



Morven Hawthorn Pit Grid Connection Project

Preliminary Environmental Information Report

Volume 2, Chapter 6: Marine Ornithology

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Glossary

Term	Meaning
The Applicant	The legal entity making the applications for consent; Morven Offshore Wind Limited (MvOWL).
Baseline	Existing conditions as represented by the latest available data, whether from literature or survey and used as a benchmark for making comparisons to assess the impact of a development or project.
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.
Climate Change	A change in global or regional climatic patterns, in particular a change apparent from the mid to late 20 th century onwards and attributed to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.
Commitments	Measures (embedded mitigation and secondary) to be adopted during the construction, operation and maintenance, and decommissioning phases of the MHPGC Project.
Construction	Used to refer to the whole construction phase of a project.
Crustacean	An invertebrate arthropod belonging to the subphylum of Crustacea, of within the phylum Arthropoda, includes crabs, lobsters, shrimps, barnacles and sand hoppers.
Cumulative effect	The combined effect of the MHPGC Project in combination with the effects from other proposed developments, on the same receptor or resource.
Cumulative effects assessment	Assessment of the likely effects arising from the MHPFC Project alongside the likely effects arising from other proposed developments on the same receptor or resource.
Decommissioning	The period during which a development and its associated processes are removed from active operation.
Demersal Fish Species	Fish species that live near or on the seabed. Includes species such as haddock, cod, whiting and flatfish.
Desk study	A desk-based research method used to collect and analyse existing information, including the review of literature, previous survey reports, databases and maps to inform the baseline environment and the need for further surveys.
Development Consent Order (DCO)	An order made under the Planning Act 2008, as amended, granting development consent.
Embedded mitigation	Measures included as part of the project design. Includes both primary and tertiary mitigation.
Environmental Impact Assessment (EIA)	The process of identifying and assessing the significant effects likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions.
EIA Regulations	A term commonly used to refer to the Infrastructure Planning (EIA) Regulations 2017 and Marine Works (EIA) Regulation 2007 which required major development projects (in Scottish and English

Term	Meaning
	waters) to undertake a EIA assessment and underpins the EIA process.
MHPGC Project Environmental Statement (ES)	The document presenting the results of the Environmental Impact Assessment process.
MHPGC Project Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach to, and information to support, the EIA and Habitats Regulations Assessment processes for certain topics.
Expert Working Groups (EWGs)	A topic-specific group of specialists formed under the EPP to resolve technical issues and agree approaches for environmental assessments.
Fishery	A group of vessel voyages which target the same species or use the same gear.
Habitat	The environment that a plant or animal lives in.
Habitats Directive	Council Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora (the Habitats Directive) is the European Union Directive from which the requirement for the consideration of likely significant effects of the MHPGC Project upon European sites and sites designated within the National Site Network is derived.
Habitats Appraisal/Habitats Assessment (HRA)	The HRA (for Scotland)/Habitats Regulation Assessment (for England) is a process that determines whether development plans could adversely affect sites within the National Site Network and their qualifying features.
Habitats Regulations	A term commonly used to refer to the collective legislation that translates the Habitats Directive (Directive 92/43/ECC) and the Wild Birds Directive (Directive 2009/147/EC) into specific legal obligations in Scotland and England. Namely: the Conservation of Habitats and Species Regulations (as amended) 2017 (applies in England out to 12nm and in Scotland for reserved activities), the Conservation of Offshore Marine Habitats and Species Regulations (as amended) 2017 (applies in English and Scottish waters beyond 12nm) and the Conservation (Natural Habitats, & c.) (as amended) Regulations 1994 (applies in Scotland out to 12nm). These Regulations provide the legal framework for the protection of European sites, including Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), and underpin the HRA process.
Inter-related effects	Effects that may arise from the interactions between different EIA topic effects considered within the project-alone assessment, potentially leading to more significant effects than if they were to be considered in isolation.
Impact	A change caused by an action that occurs during a project's lifetime.
Inshore waters	Marine waters from mean high water springs extending seaward to 12 nautical miles (nm).
Intertidal area	The area between Mean High Water Springs and the Mean Low Water Springs.
Landfall	The area in which the offshore export cables make landfall (come onshore) and the transitional area between the offshore cabling and the onshore cabling. This term applies to the entire landfall area between the trenchless technique exit pits and the transition joint bay inclusive of all construction works.

Term	Meaning
Lowest Astronomical Tide (LAT)	The lowest tide level that can be expected to occur under average meteorological conditions and under any combination of astronomical conditions.
Magnitude	A combination of the spatial extent, duration, frequency and reversibility of an impact
Morven Branxton Area Grid Connection Project	The Morven Branxton Area Grid Connection Project will be comprised of the offshore export cable in Scottish waters from the Morven North or the Morven South Offshore Substation Platforms, the onshore export cable and the onshore land substation in the vicinity of Branxton in East Lothian, Scotland.
Marine Conservation Zone (MCZ)	An area designated under the Marine and Coastal Access Act 2009 in English waters for the purpose of conserving marine flora, fauna, habitats or features of geological or geomorphological interest.
Marine Directorate Licensing Operations Team (MD-LOT)	The part of the Scottish Government's Marine Directorate responsible for assessing and administering applications for marine licences and Section 36 consent (offshore) in Scotland.
Marine Licence	A marine licence permits the undertaking of different activities in the marine environment, including construction, the deposition or removal of substances or objects from the seabed and dredging. The Marine and Coastal Access Act 2009 requires a marine licence to be obtained for licensable marine activities within the Scottish offshore region (12nm – 200nm) and in English offshore and inshore regions (noting that deemed marine licences will be included within the Development Consent Order application).
Marine Management Organisation (MMO)	The MMO, as a UK government body, is responsible for licensing, regulating and overseeing activities in the marine environment for English waters. For a DCO and deemed marine licence, the MMO acts as a statutory consultee, advising on marine planning, environmental impacts, habitats and compliance with marine licensing regulations.
Marine Protected Area (MPA)	Areas within the United Kingdom's seas designated for the protection of marine life and habitats against damage caused by human activities.
Maximum design scenario (MDS)	The realistic worst case scenario, selected on a topic-specific and impact specific basis, from a range of potential parameters for the MHPGC Project.
Mean High Water Springs (MHWS)	The most inshore level location reached by the sea at high tide during mean high water spring tide. This is defined as the average throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest.
Mean Low Water Springs (MLWS)	The average height of the low water levels of each pair of successive low waters during the periods of about 24 hours when the tidal range is at its greatest.
MHPGC Project Preliminary Environmental Information Report (PEIR)	A report that provides preliminary environmental information in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. This is information that enables consultees to understand the likely significant environmental effects of a project and which helps to inform consultation responses.
MHPGC Project Scoping Report	A Scoping Report for the MHPGC Project, scoping the likely significant effects of the project on the environment, was submitted

Term	Meaning
	and accepted by Planning Inspectorate (PINS) and submitted to the Scottish Ministers, via the MD-LOT in February 2025.
MHPGC Project Scoping Opinions	Separate scoping opinions received from PINS (on behalf of the Secretary of State) and MD-LOT (on behalf of the Scottish Ministers) in response to the MHPGC Project Scoping Report. The MHPGC Project Scoping Opinions contain the range of issues that PINS, and MD-LOT in consultation with statutory stakeholders, have identified should be considered within the EIA process.
MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment (HRA) Screening Report	A HRA Screening Report is Stage 1 of the HRA process and screens in sites within the National Site Network, and qualifying features, for consideration within Stage 2 of the HRA process. The HRA Screening Report for the MHPGC Project will be submitted to PINS and MD-LOT to obtain an opinion on which sites within the National Site Network, and qualifying features, should be screened in for consideration within the MHPGC Project Report to Inform the Appropriate Assessment.
MHPGC Project PEIR Red Line Boundary	The area within which all components of the MHPGC Project will be located, including areas required on a temporary basis during construction and/or decommissioning (such as construction compounds).
MHPGC Project Marine Protected Area and Marine Conservation Zone Assessment	The MPA and MCZ Assessment is a process used to evaluate whether a proposed activity could have a significant impact on designated nature conservation MPAs (in Scotland) or MCZs and HPMAAs (in England). It ensures that the development does not hinder the conservation objectives of the protected features of these sites, as required under the Marine (Scotland) Act 2010 (Scotland) and the Marine and Coastal Access Act 2009. The MPA/MCZ Assessment for the MHPGC Project will consider whether the activities subject to the relevant application (i.e. activities subject to a marine licence application and DCO consent) can hinder the conservation objectives of a protected feature in a nature conservation MPA, MCZ or HPMA.
MHPGC Project Report to Inform Appropriate Assessment (RIAA)	A report prepared by the Applicant containing information that the Competent Authority needs to inform an Appropriate Assessment at Stage 2 of the HRA process. The MHPGC Project will consider whether the MHPGC Project could have adverse effects, either alone or in-combination with other plans or projects, on the integrity of the National Site Network for which the likely significant effects has been previously established.
Mollusc	Invertebrate animal belonging to the phylum Mollusca that includes snails, clams, chitons, tooth shells and octopi.
Morven Branxton Area Grid Connection Project (hereafter 'MBAGC Project')	The Morven Branxton Area Grid Connection Project will be comprised of the offshore export cable in Scottish waters from the Morven North or the Morven South Offshore Substation Platforms, the onshore export cable and the onshore land substation in the vicinity of Branxton in East Lothian, Scotland.
Morven Hawthorn Pit Grid Connection Project	The MHPGC Project is comprised of the offshore export cables in Scottish and English waters from the Morven North or the Morven South offshore substation platform(s) (OSP), landfall, onshore export cables, the onshore land substation (LSS) and AC connection cables.

Term	Meaning
	Also referred to in this report as the MHPGC Project, for ease of reading.
Morven North Boundary	Boundary within which the wind turbines and foundations, Offshore Substation Platforms and foundations, inter-array and interconnector cables and associated infrastructure for Morven North will be located.
Morven North Offshore Wind Array Project (hereafter 'Morven North')	The Morven North Offshore Wind Array Project which includes the wind turbines and foundations, Offshore Substation Platforms and foundations, inter-array and interconnector cables and associated infrastructure located within the Morven North Boundary.
Morven South Boundary	Boundary within which the wind turbines foundations, Offshore Substation Platforms and foundations, inter-array and interconnector cables and associated infrastructure for Morven South will be located.
Morven South Offshore Wind Array Project ('Morven South')	The Morven South Offshore Wind Array Project, which includes the wind turbines and foundations, Offshore Substation Platforms and foundations, inter-array and interconnector cables and associated infrastructure located within the Morven South Boundary.
Morven Programme	The Morven Programme comprises the MHPGC Project, Morven North, Morven South and MBAGC Project collectively.
National Grid Hawthorn Pit Substation	The National Grid substation at Hawthorn Pit, County Durham, which the AC connection cables will connect into from the Onshore Land Substation.
National Policy Statement	Policy statements published by the Department for Energy Security and Net Zero and designated under the Planning Act 2008, setting out national policy for Nationally Significant Infrastructure Projects.
Nationally Significant Infrastructure Project (NSIP)	Large scale development which requires development consent under the Planning Act 2008.
Natural England (NE)	NE is the UK Government's statutory adviser on the natural environment in England, focusing on conserving biodiversity, landscapes, and access to nature. For a DCO and marine licence, NE provides statutory and technical advice to competent authorities on potential effects on designated sites, habitats and protected species, supporting environmental assessment and decision-making..
Offshore Export Cable Corridor	The proposed corridor in which the offshore export cables will be located, from either the Morven North or Morven South offshore substation platform to the transition joint bay (TJB) at landfall.
Offshore Export Cables	High Voltage Direct Current (HVDC) cables which bring electricity from either the Morven North or Morven South offshore substation platform to the TJB at landfall.
Offshore substation platforms (OSPs)	OSP(s) comprise the support structure, topside and electrical components used for collecting the electricity generated by the wind turbine generators for the passage or transmission to landfall. These OSP(s) can be divided into two types: • HVAC collector substations; • HVDC converter substations.

Term	Meaning
Offshore Waters	The area seaward of 12nm extending out to the UK's continental shelf.
Operations and maintenance phase (O&M)	The operational and maintenance phase of the MHPGC Project.
Ornithology	Branch of zoology that concerns the study of birds.
Outline Marine Pollution Contingency Plan	Outline plan to establish emergency response procedures for accidental marine pollution incidents, detailing methods and procedures, reporting and remediation actions.
Outline Vessel Management Plan	Outline plan to detail how vessels will be managed during offshore works, including routeing, scheduling, safety procedures and coordination to minimise environmental and navigational risks.
Pelagic Fish	Fish which live within the water column, not on or near the seabed or at the coasts. Examples include herring, mackerel and sprat.
Physical Processes	The collective term for the following: hydrodynamics (water levels and currents); winds and waves; stratification and frontal systems; geology and seabed sediments (including sediment transport); seabed geomorphology; and coastal geomorphology.
Planning Inspectorate (PINS)	The PINS is an executive agency of the UK Government responsible for administering and examining DCO applications for NSIPs in England. PINS manages the application process, oversees consultation and examination, and makes a recommendation to the relevant Secretary of State on whether consent should be granted.
Primary mitigation	Measures included as part of the location or design of the MHPGC Project made during the pre-application phase that are an inherent part of the MHPGC Project and do not require additional action to be taken. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the MHPGC Project, the parameters and associated commitments secured by the DCO and marine licence, or both.
Ramsar Site	A wetland site designated to be of international importance under the Ramsar Convention.
Residual effects	Effects that continue to exist after mitigation has been applied.
Secondary mitigation	Actions that will require further activity to achieve the anticipated outcome and may be imposed as part of the planning consent, or through inclusion in the ES. These include measures required to reduce the significance of environmental effects and may be secured through an environmental management plan. For secondary mitigation measures, both pre-mitigation and residual effects are presented.
Shellfish	For the purposes of this assessment, shellfish is considered a generic term to define molluscs and crustaceans.
Significance	Effect factor that is determined by the magnitude of impact along with the sensitivity of the receptor.
Sites of Special Scientific Interest (SSSI)	Designated areas which feature rare flora or fauna or are host to important features (physiological or geological) which are of

Term	Meaning
	scientific interest, designated under the Wildlife and Countryside Act 1981 (as amended).
Special Area of Conservation	A site designation specified in the Habitats Directive (Council Directive 92/43/EEC) and protected in the UK under the Habitat Regulations (in Scotland and England). Each site is designated for one or more of the habitats and species listed in the Directive. The Habitats Directive requires the necessary conservation measures to be established involving, if need be, appropriate management plans for each SAC to ensure the favourable conservation status of the habitats or species for which it was designated.
Special Protection Area (SPA)	Locations within the UK designated to conserve rare, vulnerable, and migratory bird species of European importance, as classified by the Habitats Regulations (in Scotland and England).
Species	A group of living organisms that share common characteristics and can interbreed to produce fertile offspring. Members of a species have similar genetic makeup and are classified under the same scientific name.
Survey Area	The area within which field surveys for the environmental topic are undertaken. This would include all areas for which impacts from the MHPGC Project may occur on relevant receptors.
Tertiary mitigation	Actions that would occur with or without input from the EIA process feeding into the design. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects.
The Study Area	For each environmental topic, the baseline environment will be characterised, and the likely significant effect will be described within a topic-specific Study Area. Specific Study Areas are defined for each topic and are based on the maximum spatial extent across which likely significant effects of the MHPGC Project may be experienced by the relevant receptors (i.e. Zone of Influence (Zol)).
Transboundary effects	Assessment of likely significant effects resulting from MHPGC Project on the interests of another European Economic Area (EEA) state(s).
Transboundary impact	Potential impacts resulting from MHPGC Project and affecting another European Economic Area (EEA) state.
Trenchless Techniques	Construction methods used to install underground or sub-surface infrastructure without the need for continuous open trench excavation, thereby avoiding or minimising disturbance to surface features, habitats and existing land users.
Underwater Sound	Sound that travels through water, made by natural sources like animals or by human activities like vessels and construction activities.
Unexploded Ordnance (UXO)	Unexploded ordnance are explosive weapons (e.g. bombs, shells, grenades, land mines and naval mines etc.) that did not explode when they were employed and still pose a risk of detonation, potentially many decades after they were used or discarded.
Zone of influence	The area within which impacts arising from the MHPGC Project could occur upon receptors.

Acronyms

Acronym	Meaning
BoCC	Birds of Conservation Concern
BDMPS	Biologically defined minimum population scales
BSI	British Standards Institute
BTO	British Trust for Ornithology
CEA	Cumulative Effect Assessment
CFE	Controlled Flow Evacuation
CIEEM	Chartered Institute of Ecology and Environmental Management
CLV	Cable Laying Vessel
COLREG	Regulations for Preventing Collisions at Sea
CPT	Cone Penetration Tests
CTV	Crew Transfer Vessels
DAS	Digital Ariel Survey
DCO	Development Consent Order
DEFRA	Department for Environment, Food & Rural Affairs
DMRB	Design Manual for Roads and Bridges
DSV	Dive Support Vessels
EcIA	Ecological Impact Assessment
EEA	European Economic Area
EIA	Environmental Impact Assessment
EPP	Evidence Plan Process
ES	Environmental Statement
EU	European Union
EWG	Expert Working Group
GPS	Global Positioning System
GV	Guard Vessels
HDD	Horizontal Directional Drilling
HPAI	Highly Pathogenic Avian Influenza
HRA	Habitats Regulations Assessment
IEMA	Institute of Environmental Management and Assessment
IMO	International Maritime Organisation
ISEP	Institute of Sustainability and Environmental Professionals
ISV	Installation Support Vessels
JNCC	Joint Nature Conservation Convention
LSE	Likely Significant Effect
LSS	Land Substation

Acronym	Meaning
MarPAMM	Marine Protected Area Management and Monitoring
MBAGC	Morven Branxton Area Grid Connection Project
MD-LOT	Marine Directorate – Licensing Operations Team
MDS	Maximum Design Scenario
MFE	Mass Flow Evacuation
MHPGC	Morven Hawthorn Pit Grid Connection
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MM	Mean Max
MMO	Marine Management Organisation
MPA	Marine Protected Area
MPCP	Marine Pollution Contingency Plan
NEWS	Non-Estuarine Waterbird Survey
NPPF	National Planning Policy Framework
NPS	National Policy Statements
NSIP	Nationally Significant Infrastructure Project
O&M	Operations and Maintenance
OEMP	Offshore Environmental Management Plan
OIPMP	Offshore In-Principal Monitoring Plan
OSP	Offshore Substation Platform
OWEC	Offshore Wind Evidence and Change programme
OWSMRF	Offshore Wind Strategic Monitoring and Research Forum
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PLGR	Pre-lay Grapple Run
RIAA	Report to Inform Appropriate Assessment
RSPB	The Royal Society for the Protection of Birds
RTD	Red - Throated Diver
RTDP	Red Throated Diver Protocol
SAC	Special Area of Conservation
SD	Standard Deviation
ScotMER	Scottish Marine Energy Research
SMP	Seabird Monitoring Programme
SNCB	Statutory Nature Conservation Body
SOLAS	Safety of Life at Sea
SoS	Secretary of State

Acronym	Meaning
SOV	Service Operation Vessels
SPA	Special Protected Area
SSCs	Suspended Sediment Concentrations
SSSI	Sites of Special Scientific Interest
TSV	Trenching Support Vessels
VC	Vibrocoring
VTMP	Vessel Traffic Management Plan
VORs	Valued Ornithology Receptors
UK	United Kingdom
USV	Uncrewed Surface Vessel
UXO	Unexploded ordnance
WCA	Wildlife and Countryside Act
WeBS	Wetland Birds Survey
ZoI	Zone of Influence

Units

Unit	Definition
km	Kilometre
m	Metre
nm	Nautical mile
°C	Degree Celsius

6 Marine Ornithology

6.1 Introduction

- 6.1.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents the preliminary findings of the Environmental Impact Assessment (EIA) work undertaken to date for the Morven Hawthorn Pit Grid Connection Project (hereafter 'MHPGC Project'), as described in **Volume 1, Chapter 2: Project Description, of the PEIR**.
- 6.1.1.2 This chapter considers the potential impacts and effects on marine (nearshore and offshore environment) ornithology receptors that could result from the construction, operation and maintenance (O&M) and decommissioning phases of the MHPGC Project. Specifically, it relates to the offshore elements of the MHPGC Project, from the offshore substation platform(s) (OSPs) within the Morven North Offshore Wind Array Project or Morven South Offshore Wind Array Project (hereafter collectively the Morven North or Morven South) located within Scottish offshore waters, transiting through English offshore and inshore waters, to Mean Low Water Springs (MLWS). The potential impacts on intertidal ornithology receptors (birds located between MLWS and Mean High Water Spring (MHWS)) and terrestrial ornithology receptors (birds located beyond MHWS) are considered separately within **Volume 3: Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR**.
- 6.1.1.3 This chapter describes the methodology and datasets that have informed the preliminary impact assessment, baseline conditions, including future baseline, mitigation measures, and the preliminary residual significant effects on intertidal and marine ornithology receptors that could result from the MHPGC Project.
- 6.1.1.4 The assessment is informed by the following chapters:
- **Volume 1, Chapter 2: Project Description, of the PEIR;**
 - **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR;**
 - **Volume 1, Chapter 5: Policy and Legislation, of the PEIR;**
 - **Volume 2, Chapter 3: Benthic Subtidal and Intertidal Ecology, of the PEIR;**
 - **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR;**
 - **Volume 2, Chapter 8: Shipping and Navigation, of the PEIR.**
 - **Volume 3: Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR;**
 - **Volume 4, Chapter 5: Inter-related Effects, of the PEIR.**
- 6.1.1.5 The chapter also draws on information contained within the following annexes:
- **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR;**
 - **Volume 1, Annex 4.2: Transboundary Screening, of the PEIR;**
 - **Volume 1, Annex 4.3: Cumulative Screening and Location Plan, of the PEIR;**
 - **Volume 3, Annex 3.13: Interim Wintering, Passage and Intertidal Birds Survey Technical Report, of the PEIR.**
- 6.1.1.6 This PEIR will offer a comprehensive overview of the MHPGC Project's potential environmental impacts and mitigation measures, presenting essential data to stakeholders for review and feedback. The PEIR will also be informed by the ongoing pre-application consultation process.
- 6.1.1.7 Following statutory consultation, comments will be reviewed and considered, where appropriate, in preparation of the Environmental Statement (ES). The ES will accompany the application to the Planning Inspectorate (PINS) for development consent and a marine licence application to Marine Directorate Licensing Operations Team (MD-LOT).

6.2 Legislative and policy context

6.2.1 Overview

- 6.2.1.1 The full relevant legislation and policy context for the MHPGC Project is detailed in **Volume 1, Chapter 5: Policy and Legislation, of the PEIR**. The legislation and planning policy of relevance specifically to marine ornithology are summarised below.

