of the Mona Offshore Wind Project, together with the operation of Morgan Generation Assets and Awel y Môr. The latest count in 2015 produced an estimate of 4,410 breeding individuals at the Ireland's Eye SPA, which converts to 5,909 adults using a multiplication factor of 1.34 to control for the fact that only 2 out of 3 individuals are visible during the census according to Walsh *et al.* (1995).

1.10.4.62 The natural background mortality rate of adult common guillemot is 0.061 (Horswill and Robinson, 2015), which means 360 guillemot are expected to experience natural mortality each year at the Ireland's Eye SPA. The addition of 0.40 mortalities from in-combination displacement during operations and maintenancethen equals an increase in baseline mortality of 0.11%.

1.10.4.63 The potential increase of 0.40 breeding adult common guillemot mortalities per annum would be indistinguishable from natural fluctuations in the population and therefore there would be no potential adverse effects from the operations and maintenance phase of the Mona Offshore Wind Project in-combination with other plans and projects.

Conclusions

1.10.4.64 Adverse effects on the qualifying features which undermine the conservation objectives of the Ireland's Eye SPA will not occur as a result of in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure impacts. An assessment of the impact 'disturbance and displacement from airborne sound, and presence of vessels and infrastructure' against each relevant conservation objective (as presented in section 1.10.2) is presented below in Table 1.258. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.258: Conclusions against the conservation objectives of the Ireland's Eye for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure impacts during the operations and maintenance phase.

Conservation objective	Conclusion
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	There is no pathway linking operations and maintenance of the Mona Offshore Wind Project and the supporting habitats at the Ireland's Eye SPA. Therefore, for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the operations and maintenance phase will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	The impact of the Mona Offshore Wind Project operations and maintenance combined with other wind farms will be affect only a small fraction of the Ireland's Eye SPA population of common guillemot. Although the Mona Offshore Wind Project is within foraging range of common guillemot from the Ireland's Eye SPA, only a small fraction of that population forages that far from the colony. The in-combination impact (0.11% increase in baseline mortality) will not have an appreciable impact on population of common guillemot at Ireland's Eye SPA. Therefore, for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the operations and maintenance phase will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	There is no overlap between the Mona Offshore Wind Project and the Ireland's Eye SPA. Therefore, for in-combination disturbance and displacement from airborne sound, and presence of vessels and infrastructure during the operations and maintenance phase will not prevent the population of each of the qualifying features from being maintained or restored.

1.10.4.65 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Ireland's Eye SPA as a result of disturbance and displacement from airborne sound and presence of vessels and infrastructure with respect to the operations and maintenance phase of the Mona Offshore Wind Project in-combination with other plans and projects.

In-combination effects of changes in prey availability

1.10.4.66 There is the potential for changes in prey (e.g. fish species) abundance and distribution to arise as a result of construction activities across multiple projects which physically disturb the seabed, which potentially result in increased SSC, and in particular piling related underwater sound. Reduction or disruption to prey availability to seabirds may cause displacement from foraging grounds in the area or reduced energy intake, affecting survival rates or productivity in the population in the short-term.

1.10.4.67 The assessment of LSE during the HRA screening process identified that LSE could not be ruled out for the potential in-combination impacts of changes in prey availability during construction. This relates to the following designated site and relevant marine ornithological features:

- Liverpool Bay/Bae Lerpwl SPA:
  - Red-throated diver
  - Little gull
  - Common scoter
  - Little tern
  - Common tern
  - Waterbird assemblage (red-breasted merganser and great cormorant in addition to species listed above).
- Irish Sea Front SPA
  - Manx shearwater.
- Ribble and Alt Estuaries SPA
  - Lesser black-backed gull.
- Morecambe and Duddon Estuary SPA
  - Lesser black-backed gull
  - Herring gull.

1.10.4.68 This impact pathway is limited to the construction phase of the Mona Offshore Wind Project and therefore temporal overlap with other plans/projects is limited to Awel y Mor, Erebus offshore wind farm, Morgan Generation Assets, Morecambe offshore wind farm generation assets, and the Morgan and Morecambe Transmission Assets as indicated within Table 1.248. Information on the assessment of changes in prey availability is only available for Awel y Mor, Erebus offshore wind farm and the Morgan Generation Assets.

Construction phase

1.10.4.69 All assessments undertaken for each plan/project considered within this section concluded a negligible impact on offshore ornithology from changes in prey availability (Table 1.259). No guidance is currently presented which provides a way to quantitively assess how changes in prey availability impact species and the SPA for which they are a feature, therefore a qualitative assessment has to be undertaken.

Table 1.259: Predicted impact resulting from changes in prey availability from projects considered in-combination during construction.

Plan/project	SPA(s) included in alone assessment for each plan/project which overlap with Mona assessment	Predicted impact of changes in prey availabilty or impacts on fish and benthos
Awel y Môr	None	Not assessed for offshore ornithology, **non- significant** impact on fish and benthos.