6.2.2 Legislation

International Legislation

Ramsar Convention on Wetlands of International Importance especially as Waterfowl Habitat 1971 (the 'Ramsar Convention')

- 6.2.2.1 Under the Ramsar Convention appropriate contracting parties can designate suitable wetlands within their territorial state for inclusion within the 'List of Wetlands of International Importance' for Wetlands with international significance in terms of ecology, botany, zoology, limnology or hydrology. The Ramsar Convention states that "where a Contracting Party in its urgent national interest, deletes or restricts the boundaries of a wetland included in the List, it should as far as possible compensate for any loss of wetland resources, and in particular it should create additional nature reserves for waterfowl and for the protection, either in the same area or elsewhere, of an adequate portion of the original habitat".

The Convention on the Conservation of European Wildlife and Natural Habitats 1979 (the 'Bern Convention')

- 6.2.2.2 The Bern Convention aims to ensure conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention). It also aims to increase cooperation between contracting parties and regulate the exploitation of those species (including migratory species) listed in Appendix III.

The Convention on the Conservation of Migratory Species of Wild Animals 1979 (the 'Bonn Convention')

- 6.2.2.3 The Bonn Convention provides for contracting parties to collaborate with the aim of conserving endangered migratory species (listed within Appendix I of the Convention) and functionally linked habitat via international cooperation.

National Legislation

The Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended)

- 6.2.2.4 The Conservation of Offshore Marine Habitats and Species Regulations (2017) (as amended) cover the requirements to protect sites that are internationally important for marine habitats and species within the United Kingdom (UK) offshore marine area (beyond the 12nm limit) (HM Government, 2017a).

The Conservation of Habitats and Species 2017 (as amended) and Conservation (Natural Habitats, & c.) (as amended) Regulations 1994.

- 6.2.2.5 The Conservation of Habitats and Species Regulations (2017) cover the requirements to protect sites that are internationally important for habitats and species in England up to the 12nm limit and in Scotland for reserved activities (HM Government, 2017b). While Conservation (Natural Habitats, & c.) Regulations (1994) cover the requirements to protect sites that are internationally important for habitats and species in Scotland up to the 12nm limit (HM Government, 1994).
- 6.2.2.6 Together the legislations above is collectively known as the 'Habitat Regulations' and Habitat Regulations Assessment (HRA) must be undertaken in accordance with the provisions in the Habitat Regulations in order to determine if a plan or project may affect the protected features of a Designated site. The Habitats Regulations transpose the (EU) Birds Directive and the Habitats Directive into national law.
- 6.2.2.7 The Habitats Regulations place an obligation on the 'competent authority' to carry out an appropriate assessment of any proposal likely to affect a designated site (Special Protection Area (SPA) in

relation to bird species), to seek advice from Natural England and/or Joint Nature Conservation Committee (JNCC), and not to approve an application that would have an adverse effect on the integrity of a designated site (except under very tightly constrained conditions that involve decisions by the Secretary of State (SoS).

The Conservation of Habitats and Species (Amendment) (European Union (EU) Exit) Regulations 2019.

- 6.2.2.8 Following the UK departure from the EU, the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (HM Government, 2019) came into force at the end of the EU-UK transition period on 31 December 2020, amending the Habitat Regulations. These amendments delegated functions from the European Commission to the appropriate authorities within the UK, with all the processes or terms unchanged. The amendments have created a “National Site Network” on land and at sea, including both the inshore and offshore marine areas in the UK. This includes all existing SACs and SPAs and new SACs and SPAs designated under the Habitats Regulations. This did result in some aspects of the Habitats Regulations being amended in England and Wales, but these amendments were only to those necessary to ensure that the Habitats Regulations remained operable and to ensure that the requirements of the Habitats and Birds Directives must continue to apply to how European sites are designated and protected.

The Wildlife and Countryside Act 1981

- 6.2.2.9 The Wildlife and Countryside Act (WCA) 1981 is one of the primary pieces of legislation aimed at the protection of wildlife and their habitats in the UK. It has been amended several times to enhance its protective measures, considering the evolving environmental and ecological threats. The Act provides legal protection to designated wildlife sites (Sites of Special Scientific Interest (SSSIs) and ensures that any development proposal, must consider and mitigate impacts on these protected areas. It lists species that are protected under the law, prohibiting harm, disturbance, or trade. Consultation with Natural England and NatureScot is often required to ensure compliance and determine appropriate mitigation measures.

6.2.3 National policy context

National Policy Statements

- 6.2.3.1 National Policy Statements (NPS) set out the primary policy framework for a Development Consent Order (DCO) under which the MHPGC Project will be considered. This framework includes guidelines, requirements and criteria that the MHPGC Project must meet to obtain consent and proceed with development. **Table 6.1** provides details of the NPS relevant to marine ornithology and how and where they are considered in the PEIR:
- NPS for energy (EN-1) (Department for Energy Security and Net Zero (DESNZ), 2025a);
 - NPS for renewable energy infrastructure (EN-3) (DESNZ, 2025b).

Table 6.1: Summary of the NPS provisions relevant to marine ornithology

Summary of relevant NPS provisions	How and where considered in the PEIR
NPS EN-1	
Paragraph 4.2.25: Compensation, by definition, does not reduce an adverse effect resulting from a development. However, applicants should set out how residual impacts will be compensated for as far as possible. Applicants should also set out how any mitigation or compensation measures will be monitored and reporting agreed to ensure success and that action is taken. Changes to measures may be needed e.g. adaptive management. The cumulative impacts of multiple developments with residual impacts should also be considered.	The approach taken to mitigation is described in Section 6.7 and follows the mitigation hierarchy defined. Such measures are also identified with the commitments register (see Volume 1, Annex 4.1: Draft Commitments Register of the PEIR) and those relevant to ornithological receptors are summarised in Table 6.24. No significant adverse residual effects have been identified, therefore compensation, and monitoring thereof, is not required. The assessment of potential effects arising from the MHPGC Project, including cumulative impacts, relevant to marine ornithology are presented in Section 6.8

Summary of relevant NPS provisions	How and where considered in the PEIR
Paragraph 4.3.1: All proposals for projects that are subject to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) must be accompanied by an Environmental Statement (ES) describing the aspects of the environment likely to be significantly affected by the project.	The proposal will be accompanied by an ES. The assessment of potential effects arising from the MHPGC Project relevant to marine ornithology are presented in Section 6.8.
Paragraph 4.3.3: The EIA Regulations require an assessment of the likely significant effects of the proposed project on the environment, covering the direct effects and any indirect, secondary, cumulative, transboundary, short, medium, and long-term, permanent and temporary, positive and negative effects at all stages of the project, and also of the measures envisaged for avoiding or mitigating significant adverse effects.	The assessment identifies and assesses the potential effects arising from the MHPGC Project, including direct, indirect and cumulative effects, as well as short, medium and long-term, permanent and temporary, positive and negative effects. The assessment of potential effects arising from the MHPGC Project relevant to marine ornithology are presented in Section 6.8 and Section 6.10. The approach taken to mitigation is described in Section 6.7 and follows the mitigation hierarchy defined. Such measures are also identified with the commitments register (see Volume 1, Annex 4.1: Draft Commitments Register of the PEIR) and those relevant to ornithological receptors are summarised in Table 6.24.
Paragraph 4.3.5: For the purposes of this NPS and the technology specific NPSs the ES should cover the environmental, social and economic effects arising from pre-construction, construction, operation and decommissioning of the project.	The assessment considers the likely significant environmental, social and economic effects of the MHPGC Project during construction, operation and decommissioning phases. The assessment of potential effects arising from the MHPGC Project relevant to marine ornithology are presented in Section 6.8.
Paragraph 4.3.10: The applicant must provide information proportionate to the scale of the project, ensuring the information is sufficient to meet the requirements of the EIA Regulations.	The assessment has been undertaken in line with the EIA Regulations. The scope of the assessment reflects consultation with statutory consultees, and the assessment follows a proportionate approach, with the level of detail reflecting the scale and likely significance of effects. The assessment of potential effects arising from the MHPGC Project relevant to marine ornithology are presented in Section 6.8.
Paragraphs 4.3.11: In some instances, it may not be possible at the time of the application for development consent for all aspects of the proposal to have been settled in precise detail. Where this is the case, the applicant should explain in its application which elements of the proposal have yet to be finalised, and the reasons why this is the case.	The Maximum Design Scenario (MDS) has been outlined in Section 6.6.2 and Table 6.23. The MDS has been selected as those scenarios having the potential to result in the greatest impact on an identified receptor or receptor group, as is according to policy.
Paragraph 4.3.12: Where some details are still to be finalised, the ES should, to the best of the applicant's knowledge, assess the likely worst-case environmental, social and economic effects of the proposed development to ensure that the impacts of the project as it may be constructed have been properly assessed.	
Paragraph 4.10.9: The ES should set out how the proposal will take account of the projected impacts of climate change, using government guidance and industry standard benchmarks such as the Climate Change Allowances for Flood Risk Assessments, Climate Impacts Tool), and British Standards for climate change adaptation, in accordance with the EIA Regulations.	Consideration of the impacts of climate change are discussed in Section 6.4.5 and 6.4.6. The assessment of potential effects arising from the MHPGC Project relevant to marine ornithology are presented in Section 6.8.

Summary of relevant NPS provisions	How and where considered in the PEIR
Paragraph 5.4.4: The highest level of biodiversity protection is afforded to sites identified through international conventions. The Habitats Regulations set out sites for which an HRA will assess the implications of a plan or project, including Special Areas of Conservation and Special Protection Areas.	As detailed within Section 6.5, the determination of conservation value of protected species has accounted for internationally, nationally and locally sites populations and their connectivity to the MHPGC Project PEIR Red Line Boundary. These conservation values have been used to inform the impact assessment within Section 6.8 and Section 6.10. Assessment against the nationally and locally designated sites and ornithological features is presented in MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment Report to Inform Appropriate Assessment (RIAA), prepared to accompany the PEIR. Internationally designated sites and their connectivity to the MHPGC Project PEIR Red Line Boundary has been considered within the transboundary effects assessment [see Section 6.11].
Paragraph 5.4.5: As a matter of policy, the following should be given the same protection as sites covered by the Habitats Regulations and an HRA will also be required: • Potential Special Protection Areas and possible Special Areas of Conservation; • Listed or proposed Ramsar sites; and • Sites identified, or required, as compensatory measures for adverse effects on Special Protection Areas, Special Areas of Conservation, and any of the other sites covered by this paragraph.	
Paragraph 5.4.18: Where the development is subject to EIA, the applicant should ensure that the ES clearly sets out any effects on internationally, nationally, and locally designated sites of ecological or geological conservation importance (including those outside England and Wales), on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity, including irreplaceable habitats.	
Paragraph 5.4.23: The design of energy NSIP proposals will need to consider the movement of mobile/migratory species such as birds, fish and marine and terrestrial mammals and their potential to interact with infrastructure. As energy infrastructure could occur anywhere within England and Wales, both inland and onshore and offshore, the potential to affect mobile and migratory species across the UK and more widely across Europe (transboundary effects) requires consideration, depending on the location of development. Applicants should consider relevant plan policies in marine plans in England.	The potential for significant effects for all marine ornithological receptors with connectivity to the MHPGC Project are considered within Section 6.8 and Section 6.11. Impacts occurring on fish and shellfish, marine mammals and terrestrial ornithology have been assessed within their own respective chapters (see Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR; Volume 2, Chapter 5: Marine Mammals, of the PEIR, Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR).
Paragraph 5.4.36: Applicants should include appropriate avoidance, mitigation, compensation and enhancement measures as an integral part of the proposed development. In particular, the applicant should demonstrate that: • During construction, they will seek to ensure that activities will be confined to the minimum areas required for the works; • The timing of construction has been planned to avoid or limit disturbance; • During construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements; • Habitats will, where practicable, be restored after construction works have finished; • Opportunities will be taken to enhance existing habitats rather than replace them, and where practicable, create new habitats of value within the site landscaping	The approach taken to mitigation is described in Section 6.7 and follows the mitigation hierarchy defined. Such measures are also identified with the commitments register (see Volume 1, Annex 4.1: Draft Commitments Register of the PEIR) and those relevant to the chapter are summarised in Table 6.24. The Applicant has made a commitment (CoT06 of Volume 1, Annex 4.1: Draft Commitments Register of the PEIR) that an Outline Offshore Environmental Management Plan (OEMP) will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the English and Scottish Ministers. This OEMP includes a VTMP (CoT30) which will mitigate any potential vessel impacts occurring on marine ornithology receptors. The Outline OEMP will detail the approach to construction activity, as well as ensuring best practice is followed during both the construction, O&M and decommissioning phases [see Table 6.24]. Detailed plans will be developed

Summary of relevant NPS provisions	How and where considered in the PEIR
proposals. Where habitat creation is required as mitigation, compensation, or enhancement, the location and quality will be of key importance. In this regard habitat creation should be focused on areas where the most ecological and ecosystems benefits can be realised; and • Mitigations required as a result of legal protection of habitats or species will be complied with.	substantially in accordance with the outline OEMP plan, and as approved by the DCO and Deemed Marine Licence conditions (England) and Marine Licence (Scotland). No significant effects have been identified, therefore compensation, and habitat creation or enhancement, is not required.
Paragraph 5.4.49: In taking decisions, the Secretary of State should ensure that appropriate weight is attached to designated sites of international, national, and local importance; protected species; habitats and other species of principal importance for the conservation of biodiversity; and to biodiversity and geological interests within the wider environment.	The assessment for marine ornithological receptors, detailed in Section 6.8, gives appropriate consideration to designated sites and protected species, in accordance with national policy.
NPS EN-3	
Paragraph 2.8.61: The applicant should assess the effects of the offshore transmission and any associated infrastructure on the marine, coastal and onshore environment.	The potential for significant effects for all marine ornithological receptors with connectivity to the MHPGC Project are considered within this chapter appropriately in Section 6.8 to Section 6.11, including consideration of cumulative effects and temporary habitat loss/disturbance from increased Suspended Sediment Concentrations (SSCs) (including indirect impacts on prey species). The approach taken to mitigation is described in Section 6.7 along with a description of the types of mitigation considered. Such measures are also identified with the commitments register (see Volume 1, Annex 4.1: Draft Commitments Register of the PEIR) and those relevant to ornithological receptors are summarised in Table 6.24. Further information on alternatives and final MHPGC Project design selected at this stage, can be found in Volume 1, Chapter 3: Site Selection and Consideration of Alternatives, of the PEIR and Volume 1, Chapter 2: Project Description, of the PEIR. The MDS relevant for the assessment of potential impacts on marine ornithology, including disturbance and temporary habitat loss/disturbance from increased SSCs (including indirect impacts on prey species) are set out in Table 6.23.
Paragraph 2.8.65: Assessment of environmental effects of transmission infrastructure and any proposed offshore or onshore substations should assess effects both alone and cumulatively with other existing and proposed infrastructure.	
Paragraph 2.8.112: Applicant assessments of the effects of installing offshore transmission infrastructure across the intertidal/ coastal zone should demonstrate compliance with mitigation measures in any relevant plan-level HRA or Marine Conservation Zone (MCZ) assessment including those prepared by The Crown Estate as part of its leasing round, and include information, where relevant, about: • Any alternative landfall sites that have been considered by the applicant during the design phase and an explanation for the final choice; • Any alternative cable installation methods that have been considered by the applicant during the design phase and an explanation for the final choice; • Potential loss of habitat; • Disturbance during cable installation, maintenance/repairs and removal (decommissioning); • Increased suspended sediment loads in the intertidal zone during installation and maintenance/repairs; • Potential risk from invasive and non-native species; • Predicted rates at which the intertidal zone might recover from temporary effects, based on existing monitoring data; • Protected sites; • Impacts on delivery of the Environment Agency's habitat compensation and restoration programme.	
Paragraph 2.8.126: Currently, cumulative impact assessments for ornithology are based on the consented Rochdale Envelope parameters of	The assessment recognises that as-built parameters may differ from consented parameters and may reduce risk to ornithological receptors. The

Summary of relevant NPS provisions	How and where considered in the PEIR
projects, rather than the 'as-built' parameters, the latter which may pose a lower risk to birds. The applicant must ensure any draft consents include provisions to define the final 'as built' parameters once construction is completed (which may not then be exceeded). These parameters must be used in future cumulative impact assessments.	cumulative ornithology assessment is based on consented Rochdale Envelope parameters using a precautionary worst-case approach. The MDS has been outlined in Section 6.6.2 and Table 6.23 .
Paragraph 2.8.186: Applicants must always employ the mitigation hierarchy, in particular to avoid as far as is possible the need to find compensatory measures for developments affecting SACs SPAs, and Ramsar sites and/or MCZs. It is essential that applicants involve Statutory Nature Conservation Bodies (SNCBs), other statutory environmental bodies (e.g. Historic England) and Department for Environment, Food and Rural Affairs (Defra), in conjunction with the relevant regulators and relevant non statutory bodies (such as RSPB and Wildlife Trust), as early as possible in the planning process to enable discussions of what is and isn't a significant and/or adverse effect, subsequent implications, and, if required, mitigation and/or compensation.	The approach taken to mitigation is described in Section 6.7 along with a description of the types of mitigation considered. Such measures are also identified with the commitments register (see Volume 1, Annex 4.1: Draft Commitments Register of the PEIR) and those relevant to ornithological receptors are summarised in Table 6.24 .
Paragraph 2.8.187: At the earliest possible stage, alternative ways of working and use of technology should be employed to avoid environmental impacts. For example, construction vessels may be rerouted to avoid disturbing seabirds. Where impacts cannot be avoided, measures to reduce and mitigate impacts should be employed, for example using trenching techniques or noise abatement technology.	The commitments relevant to marine ornithology (with reference to published guidance) are discussed in Section 6.7 and Table 6.24 . The Applicant has made a commitment (CoT30 of Volume 1, Annex 4.1: Draft Commitments Register of the PEIR) that an Outline Vessel Traffic Management Plan (VTMP) will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the Scottish and English Ministers. Vessel management plans will be developed substantially in accordance with the outline VTMP plan, and as approved by the discharging authority.
Paragraph 2.8.213: Construction vessels and post-construction maintenance vessel traffic associated with offshore wind farms and offshore transmission should, where practicable and compatible with operational requirements and navigational safety, avoid rafting seabirds during sensitive periods and follow agreed navigation routes to and from the site and minimise the number of vessel movements overall.	

National Planning Policy Framework

- 6.2.3.2 Due to the nature of National Planning Policy Framework (NPPF), no policies have been considered specifically relevant to marine ornithology, and therefore the NPPF has not been considered here.

6.2.4 Marine planning policy context

- 6.2.4.1 The following marine plans are relevant to marine ornithology and have informed the assessment of preliminary effects in this chapter, their relevance to the MHPGC Project is outlined in **Table 6.2**:

- The UK Marine Policy Statement (MPS) (DEFRA, 2020);
- Scotland's National Marine Plan (Marine Directorate, 2015);
- Northeast Inshore and Northeast Offshore Marine Plan (MMO, 2024).

Table 6.2: Marine planning policy relevant to marine ornithology

Marine plan description	How and where considered in the PEIR
UK Marine Policy Statement	
The UK MPS is the framework for preparing Marine Plans and taking decisions affecting the marine environment. The MPS ensures that marine resources are used in a sustainable way by ensuring biodiversity is protected and conserved by using the precautionary principle and relying on sound evidence. This policy facilitates and supports the creation of marine plans, ensuring that marine resources are utilised sustainably in accordance with several high-level marine objectives as described in Volume 1, Chapter 5: Policy and Legislation, of the PEIR. This includes achieving a sustainable marine economy and identifies a wide range of relevant marine uses. Ensuring a sustainable marine environment by protecting marine ecosystems, habitats, species and heritage assets. Ensure biodiversity to be protected, conserve and where appropriate recovered and loss halted.	The assessment of potential effects arising from the MHPGC Project relevant to marine ornithology are presented in Section 6.8.
Scottish National Marine Plan	
The Scottish National Marine Plan covers the management of both Scottish inshore waters and offshore waters. This National Marine Plan sets out strategic policies for the sustainable development of Scotland's marine resources. This plan provides strategic framework for sustainable development of Scotland's marine resources in the context of national and regional priorities. GEN 9 (National Heritage) requires safeguarding of biodiversity and protected species, with section 11 considering protected species and habitats.	The MHPGC Project assessment for marine ornithology has been completed in accordance with the Scottish National Marine Plan which states renewable energy projects must demonstrate compliance with Environmental Impact Assessment and Habitats Regulations Appraisal legislative requirements. Potential effects on species and designated sites relevant to marine ornithological receptors have been assessed in Section 6.8 and in MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment Report to Inform Appropriate Assessment (RIAA), prepared to accompany the PEIR.
Northeast Inshore and Northeast Offshore Marine Plan	
Northeast Inshore and Northeast Offshore Marine Plan ensures biodiversity is protected and conserved from the Scottish border to Flamborough Head. These marine plans will contribute to the achievement and integration of sectoral activity through specific policies within a framework of economic, social and environmental considerations. The marine plan will reflect the MPS at the sub-national level, considering the social, economic and environmental factors that affect the northeast marine plan areas and the communities that are dependent on, or have an interest in, the northeast marine plan areas. The plans promote sustainable development, enhancing environmental protection to ensure biodiversity and ecosystem function resilience.	The PEIR identifies designated sites with connectivity to the MHPGC Project PEIR Red Line Boundary [see Section 6.4]. This ensures that all designated features and species of conservation importance are considered within the assessment of potential effects [see Section 6.8].

6.2.5 Local policy context

6.2.5.1 The MHPGC Project lies within the jurisdiction of Durham County Council. The following local policy that is relevant to marine ornithology and has informed the assessment of preliminary effects in this chapter, their relevance to the MHPGC Project is outlined in **Table 6.3**.

- Durham Local Plan (Durham County Council, 2020);
- County Durham Landscape Strategy (Durham County Council, 2008);

- Wildlife Corridors Network Review (Burton Reid Associates, 2020).

Table 6.3: Local policy relevant to marine ornithology

Policy description	How and where considered in the PEIR
Durham Local Plan	
Policy 27: States Proposals will be permitted for new or extensions to existing energy generation, utility transmission facilities, telecommunication masts or other broadcast and broadband equipment which facilitate the electronic transfer of data where it can be demonstrated that the scheme will not cause significant adverse impacts or that its benefits outweigh any adverse negative effects.	Assessment of the potential effects of the MHPGC Project, whole-project and cumulative effects on Marine Ornithology receptors during the construction, O&M and decommissioning phase are presented in Section 6.8 and Section 6.10. Assessment concluded that effects on the Marine Ornithology receptors would be not significant in EIA terms.
Policy 37: States the council will seek to protect and enhance the Durham Heritage Coast and wider Coastal Zone. Development proposals within, or within the setting of, the Durham Heritage Coast or wider Coastal Zone, as defined on the policies map, or that have the potential to individually or cumulatively impact on their setting must only be undertaken on the basis of maintaining and enhancing its environmental capital in accordance with the principles of the Marine Policy Statement and other principles of sustainable development.	The Offshore Marine Ornithology Study Area as defined in Section 6.4 is adjacent to the Durham wider Coastal Zone (defined in the Durham Local plan as extending to "the mean low water mark on the seaward side"). The baseline presented in Section 6.4 identifies and characterised the marine ornithological receptors relevant to the policies including Northumberland Coast SPA and Teesmouth and Cleveland Coast SPA, all located (partly) within the wider Coastal Zone. Assessment of the potential effects of the MHPGC Project alone, whole-project and cumulative effects on these receptors during the construction, O&M and decommissioning phase is presented in Section 6.8 and Section 6.10. The assessment has concluded that effects on the Marine Ornithology receptors would be not significant in EIA terms. Embedded mitigation measures to avoid or reduce disturbance, including vessel management measures and the Red-Throated Diver Protocol have been considered in Section 6.7 and Table 6.24. The MHPGC Project would therefore maintain the marine ornithological value of the wider Coastal Zone and would not result in a significant project alone or cumulative effect on its ornithological environmental capital.
Policy 41: States proposals for new development will not be permitted if significant harm to biodiversity or geodiversity resulting from the development cannot be avoided, or appropriately mitigated, or, as a last resort, compensated for. Proposals for new development will be expected to minimise impacts on biodiversity by retaining and enhancing existing biodiversity assets and features and providing net gains for biodiversity including by establishing coherent ecological networks.	The approach taken to mitigation is described in Section 6.7 along with a description of the types of mitigation considered. Such measures are also identified with the commitments register (see Volume 1, Annex 4.1: Draft Commitments Register of the PEIR) and those relevant to ornithological receptors are summarised in Table 6.24. Assessment of the potential effects of the MHPGC Project alone, whole-project and cumulative effects on Marine Ornithology receptors during the construction, O&M and decommissioning phase is presented in Section 6.8 and Section 6.10. The assessment has concluded that effects on the Marine Ornithology receptors would be not significant in EIA terms.
Policy 42: States development that has the potential to have an effect on internationally designated site(s), (including all development	The PEIR identifies designated sites with connectivity (using foraging ranges Woodward <i>et al.</i>, 2019) to the MHPGC Project PEIR Red Line Boundary

Policy description	How and where considered in the PEIR
within 0.4 kilometres of the sites, as shown on Map B of the policies map document), either individually or in combination with other plans or projects, will need to be screened in the first instance to determine whether significant effects on the site are likely and, if so, will be subject to an Appropriate Assessment.	[see Section 6.4]. As such the assessment considers connectivity to designated sites beyond 0.4km of the MHPGC Project Red Line Boundary. Screening has been undertaken to determine whether likely significant effects could be excluded at designated site (see MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report, prepared to support the PEIR). Potential impacts on Northumbria Coast SPA and Ramsar, Teesmouth and Cleveland Coast SPA and Ramsar were screened in within the HRA process and are considered in MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment Report to Inform Appropriate Assessment (RIAA), prepared to accompany the PEIR.
Policy 43: States in all cases where development impacts adversely on a national or local designated site (i.e. SSSI, National Nature Reserve (NNR), Local Nature Reserve (LNR), Local Wildlife Site (LWS)), mitigation, or as a last resort compensation, must be provided and it must be demonstrated that the proposed mitigation or compensatory measures are appropriate to the designations assigned to the site and deliver clear net gains for the habitats and/or species assemblages the site is designated for.	The PEIR identifies designated sites with connectivity to the MHPGC Project PEIR Red Line Boundary [see Section 6.4]. This ensures that all designated features and species of conservation importance are considered within the assessment of potential effects [see Section 6.8]. The approach taken to mitigation is described in Section 6.7 along with a description of the types of mitigation considered. Such measures are also identified with the commitments register (see Volume 1, Annex 4.1: Draft Commitments Register of the PEIR) and those relevant to ornithological receptors are summarised in Table 6.24. Assessment of the potential effects of the MHPGC Project alone, whole-project and cumulative effects on Marine Ornithology receptors during the construction, O&M and decommissioning phase is presented in Section 6.8 and Section 6.10. The assessment has concluded that effects on the Marine Ornithology receptors would be not significant in EIA terms. Consequently, no Secondary mitigation or compensation is required for marine ornithology.
County Durham Landscape Strategy	
The County Durham Landscape Strategy covers the broad issues of climate change, biodiversity, geodiversity, cultural heritage, tranquillity and green infrastructure. The biodiversity objectives aims are to: • Support and encourage the conservation and enhancement of biodiversity; • Promote and develop a landscape-scale approach to biodiversity in county Durham; • Promote an integrated approach to action on landscape and biodiversity and particularly through the use of: – Natural Area Partnerships; – secure a 'positive audit' for biodiversity in new development; – promote biodiversity in landscape design. The overarching aims are: • Conserve and enhance the character and diversity of the Durham Landscape;	The assessment of potential effects arising from the MHPGC Project relevant to marine ornithology are presented in Section 6.8.

Policy description	How and where considered in the PEIR
- Make development and land management more sustainable by helping to ensure that they respect the character of the landscape and contribute towards wider environmental objectives; - Support and complement other environmental strategies to help promote co-ordinated action on the environment.	
Wildlife Corridors Network Review	
Policy EA3: To optimise conditions for wildlife, implement the Durham Biodiversity Action Plan and tackle habitat fragmentation through: - Securing and enhancing the integrity of designated sites; - Maintaining, enhancing, restoring and adding to biodiversity and geological conservation interests; - Ensuring that new development would result in not net loss of biodiversity to priority habitats (as named within the policy document); - Reducing the fragmentation of, improve or extending existing priority habitats; - Protecting and strengthening populations of priority or other protected species; - Enhancing the biodiversity value of wildlife corridors; - Where appropriate, restricting access and usage in order to conserve and area's biodiversity value.	The baseline presented in Section 6.4 identifies and characterised the marine ornithological receptors relevant to the policies including Northumberland Coast SPA, Teesmouth and Cleveland Coast SPA. Assessment of the potential effects of the MHPGC Project alone, whole-project and cumulative effects on these receptors during the construction, O&M and decommissioning phase is presented in Section 6.8 to Section 6.10. Potential impacts on SPAs and their qualifying features are considered in MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment Report to Inform Appropriate Assessment (RIAA), prepared to accompany the PEIR. Relevant commitments measures for offshore ornithology are also outlined within Section 6.7, including specific measures, such as a vessel traffic management plan, to reduce potential impacts on marine ornithological receptors.
Policy DM7: To protect and enhance the important environmental assets of the borough. All proposals for development: - Must ensure that any individual or cumulative detrimental impacts on sites are avoided; - Will only be permitted where they would not adversely affect the integrity, natural character or biodiversity and geodiversity value of sites including statutory sites and wildlife corridors.	The assessment has concluded that effects on the Marine Ornithology receptors would be not significant in EIA terms. Consequently, no Secondary mitigation or compensation is required for marine ornithology. Therefore compensation, and habitat creation or enhancement, is not required.

6.3 Consultation and engagement

6.3.1 Scoping

- 6.3.1.1 A Scoping Report for the MHPGC Project was issued to the PINS and MD-LOT in February 2025 (RPS, 2025). Following consultation with the appropriate statutory bodies, PINS (on behalf of the SoS) and MD-LOT both provided Scoping Opinions in March 2025 (PINS, 2025; MD-LOT, 2025, respectively).
- 6.3.1.2 **Table 6.4** sets out the key comments raised during the scoping process specific to marine ornithology, with details of how these comments have been addressed within the PEIR.

Table 6.4: Summary of scoping responses relevant to marine ornithology

Comment	How and where considered in the PEIR
PINS	
PINS 3.7.1: Indirect impacts from underwater sound affecting prey species (O&M): The MHPGC Project Scoping Report does not provide justification for scoping out this matter during the operational phase. It acknowledges that disturbance related impacts associated with the	Indirect impacts on prey species during the construction, O&M and decommissioning phase are assessed in Section 6.8 .

Comment	How and where considered in the PEIR
operation of vessels may occur. As the O&M activities are not fully described, the Inspectorate does not feel that it has sufficient justification to agree to scope this matter out of further assessment. The ES should include an assessment of indirect impacts from underwater sound affecting prey species during the operational phase, with reference to O&M activities, or information demonstrating agreement with the relevant consultation bodies and the absence of a Likely Significant Effect (LSE).	
PINS 3.7.2: Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species (O&M) - The MHPGC Project Scoping Report does not include justification as to why this matter is to be scoped out during operation, in particular in respect of O&M activities. The ES should include an assessment of temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species during the operational phase, with reference to O&M activities, or the information demonstrating agreement with the relevant consultation bodies and the absence of an LSE.	Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species (construction, O&M and decommissioning) are assessed in Section 6.8 .
PINS 3.7.3: Accidental pollution (all MHPGC Project phases) - The Inspectorate agrees that this matter can be scoped out on the basis that the mitigation measures proposed within the outline management plans, including Marine Pollution Contingency Plan (MPCP), should be sufficient to address the likely impacts and avoid a likely significant effect. The ES should include details of the mitigation and explain how its delivery is assured with reference to relevant documents.	Noted. This potential impact has been scoped out see Table 6.22 . Details of mitigation proposed relevant to marine ornithology is summarised within Section 6.7 and commitments are detailed in Table 6.24 .
PINS 3.7.4: The Inspectorate notes the intention to assess ornithological receptors in both terrestrial ecology and ornithology and in the offshore ornithology ES chapters, and thus the potential for effects to be assessed on the same ornithological receptor but presented within the two different aspect chapters. The ES should clearly identify LSEs to important ecological features, including ornithology receptors, and provide appropriate cross-reference to the findings of other relevant ES assessments to avoid duplication, whilst maintaining clarity of assessment.	Terrestrial ecology and ornithology has now been separated from marine ornithology, with intertidal ornithology now considered solely in Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR . The assessment has identified where potential impacts may occur on ornithological receptors and provides appropriate cross-references to the findings of other relevant assessments to avoid duplication, whilst maintaining clarity of assessment [see Section 6.8].
Natural England	
Natural England highlights our increasing concerns in relation to disturbance and/or displacement of red-throated divers features from the more persistent presence of offshore wind farm and oil and gas related vessel activity which could make a meaningful contribution to in-combination effects to the red-throated divers using the cable route area and any transit routes. As such, we advise appropriate consideration of both seasonal timing of construction and O&M phase works and vessel transit route is included within the application. Natural England advises as minimum use of best practice measures between 01 November and 31 March to mitigate and therefore minimise disturbance to red-throated diver namely: • Selecting routes (when transiting to site) that avoid aggregations of red-throated diver and common scoter, where practicable. • Restricting (to the extent possible) vessel movements when transiting to the site to existing navigation routes (where the densities of divers are typically relatively low). • Avoidance of over-revving of engines (to minimise noise disturbance); • Briefing of vessel crew on the purpose and implications of these vessel management practices (through, for example, tool-box talks).	Red-throated diver have been assessed for potential disturbance and displacement impacts from vessel activity within Section 6.7 and Section 6.10 . The Applicant has made commitments (CoT30 and CoT54 of Volume 1, Annex 4.1: Draft Commitments Register of the PEIR) that an Outline Vessel Traffic Management Plan (VTMP) and Red-throated diver Protocol (RTDP) will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the Scottish and English Ministers. Vessel management and red-throated diver mitigation plans will be developed substantially in accordance with the outline VTMP plan, and as approved by the discharging authority.

Comment	How and where considered in the PEIR
Monthly intertidal surveys were undertaken commencing in April 2023 and concluding in March 2024, excluding June 2023. A 1 kilometre (km) buffer was included around the landfall point. No further surveys for birds are proposed. Natural England typically would expect 24 months of site-specific survey data for an application which affects designated sites with bird features (i.e. Durham Coast SSSI, Northumbria Coast SPA and Ramsar). The surveys are required to provide certainty to draw conclusions from and inform requirements for mitigation measures and are particularly important in this location as there is limited historical data to draw on. Furthermore, Paragraph 3.5.2.1 of the MHPGC Project Scoping Report indicates that the exact landfall location of the cable is subject to a process of refinement so additional survey areas may be required as the full Scoping Boundary plus a buffer to that scoping boundary, has not been surveyed. To the north of the MHPGC Project Scoping Boundary is a rocky reef habitat which is known to be used by foraging waders but has not been included in the survey extent. Natural England advise that offshore bird surveys may be required, particularly as marine SPAs have been scoped into the assessment. Natural England would welcome engagement through our Discretionary Advice Service on surveys completed to date and what is proposed for the ecological impact assessment."	Additional requested intertidal and nearshore bird survey data will be collected from October 2025 to September 2026 as detailed within Volume 3, Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR. This data combined with the first year (April 2023 to March 2024) of intertidal data equals to 21 months of data. The additional survey period has been discussed and agreed upon in consultation [see Table 6.5]. The data has been used to inform the baseline characterisation [see Section 6.4] and impact assessment [see Section 6.8]. No offshore bird surveys have been undertaken considering the Digital Aerial Survey (DAS) data provided by Morven North and Morven South [see Table 6.11], as well as access to other public data sources that cover the Offshore Marine Ornithology Study Area [see Table 6.6]. Consultation has been undertaken through the Evidence Plan Process (EPP) and Expert Working Group (EWG) process, as well as through the sharing of focussed technical notes [see Section 6.3.2].
MD-LOT	
The Scottish Ministers are content with the Offshore and Intertidal Ornithology Study Area presented in Section 7.7.3 of the MHPGC Project Scoping Report. The Scottish Ministers note at Section 7.7.3.5 that the MHPGC Project will include minimal infrastructure that has the potential to impact offshore ornithology receptors. In line with the NatureScot representation, the Scottish Ministers advise that there is the potential for impacts to ornithology receptors in both the construction and decommissioning phases of the MHPGC Project and this must be considered further in the EIA Report.	The Scottish Ministers' agreement on the Offshore and Intertidal Ornithology Study Area is welcomed. Construction and decommissioning phase effects on marine ornithology receptors are considered in Section 6.8 and intertidal ornithology receptors are assessed within Volume 3; Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology of the PEIR.
The Applicant presents the data sources considered for offshore and intertidal ornithology in Section 7.7.4 of the MHPGC Project Scoping Report. The Scottish Ministers are largely content with the data sources presented however, highlight the additional data sources provided in the NatureScot representation and advise that the Applicant must consider these further when compiling the EIA Report.	The additional data sources provided by NatureScot including SiteLink, NatureScot Guidance notes and Ossian Offshore Wind Farm EIA Report have been considered to inform the marine ornithology assessment [see Section 6.4].
In terms of designated sites, the Scottish Ministers advise that the approach used by the Applicant to identify designated sites with offshore ornithological features within close proximity to the MHPGC Project is insufficient and may omit sites and species that could be affected by the MHPGC Project. The Scottish Ministers therefore advise that the NatureScot Guidance Note 3 must be used in the EIA Report for determining Special Protection Area (SPA) connectivity.	NatureScot Guidance Note 3 (NatureScot, 2023b) has been included to inform the baseline characterisation of this PEIR Chapter [see Section 6.4]. MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment Report to Inform Appropriate Assessment (RIAA), prepared to accompany the PEIR assesses potential effects on ornithology qualifying features of designated sites with connectivity to the MHPGC Project.
The Scottish Ministers also highlight the NatureScot representation regarding the Outer Firth of Forth and St Andrews Bay Complex SPA and request that this is considered by the Applicant.	The comment on the Outer Firth of Forth and St Andrews Bay Complex SPA has been noted when determining connectivity of designated sites to the MHPGC Project as well as the SPAs that have breeding

Comment	How and where considered in the PEIR
	connectivity along the east coast of Scotland to this European site. MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment Report to Inform Appropriate Assessment (RIAA) , prepared to accompany the PEIR, assesses impacts on ornithology receptors of designated sites with connectivity to the MHPGC Project.
The impacts proposed to be scoped in for further assessment in the EIA Report are outlined in Table 7.44, while the impact proposed to be scoped out of further assessment is presented in Table 7.45. The Scottish Ministers are broadly content with the impacts proposed to be scoped in and out of the EIA Report however, in line with the NatureScot representation, advise that no justification has been provided in the MHPGC Project Scoping Report as to the scoping out of “indirect impacts from underwater sound affecting prey species” and “temporary habitat loss/disturbance from increased Suspended Sediment Concentrations (SSCs), including indirect impacts on prey species” during the operation and maintenance phases of the Proposed Works. The Scottish Ministers advise that the Applicant must discuss this further with NatureScot prior to submission of the EIA Report.	Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species and indirect impacts from underwater sound affecting prey have subsequently been scoped in and assessed within Section 6.8 .
With regards to the approach to assessment described in Section 7.7.8 of the MHPGC Project Scoping Report, the Scottish Ministers are generally content with this and advise that the NatureScot representation regarding Zone of Influence (Zol) must be considered further by the Applicant. In addition, the Scottish Ministers refer the Applicant to the NatureScot representation regarding valued ornithological receptors and Highly Pathogenic Avian Influenza and advise that this must be fully considered and implemented in the EIA Report.	Zol, valued ornithological receptors and Highly Pathogenic Avian Influenza (HPAI) have been considered in Section 6.4 .
In terms of mitigation and monitoring, the Scottish Ministers are broadly content with the designed in measures and mitigation presented by the Applicant in Section 7.7.7. The Scottish Ministers advise however, that the full range of mitigation measures and published guidance must be included in the EIA Report along with further information on ornithological monitoring. The Scottish Ministers draw the Applicant’s attention to the representation by NatureScot in this regard and request that this is considered by the Applicant when compiling the EIA Report.	The commitments relevant to marine ornithology (with reference to published guidance) are discussed in Section 6.7 [Table 6.24] . No significant adverse residual effects with Section 6.8 and Section 6.10 have been identified, therefore monitoring, is not required.
The Scottish Ministers are content with the approach to potential cumulative impacts outlined in Section 7.7.9 of the MHPGC Project Scoping Report.	The Scottish Ministers’ agreement is welcomed. The assessment of cumulative impacts for marine ornithology receptors is presented within Section 6.9 .
With regard to transboundary impacts presented in Section 7.7.11 of the MHPGC Project Scoping Report, the Scottish Ministers advise that, there is no potential for transboundary impacts based on the information presented in the MHPGC Project Scoping Report. This is a view supported by the NatureScot representation.	The Scottish Ministers’ conclusion of no potential for transboundary impacts with respect to marine ornithology receptors is welcomed. This aligns with the conclusion as presented within Section 6.11 .
The Scottish Ministers note that a Marine Protected Area (MPA) screening assessment has been provided in Appendix E of the Scoping Report. The Scottish Ministers are content that there is no connectivity to any ornithological features of Nature Conservation MPAs. This view is supported by the NatureScot representation.	The Scottish Ministers’ conclusion that there is no connectivity to any ornithological features of Nature Conservation MPAs is welcomed.
NatureScot	
It is noted in Paragraph 7.7.3.5 that the MHPGC Project will include minimal infrastructure that has the potential to impact offshore ornithology receptors, which we would agree with for the O&M phase.	Construction and decommissioning phase effects on marine ornithology receptors are considered in Section 6.8 .

Comment	How and where considered in the PEIR
However, we would highlight that there is the potential for impacts to ornithology receptors in the construction and decommissioning phase.	
Paragraph 7.7.3.6 acknowledges that as seabirds and other migratory birds are highly mobile species, there is the potential for birds occurring within the study area to have originated from more distant locations (e.g. breeding colony). Therefore, it is proposed, for each species, to identify a regional study area based on a number of factors including published foraging ranges from Woodward <i>et al.</i> , 2019. We are content with this approach.	Details of the baseline environment for marine ornithology including definitions of the study areas considered are presented within Section 6.4 .
Examples of data sources that will be used to inform the ornithology assessment are discussed in Section 7.7.4. We are content with these but would recommend the following additional data sources are also considered: • SiteLink – provides access to data and information on key protected areas around Scotland; • NatureScot guidance notes to support offshore wind applications - marine ornithology; • Ossian Offshore Wind Farm EIA Report.	The SiteLink, NatureScot guidance, and Ossian Offshore Wind Farm EIA reports have been reviewed to inform this PEIR Chapter [see Section 6.4 and Section 6.9].
Paragraph 7.7.5.3 acknowledges that species which occur within the Offshore and Intertidal Ornithology Study Area may be qualifying features of designated sites. It goes on to state that to inform the scoping report, a generic 50km buffer has been used to identify designated sites with offshore ornithological features (e.g. SPAs) within close proximity to the MHPGC proposal. We advise that this approach is insufficient and may omit species and sites that could be impacted by the proposal. For SPA connectivity we advise following our Guidance note 3 – identifying theoretical connectivity with breeding site SPAs using breeding season foraging ranges.	This approach have been updated in accordance with NatureScot Guidance Note 3 (NatureScot, 2023b) using species specific foraging ranges to determine connectivity between designated sites and the MHPGC Project PEIR Red Line Boundary [see Section 6.4].
Table 7.42 includes mention of the Outer Firth of Forth and St Andrews Bay Complex SPA – just to highlight that a number of the Outer Firth of Forth and St Andrews Bay Complex SPA qualifying seabird species are functionally linked to breeding colony SPAs along the east coast of Scotland. Further information can be found in the Sites' Conservation and Management Advice note14 via SiteLink, which may be helpful when undertaking the assessment.	Consideration of potential likely significant effects on the Outer Firth of Forth and St Andrews Bay Complex SPA and subsequent the SPAs functionally linked to the designated site have been appropriately considered within MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment Report to Inform Appropriate Assessment (RIAA), prepared to accompany the PEIR . The conclusion of which was the potential for a likely significant effect on the Outer Firth of Forth and St Andrews Bay Complex SPA and subsequent connected SPAs qualifying seabird species can be confidently ruled out for all effect pathways.
The potential impact 'indirect impacts from underwater sound affecting prey species' is proposed to be scoped out for the O&M phase, with no justification provided	Indirect impacts from underwater sound affecting prey species during the construction, O&M and decommissioning phase are assessed in Section 6.8 . Further consultation on the matter was discussed as detailed in Table 6.5 .
Underwater sound impacting fish and shellfish was proposed to be scoped out as per Table 7.27 of the MHPGC Project Scoping Report as it states that major maintenance activities will be non-routine. However, no detail is provided on what major maintenance, or any maintenance activities, might comprise. Therefore, as per our advice for fish and shellfish (Appendix D), this impact should remain scoped in for ornithology for the operation and maintenance phase until some	Indirect impacts from underwater sound affecting prey species are assessed in Section 6.8 . Further consultation on the matter was discussed as detailed in Table 6.5 .