Plan/project	SPA(s) included in alone assessment for each plan/project which overlap with Mona assessment	Predicted impact of changes in prey availabilty or impacts on fish and benthos
Erebus offshore wind farm	None	Not assessed for offshore ornithology, **non- significant** impact on fish and benthos.
Mona Offshore Wind Project	N/A	**Negligible**
Morecambe Offshore Windfarm Generation Assets	Unknown	Unknown– scoped into assessment.
Morgan and Morecambe transmission assets	Unknown	Unknown– scoped into assessment.
Morgan Generation Assets	All	**Negligible**
Overall impact	N/A	**Negligible**

1.10.4.70 The overall impact during construction of the projects within Table 1.259 will have a negligible impact on offshore ornithology from changes in prey availability, therefore the ability to apportion impacts to individual SPAs is not possible and this section has not been presented as such. Potential effects from this impact on the relevant conservation objectives of Liverpool Bay/Bae Lerpwl SPA, Irish Sea Front SPA, Ribble and Alt Estuaries SPA and Morecambe and Duddon Estuary SPA are discussed in turn below.

Liverpool Bay/Bae Lerpwl SPA

All species

Conclusions

1.10.4.71 Adverse effects on the qualifying features which undermine the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA will not occur as a result of in-combination changes in prey availability. An assessment of the impact 'changes in prey availability' against each relevant conservation objective (as presented in paragraph 1.10.2.19) is presented below in Table 1.260. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.260: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for in-combination changes in prey availability during the construction phase.

Conservation objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	There is no effect of changes in prey availability on the supporting habitats. Therefore, for in-combination changes in prey availability during the construction phase will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	Changes in prey availability could have an indirect effect on the population size of the SPAs. However constructional impacts are the short-term, temporary and reversible in nature, lasting only for the duration of construction activities, as prey species and the birds foraging on them would return to the area once construction activities have ceased. For all projects assessed, any changes in prey distributions was not predicted to have an appreciable impact on populations of qualifying ornithological features. Therefore, for in-combination changes in prey availability during the construction phase will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	Changes in prey availability could have an indirect effect on the on the distribution of birds within/outwith the SPA. However construction impacts are short-term, temporary and reversible in nature, lasting only for the duration of construction activities, as prey species and the birds foraging on them would return to the area once construction activities have ceased. For all projects assessed, any changes in prey distributions was not predicted to have an appreciable impact on populations of qualifying ornithological features. Therefore, for in-combination changes in prey availability during the construction phase will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.4.72 It can be concluded that there is no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA a result of changes in prey availability with respect to the construction of the Mona Offshore Wind Project in-combination with other plans/projects. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Irish Sea Front SPA

Manx shearwater

Conclusions

1.10.4.73 Adverse effects on the qualifying features which undermine the conservation objectives of the Irish Sea Front SPA will not occur as a result of in-combination

changes in prey availability. An assessment of the impact 'changes in prey availability' against each relevant conservation objective (as presented in paragraph 1.10.2.37) is presented below in Table 1.261.

Table 1.261: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for in-combination changes in prey availability during the construction phase.

Conservation objective	Conclusions
Avoid significant mortality, injury and disturbance of the qualifying features, so that the distribution of the species and ability to use the site are maintained in the long-term	Mona Offshore Wind Project is the closest project to this SPA, the sound contour modelling indicates that no impact would occur within the Irish Sea Front SPA and therefore no prey species would be impacted with a change in distribution. Similarly, no assessment was undertaken for other projects indicating no impact. Therefore, is no pathway linking change in prey availability to mortality, injury and disturbance of the qualifying feature. Therefore, in-combination changes in prey availability will not result in significant mortality, injury or disturbance of the qualifying features and the distribution of the species and ability to use the site will be maintained in the long-term.
Maintain the habitats and food resources of the qualifying features in favourable condition	It is unlikely that prey species at the Irish Sea Front SPA will be affected by construction of the Mona Offshore Wind Project given the zone of influence of underwater sound impacts on fish species. Moreover, Manx Shearwater are flexible in habitat use with a large foraging range. Therefore, in-combination changes in prey availability will not prevent the habitats and food resources of the qualifying features from being maintained at favourable condition.
Ensure access to the site from linked breeding colonies.	There is no pathway linking change in prey availability and access of Manx shearwater between linked breeding colonies. Therefore, in-combination changes in prey availability will not prevent access to the site from linked breeding colonies.

1.10.4.74 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Irish Sea Front SPA as a result of changes in prey availability with respect to the construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Ribble and Alt Estuaries SPA

Lesser-black backed gull

Conclusions

1.10.4.75 Adverse effects on the qualifying features which undermine the conservation objectives of the Ribble and Alt Estuaries SPA will not occur as a result of in-combination changes in prey availability. An assessment of the impact 'changes in prey availability' against each relevant conservation objective (as presented in paragraph 1.10.2.26) is presented below in Table 1.262. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.262: Conclusions against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA for in-combination changes in prey availability during the construction phase.