Comment	How and where considered in the PEIR
justification is provided. We advise this could be agreed during discussions prior to application submission.	
Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species has also similarly been scoped out for the operation and maintenance phase, with no justification provided. This potential impact has also been proposed to be scoped out for a number of receptors including benthic ecology, physical processes and fish and shellfish interests. However, as advised for those receptors, without justification or evidence that repairs are likely to be minor in nature, this impact should be scoped into the operation and maintenance phase for further assessment. Particularly as it acknowledges in Table 7.44 that increased SSCs has the potential to affect the foraging efficiency of diving birds as well as indirect impacts on fish and shellfish prey. We advise that this could be discussed further prior to application submission.	Indirect impacts from underwater sound affecting prey species are assessed in Section 6.8 . Further consultation on the matter was discussed as detailed in Table 6.5 .
Paragraph 7.7.8.3 states that the assessment of likely ecological impacts of the MHPGC proposal will focus on valued ornithological receptors' (VORs) and that VORs are species populations and assemblages of high ecological value present within the ZoI and in numbers that could mean any impacts associated with the proposal are considered significant. These VORs will then be subject to a semi-quantitative, evidence-based assessment to consider impacts and identify any required mitigation. We are generally content with this approach, subject to our previous advice around the Zone of Influence (ZoI), but advise the Applicant to consult us further on the list of VORs and detailed assessment approach prior to application submission. Additional advice in relation to taking account of Highly Pathogenic Avian Influenza (HPAI) within the assessment is provided below.	Noted. List of key receptors was provided to Natural England and NatureScot for feedback [see Table 6.5]. The list of key receptors considered for assessment have been discussed in Section 6.4 . As well HPAI has been considered in Section 6.4
We advise that there is a need to incorporate HPAI impacts within the assessment. Work is continuing within NatureScot to provide further information and guidance, which will be available in due course. In the meantime, we expect the impact of HPAI on colonies to be considered qualitatively. Surveys have been undertaken at a number of key seabird colonies in 2023, coordinated by the Royal Society for the Protection of Birds (RSPB), some of which were repeated in 2024. Recent data for key species at some sites can be found on the Seabird Monitoring Programme (SMP) database. In addition, the RSPB have published a report (Tremlett <i>et al.</i> 2024) on HPAI effects, which will provide useful context.	Discussion on the impact of HPAI has been considered qualitatively with the use of Tremlett <i>et al.</i> (2024), while the SMP database has been used as part of our baseline data [see Section 6.4].
Designed in measures and mitigation relevant to ornithology is outlined in Table 7.46. We welcome the identification of embedded mitigation at an early stage. However, as noted in the cover letter and previous appendices, much of the designed in measures / mitigation includes adherence to post-consent plans. Plans do not strictly constitute mitigation as it is the measures contained within the plans that will mitigate impacts for which no detail has been provided yet.	The commitments relevant to marine ornithology are discussed in Table 6.24 .
We welcome designed in measure MM-79, which commits to developing a VTMP. However, we note that this appears to cover the construction phase only. We would advise the VTMP contains measures to minimise disturbance of bird species across all phases of the proposal and should consider most likely ports and harbours to be used by vessels transiting to and from the MHPGC Project.	The VTMP (CoT30) and RTDP (CoT54) will be applied in the O&M phase to minimise disturbance of bird species during construction and operation and maintenance phase of the MHPGC Project [see Table 6.24].

We advise that there is no potential for transboundary impacts from the proposal description and information provided within the EIA Scoping Report. Please see our scoping advice in respect of the Morven Offshore Wind Array (24 August 2024), where we advise consideration will be required for cross border impacts for the array alone.	Noted. No further action.
An MPA screening assessment (Appendix E) has been provided within the Scoping Report. We have reviewed the information provided in Section E.3 and agree that there is no connectivity to any ornithology features of MPAs.	Noted. A document outlining the approach to the MPA/MCZ assessment is provided within Approach to Marine Protected Area/Marine Conservation Zone and Highly Protected Marine Area Assessments, prepared to accompany the PEIR . A detailed MPA/MCZ assessment will be provided to support the Development Consent Order (DCO) application.

6.3.2 Further consultation and engagement

- 6.3.2.1 The scope and methodology of the marine ornithology assessments completed to date have been discussed and, where appropriate, agreed with stakeholders via technical notes and the marine ornithology EWG meetings, as part of the MHPGC Project EPP.
- 6.3.2.2 In advance of the first EWG, a technical note was issued to Natural England (16 July 2025) to gain agreement on survey methodologies, with a response received from Natural England on 11 September 2025. A marine ornithology EWG meeting was subsequently held on 18 November 2025, attended by Natural England and MMO. NatureScot did not attend the EWG but provided feedback prior to the meeting, having received the technical note and accompanying slide deck [see **Table 6.5**]. The agenda provided an overview of the MHPGC Project, project updates, scoping comments and the proposed baseline, approach to impact assessment and mitigation approach. The first EWG technical note was issued to Natural England and NatureScot on 18 November 2025, outlining the MHPGC Project's proposed scope of intertidal ornithological surveys. Natural England provided their feedback on the 19 December 2025.
- 6.3.2.3 The list of VORs screened in for assessment were provided to NatureScot and Natural England for feedback. A response was received from NatureScot on 15 July 2026. Natural England confirmed they did not have capacity to review but noted NatureScot's comment. The second EWG meeting was held on 16 July and attended by Natural England. NatureScot circulated comments after the EWG having received the accompanying slide deck. The second EWG meeting provided an update to the MHPGC Project, addressed the EWG1 actions, initial assessment outcomes and next steps. Comments received as part of this consultation are set out in in **Table 6.5**.

Table 6.5: Summary of further consultation and engagement

Date	Consultee and response type	Comment	How and where considered in the PEIR
18 November 2025	Natural England, EWG1	Stakeholder recommendation: Species such as red-throated divers may require more detailed qualitative assessment if present.	This chapter undertakes a separate red-throated qualitative assessment of these effect pathways where appropriate during all phases [see Section 6.8.2].
18 November 2025	Natural England, EWG1	The MHPGC Project Scoping Report scoped out vessel-disturbance impacts for gulls, gannet (<i>Morus bassanus</i>) and auks. Stakeholder response to assessment approach: Further evidence is required before removing the impact pathway.	This chapter undertakes a qualitative assessment of these effect pathways during all phases [see Section 6.8].

Date	Consultee and response type	Comment	How and where considered in the PEIR
18 November 2025	Natural England and NatureScot, EWG1	The Applicant proposed scoping out: the O&M phase assessment of: - Indirect impacts from underwater sound affecting prey species; - Temporary habitat loss/disturbance from increase SCC, including indirect impacts on prey species. Stakeholder response to assessment approach: These impact pathways should be included for consideration. Based on feedback received, it was agreed that a short qualitative assessment within the PEIR, and ES, is appropriate for the O&M phase.	This chapter undertakes a qualitative assessment of these effect pathways during all phases [see Section 6.8].
18 November 2025	Natural England, EWG1	Agreement was sought on sensitivity of key receptors to impact pathways. Stakeholder response to assessment approach: Offshore ornithology receptors are to be considered for the assessment of impact of disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels. NE did not agree this impact can be scoped out of the assessment as further information is required.	This chapter has considered all marine ornithology receptors present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area and have been assessed for disturbance and displacement from airborne noise, underwater sound, and visual disturbance in Section 6.8 . Species excluded from assessment have been justified within Section 6.8.2 .
18 November 2025	Natural England, EWG1	The Applicant proposed a quantitative assessment is not considered necessary, and a qualitative evaluation is proportionate and sufficient to inform significance of effects. Stakeholder response to assessment approach: It is agreed the use of a qualitative assessment of all potential impact pathways to offshore ornithological receptors during all MHPGC Project phases is proportionate. This agreement is subject to provision of the methods provided in the PEIR and subsequent ES and further details of the potential impacts.	This has been noted and with the initial assessment outcomes presented in EWG2 (see comment from NE on 16 th July). Subsequently, this PEIR undertakes a qualitative assessment of these effect pathways during all phases [see Section 6.8].
19 December 2025	Natural England, Technical Note	Response to proposed intertidal survey methodology: Natural England advised that the second year of intertidal bird survey to be extended to September 2026 to ensure a full second year of intertidal data is collected.	The second year of intertidal bird surveys will be undertaken monthly between October 2025 and September 2026.
15 July 2026	NatureScot	We are generally content with the species that have been screened in for the offshore displacement and indirect	Screened VORs have been determined based on baseline data presented in Section 6.4.5 . Identification of

Date	Consultee and response type	Comment	How and where considered in the PEIR
	Feedback for the list of VORs	impacts, but please see our comments below. It would have been helpful if the spreadsheet could have been accompanied by more detailed explanatory text. For example, it is not entirely clear how the lists of possible receptors have been developed, or how connectivity to designated sites has been determined. Nevertheless the list of possible receptors contains all the species we would expect to see. For the connectivity, we have assumed that you have followed the approach used in the Morven North and Morven South Array Applications, as the species with potential connectivity lists matches what we would generally expect (although in several cases the designated sites with connectivity have not been provided). The small section of the export cable corridor (ECC) that is within Scottish waters is the section closest to the array area, therefore we would expect that the seabird species using this area will be roughly similar to the species composition and abundance using the array area. As such, we have also taken into account the baseline characterisation document for Morven South when considering this screening.	theoretical connectivity to designated sites utilised species generic Mean Max (MM) plus one standard deviation (MM+1SD) foraging ranges (Woodward <i>et al.</i>, 2019) to determine qualifying feature connectivity (see MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment Report to Inform Appropriate Assessment (RIAA), prepared to accompany the PEIR).
15 July 2026	NatureScot Feedback for the list of VORs	For the displacement impacts you have scoped in guillemot, razorbill and puffin. We agree with this as these species were present in the Digital Aerial Survey (DAS) for Morven and are known to be vulnerable to disturbance from vessel movements. All other species have been scoped out. From the DAS, we would expect that the Scottish section of the ECC may have significant numbers of kittiwake, herring gull, gannet and fulmar, but these species are not expected to be vulnerable to disturbance from vessel movements, especially when far from the colonies. We are therefore content with the scoping out of these species. The spreadsheet does not seem to consider vessel movements to and from port(s) during the pre-construction and construction activities relating to the ECC. We would expect this to be covered by the Morven Hawthorn Pit Grid Connection Project application. Some of the species screened out here might need to be screened in for vessel movements to and from port(s). You should consider	Agreement is welcomed acknowledging that contentment within the scoping of each species for each impact pathway. Vessel movements to and from port(s) during pre-construction and construction activities have been considered. As a result the list of species screened into the assessment has not changed. Furthermore, the VTMP (CoT30) [described in Table 6.24] will address the level of traffic, and the routes and ensure aggregation of vulnerable species are avoided. Wade <i>et al.</i> (2016) has been included as a data source for the assessment of disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels [see Section 6.8].

Date	Consultee and response type	Comment	How and where considered in the PEIR
		which port(s) may be used, the level of vessel traffic per day and per season, and whether the vessel routes will go through or near designated sites, or hotspots of species potentially vulnerable to disturbance from vessel movements. Also, we recommend that Wade <i>et al.</i> (2016) should also be included as a data source when considering the potential impacts of disturbance from vessel movements.	
15 July 2026	NatureScot Feedback for the list of VORs	For the indirect impacts, including impacts from underwater noise affecting prey species and temporary habitat loss/disturbance from increased suspended sediment (including impacts on prey species), you have scoped in razorbill, guillemot, puffin, sandwich tern, arctic tern, common tern and roseate tern. We agree with this scoping, with the Scottish species of concern being razorbill, guillemot, puffin, and possibly arctic and common tern. We would expect gannet and kittiwake to also be on site. Kittiwake may also be vulnerable to impacts to prey, but due to the distance of the Scottish section of the ECC from shore, the small area likely to be directly impacted, and the wide foraging range of kittiwake, it seems unlikely that the impact would be significant. Gannet have very wide foraging ranges, and a more generalist diet, so we would expect that they would also be unlikely to be significantly impacted by these indirect impacts.	The NatureScot agreement on the justification of screened in species for indirect impacts is welcomed.
16 July 2026	Natural England MMO NatureScot EWG2	Agreement was sought on the appropriateness of the data sources used to characterised the baseline. Both NE and NS are in agreement that the data sources used to characterise the baseline are acceptable.	Data sources used to characterised the baseline are presented within Table 6.6 .
16 July 2026	Natural England NatureScot EWG2	Agreement was sought on that a qualitative assessment is acceptable and proportionate for this EIA, and that quantitative is not required to inform the significance of effects. NE are in agreement that a quantitative assessment will not be undertaken within the PEIR or ES.	A quantitative assessment has not been undertaken in this PEIR chapter. Subsequently, this PEIR undertakes a qualitative assessment of these effect pathways during all phases [see Section 6.8].
16 July 2026	Natural England NatureScot EWG2	Agreement was sought on the species included for assessment for the effect pathways. NE require further information before agreeing the species included for	The list and justification for each species included for each effect pathway have been presented throughout Section 6.8 . Agreement

Date	Consultee and response type	Comment	How and where considered in the PEIR
		assessment for the four impact pathways are acceptable. However, NatureScot required further information on the justification for inclusion or exclusion.	was secured with NatureScot (see comment from 15th July).

6.4 Baseline characterisation

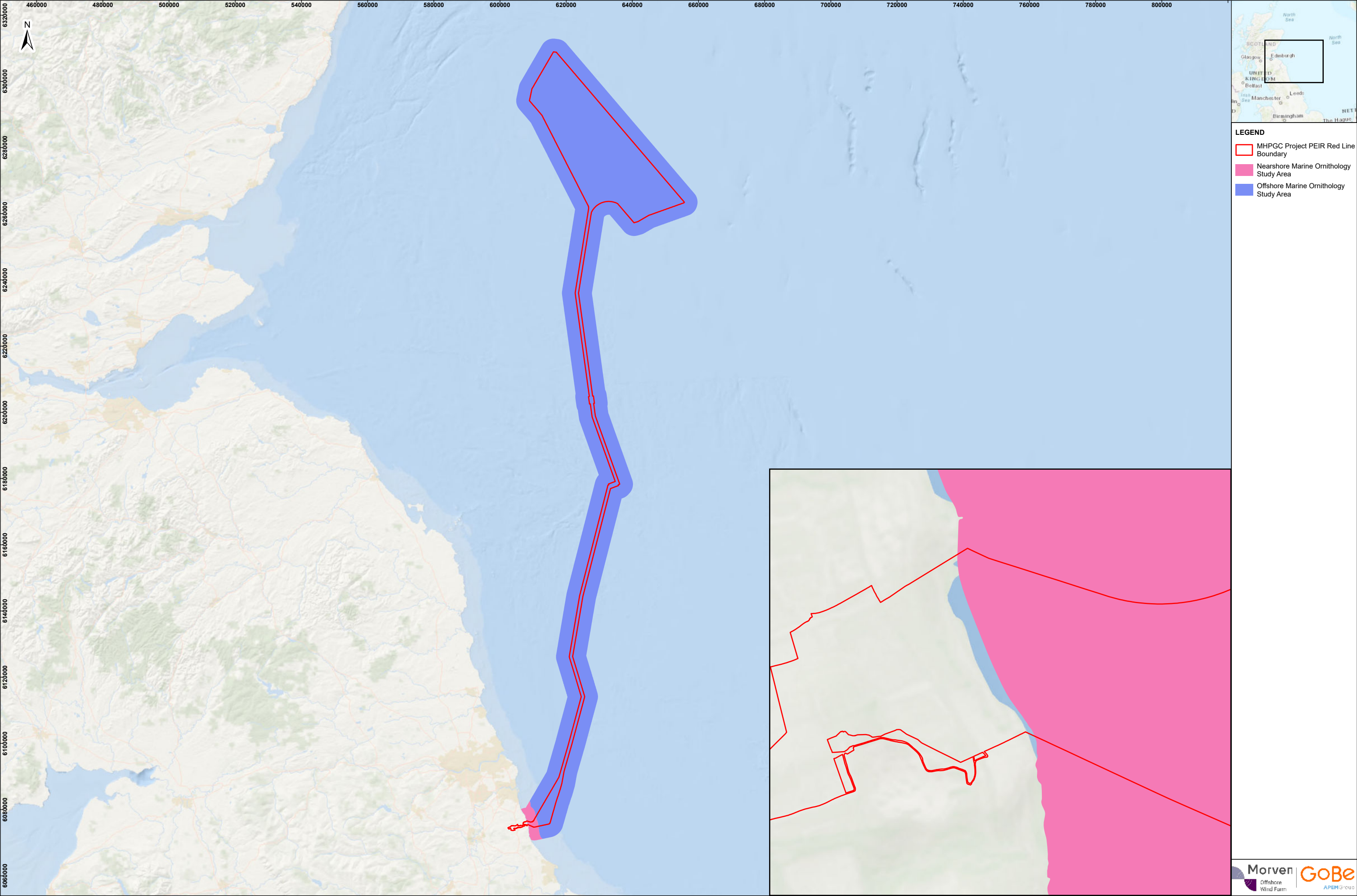
6.4.1 Overview

- 6.4.1.1 **Volume 1, Chapter 2: Project Description, of the PEIR** sets out the description of the MHPGC Project and **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** sets out the overarching approach that has been used in developing the preliminary environmental information.
- 6.4.1.2 This section describes the methods and data sources used to characterise the baseline for ornithology receptors within the Nearshore Marine Ornithology Study Area and Offshore Marine Ornithology Study Area and describes the existing baseline characteristics.

6.4.2 Study Areas

- 6.4.2.1 The MHPGC Project is located in the Central North Sea, connecting the OSPs within Morven North or Morven South, located 60km and 86km respectively off the coast of Aberdeenshire, Scotland to MHWS at landfall. The offshore export cables will transit Scottish offshore, English offshore and English inshore waters. The landfall is located south of Seaham, County Durham in England. Accordingly, the ornithology baseline is considered both in a Scottish and English context.
- 6.4.2.2 The study area has been split into two distinctive environments (nearshore and offshore), as presented in **Figure 6.1**, enabling clearer identification and subsequent assessment of key ornithological receptors and effect pathways relevant to the MHPGC Project:
- **Offshore Marine Ornithology Study Area** – comprising the MHPGC Project PEIR Red Line Boundary, (plus a 4km Zol buffer) spanning both Scottish and English waters, seaward of 3km from the MLWS [see **Figure 6.1**]. The Offshore Marine Ornithology Study Area spans both English and Scottish waters, encompassing 98km of the offshore export cable corridor located within Scottish waters and with 228km of the offshore export cable corridor located within English waters.
 - **Nearshore Marine Ornithology Study Area** – comprising the MHPGC Project PEIR Red Line Boundary extending 3km seaward of MLWS, together with a 4km Zol buffer. Although the offshore boundary for other environmental topics extends to MHWS, the Nearshore Marine Ornithology Study Area is defined by MLWS to provide a clear assessment boundary between the marine and intertidal ornithology assessments and to avoid double-counting receptors. The 4 km Zol buffer is truncated where it would overlap with terrestrial or intertidal habitats and at the interface between the nearshore and offshore study areas, ensuring receptors are assessed only once within the most relevant study area. The boundary is an assessment tool rather than an ecological separation between habitats.
Species primarily associated with intertidal habitats, such as waders and other shorebirds, are assessed within the Intertidal Ornithology Study Area, while species using nearshore marine waters are assessed within the Nearshore Marine Ornithology Study Area. The MLWS boundary is therefore applied as a pragmatic assessment boundary rather than representing an ecological separation between habitats.
This area includes shallow and coastal waters where nearshore species may be sensitive to noise, visual disturbance and localised changes in prey availability. At landfall locations, the site-specific intertidal bird surveys extend 1.5km offshore, providing partial coverage of the Nearshore Marine Ornithology Study Area, which is considered sufficient coverage for nearshore assessment [see **Figure 6.1**]. The Nearshore Marine Ornithology Study Area is fully encompassed within English inshore waters.

- 6.4.2.3 There is no guidance or literature to support a specific distance for the consideration of marine ornithological receptors for offshore export cables impact assessment. However, using professional judgement and in line with relevant studies (SNCBs, 2022; Goodship and Furness 2022; Fliessbach *et al.*, 2019) related to displacement distances from vessel presence, a 4km buffer zone was chosen for both the Nearshore Marine Ornithology Study Area and Offshore Marine Ornithology Study Area.



6.4.3 Relevant guidance

6.4.3.1 The preliminary assessment has been carried out in accordance with the following guidance documents:

- Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications (Natural England, 2022a);
- Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase II: Expectations for pre-application engagement and best practice guidance for the evidence plan process (Natural England, 2022b);
- Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase III: Expectations for data analysis and presentation at examination for offshore wind applications (Natural England, 2022c);
- Guidelines for ecological impact assessment (EclA) in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. September 2018 Version 1.3 – updated September 2024 (Chartered Institute of Ecology and Environmental Management (CIEEM), 2024);
- EIA for Offshore Renewable Energy projects (British Standards Institute (BSI) (2015);
- Nationally significant infrastructure projects: advice on transboundary impacts and process (PINS, 2024; and Advice Note Seventeen: Cumulative Effects Assessment (PINS, 2019);
- Guidance to support Offshore Wind Applications: Marine Ornithology and associated topic-specific guidance notes (NatureScot, 2023a; 2023b; 2023c);
- Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas (Natural England and JNCC, 2019);
- Nature Conservation Considerations and Environmental Best Practice for subsea cable for English Inshore and UK Offshore Waters (JNCC and Natural England, 2022).

6.4.4 Baseline data sources

Desk study

6.4.4.1 A desk study was undertaken to inform the baseline of the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area. The data sources identified to aid characterisation are summarised in **Table 6.6**.

Table 6.6: Summary of key offshore and nearshore ornithology data sources

Source	Summary	Date
Project-specific datasets		
APEM (2025) Morven Option Agreement Area 33 Month Report - Aerial Bird & Marine Mammal Digital Survey, Year 01-03 January 2021 – September 2023. APEM Scientific Report.	DAS data captured between January 2021 and September 2023, including Morven North and Morven South and 4km buffer. These have informed part of the marine ornithology impact assessment where MHPGC PEIR Red Line Boundary overlaps with Morven North and Morven South (and buffer).	January 2021 to September 2023.
Volume 3, Annex 3.13: Interim Wintering, Passage and Intertidal Birds Survey Technical Report, of the PEIR.	Monthly site-specific survey data captured between April 2023 to May 2024 and October 2025 to September 2026. These have informed the nearshore ornithology impact assessment.	April 2023 to March 2024 and October 2025 to September 2026.
Regional Datasets		
APEM (2023; 2024a) Ornithological and Marine Mammal Baseline Characterisation Surveys for the POSEIDON project.	DAS data a part of the POSEIDON project providing baseline information on species within the Central North Sea.	December 2022 to June 2023.
Cambois Connection - Marine Scheme, Environmental Statement - Volume 2, ES Chapter 10: Offshore and Intertidal Ornithology.	Publicly available ES Chapter for Berwick Bank cable connection in planning briefly overlaps with the MHPGC Project.	October 2022 to March 2023.
Seabird distribution datasets		
Waggitt <i>et al.</i> (2019); Cleasby <i>et al.</i> (2020); Kober <i>et al.</i> (2010).	UK seabird distribution datasets.	Various dates.
Wernham <i>et al.</i> (2002); Wakefield <i>et al.</i> (2013; 2015);	Bird distribution, migration and foraging movements.	Various dates.
Population datasets		
SMP Online Database (British Trust for Ornithology (BTO), 2025).	Online database of recent colony counts of seabirds across the UK and Ireland.	2025
Wetland Bird Survey (WeBS) and Non-Estuarine Waterbird Survey (NEWS) data (survey data obtained from the BTO, summary reports including Austin <i>et al.</i> 2017 and Calbrade <i>et al.</i> (2025); Burnell <i>et al.</i> (2023); Woodward <i>et al.</i> (2020).	Bird breeding ecology and population estimates.	Various dates
Furness (2015); Mitchell <i>et al.</i> (2004)	Seasonal UK seabird population data categorised into geographical regions.	Various dates.
Project relevant literature		
Garthe and Hüppop (2004); Drewitt and Langston (2006); Maclean <i>et al.</i> (2009); Cutts <i>et al.</i> (2013).	Peer-reviewed literature referring to potential impacts of offshore cables on birds.	Various dates
Kober <i>et al.</i> (2010); Bradbury <i>et al.</i> (2014); Woodward <i>et al.</i> (2019); Waggitt <i>et al.</i> (2019).	Bird distribution, migration and foraging movements.	Various dates.
Garthe and Hüppop (2004); Furness <i>et al.</i> (2013); Bradbury <i>et al.</i> (2014); Wade <i>et al.</i> 2016; Webb <i>et al.</i> (2016); Dierschke <i>et al.</i> (2017); Jarrett <i>et al.</i> (2018); Leopold and Verdaat (2018); Mendel <i>et al.</i> (2019); Cutts <i>et al.</i> (2013).	Peer-reviewed literature referring to potential impacts of offshore cables on birds.	Various dates

Source	Summary	Date
Del Hoyo <i>et al.</i> (1992-2010); Mitchell <i>et al.</i> (2004); Furness (2015); WeBS and NEWS data (survey data obtained from the BTO, summary reports including Austin <i>et al.</i> 2017 and Calbrade <i>et al.</i> 2025); Burnell <i>et al.</i> (2023); Woodward <i>et al.</i> (2020).	Bird breeding ecology and population estimates.	Various dates

Site specific surveys

- 6.4.4.2 No site-specific surveys of the proposed offshore export cable corridor have been undertaken to characterise the Offshore Marine Ornithology Study Area; based on the expected temporary and low-level impacts arising, existing data sources are considered sufficient to characterise this Offshore Marine Ornithology Study Area. Intertidal bird surveys are currently ongoing, with data collection extending out into the nearshore environment, and so available survey data has been used to characterise the Nearshore Marine Ornithology Study Area for this PEIR Chapter.

Intertidal bird surveys

- 6.4.4.3 Intertidal bird surveys for the MHPGC Project are ongoing at the time of writing, with data collected thus far between April 2023 and March 2024 (RPS, 2024), and between October 2025 and June 2026 (see **Volume 3, Annex 3.13: Interim Wintering, Passage and Intertidal Birds Survey Technical Report, of the PEIR**) extending until September 2026. The further 2026 surveys will further inform baseline characterisation of the Nearshore Marine Ornithology Study Area as well as the assessment of impacts within the subsequent ES Chapter.
- 6.4.4.4 The intertidal surveys serve to provide an estimate of the abundance and diversity of bird species using the Intertidal Ornithology and Nearshore Marine Ornithology Study Area, as well as to identify any areas of high ornithological sensitivity.
- 6.4.4.5 Weekly intertidal ornithology surveys were carried out from April 2023 to March 2024 (with the exception of June 2023; detailed in **Volume 3, Annex 3.13: Interim Wintering, Passage and Intertidal Birds Survey Technical Report, of the PEIR**), totalling 48 site visits (RPS, 2024). While intertidal surveys between October 2025 to September 2026 were once a month.
- 6.4.4.6 The Intertidal Bird Survey Area for the 2023 to 2024 surveys included a 1.5km buffer seaward of the North Landfall Option and Central Landfall Option intertidal area. While the Intertidal Bird Survey Area for the 2025 to 2026 surveys comprises intertidal habitats present within the MHPGC Project PEIR Onshore Red Line Boundary, including a 1.5km viewshed from the coast (to cover subtidal/marine habitat) and a 250m buffer of habitats on land. Surveyors walked transects paying particular attention to the rocky shores area suitable for roost sites, with the approximate locations of birds plotted, using the FieldMaps application, as well as the count of the number of birds observed noted. All surveys were carried out following the WeBS method (BTO, 2017) and align with the survey best practice, as adapted from Gilbert *et al.* (1998). The survey design considered the appropriate strategy for non-breeding target species and any notable aggregations of target or non-target species at high and low tide by undertaken counts at each tidal phase.

Morven North and Morven South DAS

- 6.4.4.7 Site-specific DAS were undertaken encompassing Morven North and Morven South plus a 4km buffer. Monthly surveys were undertaken from January 2021 to September 2023, where digital still images were collected and analysed for the presence of seabirds (APEM, 2025). From this data, abundance and density estimates were calculated for species recorded. Morven North and Morven South are located within the MHPGC Project PEIR Red Line Boundary. These surveys provide a small degree of coverage for the Offshore Marine Ornithology Study Area where study areas overlap. Therefore, this DAS is not considered site specific data for the purpose of the assessment.

6.4.5 Overview of baseline environment

Nearshore Marine Ornithology Study area baseline characterisation

Summary of desk-based data

- 6.4.5.1 Non-estuarine waterbird surveys (NEWS) have been undertaken by BTO along the Durham coast, with data available up to the 2015/2016 count year (NEWS III; BTO, 2026). A total of 21 species were recorded in these surveys. Excluding waders, the most commonly recorded species were black-headed gull (*Chroicocephalus ridibundus*) (669 individuals), herring gull (*Larus argentatus*) (452 individuals), great black-backed gull (124 individuals) and common scoter (84 individuals). All other species had total counts of less than 20 individuals. To note, this dataset does not explicitly specify whether birds were recorded in the intertidal or nearshore marine environment.

Intertidal survey results

- 6.4.5.2 A total of 64 different species were recorded during the 2023 / 2024 intertidal surveys, and a total of 38 different species were recorded during the 2025 / 2026 surveys.
- 6.4.5.3 Further site-specific surveys are currently ongoing, the results of which will be presented within the Environmental Statement.
- 6.4.5.4 During the 2025/2026 surveys, species in the Nearshore Marine Ornithology Study Area were separated from those found in the intertidal area. The results of peak abundance and frequency of species present within the Nearshore Marine Ornithology Study Area between October 2025 to June 2026 is presented in **Table 6.7**.

Table 6.7: Results of the 2025/2026 Intertidal Bird Surveys within the Nearshore Marine Ornithology Study Area.

Species	Peak abundance	Frequency (number of visits species observed/number of visits)
Avocet (<i>Recurvirostra avosetta</i>)	1	1/9
Black-headed Gull	135	7/9
Black-throated Diver (<i>Gavia arctica</i>)	3	3/9
Common Gull (<i>Larus canus</i>)	4	3/9
Common Scoter	117	3/9
Cormorant (<i>Phalacrocorax carbo</i>)	27	7/9
Curlew (<i>Numenius Arquata</i>)	1	2/9
Eider (<i>Somateria mollissima</i>)	1	1/9
Fulmar (<i>Fulmarus glacialis</i>)	144	4/9
Gannet (<i>Morus bassanus</i>)	3	1/9
Great black-backed gull (<i>Larus marinus</i>)	3	5/9
Grey Heron (<i>Ardea cinerea</i>)	1	1/9
Greylag Goose (<i>Anser anser</i>)	4	2/9
Guillemot (<i>Uria aalge</i>)	1	2/9
Herring Gull	72	9/9
Lesser black-backed gull (<i>Larus fuscus</i>)	19	5/9
Little Grebe (<i>Tachybaptus ruficollis</i>)	1	1/9
Little gull (<i>Hydrocoloeus minutus</i>)	2	1/9

Species	Peak abundance	Frequency (number of visits species observed/number of visits)
Oystercatcher (<i>Haematopus ostralegus</i>)	12	5/9
Pink-footed Goose (<i>Anser brachyrhynchus</i>)	120	1/9
Red-throated diver	3	2/9
Redshank (<i>Tringa totanus</i>)	1	2/9
Shag (<i>Phalacrocorax aristotelis</i>)	4	2/9
Whooper Swan (<i>Cygnus cygnus</i>)	42	1/9

- 6.4.5.5 Species such as geese, swans, grebes and waders have not been considered further for assessment. These species are primarily associated with terrestrial, intertidal and estuarine habitats, where they undertake foraging, roosting and other key life-history activities. The Nearshore Marine Ornithology Study Area is not considered to provide an important environment for these species and any use of the area would be limited to infrequent transit or passage movements. These species have been assessed within **Volume 3: Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR**.
- 6.4.5.6 Additionally, pink-footed geese were observed within a relatively high abundance, but it is assumed this species was on a post-breeding migratory flight considering this species was observed 1km seaward of the intertidal area in October (the key migration period) (Fox *et al.*, 1994).
- 6.4.5.7 Furthermore, offshore cable installation activities would not result in significant temporary habitat loss, disturbance or displacement, indirect impact on prey for these species found within their ecological range (intertidal and estuarine habitat). As such these have been scoped out of the Nearshore Marine Ornithology assessment but are assessed within **Volume 3: Chapter 3: Terrestrial Ecology and Terrestrial and Intertidal Ornithology, of the PEIR**.
- 6.4.5.8 A summary of the species recorded within the Nearshore Marine Ornithology Study Area is presented in **Table 6.8**. Although the intertidal survey results are not exclusively separated out for the Nearshore Marine Ornithology Study Area for 2023/ 2024, expected species presence has been inferred from the survey results based on species habitat preference.

Table 6.8: Species expected to be present within the Nearshore Marine Ornithology Study Area

Divers	Sea ducks	Terns and gulls	Seabirds
Red-throated diver	Long-tailed duck (<i>Clangula hyemalis</i>)	Sandwich tern (<i>Thalasseus sandvicensis</i>)	Razorbill (<i>Alca torda</i>)
Black-throated diver	Eider	Common tern (<i>Sterna hirundo</i>)	Fulmar
	Common scoter	Roseate tern (<i>Sterna dougallii</i>)	Gannet
	Velvet scoter (<i>Melanitta fusca</i>)	Little gull	Shag
	Red-breasted merganser (<i>Mergus serrator</i>)	Kittiwake (<i>Rissa tridactyla</i>)	Cormorant
		Black-headed gull	
		Common gull	
		Mediterranean gull (<i>Ichthyaeetus melanocephalus</i>)	

Divers	Sea ducks	Terns and gulls	Seabirds
		Herring gull	
		Great black-backed gull	
		Lesser black-backed gull	
		Iceland gull (<i>Larus glaucoides</i>)	

Conservation status of nearshore marine ornithology receptors

6.4.5.9 The conservation status of receptors either recorded within (intertidal data) or expected to be present within the Nearshore Marine Ornithology Study Area (desk-based data) is presented in **Table 6.9**. This is inclusive of information on whether a receptor is likely to be connected to a designated site, listed as an Annex 1 of the EU Birds Directive, as well as their Birds of Conservation Concern (BoCC) status (Stanbury *et al.*, 2021 & 2024) and WCA Schedule 1 status.

Table 6.9: Conservation status of ornithology receptors recorded within or expected to be present within the Nearshore Marine Ornithology Study Area

Species	Conservation status
Long-tailed duck	Red listed UK BoCC 5, Schedule 1 of the WCA 1981, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Eider	Amber listed UK BoCC 5, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Areas.
Common scoter	Red listed UK BoCC 5, Schedule 1 of the WCA 1981, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Velvet scoter	Red listed UK BoCC 5, Schedule 1 of the WCA 1981, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Red-breasted merganser	Amber listed UK BoCC 5, not a qualifying feature of designated sites which have potential connectivity to the Offshore and Nearshore Marine Ornithology Study Areas.
Razorbill	Amber listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Guillemot	Amber listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Sandwich tern	Amber listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Arctic tern	Red listed UK BoCC 5a, Birds Directive Annex I, qualifying feature of Teesmouth and Cleveland SPA/Ramsar which has potential connectivity to the Nearshore Marine Ornithology Study Area.
Common tern	Amber listed UK BoCC 5, Birds Directive Annex I, qualifying feature of Teesmouth and Cleveland SPA/Ramsar and Northumbria Coast SPA/Ramsar site which has potential connectivity to the Nearshore Marine Ornithology Study Area.
Roseate tern	Red listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, Birds Directive Annex I, a qualifying feature of Farne Islands SPA and Coquet Island SPA which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Little gull	Green listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.

Species	Conservation status
Kittiwake	Red listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Black-headed gull	Amber listed UK BoCC 5, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Mediterranean gull	Amber listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, Birds Directive Annex I, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Common gull	Red listed UK BoCC 5, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Herring gull	Red listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Great black-backed gull	Red listed UK BoCC 5a, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Lesser black-backed gull	Red listed UK BoCC 5a, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Iceland gull	Amber listed UK BoCC 5, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Red-throated diver	Green listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, Birds Directive Annex I, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Great northern diver	Amber listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Black-throated diver	Amber listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, Birds Directive Annex I, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Fulmar	Amber listed UK BoCC 5a, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Gannet	Amber listed UK BoCC 5a, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Shag	Amber listed UK BoCC 5a, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
Cormorant	Green listed UK BoCC 5, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.

Offshore Marine Ornithology study area baseline characterisation

Summary of desk-based data

- 6.4.5.10 The Waggitt *et al.* (2019) report presents monthly 10km resolution distribution maps of cetaceans and seabirds, modelled using aerial and vessel survey data. These are extrapolated to create predicted density heatmaps to identify important habitat and areas around the UK. Survey data was collated in the North-East Atlantic between 1980 and 2018. Modelled densities were predicted using environmental data too, including temperature, depth and fronts (the linear boundary between mixed coastal waters and stratified offshore waters).

- 6.4.5.11 Within the Offshore Marine Ornithology Study Area, the predicted density maps indicate moderate to high relative densities of Atlantic puffin (*Fratercula arctica*, hereafter referred to as “puffin”) (breeding); black-legged kittiwake (hereafter referred to as “kittiwake”)(annually); herring gull (annually); common guillemot (hereafter referred to as “guillemot”)(annually); Northern fulmar (hereafter referred to as “fulmar”)(breeding) and Northern gannet (hereafter referred to as “gannet”)(breeding).
- 6.4.5.12 Other species predicted to occur in lower densities include puffin (non-breeding); lesser black backed gull (annually); Manx shearwater (*Puffinus puffinus*) (annually); storm petrel (*Hydrobates pelagicus*); great skua (*Stercorarius skua*) (annually) and European shag (hereafter referred to as “shag”)(annually).
- 6.4.5.13 These species have all been recorded within the wider North Sea area, however, the coarseness and age of the data means that only a high-level narrative can be formed, and the outputs should be interpreted as broad contextual indicators.
- 6.4.5.14 The POSEIDON project, commissioned by Natural England, was undertaken to provide further baseline data on seabird abundance distribution and behavioural data in the Central North Sea. DAS were carried out between October 2022 to September 2024 (APEM, 2023a; 2024a to 2024h). The species recorded across the survey periods are characteristic of historical records in the area, with the dominant species being auks, fulmar, gannet and kittiwake, which are routinely observed in the wider North Sea [see **Table 6.10**].

Table 6.10: Summary of POSEIDON Project frequency of seabird observations (APEM, 2023a; 2024a to 2024h)

Species	Year and months observed
Arctic skua (<i>Stercorarius parasiticus</i>)	April to June 2023, April to June 2024
Arctic/ Long-tailed skua (<i>Stercorarius longicaudus</i>)	July to September 2024
Pomarine skua (<i>Stercorarius pomarinus</i>)	July to September 2024
Great skua	July to September 2023
Puffin	All years and seasons
Razorbill	All years and seasons
Little auk	October to December 2022, October to December 2023, January to March 2024
Guillemot	All years and seasons
Arctic tern	April to June 2023, April to June 2024, July to September 2024
Common tern	April to June 2023, April to June 2024
Little gull	July to September 2023
Kittiwake	All years and seasons
Common gull	October to December 2022, January to March 2023, January to March 2024, July to September 2024
Herring gull	October to December 2022, January to March 2023, April to June 2023, October to December 2023, January to March 2024, April to June 2024
Great black-backed gull	October to December 2022, January to March 2023, July to September 2023, October to December 2023, January to March 2024, April to June 2024, July to September 2024
Lesser black-backed gull	January to March 2023, April to June 2023, April to June 2024, July to September 2024
Red-throated diver	October to December 2022

Species	Year and months observed
Great northern diver	October to December 2023, January to March 2023, January to March 2024
White-billed diver (<i>Gavia adamsii</i>)	October to December 2023, January to March 2023
European storm petrel	April to June 2024, July to September 2024
Leach's storm petrel (<i>Hydrobates leucorhous</i>)	July to September 2024
Fulmar	All years and seasons
Manx shearwater	July to September 2023, July to September 2024
Sooty shearwater (<i>Ardenna grisea</i>)	July to September 2024
Gannet	All years and seasons

6.4.5.15 During the January 2023 surveys, the most abundant species recorded were guillemot, fulmar then kittiwake, with notable numbers of auks and great black-backed gulls recorded, reflecting the typical wintering assemblages (APEM, 2023). In the May 2023 surveys, kittiwake was the dominant species followed by guillemot, fulmar and gannet, also occurring in high abundances; auks and lesser black-backed gulls were present in moderate numbers (APEM, 2024a). These species are widely known to forage at sea during the breeding season. In the December 2023 surveys, guillemot, fulmar and kittiwake again comprised the majority of observations, while auks and great black-backed gulls remained present but were less abundant than in earlier surveys (APEM, 2024b). These results align with typical wintering populations in the area.

6.4.5.16 In combination, the Waggitt *et al.* (2019) models provide a broad long-term depiction of the presence and density of species, whereas the POSEIDON project supplies contemporary high-resolution data specific to the North East Area of Opportunity, which the Offshore Marine Ornithology Study Area is expected to intersect [see **Figure 6.2**]. The species highlighted in Waggitt *et al.* (2019) as occurring in moderate to high relative densities (auks, kittiwake, fulmar and gannet) align with those presented in the POSEIDON data. The species predicted to occur in low density such as non-breeding puffin, Manx shearwater, petrel *spp.*, skua *spp.* and shag, were also intermittently recorded. This alignment supports the typical regional offshore seabird assemblage in the North Sea.

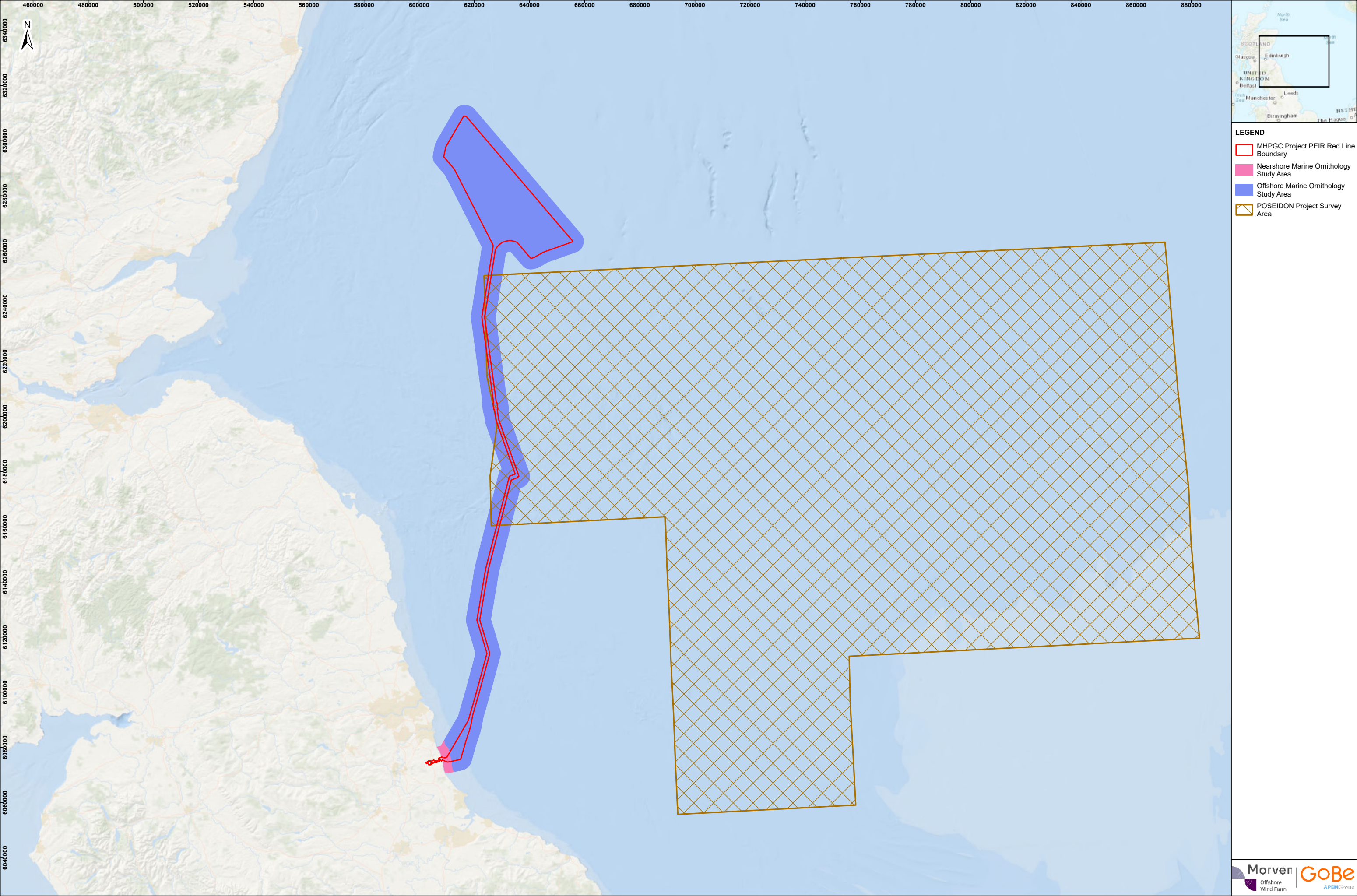
Morven North and Morven South Digital Aerial Surveys

6.4.5.17 The presence and relative abundance of bird species within the Offshore Marine Ornithology Study Area in Scottish waters can be inferred from the data collected as part of the Morven North and Morven South DAS campaign. A total of 33 months of DAS were collected between January 2021 and September 2023. The peak abundance estimates of seabird species recorded within Morven North and Morven South plus a 4km buffer, and frequency of records are presented in **Table 6.11**: (APEM, 2025).