Conservation objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored**	There is no effect of changes in prey availability on the supporting habitats. Therefore, for in-combination changes in prey availability during the construction phase will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	Changes in prey availability could have an indirect effect on the population size of the SPAs. However constructional impacts are the short-term, temporary and reversible in nature, lasting only for the duration of construction activities, as prey species and the birds foraging on them would return to the area once construction activities have ceased. For all projects assessed, any changes in prey distributions was not predicted to have an appreciable impact on populations of qualifying ornithological features. Therefore, for in-combination changes in prey availability during the construction phase will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	Changes in prey availability could have an indirect effect on the on the distribution of birds within/outwith the SPA. However, construction impacts are short-term, temporary and reversible in nature, lasting only for the duration of construction activities, as prey species and the birds foraging on them would return to the area once construction activities have ceased. For all projects assessed, any changes in prey distributions was not predicted to have an appreciable impact on populations of qualifying ornithological features. Therefore, for in-combination changes in prey availability during the construction phase will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.4.76 It can be concluded that there is no risk of an adverse effect on the integrity of the Ribble and Alt Estuaries SPA as result of changes in prey availability with respect to the construction of the Mona Offshore Wind Project in-combination with other plans/projects.

Morecambe and Duddon Estuary SPA

All species

Conclusions

1.10.4.77 Adverse effects on the qualifying features which undermine the conservation objectives of the Morecambe and Duddon Estuary SPA will not occur as a result of in-combination changes in prey availability. An assessment of the impact 'changes in prey availability' against each relevant conservation objective (as presented in paragraph 1.10.2.32) is presented below in Table 1.263. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.263: Conclusions against the conservation objectives of the Morecambe and Duddon Estuary SPA for in-combination changes in prey availability during the construction phase.

Conservation objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored**	There is no effect of changes in prey availability on the supporting habitats. Therefore, for in-combination changes in prey availability during the construction phase will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored] **The distribution of the qualifying features within the site [are maintained or restored]**	Changes in prey availability could have an indirect effect on the population size of the SPAs. However construction impacts are the short-term, temporary and reversible in nature, lasting only for the duration of construction activities, as prey species and the birds foraging on them would return to the area once construction activities have ceased. For all projects assessed, any changes in prey distributions was not predicted to have an appreciable impact on populations of qualifying ornithological features. Therefore, for in-combination changes in prey availability during the construction phase will not prevent the population or distribution of each of the qualifying features from being maintained or restored.

1.10.4.78 It can be concluded that there is no risk of an adverse effect on the integrity of the Morecambe and Duddon Estuary SPA as result of changes in prey availability with respect to the construction of the Mona Offshore Wind Project in-combination with other plans/projects.

In-combination disturbance and displacement from airborne sound, presence of vessels and infrastructure and collision risk combined impacts

All phases

1.10.4.79 The assessment for potential in-combination disturbance and displacement from airborne soundnoise, underwater sound and presence of vessels and infrastructure and collision risk combined impacts on northern gannet, is presented under all phases below for all sites (i.e. Grassholm SPA and Ailsa Craig SPA). The assessment of potential mortality from disturbance and displacement and collision risk has not been separated between the development phases. A single annual figure of estimated mortality is presented for all phases of the project noting that this number will be highly conservative for the construction and decommissioning phases.

Ailsa Craig SPA

Tier 1 and Tier 2

Northern gannet

1.10.4.80 During all phases of the Mona Offshore Wind Project, potential displacement and collision impacts are attributed to Ailsa Craig SPA from the Mona Offshore Wind Project. The in-combination assessment therefore combines these potential impacts, alongside potential impacts from other plans and projects within mean-maximum foraging range + 1SD (Woodward *et al*., 2019) attributed to the Ailsa Craig SPA. This includes Walney Wind Farm extension, Awel y Môr Wind Farm and Morgan generation assets, alongside the Mona Offshore Wind Project.

1.10.4.81 Aside from the offshore wind farms included in Table 1.264, no other plans or projects have assessed displacement impacts to northern gannet at Ailsa Craig SPA.

1.10.4.82 The predicted annual mortality rates presented in Table 1.264 are based on a 70% displacement and 1% mortality rate, with upper and lower limits (60 to 80% displacement, 1 to 10% mortality) presented for projects if available. The 70% displacement and 1% mortality rate values were used as they are in line with values used by other offshore wind farm displacement assessments (e.g. Awel y Mor, Hornsea Project Four and Berwick Bank), with evidence used to support a northern gannet displacement rate of 70% within offshore array areas and a 2km buffer (Krijgsveld *et al*., 2011).

Table 1.264: Ailsa Craig SPA predicted annual mortality rate of breeding adult northern gannet resulting from collision risk, disturbance and displacement from projects considered in-combination during the operations and maintenance phase.