Table 6.11: Summary of Morven North and Morven South plus 4km buffer predicted abundance and frequency of seabirds recorded (APEM, 2025)

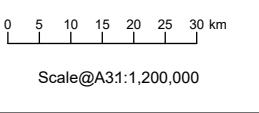
Species	Number of months recorded	Peak count month	Peak count abundance estimate
Arctic skua	1	Sep-21	16
Arctic/long-tailed skua	1	Sep-21	1
Great skua	4	Aug-Oct-21; Sep-23	9
Puffin	31	Sep-21	2,492
Black guillemot (<i>Cephus grylle</i>)	2	May-21; Aug-23	9
Razorbill	33	Jul-21	9,673
Little auk (<i>Alle alle</i>)	1	Jan-21	50

Species	Number of months recorded	Peak count month	Peak count abundance estimate
Guillemot	33	Jul-23	29,795
Guillemot/ razorbill	33	Jul-21	3,890
Arctic tern	6	Aug-22	3,597
Common/ 'commic' tern	5	Aug-22	1,097
Sandwich tern	1	Aug-22	9
Kittiwake	33	Jun-21	7,598
Common gull	5	Aug-22	49
Herring gull	14	Jul-21	353
Great black-backed gull	14	Nov-21	77
Lesser black-backed gull	1	Jun-23	9
Red-throated diver	4	May-21; May-22; Jul-22; May-23	9
European storm petrel	1	Aug-23	108
Fulmar	33	Jul-22	7,761
Sooty shearwater	1	Sep-21	17
Manx shearwater	7	Sep-23	425
Gannet	32	Jul-21	2,266



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
POSEIDON PROJECT OVERLAP WITH THE MHPGC PROJECT RED-LINE
BOUNDARY



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
World Ocean Base: OceanWise, Esri, GEBCO, Garmin, NaturalVue

LEGEND

- MHPGC Project PEIR Red Line Boundary
- Nearshore Marine Ornithology Study Area
- Offshore Marine Ornithology Study Area
- POSEIDON Project Survey Area

Drawing Number:
FIGURE 6-2

VER	DATE	DETAILS	BY	CHECK
00	18/08/2025	Initial Issue	GB	SZ
-	-	-	-	-

Seasonality

- 6.4.5.18 Seabird behaviour and distribution is recognised to vary across biological seasons (bio-seasons). Separate bio-seasons are recognised in this PEIR chapter in order to establish the level of importance any seabird species has within the MHPGC Project PEIR Red Line Boundary during any particular period of time. The biologically defined minimum population scales (BDMPS) bio-seasons are recommended by Natural England (Parker *et al.*, 2025) based on the definitions within Furness (2015) relevant to the North Sea (and English Channel where appropriate). To note, the seasonal definition recommended by Natural England (Parker *et al.*, 2025) may differ slightly to those recommended by NatureScot (2020), though this is not expected to materially alter any baseline conclusions.
- 6.4.5.19 The expected seasonal presence of seabirds within the Offshore Marine Ornithology Study Area is provided within **Table 6.12** identified from relevant literature listed in **Section 6.4.4**, categorised into either a yes (present within the Offshore Marine Ornithology Study Area), no (not present within the Offshore Marine Ornithology Study Area) or N/A (BDMPS bio-season is not relevant for the particular seabird based on expected migratory behaviour). Reviewed data sources on seabird presence are provided in **Table 6.6**, with summary of key sources provided above.

Table 6.12: Expected seabird presence within the Offshore Marine Ornithology Study Area seasonally

Seasonal presence within the Offshore Marine Ornithology Study Area				
Species	Return migration	Breeding	Post-breeding migration	Migration-free winter/non-breeding
Common scoter	N/A	N/A	N/A	Yes*
Arctic skua	Yes*	No	Yes*	N/A
Long-tailed skua	N/A	No	Yes*	N/A
Pomarine skua	N/A	No	Yes*	N/A
Great skua	Yes*	No	Yes*	No
Puffin	N/A	Yes	N/A	Yes
Black guillemot	N/A	No	N/A	Yes*
Little auk	No	NA	NA	Yes*
Guillemot	N/A	Yes	N/A	Yes
Sandwich tern	Yes*	Yes*	Yes*	N/A
Arctic tern	Yes*	Yes*	Yes*	N/A
Common tern	Yes*	Yes*	Yes*	N/A
Roseate tern	Yes*	Yes*	Yes*	N/A
Little gull	Yes*	N/A	Yes*	Yes*
Kittiwake	Yes	Yes	Yes	NA
Common gull	N/A	Yes	N/A	Yes
Herring gull	N/A	Yes	N/A	Yes
Great black-backed gull	N/A	Yes	N/A	Yes
Lesser black-backed gull	Yes	Yes*	Yes	Yes
Red-throated diver	Yes*	No	Yes*	Yes*
Great northern diver	N/A	No	N/A	Yes*

Seasonal presence within the Offshore Marine Ornithology Study Area				
Species	Return migration	Breeding	Post-breeding migration	Migration-free winter/non-breeding
White-billed diver	N/A	No	N/A	Yes*
European storm petrel	N/A	No	Yes*	N/A
Leach's storm petrel	N/A	No	Yes*	N/A
Fulmar	Yes	Yes	Yes	Yes
Manx shearwater	Yes*	No	Yes*	N/A
Sooty shearwater	N/A	No	Yes*	N/A
Gannet	Yes	Yes	Yes	N/A

* Likely present but in low to very low abundances based on available desk-based evidence and expert judgement.

N/A = no seasons defined by Furness (2015) and Kober et al. (2010)

Conservation status of offshore marine ornithology receptors

6.4.5.20 The conservation status of receptors, either recorded within site-specific surveys or expected to be present within the Offshore Marine Ornithology Study Area based on desk-based data, are presented in **Table 6.13**. This is inclusive of information on whether a receptor is likely to be connected to a designated site, listed as an Annex 1 of the EU Birds Directive, as well as their BoCC status (Stanbury et al., 2021 & 2024) and WCA Schedule 1 status.

Table 6.13: Conservation status of ornithology receptors recorded within or expected to be present within the Offshore Marine Ornithology Study Area

Species	Conservation status
Common scoter	Red listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Arctic skua	Red listed UK BoCC 5, individuals may be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Long-tailed skua	Green listed UK BoCC 5, not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Pomarine skua	Green listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Great skua	Red listed UK BoCC 5a, individuals may be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Puffin	Red listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Black guillemot	Green listed UK BoCC 5a, not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Razorbill	Amber listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Little auk	Green listed UK BoCC 5, not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.

Species	Conservation status
Guillemot	Amber listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Sandwich tern	Amber listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Arctic tern	Red listed UK BoCC 5a, Birds Directive Annex I, qualifying feature of Teesmouth and Cleveland SPA/Ramsar which has potential connectivity to the Offshore Marine Ornithology Study Area.
Common tern	Amber listed UK BoCC 5, Birds Directive Annex I, qualifying feature of Teesmouth and Cleveland SPA/Ramsar and Northumbria Coast SPA/Ramsar site which has potential connectivity to the Offshore Marine Ornithology Study Area.
Roseate tern	Red listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, Birds Directive Annex I, a qualifying feature of Farne Islands SPA and Coquet Island SPA which have potential connectivity to the Offshore Marine Ornithology Study Area.
Little gull	Green listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Kittiwake	Red listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Common gull	Red listed UK BoCC 5a, not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Herring gull	Red listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Great black-backed gull	Red listed UK BoCC 5a, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Lesser black-backed gull	Amber listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which has potential connectivity to the Offshore Marine Ornithology Study Area.
Red-throated diver	Green listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, Birds Directive Annex I, not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Great northern diver	Amber listed UK BoCC 5, Schedule 1 of the Wildlife and Countryside Act 1981, not a qualifying feature of designated sites which have potential connectivity to the Nearshore Marine Ornithology Study Area.
White-billed diver (<i>Gavia adamsii</i>)	Classed as Vulnerable on the European Red List of Birds (BirdLife International, 2021), not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
European storm petrel	Amber listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Leach's storm petrel	Red listed UK BoCC 5a, , Schedule 1 of the Wildlife and Countryside Act 1981, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Fulmar	Amber listed UK BoCC 5a, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.

Species	Conservation status
Sooty shearwater	Green listed UK BoCC 5, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Manx shearwater	Amber listed UK BoCC 5a, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Gannet	Amber listed UK BoCC 5a, individuals likely to be a combination of birds from non-designated and designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.

Designated sites

Special Protection Areas and Ramsar sites

- 6.4.5.21 Stage 1 of the HRA process (i.e. Screening) identified a total of 35 designated sites with relevant qualifying features with potential connectivity to the MHPGC Project (see **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report, prepared to support the PEIR**). Identification of theoretical connectivity to designated sites utilised species generic Mean Max(MM) plus one standard deviation (MM+1SD) foraging ranges (Woodward *et al.*, 2019) to determine qualifying feature connectivity (see **MHPGC Project Habitats Regulations Appraisal/Habitats Regulations Assessment Report to Inform Appropriate Assessment (RIAA), prepared to accompany the PEIR**).
- 6.4.5.22 Following HRA Screening the potential for a LSE could not be ruled out for a total of four designated sites. The details of these designated sites are summarised within **Table 6.14**. The potential for a likely significant effect was confidently ruled out for all other designated sites based on limited potential for temporal and spatial overlap (see **MHPGC Project Habitats Regulations Assessment/Habitats Regulations Appraisal Screening Report, prepared to support the PEIR**) when considering the localised nature of any potential effect which may arise from the MHPGC Project.

Table 6.14: SPA and Ramsar sites relevant features where LSE could not be ruled out with potential connectivity to the Marine Ornithology Study Areas.

Relevant designated sites	Qualifying feature(s) for which the connectivity distance overlaps	Distance (km)	
		From the Nearshore Marine Ornithology Study Area	From the Offshore Marine Ornithology Study Area
Northumbria Coast SPA/Ramsar (UK9020325/UK11049)	Breeding: • Little tern; • Arctic tern. Non-breeding: • Purple sandpiper (<i>Calidris maritima</i>); • Turnstone (<i>Arenaria interpres</i>).	0.0 (adjacent)	3.0

Relevant designated sites	Qualifying feature(s) for which the connectivity distance overlaps	Distance (km)	
		From the Nearshore Marine Ornithology Study Area	From the Offshore Marine Ornithology Study Area
Teesmouth and Cleveland Coast SPA/Ramsar (UK9006061/UK11068)	Breeding: • Little tern; • Common tern; • Sandwich tern. Non-breeding: • Knot (<i>Calidris canutus</i>); • Redshank; • Ruff (<i>Calidris pugnax</i>); • Sandwich tern.	4.2	2.8

Durham Coast Site of Special Scientific Interest (SSSI)

- 6.4.5.23 This SSSI consists of multiple discrete areas of coastline across the County Durham, including the majority of MHPGC Project PEIR Red Line Boundary at landfall, and is designated for biological, geological and physiographical reasons. With regard to bird species, the SSSI citation states that the site supports nationally important populations of wintering purple sandpiper and sanderling (*Calidris alba*), as well as wintering turnstone and knot.
- 6.4.5.24 The SSSI is also designated for a nationally important breeding colony of little tern at Crimdon Beach. Though at an approximate distance of 5.5km south of the Nearshore Marine Ornithology Study Area, the colony is outside of foraging range of little tern from both the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas (Woodward *et al.*, 2019).

HPAI impacts

- 6.4.5.25 During the winter season of 2020 to 2021, the HPAI (H5N1 clade 2.3.4.4b) caused widespread mortality among wild bird populations in the northwest Europe (Atkinson and Baille, 2024). The virus was first detected in great skua from Scottish colonies during the 2021 breeding season. However, the greatest spread of infection in seabirds was in 2022 (Falchieri *et al.*, 2022). To assess its impact on the UK seabird population, the RSPB conducted surveys across several SPAs for 14 species between May and July 2023 (Tremlett *et al.*, 2024). These colony counts were compared to a pre-HPAI baseline population (before from the Seabird Count census (2015 to 2021) (Tremlett *et al.*, 2024). The results revealed population declines for several species including gannet (-25%), sandwich tern (-35%), common tern (-42%), lesser black-backed gull (-25%), great black-backed gull (-20%) (Tremlett *et al.*, 2024). Gannet population decline is largely attributed to HPAI due to their rising population trends prior to the outbreak (Tremlett *et al.*, 2024). Other species such as kittiwake, herring gull, guillemot and Arctic tern exhibited variable local trends, adding to the uncertainty to the full scale of HPAI impacts.
- 6.4.5.26 Other species which have not been monitored during the RSPB survey include divers, sea ducks and Procellariidae. There is limited information on the impacts of HPAI on these species, with a small number of cases being reported for red-throated diver and fulmar across the UK (DEFRA, 2023) and for Manx shearwater in their non-breeding range in Brazil (DEFRA, 2025a).
- 6.4.5.27 The impacts of HPAI have persisted beyond the 2021 to 2022 outbreak, with continued mortalities recorded in 2023 (Tremlett *et al.*, 2024). Cases of HPAI in wild birds have continued through 2025 (DEFRA, 2025b), however there have been no significant outbreaks in seabirds post 2022. Evidence of antibodies has been detected in European shags, kittiwake, puffin, guillemot and razorbill on the Isle of May, (Greco *et al.*, 2024) and in gannet at Bass Rock where the development black eye colour indicated past exposure (Lane *et al.*, 2024). However, these results may not represent a whole population immunity.

6.4.5.28 While HPAI is a driver of seabird declines for certain species, the baseline data collated remain the most reliable source for assessing seabird presence within the Offshore and Nearshore Marine Ornithology Study Areas. It is important to recognise that HPAI is not the only factor influencing seabird populations, climate change and its associated effects on prey availability also cause long-term changes (Birkhead and Hatchwell, 2025). The outbreak of HPAI in the non-breeding season of 2021 and the breeding season of 2022 occurred prior to the collection of baseline data for the MHPGC Project. As a result, any population-level effects associated with the outbreaks will have already been reflected in the data collected, ensuring that the baseline represents the current post-HPAI status of seabird population within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas.

Vulnerability to climate change

- 6.4.5.29 Seabird species climate vulnerability has been modelled by the Marine Protected Area Management and Monitoring (MarPAMM) for 19 species across Northern Ireland, Ireland and Scotland (referred to as INTERREG Va area). This study projects significant population declines of highly climate vulnerable species in the UK and Ireland by 2050, including kittiwake (-54%), herring gull (-29%) Arctic tern (-75%), puffin (-89%) and fulmar (-73%) (Davies *et al.*, 2021). Population declines across the UK and Ireland, although by a lesser extent, are also predicted for species with moderate climate vulnerability, including sandwich tern (-69%), guillemot (-50%) and razorbill (-51%) (Davies *et al.*, 2021).
- 6.4.5.30 Other species such as common tern and lesser black-backed gull have low climate vulnerability and are predicted to experience population increases under climate change. Common tern is projected to increase within both the INTERREG Va area (+18%) and the UK and Ireland overall (+4%) by 2050, as new suitable nesting habitat becomes available (Davies *et al.*, 2021). Lesser black-backed gull is predicted to experience significant population increases across the INTERREG Va area by 2050 (+198%), with a 9% increase predicted across the UK and Ireland overall (Davies *et al.*, 2021). The availability of suitable nesting areas for lesser black-backed gulls is predicted to increase with temperature changes facilitating further colonisation across the UK (Davies *et al.*, 2021).
- 6.4.5.31 However, a low confidence level was given for the climate vulnerability scores for these species within in Davies *et al.* (2021) due to the strength of evidence for the projected changes and the model fit. Great black-backed gull is another species with potentially low vulnerability to climate change (Davies *et al.*, 2021) however, other studies for examples Searle *et al.* (2022) suggests the species may experience negative impacts from climate change. Searle *et al.* (2022) predicts decline in breeding success of great black-backed gull within North Sea populations between 2070 – 2099.
- 6.4.5.32 Similarly, Common gull are expected to decline in the INTERREG Va area by 2050, although across the UK and Ireland the species is predicted to increase by 2% (Davies *et al.*, 2021). These further highlights the discrepancies in species' climate vulnerability across regions and suggest common gull are more vulnerable to climate change impacts within the INTERREG Va area that other areas of the UK and Ireland.
- 6.4.5.33 Other species not included or that lacked data to be fully assessed within the MarPAMM study, have been evaluated based on peer reviewed literature. Manx shearwater is expected to benefit from the rising sea temperature and extreme weather events (aiding in flight energetics) (Pearce-Higgins *et al.*, 2017), with the total distribution in Europe expected to increase between 24% and 29% (Huntley *et al.*, 2007; Russell *et al.*, 2015). Similarly, gannet is projected to have a widespread increase in density, abundance and breeding success by 2070 to 2099 within the North Sea compared to levels in 1961 to 1990 and 2017 (Searle *et al.*, 2022). In contrast, red-throated diver distribution under climate scenarios between 2070 and 2099 was modelled across Europe, with results suggesting widespread declines and the loss as a breeding species within the UK (Huntley *et al.*, 2006). There is limited information on future climate impacts to common scoter for the UK alone, however, European wide studies predict a reduction in suitable breeding habitat across the species range (Fox *et al.*, 2015). With predicted temperature increases within the North Sea and around the UK, it can be assumed that habitat suitability would decrease for non-breeding individuals as well.
- 6.4.5.34 Seabird species have varying vulnerability to climate change, however overall future predicted warming is expected to intensify pressures to UK seabirds through reduction in prey availability and breeding and wintering suitable habitat (Burton *et al.*, 2023). Projected trends outlined above suggest

many species will experience significant population changes across the UK and Ireland by 2050, including declines in several species but increases in others such as Manx shearwater, gannet and lesser black-backed gull.

6.4.6 Future baseline conditions

- 6.4.6.1 During the 35 year operational lifetime of the MHPGC Project, the marine ornithology baseline can be expected to evolve both on a natural basis and in response to global trends, such as climate change and other anthropogenic activities. The Infrastructure Planning (EIA) Regulations 2017, the Marine Works (EIA) Regulations 2007 require that "an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge" is included. Therefore, an assessment of future baseline conditions, in the absence of the MHPGC Project, has been undertaken and is described within this section.
- 6.4.6.2 Throughout the globe, there are several key anthropogenic pressures that affect seabird populations which are identified as climate change, prey availability, bycatch, invasive species and pollution (Dias *et al.*, 2019; Mitchell *et al.*, 2020). In the UK North Sea, the primary threats to seabird population are changes in prey availability and climate change (Monaghan, 1992; Tasker *et al.*, 2000; Mitchell *et al.*, 2020).
- 6.4.6.3 Climate change can impact seabirds both directly and indirectly. In the North Sea, the sea surface temperatures have been increasing by 0.4°C per decade since the 1980s (Cornes *et al.*, 2023), leading to a shift in the plankton community (Beaugrand, 2003) which influences decline in prey availability (Sandvik *et al.*, 2012; Lindegren *et al.*, 2018; Wright *et al.*, 2018). In turn, this impact on the availability of key prey species leads to a struggle to find sufficient food for chicks during the breeding season (Brander *et al.*, 2016). Limited adaptation can also be caused by species biological traits such as preference to colder temperatures, which would reduce suitable habitat (Mitchell *et al.*, 2020). Direct impacts of climate change can include extreme weather events (heavy rain and strong wind) resulting in egg and chick mortalities and reduce foraging success (Mitchell *et al.*, 2020).
- 6.4.6.4 Commercial fishing can also impact prey availability within the North Sea. Scavengers (e.g. gull, gannet and fulmar) diets consist of fishery discards which has increased populations. However, food supply for these species has reduced following the introduction of the Common Fisheries Policy Landings Obligation which contains a legal duty to keep and land fish, including those that would have been discarded in the past. The primary prey source for breeding seabirds in the North Sea is sandeel (*A. tobianus*) (Furness and Tasker, 2000), which has faced severe declines due to overfishing (Frederiksen *et al.*, 2007). In response, sandeel fishing is banned within the English and Scottish waters of the North Sea, which has the potential to increase prey availability (Scottish Government, 2024). However, studies following the initial sandeel ban consider that this species is unlikely to recover due to climate change (Hiddink *et al.*, 2015). Therefore, the future population trends of seabirds in the North Sea are currently uncertain.
- 6.4.6.5 These factors are expected to affect the marine environment regardless of whether the MHPGC Project is constructed or not.

6.5 Impact assessment methodology

6.5.1 Overview

- 6.5.1.1 **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** sets out the overarching approach that has been used in developing the preliminary environmental information. This section describes the technical methods used to determine the sensitivity of the receptors and magnitude of impacts and sets out the significance criteria that have been used for the preliminary marine ornithology assessment. The methodologies for assessing sensitivity, magnitude and significance for marine ornithology are described in more detail below.
- 6.5.1.2 The criteria to determine the significance of effect were adapted to provide specific relevance for marine ornithology receptors. The general approach to significance of effect are consistent with the Design Manual for Roads and Bridges (DMRB) approach as recommended within **Volume 1, Chapter**

4: Approach to Environmental Impact Assessment, of the PEIR, whilst generally aligning with CIEEM guidelines on EclA (CIEEM, 2024).

6.5.2 Receptor sensitivity

6.5.2.1 When defining sensitivity, reference has been made to the criteria levels set out in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**. As defined within the MHPGC Project Scoping Report, the sensitivity of marine ornithology receptors are defined based on the following criteria:

- A receptor's behavioural sensitivity to an effect pathway, taking into account receptors vulnerability to any potential impact posed and species ability to recover from any impact posed;
- The conservation importance of the receptor.

6.5.2.2 Definitions of the above factors are provided in the following sections below, including context of how both factors have been considered together to conclude overall sensitivity values for receptors.

Behavioural sensitivity

6.5.2.3 Vulnerability of receptors to potential effects arising from developments and subsequent expected recovery from any potential impacts have been previously reviewed for marine ornithology receptors (such as Garthe and Hüppop, 2004; Furness *et al.*, 2013; Bradbury *et al.*, 2014; Fliessbach *et al.*, 2019; Goodship and Furness, 2022; Cutts *et al.*, 2013). These reports include information regarding sensitivity and uncertainty scores for tolerance to visual and noise impacts stemming from anthropogenic activities in the marine environment. The results of these reviews were used to inform the behavioural sensitivity definitions. Behavioural sensitivity criteria has been based on the criteria presented **Table 6.15**. To note that this deviated from the EIA methodology set out in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**, which includes a 'very high' sensitivity classification. This 'very high' classification was not deemed required in this chapter as the majority of evidence bases used in **Section 6.8** and **Section 6.10** use High as the most sensitive definition. The addition of Very High would be difficult to provide a clear definition from High. Therefore classification of behavioural sensitivity (and subsequently overall sensitivity) presented as Negligible to High.

Table 6.15: Behavioural sensitivity criteria for key receptors

Behavioural sensitivity classification	Definition
High	Receptor classified as being highly vulnerable, due to the effect pathway having the potential to cause substantial decline in key functional and physiological attributes through direct mortality, reduced reproductive success, or other effects impacting receptor fitness, due to being unable to avoid / adapt to / accommodate the pressure posed by the potential effect pathway. Receptor is also classified as having poor reproductive success and a long-term declining population trend, which is likely to significantly affect the receptors potential to recover from any impacts posed.
Medium	Receptor classified as being moderately vulnerable, due to the effect pathway having the potential to cause decline in key functional and physiological attributes through direct mortality, reduced reproductive success, or other effects impacting receptor fitness, due to being less able to avoid / adapt to / accommodate the pressure posed by the potential effect pathway. Receptor is also classified as having poor reproductive success or there is uncertainty regarding the long-term population trend of the receptor, which may impede the receptor's ability to recover from any impacts posed.