Plan/project	Predicted Annual Mortality (impact type)
Awel y Môr	7.4 (displacement and collision)
Mona Offshore Wind Project	0.66 (0.57 to 7.5 displacement and collision)
Morgan generation assets	0.48 (0.41 to 5.6 displacement and collision)
Other projects	Unknown
Walney extension	25.0 (collision only)
Total	**33.6 (33.4 to 45.5)**

1.10.4.83 For Ailsa Craig SPA during the operations and maintenance phase of the Mona Offshore Wind Project, 33.6 mortalities are expected for Ailsa Craig SPA in-combination with the other offshore wind projects, with 0.7 of which are attributable to the Mona Offshore Wind Project. With an adult breeding population of 66,452, and a background mortality of 0.081, the expected baseline mortality is 5,383 gannets associated with this SPA. The addition of 33.6 mortalities from in-combination displacement during the operations and maintenance phase then equals an increase in baseline mortality of 0.62%.

1.10.4.84 The potential addition of 33.6 breeding adult northern gannet mortalities per annum would be indistinguishable from natural fluctuations in the population and therefore there would be no potential adverse effects from all phases of the Mona Offshore Wind Project in-combination with other plans and projects.

Conclusions

1.10.4.85 Adverse effects on the qualifying features which undermine the conservation objectives of the Ailsa Craig SPA will not occur as a result of in-combination displacement and collision risk combined impacts. An assessment of the impact 'displacement and collision risk combined' against each relevant conservation objective (as presented in paragraph 1.10.2.19) is presented below in Table 1.265. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.265: Conclusions against the conservation objectives of the Ailsa craig SPA for in-combination displacement and collision risk combined impacts during all phases.

Conservation Objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	There is no pathway linking the Mona Offshore Wind Project and the supporting habitats at the Ailsa Craig SPA. Therefore, for in-combination displacement and collision risk combined impacts during all phases will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	The impact of the Mona Offshore Wind Project operations and maintenance combined with other wind farms will be affecting only a small fraction of the Ailsa Craig SPA population of northern gannet. Although the Mona Offshore Wind Project is within foraging range of northern gannet from the Ailsa Craig SPA, only a small fraction of that population forages that far from the colony. The in-combination impact (0.62% increase in baseline mortality) will not have an appreciable impact on population of northern gannet at Ailsa Craig SPA (noting the Mona Offshore Wind Project only accounts for a very small proportion of this total). Therefore, for in-combination displacement and collision risk combined impacts during all phases will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	There is no overlap between the Mona Offshore Wind Project and the Ailsa Craig SPA. Therefore, for in-combination displacement and collision risk combined impacts during all phases will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.4.86 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Ailsa Craig SPA as a result of the combined impacts of disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision with offshore wind turbines with respect to all phases of the Mona Offshore Wind Project in-combination with other plans and projects.

Grassholm SPA

Tier 1 and Tier 2

Northern gannet

1.10.4.87 During all phases of the Mona Offshore Wind Project, potential displacement and collision impacts are attributed to Grassholm SPA from the Mona Offshore Wind Project. The in-combination assessment therefore combines these impacts, alongside impacts from other plans and projects within mean-maximum foraging range + 1SD (Woodward *et al.*, 2019) attributed to the Grassholm SPA.

1.10.4.88 Only Project Erebus and Awel y Môr Wind Farm offshore wind farm have apportioned displacement impacts to northern gannet for Grassholm SPA.

1.10.4.89 Aside from the offshore wind farms included in Table 1.266, no other plans or projects have assessed displacement impacts to northern gannet at Grassholm SPA.

1.10.4.90 The predicted annual mortality rates presented in Table 1.266 are based on a 70% displacement and 1% mortality rate, with upper and lower limits (60 to 80% displacement, 1 to 10% mortality) presented for projects if available.

Table 1.266: Grassholm SPA predicted annual mortality rate of breeding adult northern gannet resulting from collision risk, disturbance and displacement from projects considered in-combination during the operations and maintenance phase.

Plan/project	Predicted Annual Mortality
Awel y Môr	5.1
Erebus	24.8
Mona Offshore Wind Project	0.52 (0.44 to 5.8)
Morgan generation assets	0.17 (0.14 to 2.0)
Other projects	Unknown
Total	**30.6 (30.4 to 37.7)**

1.10.4.91 For Grassholm SPA during the operations and maintenance phase of the Mona Offshore Wind Project, 30.6 mortalities are expected for Grassholm SPA, 0.52 of which are attributable to the Mona Offshore Wind Project. With an adult breeding population of 72,022, and a background mortality of 0.081, the expected baseline mortality is 5,834 gannets associated with this SPA. The addition of 30.6 mortalities from in-combination displacement during the operations and maintenance phase then equals an increase in baseline mortality of 0.52%.

1.10.4.92 The potential increase of 30.6 breeding adult northern gannet mortalities per annum would be indistinguishable from natural fluctuations in the population and therefore there would be no potential adverse effects from the operations and maintenance phase of the Mona Offshore Wind Project in-combination with other plans and projects.