Behavioural sensitivity classification	Definition
Low	Receptor is not expected to be vulnerable to potential effect pathways, as only minor changes at most in key functional and physiological attributes are expected, which may not be detectable against natural variation, as the receptor can avoid / adapt to / accommodate the pressure posed by the potential effect pathway. Receptor is also likely to be able to recover efficiently to any impacts posed, due to the receptor having a stable to increasing long-term population trend and reproductive success.
Negligible	Minimal to no change in a receptors key functional and physiological attributes are expected in response to the effect pathway due to the receptor being insensitive to the effect pathway and / or known to be highly resilient based on known population status.

Conservation importance

- 6.5.2.4 When considering conservation value, it is important to consider the population from which the individuals are predicted to have originated from (where known) and the associated degree of connectivity to the MHPGC Project. This accounts for the seasonal movements of species, since SPA protections are generally applied during specific periods (e.g. the breeding season). As such, the conservation value can vary depending on the numbers of individuals potentially at risk of impacts associated with the MHPGC Project and the relative importance of the population. For this assessment, receptors conservation values were based on the criteria presented in **Table 6.16**.

Table 6.16: Conservation value criteria

Conservation Value	Definition
International	Receptor where all individuals at risk can clearly be linked to a specific SPA or have been confirmed present in internationally important numbers within the Marine Ornithology Study Areas. Receptor is also Red listed in the BoCC5 or BoCC5a (Stanbury <i>et al.</i> , 2021; 2024).
National	Receptor where individuals at risk are linked to both designated (SPA or SSSIs) and non-designated sites or have the potential to occur in nationally important numbers within the Marine Ornithology Study Areas. Receptor is also Red or Amber listed in the BoCC5 or BoCC5a (Stanbury <i>et al.</i> , 2021; 2024).
Regional	Receptor where all individuals at risk are not linked to any designated (SPA or SSSIs) and occur in abundance within the Marine Ornithology Study Areas at a level of county / local importance only. Receptor is Red listed in the BoCC5 or BoCC5a (Stanbury <i>et al.</i> , 2021; 2024).
Local	Receptor where all individuals at risk are not linked to any designated (SPA or SSSIs) and occur in abundance within the Marine Ornithology Study Areas at a level of local importance only. Receptor is Amber listed in the BoCC5 or BoCC5a (Stanbury <i>et al.</i> , 2021; 2024).
Negligible	Receptor where all individuals at risk are not linked to any designated (SPA or SSSIs) and occur in abundance within the Marine Ornithology Study Areas at a level of local importance only. Receptor is Green listed in the BoCC5 or BoCC5a (Stanbury <i>et al.</i> , 2021; 2024).

Overall sensitivity

- 6.5.2.5 The overall sensitivity of receptors requiring assessment is determined on a case-by-case basis via professional judgement, using the matrix presented in **Table 6.17** as a guide using the previously

defined definitions for behavioural sensitivity [Table 6.15] and conservation value [Table 6.16]. To note, there may be particular receptors classified as international conservation importance which may not be sensitive to a specific effect pathway and vice versa. An example of this is herring gull that is an interest feature of some SPAs and has a conservation concern listing of 'Red' because of recent population declines but cannot be judged to be sensitive to vessel disturbance based on known behavioural attraction (Garthe and Huppopp, 2004; Cook and Burton, 2010). In such a case, it would be reasonable to assign herring gull as Negligible/Low sensitivity. This reasoned judgement is an important part of the overall narrative used to determine the potential effect significance and can be used where relevant as a mechanism for modifying the sensitivity of an effect assigned to a specific receptor.

Table 6.17: Matrix for determining the overall sensitivity of the receptor

Conservation value	Behavioural sensitivity classification			
	Negligible	Low	Medium	High
International	Low	Medium	High	High
National	Negligible to Low	Low to Medium	Medium to High	High
Regional	Negligible	Low	Medium	Medium to High
Local	Negligible	Low	Low to Medium	Medium
Negligible	Negligible	Negligible	Negligible to Low	Low

6.5.3 Magnitude of impact

6.5.3.1 The predicted magnitude of a potential impact is influenced by key factors comprising the scale of the change, the spatial extent the impact is likely to occur and the duration and frequency of the impact. When defining the magnitude of the impact, criteria detailed in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** have been followed. Definitions of magnitude of impact refined for applicability to ornithological receptors is provided within **Table 6.18** below.

Table 6.18: Definition of terms relating to the magnitude of an impact

Magnitude	Definition
High	Large scale change in size, extent or distribution of the relevant populations that is irreversible, altering the population from the short to long term and affecting the long-term viability of the population or the integrity of the designated site. Impacts predicted are reversible over the long-term (more than five years) after development activity ceases.
Medium	A change in size, extent or distribution of the relevant populations that occurs over short and long term but is not expected to alter the long-term viability of the population or the integrity of the designated site. Impacts predicted are reversible over the medium term (approximately five years) after development activity ceases.
Low	A change in size, extent or distribution of the relevant populations that is small-scale or short-term, causing no long-term impacts to the feature/population. Impact predicted are reversible over the short-term (no more than a year) after development activity ceases.
Negligible	Very slight to no discernible change in size, extent or distribution of the relevant populations. Impact predicted are highly reversible (no more than six months) after development activity ceases.

6.5.4 Significance of effect

- 6.5.4.1 The significance of effect on receptors is determined by correlating the magnitude of the impact [Table 6.18] and the overall sensitivity of the receptor [Table 6.17]. A matrix approach is the method employed for this assessment as presented in Table 6.19.
- 6.5.4.2 Following the classification of an effect using this methodology, a clear statement will then be made as to whether that effect is significant or not significant. Major and moderate effects are considered to be significant in EIA terms, whilst minor and negligible effects are considered to be not significant in EIA terms. However, professional judgement will also be applied in reaching conclusions as to the significance of effects as per the CIEEM guidance (CIEEM, 2024), in particular where the significance matrix [Table 6.19] suggests a range of significance. Typical definitions for the significance of effects are presented in Table 6.20.

Table 6.19: Matrix used for the assessment of the significance of the effect

Overall sensitivity of receptor	Magnitude of impact			
	Negligible	Low	Medium	High
Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
Low	Negligible or minor	Negligible or minor	Minor	Minor or moderate
Medium	Negligible or minor	Minor	Moderate	Moderate or major
High	Minor	Minor or moderate	Moderate or major	Major

Table 6.20: Significance definitions

Significance classification	Definition	Significance of effect
Major	A large and detrimental change to a valuable/sensitive receptor, likely exceeding an accepted threshold. A large and beneficial change, resulting in enhancements in baseline conditions, transitioning from previously poor conditions to new legal compliance, or making a major contribution to national goals These effects may represent key factors in the decision-making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional scale. Major effects may relate to features that are unique and irreplaceable.	Significant
Moderate	A medium scale change that, although not beyond an accepted threshold, is still considered to be generally unacceptable, unless offset by significant positive benefits of the project. If adverse, these effects are likely to be important at a regional or local scale and on their own could influence on decision making. A positive moderate effect is a medium scale change that improves baseline conditions sufficiently to contribute to guideline targets.	Significant
Minor	A minor adverse change that remains within legal and planning policy limits. Minor positive change that is unlikely to significantly impact the overall balance of considerations. These effects might be raised as local issues and could be relevant to the detailed design of a project, but they are unlikely to be critical in the decision-making process.	Not significant
Negligible	A very small change that is so inconsequential it can be considered acceptable to disregard.	Not significant

Significance classification	Definition	Significance of effect
	These effects fall below perceptible limits, lie within normal variations, or fall within the margin of forecasting error. They are unlikely to influence decision-making.	

- 6.5.4.3 Where the residual effect is classified as significant in EIA terms (moderate or major effect significance; **Table 6.20**), appropriate secondary mitigation is considered, where feasible.
- 6.5.4.4 Following initial assessment, if the effect does not require secondary mitigation (or none is possible), the residual effect would remain the same. If, however, secondary mitigation is proposed, an assessment of the post-mitigation residual effect is provided.
- 6.5.4.5 Effects are more likely to be considered significant where they affect ornithology receptors of higher overall sensitivity or where the magnitude of the impact is high. Effects not considered to be significant would be those where the integrity of the receptor is not threatened, effects on receptor of lower overall sensitivity, or where the magnitude of the impact is low.

6.5.5 Assumptions and limitations of the assessment

- 6.5.5.1 The information provided in the PEIR was based on a range of relevant and publicly available data and literature. Site-specific ornithology survey data within and adjacent to the MHPGC Project PEIR Red Line Boundary at landfall and the MHPGC Project PEIR Red Line Boundary where it overlaps with Morven North and Morven South have been supplemented by the desk study data to characterise the marine ornithology baseline. The data sources used are considered sufficient for the MHPGC Project marine ornithology assessments at PEIR stage and are in line with other offshore transmission projects, some of which have used a desk study only to inform assessment.
- 6.5.5.2 The data collated as part of the desk study was assumed to be accurate. The sources used were the most current publicly available sources with multiple sources data either encompassing, or in close proximity to, the Nearshore Marine Ornithology Study Areas and Offshore Marine Ornithology Study Areas. Additionally, wider sources that span the entire Central North Sea region have been utilised. Although the DAS surveys did not include the full extent of the Offshore Marine Ornithology Study Area, the results provide an insight into which species are present where the MHPGC Project PEIR Red Line Boundary overlaps with Morven North and Morven South and could potentially be present within the MHPGC Project PEIR Red Line Boundary. Additionally, designated sites offer an indication of which qualifying species have the potential to use the Nearshore Ornithology Study Area and Offshore Marine Study Areas.
- 6.5.5.3 The baseline characterisation of the Nearshore Marine Ornithology Study Area and subsequent assessment were partially informed by the site-specific data captured during the intertidal bird surveys. Desk-based information presented in **Volume 3, Annex 3.13: Interim Wintering, Passage and Intertidal Birds Surveys Technical Report, of the PEIR** has also been considered.

6.6 Key parameters for assessment

6.6.1 Scope of the assessment

- 6.6.1.1 The approach to assessment was presented in the MHPGC Project Scoping Report and has been refined in consultation with relevant statutory and non-statutory consultees as detailed in **Section 6.3**.
- 6.6.1.2 **Table 6.21** summarises the impacts considered as part of the assessment, while a summary of the effects scoped out of the assessment is presented in **Table 6.22**.

Table 6.21: Impacts scoped into the assessment

Impact	Phase			Potential effects scoped into the assessment
	C	O&M	D	
Disturbance and displacement from airborne noise, underwater noise and visual disturbance associated with the presence of vessels.	✓	✓	✓	Airborne noise and underwater sound generated during construction activities (such as unexploded ordnance (UXO) clearance) and the presence of vessels, may temporarily disturb or displace VORs from foraging areas in the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas. The O&M phase also has the potential to result in similar effects. However, during the O&M phase activity is expected to be reduced in comparison to other project phases. While disturbance from vessels undertaking maintenance and repair activities may occur, the effect is considered to be equal to or less than during the construction phase. The effect from this predicted impact during the decommissioning phase is considered to be analogous to that of the construction phase.
Indirect impacts from underwater noise affecting prey species from vessels.	✓	✓	✓	There is potential for mortality, injury and/or displacement of sensitive fish and shellfish species as a result of underwater noise from construction activities such as pre-construction geophysical surveys, UXO clearance and increased SSCs. This may lead to reduced prey availability and subsequent energy intake affecting the productivity (in the breeding season) or survival of VORs. The O&M phase has the potential to result in similar effects. However, during the O&M phase activity is expected to be reduced. While impacts on prey from vessels undertaking maintenance and repair activities may occur, the effect is considered to be equal to or less than during the construction phase. The effect from this predicted impact during the decommissioning phase is considered to be analogous to that of the construction phase.
Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species.	✓	✓	✓	There is potential for increased SSC as a result of the construction phase to affect the foraging efficiency of receptors. The O&M phase has the potential to result in similar effects. However, during the O&M phase, activity is expected to be reduced. While there is potential for increased SSC as a result of the O&M phase to affect the foraging efficiency of receptors, the effect is considered to be equal to or less than during the construction phase. The effect from this predicted impact during the decommissioning phase is considered to be analogous to that of the construction phase.

Table 6.22: Impacts scoped out of the assessment

Impact	Justification for scoping out of the assessment
Accidental pollution	Pollution impacts (accidental oil/fuel spills) during all phases of the MHPGC Project are scoped out on the basis that the implementation of a MPCP will avoid the risk of significant pollution events [see Section 6.7]. Consequently, VORs are extremely unlikely to be significantly affected by accidental pollution.

6.6.2 Maximum design scenario

- 6.6.2.1 The MDS for each impact identified in **Section 6.6.1** has been chosen as a precautionary approach in order to assess the impacts within the context of the greatest potential effect on a VOR or VOR group. The MDS in **Table 6.23** presents the parameters set out in **Volume 1, Chapter 2: Project Description, of the PEIR** in line with the methodology outlined in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**.

Table 6.23: MDS relevant for the assessment of potential impacts on marine ornithology

Impact	MDS	Explanation
Note: Note: The cable length measurements are for the maximum distance between the Morven North or Morven South OSP and trenchless drill exit pit unless otherwise stated. For clarity one trench length is as follows: - OSP to exit pit – up to 324.67km; - OSP to MHWS – up to 326.00km; - Scottish waters (OSP – Scottish-English offshore waters boundary) – up to 98.00km; - English waters (English offshore waters boundary – exit pit) – up to 226.67km; - English waters (English offshore waters boundary – MHWS) – up to 228.00km.		
Construction		
Temporary loss/disturbance from increased SSCs, including indirect impacts on prey species habitat from including on prey species	Construction duration: up to four years. Sandwave clearance: - Sandwave clearance activities undertaken using Mass Flow Evacuation (MFE) over an approximate four month duration; - Sediment disturbance rate is 1000kg/s; - Surface width of up to 28m per trench and base width of up to 20m per trench; <u>Per trench = 1,484,000m²</u> - Scottish waters: 31km length × 28m width = 868,000m²; - English waters: 22km length × 28m width = 616,000m². <u>Total (up to two trenches) = 2,968,000m²</u> - Scottish waters: 1,736,000m²; - English waters: 1,232,000m². Cable installation (trenching): - Installation via trenching of up to 324.67km of cable, with a trench width of up to 2.1m and a depth of up to 3m; - Trenching rate is 400m/hr. <u>Per trench = 2,045,421m³</u> - Scottish waters: 98km length × 2.1m width × 3m depth = 617,400m²;	The MDS is defined by the maximum spatial extent of seabed disturbance from cable installation, route preparation, sandwave clearance and landfall works. Landfall works and vessel interactions are defined by the maximum footprint of exit pits, floatation pits, anchor spreads and jack-up activities. The MDS is inherently precautionary, assuming all maximum parameters occur concurrently with no reduction for overlapping disturbance footprints. Site preparation: - Sandwave clearance activities may be undertaken using a range of techniques (plough and MFE), over an approximate four-month duration in both Scottish and English waters. Releases via both are modelled; - A conservative MFE near-bed sediment release rate of 1000kg/s conservatively estimated based on the MDS trench cross section dimensions, the speed of progress of the tool and the bulk density of the local sediment type; - Dredge spoil release is simulated as an instantaneous release at the water surface. 10% of 11,000 m³ is assumed to form the passive phase of the plume; - Other seabed preparation such as sandwave clearance plough, boulder clearance and pre-lay grapnel run (PLGR) may be

Impact	MDS	Explanation
	- English waters: 226.67km length × 2.1m width × 3m depth = 1,428,021m³. <u>Total (up to two trenches) = 4,090,842m³</u> - Scottish waters: 1,234,800m³; - English waters: 2,856,042m³. Trenchless techniques (landfall) (English waters): - Up to four boreholes. Trenchless installation via Horizontal Directional Drilling (HDD), (conduit diameter of 1.6m, conduit length of 2,000m). Drilling fluid discharge up to 180m³ each and up to 1,083m³ total; - Trenchless drill punchout will be up to approximately 1660m offshore of MHWS in water depths up to 20m Lowest Astronomical Tide (LAT); - Up to four exit pits (140m long × 50m wide × 5m deep). Area up to 7,000m² each; 28,000m² total. Volume up to 18,667m³ each; 74,668m³ total. Up to two floatation pits (240m long × 55m wide × 5m deep). Area up to 13,200m² each; 26,400m² total. Volume up to 39,167m³ each; 78,334m³ total.	used but do not represent the MDS in terms of potential increases in SSC and associated deposition. Cable installation: - Trenching may be carried out by mechanical cutting, jet trenching, ploughing or Controlled Flow Excavation (CFE). Jet trenching is anticipated to generate the highest SSC and has therefore been assumed as the MDS; - Suspension of 100% of material from the trench cross section will give the MDS for sediment disturbance; - Conservatively assumes 100% fluidisation of material expelled from a U-shaped trench. In reality, trenching will move a proportion of material rather than bringing it fully into suspension; - Offshore export cable corridor trenching modelling assumes sediment release along the whole offshore export cable corridor; - Cable routes cross a variety of seabed materials, and burial depth may be up to 3m in some areas. The assessment therefore considers this upper bound to define the MDS in terms of sediment disturbance; - Trenching rate will be up to 400m/hr. Trenchless techniques (landfall): - HDD represents the maximum MDS for sediment disturbance due to the potential for drilling fluid release (frac-out); - The MDS for sediment disturbance by trenchless installation is given by applying a conservative Bentonite concentration of 100 kg/m³ in drilling mud, the volume of spoil released is equal to the maximum volume of the bore; - Other stages of drilling (pilot hole drilling and stages of reaming) may result in smaller release events separated in time. But the MDS is considered as a release of drilling mud from a single conduit; - Two drills could be operational at one time; however, the timing of drilling will be staggered meaning there will not be an

Impact	MDS	Explanation
		occasion where punch-out occurs simultaneously (or within 6 hours of each other). Trenchless drill punchout will be up to approximately 1,660m offshore of MHWS in water depths up to -20m LAT.
Indirect impacts from underwater sound affecting prey species	Construction duration: up to four years. UXO Clearance: • Low order clearance of up to 22 UXOs/kg; • Scottish waters: 8 UXOs (for funnel area out with overlap with Morven North and Morven South); • English waters: 14 UXOs; • One detonation within a 24 hour period to be undertaken within daylight hours. Low order UXO clearance: • Maximum size of donor charge: 0.08kg; • Maximum charge configuration for low yield technique: 4 x 0.75kg. Pre-construction geophysical surveys: Operating frequency of equipment: • Multibeam echosounder: 200kHz to 400kHz; • Side scan sonar: 300kHz to 600kHz; • Single beam echosounder: 20kHz to 40kHz; • Sub bottom profilers: 0.2kHz to 14kHz (chirp), and 85kHz to 115kHz (high frequency); • Ultra high resolution seismic (such as sparker): 0.05kHz to 4kHz; • USBL transponder: 21kHz to 31kHz; • Up to two survey vessels may be present on site at any one time. Pre-construction geotechnical surveys: • Seismic cone penetration tests (CPT) with a low frequency and low intensity sound source; • Vibrocoreing (VC) with operating frequency of 0.02kHz to 20kHz. Offshore vessel activity:	The MDS assumes the maximum number and maximum size of UXO requiring clearance. Due to uncertainties in UXO presence and characteristics prior to detailed survey, a precautionary approach has been adopted. Low order clearance techniques are assumed as the worst-case scenario for the assessment, including the use of small clearance charges and low-yield configurations. It should be noted that only low order detonations are being sought under the consent applications. High order has been considered in the assessment for information only. The MDS for underwater sound (excluding unexploded ordnance) assumes all relevant sound-generating activities across the construction phase, including geophysical surveys, geotechnical surveys, cable installation activities and associated vessel movements. Cable installation may be undertaken by mechanical cutting, jet trenching, ploughing or CFE (at localised points along the route where required). Route preparation and seabed preparation activities, including sandwave clearance (which may include MFE), boulder clearance and PLGR, are also assumed to occur. The sound associated with the CLV vessel represents the MDS for these construction phase activities associated with the installation of the export cables. A range of geophysical activities using equipment assumed to be typical for the types of surveys anticipated. Parameters have been selected to represent the highest source characteristics (e.g. operating frequencies, pulse rates and durations), thereby defining a precautionary worst-case scenario for sound generation. The MDS assumes the maximum number of vessels on site at one time and the greatest number of vessel movements during these activities. This represents the broadest range of vessel types and

Impact	MDS	Explanation
	- Up to 550 return trips by installation vessels (including Cable Lay Vessels (CLV), trenching support vessels (TSV), installation support vessel (ISV), guard vessels (GV), survey vessels, PLGR vessel, out of service cable removal vessel, boulder clearance vessel, dredging vessel, crew transport vessel (CTV), rock dumping vessel, construction support vessel, tug/anchor handler and cable barge); - A maximum of 33 vessels may be operational at any one time during the construction phase. Landfall vessel activity: - Up to 250 return trips by installation and support vessels (including CLV, ISV, GV, dredging vessels, tug/anchor handlers, cable barge, CTV and dive support vessels (DSV)); - A maximum of 14 vessels may be operational at any one time during the construction phase.	therefore sound signatures which may impact fish or shellfish receptors.
Disturbance and displacement from airborne noise, underwater sound and visual disturbance associated from the presence of vessels	Construction duration: up to four years. Offshore vessel activity: - There will be up to 550 return trips by installation vessels (including CLV, TSV, ISV, GV, survey vessels, PLGR vessel, out of service cable removal vessel, boulder clearance vessel, dredging vessel, crew transport vessel (CTV), rock dumping vessel, construction support vessel, tug/anchor handler and cable barge); - A maximum of 33 vessels may be operational at any one time during the construction phase. Landfall vessel activity: - There will be up to 250 return trips by installation and support vessels (including CLV, ISV, GV, dredging vessels, tug/anchor handlers, cable barge, CTV and DSV); - A maximum of 14 vessels may be operational at any one time during the construction phase.	The MDS is defined by the maximum number of vessels on site at any one time and the greatest number of round trips. This represents the greatest range of vessel types and movements which may result the greatest disturbance from vessel presence.
Operation and Maintenance		
Temporary habitat loss/disturbance from	O&M: Operational lifespan of 35 years.	Cable repairs (English and Scottish waters):

Impact	MDS	Explanation
increased SSCs, including indirect impacts on prey species	Cable repairs (English and Scottish waters): - Up to 41 export cable repairs, each with a length of up to 2km and a 20m width. Up to 40,000m² of temporary disturbance each; 1,640,000m² total; - Up to 4% of the cable route length, up to 13km, may require remediation per year. Remediation may occur in different locations and for varying lengths but it is anticipated that up to 13km of export cable length per year per trench will require remediation with a maximum width of 20m. Up to 522,240m² of temporary disturbance per year; total 18,278,400m².	- The greatest foreseeable number of cable reburial and repair events is considered to be the MDS for sediment dispersion; - The majority of cable repairs are anticipated to be c.500-1000m. The MDS utilises the area of disturbance by repair which provides a highly conservative area; - The repair 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.
Indirect impacts from underwater sound affecting prey species	O&M: Operational lifespan of 35 years. - Up to 5 geophysical surveys proposed per year; - Geophysical equipment as detailed in the construction phase MDS. Vessel activity: Routine inspection (no remediation/repair) constitutes survey activity (survey vessel) up to 2 surveys per year per trench; duration 2 weeks per survey; 3 return trips per survey; 2 vessel max at 1 time per survey. Per year for 2 trenches: - Surveys – 4 - Return trip – 4 x 3 = 12 - Total vessels at time – 2 Routine inspection (no remediation/repair) constitutes survey activity (Uncrewed Surface Vessel (USV)) up to 2 surveys per year per trench; duration 6 weeks per survey; 110 return trips (up to 4 USV + 1 guard vessel with port call every 4 days) (55 per survey = 110); up to 4 USV + 1 guard vessel = 5 max at 1 time per survey. Per year for 2 trenches: - Surveys – 4 - Return trips – 4 x 55 = 220 - Total vessels at time – 5	The MDS for underwater sound assumes all relevant sound-generating activities across the O&M phase, including geophysical surveys, and vessel movements for O&M purposes which may indirectly impact Marine Ornithology receptors through prey species disturbance.