1.10.4.93 Additionally, tracking data of northern gannets from Grassholm SPA show that tracked individuals remain in the southwest region of Wales and England, spreading out to southern Republic of Ireland (Wakefield *et al.*, 2013). Northern gannets show foraging segregation between colonies (Wakefield *et al.*, 2013) so northern gannets recorded at the Mona Offshore Wind Project are more likely to come from Ailsa Craig SPA than Grassholm SPA. The potential impact attributed to the Grassholm SPA from the Mona Offshore Wind Project is likely to be an overestimate of the actual impact, therefore,

the total mortalities from the Mona Offshore Wind Project are likely less than 0.52 individuals.

Conclusions

1.10.4.94 Adverse effects on the qualifying features which undermine the conservation objectives of the Grassholm SPA will not occur as a result of in-combination displacement and collision risk combined impacts. An assessment of the impact 'displacement and collision risk combined' against each relevant conservation objective (as presented in paragraph 1.10.2.51) is presented below in Table 1.267. Where the justifications and supporting evidence are the same for more than one conservation objective, the assessments have been grouped.

Table 1.267: Conclusions against the conservation objectives of the Grassholm SPA for in-combination displacement and collision risk combined impacts during all phases.

Conservation Objective	Conclusions
The extent and distribution of the habitats of the qualifying features [are maintained or restored] **The structure and function of the habitats of the qualifying features [are maintained or restored]** **The supporting processes on which the habitats of the qualifying features rely [are maintained or restored]**	There is no pathway linking the Mona Offshore Wind Project and the supporting habitats at the Grassholm SPA. Therefore, for in-combination displacement and collision risk combined impacts during all phases will not prevent the extent and distribution, the structure and function or the supporting processes on which the habitats of the qualifying features rely from being maintained or restored.
The population of each of the qualifying features [are maintained or restored]	The impact of the Mona Offshore Wind Project during all phases combined with other wind farms will be affecting only a small fraction of the Grassholm SPA population of northern gannet. Although the Mona Offshore Wind Project is within foraging range of northern gannet from the Grassholm SPA, only a small fraction of that population forages that far from the colony. The in-combination impact (0.52% increase in baseline mortality) will not have an appreciable impact on population of northern gannet at Grassholm SPA. Therefore, for in-combination displacement and collision risk combined impacts during all phases will not prevent the population of each of the qualifying features from being maintained or restored.
The distribution of the qualifying features within the site [are maintained or restored]	There is no overlap between the Mona Offshore Wind Project and the Grassholm SPA. Therefore, for in-combination displacement and collision risk combined impacts during all phases will not prevent the distribution of each of the qualifying features from being maintained or restored.

1.10.4.95 Therefore, it can be concluded that there is no risk of an adverse effect on the integrity of the Grassholm SPA as a result of the combined impacts of disturbance and displacement from airborne sound and presence of vessels and infrastructure and collision with offshore wind turbines with respect to all phases of the Mona Offshore Wind Project in-combination with other plans and projects.

1.11 Summary

Effects on site integrity

1.11.1.1 A summary of the assessments presented in this ISAA, considering the relevant SACs and SPAs, is provided in the sections below. Table 1.268. 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.

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

1.11.1.2 Based on the information presented in sections 1.7.3 and 1.7.4, no Adverse Effect on Integrity of the Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC, with specific regard to the qualifying Annex I habitats for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Dee Estuary/Aber Dyfrdwy SAC

1.11.1.3 Based on the information presented in sections 1.7.3 and 1.7.4, no Adverse Effect on Integrity of the Dee Estuary/Aber Dyfrdwy SAC, with specific regard to the qualifying Annex I habitats and Annex II diadromous fish for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Dee Estuary Ramsar

1.11.1.4 Based on the information presented in sections 1.7.3 and 1.7.4, no Adverse Effect on Integrity of the Dee Estuary Ramsar, with specific regard to the qualifying habitats for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

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

1.11.1.5 Based on the information presented in sections 1.8.3 and 1.8.4, no Adverse Effect on Integrity of the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC, with specific regard to the qualifying Annex II diadromous fish features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

River Ehen SAC

1.11.1.6 Based on the information presented in sections 1.8.3 and 1.8.4, no Adverse Effect on Integrity of the River Ehen SAC, with specific regard to the qualifying Annex II diadromous fish features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

River Eden SAC

1.11.1.7 Based on the information presented in sections 1.8.3 and 1.8.4, no Adverse Effect on Integrity of the River Eden SAC, with specific regard to the qualifying Annex II diadromous fish features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

River Derwent and Bassenthwaite Lake SAC

1.11.1.8 Based on the information presented in sections 1.8.3 and 1.8.4, no Adverse Effect on Integrity of the River Derwent and Bassenthwaite SAC, with specific regard to the qualifying Annex II diadromous fish features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Solway Firth SAC

1.11.1.9 Based on the information presented in sections 1.8.3 and 1.8.4, no Adverse Effect on Integrity of the Solway Firth SAC, with specific regard to the qualifying Annex II diadromous fish features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

River Kent SAC

1.11.1.10 Based on the information presented in sections 1.8.3 and 1.8.4, no Adverse Effect on Integrity of the River Kent SAC, with specific regard to the qualifying Annex II diadromous fish features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

River Bladnoch SAC

1.11.1.11 Based on the information presented in sections 1.8.3 and 1.8.4, no Adverse Effect on Integrity of the River Bladnoch SAC, with specific regard to the qualifying Annex II diadromous fish features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Afon Gwyrfai a Llyn Cwellyn SAC

1.11.1.12 Based on the information presented in sections 1.8.3 and 1.8.4, no Adverse Effect on Integrity of the Afon Gwyrfai a Llyn Cwellyn SAC, with specific regard to the qualifying Annex II diadromous fish features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

North Anglesey Marine/Gogledd Môn Forol SAC

1.11.1.13 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the North Anglesey Marine/Gogledd Môn Forol SAC, with specific regard

to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

North Channel SAC

1.11.1.14 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the North Channel SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Pen Llyn a`r Sarnau/Lleyn Peninsula and the Sarnau SAC

1.11.1.15 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Pen Llyn a`r Sarnau/Lleyn Peninsula and the Sarnau SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project alone.

1.11.1.16 On the basis of the preliminary assessments undertaken to date it is considered unlikely that there will be 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 from piling with respect to the Mona Offshore Wind Project in-combination with other plans/projects. It is not, however, possible to conclude this definitively at this stage (i.e. beyond reasonable scientific doubt) until further assessment work, on the population level effects, is complete. The final conclusion of potential adverse effect on integrity is, therefore, deferred to the assessments which will be presented in the ISAA submitted with the application for consent.

West Wales Marine/Gorllewin Cymru Forol SAC

1.11.1.17 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the West Wales Marine/Gorllewin Cymru Forol SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Cardigan Bay/Bae Ceredigion SAC

1.11.1.18 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Cardigan Bay/Bae Ceredigion SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project alone.

1.11.1.19 On the basis of the preliminary assessments undertaken to date it is considered unlikely that there will be an adverse effect on the integrity of the 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. It is not, however, possible to conclude this definitively at this stage (i.e. beyond reasonable scientific doubt) until further assessment work, on the population level effects, is complete. The final conclusion of potential adverse effect on integrity is, therefore, deferred to the assessments which will be presented in the ISAA submitted with the application for consent.

Pembrokeshire Marine/Sir Benfro Forol SAC

1.11.1.20 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Pembrokeshire Marine/Sir Benfro Forol SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC

1.11.1.21 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Bristol Channel Approaches/Dynesfeydd Môr Hafren SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Isles of Scilly Complex SAC

1.11.1.22 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Isles of Scilly Complex SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Lundy SAC

1.11.1.23 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Lundy SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

The Maidens SAC

1.11.1.24 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of The Maidens SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Strangford Lough

1.11.1.25 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Strangford Lough, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Murlough SAC

1.11.1.26 Based on the information presented in sections1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Murlough SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Rockabill to Dalkey Island SAC

1.11.1.27 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Rockabill to Dalkey Island SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Roaringwater Bay and Islands SAC

1.11.1.28 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Roaringwater Bay and Islands SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Blasket Islands SAC

1.11.1.29 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Blasket Islands SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Saltee Islands SAC

1.11.1.30 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Saltee Islands SAC, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Mers Celtiques - Talus du golfe de Gascogne SCI

1.11.1.31 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Mers Celtiques - Talus du golfe de Gascogne SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Abers - Côte des legends SCI

1.11.1.32 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Abers - Côte des legends SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Ouessant-Molène SCI

1.11.1.33 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Ouessant-Molène SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Côte de Granit rose-Sept-Iles SCI

1.11.1.34 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Côte de Granit rose-Sept-Iles SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Anse de Goulven, dunes de Keremma SCI

1.11.1.35 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Anse de Goulven, dunes de Keremma SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Tregor Goëlo SCI

1.11.1.36 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Tregor Goëlo SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Côtes de Crozon SCI

1.11.1.37 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Côtes de Crozon SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Chaussée de Sein SCI

1.11.1.38 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Chaussée de Sein SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Cap Sizun SCI

1.11.1.39 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Cap Sizun SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Récifs du talus du golfe de Gascogne SCI

1.11.1.40 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Récifs du talus du golfe de Gascogne SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Anse de Vauville SCI

1.11.1.41 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Anse de Vauville SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Cap d'Erquy-Cap Fréhel SCI

1.11.1.42 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Cap d'Erquy-Cap Fréhel SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Baie de Saint-Brieuc – Est SCI

1.11.1.43 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Baie de Saint-Brieuc – Est SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Banc et récifs de Surtainville SCI

1.11.1.44 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Banc et récifs de Surtainville SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI

1.11.1.45 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Baie de Lancieux, Baie de l'Arguenon, Archipel de Saint Malo et Dinard SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Estuaire de la Rance SCI

1.11.1.46 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Estuaire de la Rance SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Baie du Mont Saint Michel SCI

1.11.1.47 Based on the information presented in sections 1.9.3 and 1.9.4, no Adverse Effect on Integrity of the Baie du Mont Saint Michel SCI, with specific regard to the qualifying Annex II marine mammal features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Liverpool Bay/Bae Lerpwl SPA

1.11.1.48 Based on the information presented in sections 1.10.3 and1.10.4, no Adverse Effect on Integrity of the Liverpool Bay/Bae Lerpwl SPA, with specific regard to the qualifying marine ornithological features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.

Ribble and Alt Estuaries SPA

1.11.1.49 Based on the information presented in sections 1.10.3 and1.10.4, no Adverse Effect on Integrity of the Ribble and Alt Estuaries SPA, with specific regard to the qualifying marine ornithological features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Morecambe Bay and Duddon Estuary SPA

1.11.1.50 Based on the information presented in sections 1.10.3 and 1.10.4, no Adverse Effect on Integrity of the Morecambe Bay and Duddon Estuary SPA, with specific regard to the qualifying marine ornithological features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Irish Sea Front SPA

1.11.1.51 Based on the information presented in sections 1.10.3 and 1.10.4, no Adverse Effect on Integrity of the Irish Sea Front SPA, with specific regard to the qualifying marine ornithological features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Lambay Island SPA

1.11.1.52 Based on the information presented in sections 1.10.3 and 1.10.4, no Adverse Effect on Integrity of the Lambay Island SPA, with specific regard to the qualifying marine ornithological features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Ireland's Eye SPA

1.11.1.53 Based on the information presented in sections 1.10.3 and 1.10.4, no Adverse Effect on Integrity of the Ireland's Eye SPA, with specific regard to the qualifying marine ornithological features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Grassholm SPA

1.11.1.54 Based on the information presented in sections 1.10.3 and 1.10.4, no Adverse Effect on Integrity of the Grassholm SPA, with specific regard to the qualifying marine ornithological features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Ailsa Craig SPA

1.11.1.55 Based on the information presented in sections 1.10.3 and 1.10.4, no Adverse Effect on Integrity of the Ailsa Craig SPA, with specific regard to the qualifying marine ornithological features for which LSE could not be excluded, is predicted as a result of the Mona Offshore Wind Project, either alone or in-combination with other plans and projects.

Table 1.268.:Summary of conclusions.

ID	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
1	Dee Estuary/Aber Dyfrdwy SAC	Estuaries Mudflats and sandflats not covered by seawater at low tide	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • 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 only) • Changes in physical processes • In-combination effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
		Sea lamprey River lamprey	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • Underwater sound • 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 only) • EMF • In-combination effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
2	Dee Estuary Ramsar	Estuaries Mudflats and sandflats not covered by seawater at low tide	Construction/decommissioning	• Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • 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 only) • Changes in physical processes • In-combination effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
3	Menai Strait and Conwy Bay/Y Fenai a Bae Conwy SAC	Reefs Sandbanks which are slightly covered by seawater all the time	Construction/decommissioning	• Temporary habitat loss/disturbance (Mona Offshore Cable Corridor only) • Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Release of sediment bound contaminants (Mona Offshore Cable Corridor only) • Accidental pollution • In-combination effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

ID	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	• Temporary habitat loss/disturbance (Mona Offshore Cable Corridor only) • Increase in SSC and sediment deposition (Mona Offshore Cable Corridor only) • Long-term subtidal habitat loss • 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 (only)	• Long-term subtidal habitat loss/alteration (Mona Offshore Cable Corridor only)	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
4	River Dee and Bala Lake/Afon Dyfrydwy a Llyn Tegid SAC	Atlantic salmon *Salmo salar* Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound • 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.
5	River Ehen SAC	Atlantic salmon *Salmo salar* Freshwater pearl mussel *Margaritifera margaritifera*	Construction/decommissioning	• Underwater sound • 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.
6	River Eden SAC	Atlantic salmon *Salmo salar* Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound • 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.
			Construction/decommissioning	• Underwater sound • 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.
7	River Derwent and Bassenthwaite SAC	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound • In-combination effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

ID	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.
8	Solway Firth SAC	Sea lamprey *Petromyzon marinus* River lamprey *Lampetra fluviatilis*	Construction/decommissioning	• Underwater sound • 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.
9	River Kent SAC	Freshwater pearl mussel *Margaritifera margaritifera*	Construction/decommissioning	• Underwater sound • 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.
10	River Bladnoch SAC	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound • 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.
11	Afon Gywrfai a Llyn Gwellyn SAC	Atlantic salmon *Salmo salar*	Construction/decommissioning	• Underwater sound • 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.
12	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 • Changes in prey availability (construction only) • 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.
13	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.

ID	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.
14	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.	On the basis of the preliminary assessments undertaken to date it is considered unlikely that there will be an adverse effect on the integrity of the Pen Llyn 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. It is not, however, possible to conclude this definitively at this stage (i.e. beyond reasonable scientific doubt) until further assessment work, on the population level effects, is complete. The final conclusion of potential adverse effect on integrity is, therefore, deferred to the assessments which will be presented in the ISAA submitted with the application for consent.
			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.
15	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.

ID	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
16	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.	On the basis of the preliminary assessments undertaken to date it is considered unlikely that there will be an adverse effect on the integrity of the 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. It is not, however, possible to conclude this definitively at this stage (i.e. beyond reasonable scientific doubt) until further assessment work, on the population level effects, is complete. The final conclusion of potential adverse effect on integrity is, therefore, deferred to the assessments which will be presented in the ISAA submitted with the application for consent.
			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.
		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.
17	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.
18	Bristol Channel Approaches 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.

ID	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.
19	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.
20	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 • 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.
21	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.
22	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 • In-combination effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
23	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.

ID	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.
24	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.
25	Roaringwater Bay and 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.
26	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.
27	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 • 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.
28-45	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.

ID	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.
SPAs						
1	Liverpool Bay/Bae Lerpwl SPA	Red-throated diver *Gavia stellata* Little gull *Hydrocoloeus minutus* Common scoter *Melanitta nigra* Little tern *Sternula albifrons* Common tern *Sterna hirundo*	Construction/decommissioning	• Temporary habitat loss/disturbance and increased SSC • Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Changes in prey availability (construction only) • Accidental Pollution • In-combination Effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.
			Operations and maintenance	• Temporary habitat loss/disturbance and increased SSC • Disturbance and displacement from airborne sound and presence of vessels and infrastructure • Accidental pollution • In-combination Effects	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site. The conclusions of no risk of an adverse effect on the integrity of the Liverpool Bay/Bae Lerpwl SPA have been made with reference to the Conservation Objectives detailed in Natural England (2019d). Whilst it is considered that these conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the ISAA submitted with the application for consent.
2	Irish Sea Front SPA	Manx shearwater	Construction/decommissioning	• Changes in prey availability	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
			Operations and maintenance	N/A	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
3	Ribble and Alt Estuaries SPA	Lesser black-backed gull *Larus fuscus*	Construction/decommissioning	• Changes in prey availability (construction only)	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
			Operations and maintenance	N/A	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
4	Morecambe Bay and Duddon Estuary SPA	Lesser black-backed gull *Larus fuscus* Herring gull *Larus argentatus*	Construction/decommissioning	• Changes in prey availability (construction only)	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
			Operations and maintenance	N/A	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

ID	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
5	Lambay Island	Guillemot	Construction/decommissioning	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only)	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
			Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only)	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
6	Grassholm SPA	Gannet	Construction/decommissioning Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only) • Collison risk (in-combination effect only)	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
					No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
7	Ailsa Craig SPA	Gannet	Construction/decommissioning Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only) • Collison risk (in-combination effect only)	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
					No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
8	Ireland's Eye SPA	Guillemot	Construction/decommissioning	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only)	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.
			Operations and maintenance	• Disturbance and displacement from airborne sound and presence of vessels and infrastructure (in-combination effect only)	No adverse effect on the integrity of the site.	No adverse effect on the integrity of the site.

1.12 Next steps

1.12.1.1 This HRA Stage 2 ISAA report will be updated, where relevant, to address stakeholder responses and to include any additional data for submission with the application for consent.

1.12.1.2 As outlined in section 1.9.4, on the basis of the preliminary assessments undertaken to date it is considered unlikely that there will be an adverse effect on the integrity of the Pen Llyn a`r Sarnau/Lleyn Peninsula and the Sarnau SAC and 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. It is not, however, possible to conclude this definitively at this stage (i.e. beyond reasonable scientific doubt) until further assessment work, on the population level effects, is complete. The final conclusion of potential adverse effect on integrity is, therefore, deferred to the assessments which will be presented in the HRA Stage 2 ISAA report submitted with the application for consent.

1.12.1.3 As outlined in section 1.10.2, a CAP for the Liverpool Bay/Bae Lerpwl SPA was released on the 24 January 2023 (Natural England, NRW and JNCC, 2022). However, due to the limited timeframe between the release date of this CAP and the submission date of this HRA Stage 2 ISAA report, the Appropriate Assessment has been undertaken against the conservation objectives of the Liverpool Bay/Bae Lerpwl SPA released in 2019 (Natural England, 2019a) (see paragraph 1.10.2.19). Whilst it is considered that the conclusions would also be applicable to the conservation objectives detailed in the latest CAP for the Liverpool Bay/Bae Lerpwl SPA (Natural England, NRW and JNCC, 2022), these will be fully reviewed and considered in the HRA Stage 2 ISAA report submitted with the application for consent.

1.13 References

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