Impact	MDS	Explanation
	- Remediation (up to 13.056km per year per trench, in different locations along route) Vessels on site for REMEDIATION activities, for up to two trenches: - Up to four operation and maintenance vessels on site at any one time, comprising a combination of construction support vessel (CSV) and/or Service Operation Vessels (SOV) and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. Vessel movements (remediation), for up to two trenches: - Up to 62 operation and maintenance vessel movements (return trips) each year, consisting of CSV or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. - Repair (41 lifetime repairs, for up to two trenches) Vessels on site for REPAIR activities, for up to two trenches: - Up to four operation and maintenance vessels on site at any one time, comprising a combination of CLV and/or barge and/or Barge Handlers/Tugs and/or Jack-Up and/or CSV and/or CTV and/or Rockdump. Vessel movements (repair), for up to two trenches: - Up to 245 operation and maintenance vessel movements (return trips) over the operational lifetime (35 yrs) consisting of CLV and/or barge and/or Jack-Up and/or Barge Handlers/Tugs and/or CSV and/or CTV and/or Rockdump.	
Disturbance and displacement from airborne noise, underwater sound and visual disturbance associated from the presence of vessels	O&M: Operational lifespan of 35 years. - Up to 5 geophysical surveys proposed per year; - Geophysical equipment as detailed in the construction phase MDS. Vessel activity: Routine inspection (no remediation/repair) constitutes survey activity (survey vessel) up to 2 surveys per year per trench; duration 2 weeks per survey; 3 return trips per survey; 2 vessel max at 1 time per survey. Per year for 2 trenches: - Surveys – 4;	The MDS is defined by the maximum number of vessels on site at any one time and the greatest number of round trips. This represents the greatest range of vessel types and movements which may result the greatest disturbance from vessel presence.

Impact	MDS	Explanation
	• Return trip – $4 \times 3 = 12$; • Total vessels at time – 2. Routine inspection (no remediation/repair) constitutes survey activity (USV) up to 2 surveys per year per trench; duration 6 weeks per survey; 110 return trips (up to 4 USV + 1 guard vessel with port call every 4 days) (55 per survey = 110); up to 4 USV + 1 guard vessel = 5 max at 1 time per survey. Per year for 2 trenches: • Surveys – 4; • Return trips – $4 \times 55 = 220$; • Total vessels at time – 5; • Remediation (up to 13.056km per year per trench, in different locations along route). Vessels on site for REMEDIATION activities, for up to two trenches: • Up to four operation and maintenance vessels on site at any one time, comprising a combination of CSV and/or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats. Vessel movements (remediation), for up to two trenches: • Up to 62 operation and maintenance vessel movements (return trips) each year, consisting of CSV or SOV and/or guard vessel and/or rock dump vessels and/or CTVs/workboats; • Repair (41 lifetime repairs, for up to two trenches). Vessels on site for REPAIR activities, for up to two trenches: • Up to four operation and maintenance vessels on site at any one time, comprising a combination of CLV and/or barge and/or Barge Handlers/Tugs and/or Jack-Up and/or CSV and/or CTV and/or Rockdump. Vessel movements (repair), for up to two trenches: • Up to 245 operation and maintenance vessel movements (return trips) over the operational lifetime (35 yrs) consisting of CLV and/or barge and/or Jack-Up and/or Barge Handlers/Tugs and/or CSV and/or CTV and/or Rockdump.	

Impact	MDS	Explanation
Decommissioning		
Temporary loss/disturbance from increased SSCs, including indirect impacts on prey species	Cables and cable protection (English and Scottish waters): All export cables and cable protection will be removed.	Cables and cable protection (English and Scottish waters): 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. Whilst the MDS is for all export cable materials to be removed for decommissioning, in many cases it may be less environmentally impactful to leave assets in place. The decommissioning approach will be reviewed at the time of decommissioning following the most up to date and best available guidance.
Indirect impacts from underwater sound affecting prey species	The MDS for sound from vessels for the decommissioning phase is assumed to be as that described for the construction phase.	A range of geophysical activities using equipment assumed to be typical for the types of surveys anticipated. Parameters have been selected to represent the highest source characteristics (e.g. operating frequencies, pulse rates and durations), thereby defining a precautionary worst-case scenario for sound generation. The MDS assumes the maximum number of vessels on site at one time and the greatest number of vessel movements during these phases. This represents the broadest range of vessel types and therefore sound signatures which may impact fish or shellfish receptors. Whilst the MDS is for all materials to be removed for decommissioning, in many cases it may be less environmentally impactful to leave assets in place. The decommissioning approach will be reviewed at the time of decommissioning following the most up to date and best available guidance
Disturbance and displacement from airborne noise, underwater sound and visual disturbance associated from the presence of vessels	Decommissioning Vessel presence: The MDS for vessel presence for the decommissioning phase is assumed to be as that described for the construction phase.	The MDS is defined by the maximum number of vessels on site at any one time and the greatest number of round trips. This represents the greatest range of vessel types and movements which may result the greatest disturbance from vessel presence. Whilst the MDS is for all materials to be removed for decommissioning, in many cases it may be less environmentally impactful to leave assets in place. The actual decommissioning strategy will be defined at the time of decommissioning following the most up to date and best available guidance.

6.7 Commitments adopted as part of the MHPGC Project

- 6.7.1.1 As set out in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR** and **Volume 1, Annex 4.1: Draft Commitments Register, of the PEIR**, mitigation measures have been adopted as part of the MHPGC Project to reduce the potential for impacts on marine ornithology.
- 6.7.1.2 Embedded mitigation includes the following measures as identified in the Institute of Sustainability and Environmental Professionals (ISEP), formerly Institute of Environmental Management and Assessment (IEMA), Guide to Shaping Quality Development (IEMA, 2015):
- Primary mitigation – measures included as part of location or design of the MHPGC Project and do not require additional action to be taken. ISEP describes these as “modifications to the location or design of the development made during the pre-application phase that are an inherent part of the project and do not require additional action to be taken”. This includes modifications arising through the iterative design process. These measures will be secured through the consent itself through the description of the MHPGC Project, the parameters and associated commitments secured by the DCO and marine licence, or both;
 - Tertiary mitigation – ISEP describes these as “actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements, or actions that are considered to be standard practices used to manage commonly occurring environmental effects”.
- 6.7.1.3 Embedded mitigation measures that will form part of the final design (and are established legislative requirements, good practice, or both) have been taken into account as part of the initial assessment presented in **Section 6.8** (i.e., the initial determination of impact magnitude and significance of effects assumes implementation of these measures). This ensures that the measures that the Applicant is committed to are considered in the assessment of effects.
- 6.7.1.4 Where an assessment identifies likely significant adverse effects, secondary mitigation measures may be applied. These are measures that could further prevent, reduce and, where possible, offset these effects. They are defined by ISEP as “actions that will require further activity to achieve the anticipated outcome” and may be imposed as part of the planning consent, or through inclusion in the ES. These include measures required to reduce the significance of environmental effects and may be secured through an environmental management plan. For secondary mitigation measures both pre-mitigation and residual effects are presented.
- 6.7.1.5 The measures relevant to marine ornithology are outlined in **Table 6.24**. As there is a secured commitment to implementing these measures, they are considered inherently part of the design of the MHPGC Project and have therefore been considered in the assessment presented in **Section 6.8**.

Table 6.24: Embedded commitments relevant to marine ornithology implemented as part of the MHPGC Project

Commitment number	Measure adopted	How the measure will be secured
CoT06/MM-006	An Outline OEMP will be prepared and submitted with the application for development consent. A Detailed OEMP will be developed in accordance with the Outline OEMP. The Outline OEMP will include: • An Outline Marine Biosecurity Plan; • An Outline Marine Pollution Contingency Plan; • An Outline Marine Mammal Mitigation Protocol; • An Outline Vessel Traffic Management Plan (VTMP); • An Outline Navigational Safety Plan; • A chemical risk assessment that includes information such as how chemicals will be used, stored, and transported, in line with recognised best-practice guidance; • A dropped-object protocol will be established to cover the reporting and recovery of any items lost overboard that could endanger other sea users; • A Marine Emergency Action Card outlining the steps to be followed in the case of a marine emergency; • Provisions for the handling and disposal of waste.	The OEMP will be secured through the DCO and Deemed Marine Licence conditions (England) and Marine Licence(s) (Scotland).
CoT30/MM-078	An Outline VTMP will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent. A Detailed VTMP will be developed pre-construction in line with the Outline VTMP, and in accordance with the relevant legislation, guidance and industry best practice. The Detailed VTMP will: • Detail vessel routing to and from construction areas and ports to avoid areas of high risk, including liaison with the Port of Seaham and the Port of Sunderland; • Include vessel standards and a code of conduct for vessel operators in compliance with international marine regulations as adopted by the Flag State, including the International Regulations for Preventing Collisions at Sea (COLREGs) (International Maritime Organization (IMO), 1972/77) and the International Convention for the Safety of Life at Sea (SOLAS) (IMO, 1974); • Detail measures to reduce disturbance to marine mammal receptors from transiting vessels, such as slow transit through the MHPGC Project and other measures as detailed in the Outline Marine Mammal Mitigation Protocol; • Detail measures to reduce disturbance to red throated diver from transiting vessels, such as slow transit through the MHPGC Project and other measures as detailed in the Red Throated Diver Protocol;	The VTMP will be secured through the DCO and Deemed Marine Licence conditions (England) and Marine Licence (Scotland).

Commitment number	Measure adopted	How the measure will be secured
CoT37	An Outline MPCP will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent. The Outline MPCP will describe the hazards, response strategies, and step-by-step actions for handling spills, contaminant releases (including details of non-toxic, biodegradable drilling fluids), and vessel collisions during construction or operations below MHWS, and will include all essential emergency contacts and information. A Detailed MPCP will be developed in accordance with the Outline MPCP.	The MPCP will be secured through the DCO and Deemed Marine Licence conditions (England) and Marine Licence (Scotland).
CoT54	A RTDP will form part of the Outline OEMP, which will be prepared and submitted with the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. The RTDP will include measures such as: • select routes (when transiting to site) that avoid aggregations of red-throated diver (RTD) and common scoter, where practicable; • restrict (to the extent possible) vessel movements when transiting to the site to existing navigation routes (where the densities of RTDs are typically relatively low); • avoid over-revving of engines (to minimise noise disturbance); • briefing of vessel crew on the purpose and implications of these vessel management practices (through, for example, tool-box talks).	This RTDP will be secured through the DCO and Deemed Marine Licence conditions (England) and Marine Licence (Scotland).
CoT56	An Offshore In-Principal Monitoring Plan (OIPMP) will be prepared and submitted as part of the application for development consent and as part of the marine licence application(s) to the Scottish Ministers. The OIPMP will include for monitoring as part of the operational asset integrity surveys. A Detailed Offshore Monitoring Plan will be produced prior to operation and maintenance phases substantially in accordance with the OIPMP, and will be approved in consultation with statutory advisors and regulators.	The OIPMP will be secured through the DCO and Deemed Marine Licence conditions (England) and Marine Licence (Scotland).

6.8 Assessment of impacts

6.8.1 Overview

- 6.8.1.1 This section comprises of the assessment of the potential impacts to receptors arising from the construction, O&M and decommissioning phases of the MHPGC Project. A summary of the conclusions is presented in **Table 6.47**.

6.8.2 Construction phase

Disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels

- 6.8.2.1 During the construction phase of the MHPGC Project, there is potential for disturbance and displacement of sensitive ornithological receptors in both Scottish and English waters. Disturbance and displacement could potentially arise from airborne noise and underwater sound generated by associated construction activities (such as UXO clearance), and from the presence of construction vessels. Disturbance and displacement may reduce the amount of functional habitat available for foraging, resting and other activities and may therefore reduce survival or reproductive fitness of the birds involved.

Offshore Marine Ornithology Receptors (Scottish and English waters)

Receptor sensitivity:

- 6.8.2.2 The overall sensitivity of receptors with the potential to occur within the Offshore Marine Ornithology Study Area considered for the assessment of this effect pathway is presented in **Table 6.25**, based on information within **Section 6.4.5**. Overall sensitivity of receptor is determined by the matrix presented in **Table 6.17**. Conservation values have been based on **Table 6.13**. These receptors have varying levels of behavioural sensitivity to the effect pathway, ranging from low to high (Garthe and Hüppop, 2004; Furness *et al.*, 2013; Wade *et al.*, 2016; Fliessbach *et al.*, 2019; Goodship and Furness, 2022; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Note that where a species has been attributed different sensitivity scores between publications, the highest given sensitivity score has been used as a precautionary measure. Consequently, overall sensitivity of the receptors at the lowest is **negligible** and at highest is **medium to high**. Justification of the scoping of receptors for assessment is provided in **Table 6.25**.

Table 6.25: Summary of valued ornithological receptors within the Offshore Marine Ornithology Study Area (Scottish and English waters) scoped in for assessment of disturbance and displacement from airborne noise, underwater noise and visual disturbance associated with the presence of vessels.

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
Common scoter	High	Regional	Medium to High	No	The receptor is classified as High overall sensitivity with a High behavioural sensitivity score (Fliessbach <i>et al.</i> , 2019; Goodship and Furness, 2022; Natural England, 2024a; FeAST Working Group Organisations, 2023). However, the potential for a significant population level effect can be confidently ruled out, based on the very low likelihood of the receptor being consistently presented within the Offshore Marine Ornithology Study Area in significant numbers, as common scoter typically forage within open coastal habitats, typically with a depth of 20m or less (Woodward and Humphreys, 2018), rather than offshore waters. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Arctic skua	Negligible	National	Negligible to Low	No	The receptor is classified as low overall sensitivity with a negligible behavioural sensitivity (FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Long-tailed skua	Negligible	Negligible	Negligible	No	The receptor is classified as low overall sensitivity with a negligible behavioural sensitivity (lack of evidence so based on Arctic skua; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only,

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Pomarine skua	Negligible	Negligible	Negligible	No	The receptor is classified as low overall sensitivity with a negligible behavioural sensitivity (lack of evidence so based on Arctic skua; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Great skua	Negligible	National	Negligible to Low	No	The receptor classified as Low overall sensitivity with a negligible behavioural sensitivity based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Puffin	Medium	National	Medium to High	Yes	Receptor classified High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore, there is potential for a material effect pathway to occur.
Black guillemot	Medium	Negligible	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a Medium behavioural sensitivity based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; FeAST Working Group Organisations, 2023). The potential for a significant population level effect can be confidently ruled out, based on the very low likelihood of the receptor being consistently present within the Offshore Marine Ornithology Study Area in significant numbers, as black guillemot typically forage in sheltered shallow coastal areas (Johnston <i>et al.</i> , 2018), rather than offshore waters. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Razorbill	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore, there is potential for a material effect pathway to occur.
Little auk	Low	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with a behavioural sensitivity of negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Guillemot	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore, there is potential for a material effect pathway to occur.
Sandwich tern	Low	National	Low to Medium	No	Although the receptor is classified as Medium overall sensitivity, the behavioural sensitivity is classified as Low based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Arctic tern	Low	National	Low to Medium	No	Although the receptor is classified as Medium overall sensitivity, the behavioural sensitivity is classified as Low based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Common tern	Low	National	Low to Medium	No	Although the receptor is classified as Medium overall sensitivity, the behavioural sensitivity is classified as Low based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Roseate tern	Low	International	Medium	No	Although the receptor is classified as Medium overall sensitivity, the behavioural sensitivity is classified as Low based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the international conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Little gull	Negligible	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with the behavioural sensitivity of negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur.
Kittiwake	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Common gull	Negligible	Regional	Negligible	No	The receptor is classified as Negligible overall sensitivity with a behavioural sensitivity of negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> ,

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the regional conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Herring gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Great black-backed gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Lesser black-backed gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Red-throated diver	High	Negligible	Low	No	Although the receptor is classified as High behavioural sensitivity, the potential for a significant population level effect can be confidently ruled out, based on the very low likelihood of the receptor being consistently present within the Offshore

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					Marine Ornithology Study Area in significant numbers, as red-throated diver typically forage in nearshore, sandy, shallow marine waters and estuaries (Dierschke <i>et al.</i> , 2017), rather than offshore waters.
Great northern diver	High	Local	Medium	No	Although the receptor is classified as High behavioural sensitivity, the potential for a significant population level effect can be confidently ruled out, based on the very low likelihood of the receptor being consistently present within the Offshore Marine Ornithology Study Area in significant numbers, as great northern diver typically forage in inshore waters off the coast of Scotland, although low numbers of great northern diver have been recorded wintering within the Dogger Bank zone (BTO, 2026a; Burton <i>et al.</i> , 2013 & 2014; APEM, 2025). Potential for theoretical connectivity to occur is therefore concluded as highly limited.
White-billed diver	Medium	Negligible	Negligible to Low	No	Within UK waters White-billed divers are classified as scarce migrants (BTO, 2026b) and winter visitors (British Birds, 2020), with UK records being limited to discrete areas along the Scottish coast and Dogger Bank zone (Burton <i>et al.</i> , 2013 & 2014; APEM, 2025). Given the scarcity of the receptor within UK waters the potential for theoretical connectivity is considered highly limited.
European storm petrel	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur.

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
Leach's storm petrel	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur.
Fulmar	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Sooty shearwater	Negligible	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur.
Manx shearwater	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; FeAST Working Group Organisations, 2023). Therefore, despite the national

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Gannet	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.

Magnitude of impact:

- 6.8.2.3 The construction associated with the installation of the offshore export cables is expected to be completed in a maximum of four years. During this period, vessel movements and associated construction activities will occur along the extent of MHPGC Project PEIR Red Line Boundary. Construction activities will be spatially limited to the construction area footprint, and vessels will gradually travel along the route rather than remaining in one location over the whole construction period. There will be up to 550 return trips by installation vessels with a maximum of 33 vessels expected to be present on site at once during the construction phase in the Offshore Marine Ornithology Study Area. Pre-construction site investigations and seabed preparation will involve a limited number of vessels. A maximum of up to two offshore export cables are to be installed and any overlap between preparation and installation will be spatially constrained. As further discussed in **Volume 2, Chapter 8: Shipping and Navigation of the PEIR**, the Offshore Marine Ornithology Study Area has a baseline of frequent shipping activity. Consequently, any additional vessel presence associated with construction is not predicted to considerably increase disturbance and displacement in the Offshore Marine Ornithology Study Area. Low Order clearance of up to 22 UXOs within both Scottish (8 UXOs) and English (14 UXOs) waters, with one detonation occurring within a 24-hour period during daylight hours. The pre-construction geophysical surveys include a maximum sonar operating frequency of 300 to 600kHz, with the potential of two survey vessels on site at one time.
- 6.8.2.4 Available data on seabird abundance and distribution across UK waters suggests that guillemot, in particular, may occur in moderate densities, throughout much of the year within the area of the North Sea that overlaps the Offshore Marine Ornithology Study Area (Waggitt *et al.*, 2019). This is true of both Scottish and English waters and is further supported (especially in a Scottish context) by the data from Morven North and Morven South (APEM, 2025), which also suggests guillemot occur in large numbers especially during the breeding season. Razorbill and puffin too were recorded in moderate numbers during the breeding season within Morven North and Morven South (APEM, 2025) but overall occurring in low densities within this area of Scottish and English waters throughout the year (Waggitt *et al.*, 2019). Therefore, these species have the potential to overlap with construction activities within the Offshore Marine Ornithology Study Area.
- 6.8.2.5 During the breeding season, guillemot, razorbill and puffin have extensive foraging ranges (MM+1SD of 153.7km, 164.9km 265.4km, respectively (Woodward *et al.*, 2019)), providing them with an abundance of suitable alternative habitat and reducing the potential for interactions with proposed construction activities, as the Offshore Marine Ornithology Study Area makes up only a small proportion of their potential range. This is similarly true for the non-breeding season as these species disperse widely across the North Sea (Buckingham *et al.*, 2022) during this period and so are unlikely to be present with the Offshore Marine Ornithology Study Area in significant numbers. In addition, even if a minor displacement effect occurs, the abundance of suitable habitat beyond the Offshore Marine Ornithology Study Area allows these species to relocate without significant energetic costs.
- 6.8.2.6 Furthermore, the commitment to a VTMP (CoT30) [see **Section 6.7**] will ensure, where possible, that vessel transit routes and activities avoid any aggregations of sensitive species, further reducing the potential for disturbance and displacement impacts.
- 6.8.2.7 Therefore, the magnitude of disturbance and displacement from airborne noise, underwater sound and visual disturbance associated with the presence of vessels, during the construction phase for all receptors considered for assessment within the Offshore Marine Ornithology Study Area is **negligible**.

Significance of effect:

- 6.8.2.8 Summary of the significance of effect for each species is presented in **Table 6.26**.
- 6.8.2.9 Overall, it is considered that the sensitivity of the offshore receptors both in Scottish and English waters is **medium** to **high**, but the magnitude of disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels is **negligible**. Therefore, when considering the above, the effect of disturbance and displacement on the receptors during the construction phase is concluded to be **minor**, which is not significant in EIA terms.

Secondary mitigation and residual effect:

- 6.8.2.10 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant. Therefore, residual effects both in Scottish and English waters are concluded to be **minor**, which is not significant in EIA terms.

Table 6.26: Summary of significance of effect in relation to disturbance and displacement from airborne noise, underwater sound and visual disturbance associated with the presence of vessels for each scoped in Offshore Marine Ornithology receptors (Scottish and English waters).

Species	Overall Sensitivity	Magnitude of Impact	Significance of the effect
Puffin	Medium to High	Negligible	Minor
Razorbill	Medium to High	Negligible	Minor
Guillemot	Medium to High	Negligible	Minor

Nearshore Marine Ornithology Receptors

Receptor Sensitivity:

- 6.8.2.11 The overall sensitivity of receptors, with the potential to occur within the Nearshore Marine Ornithology Study Area, considered for the assessment of this effect pathway is presented in **Table 6.27**. This is based on information within **Section 6.4.5**. Overall sensitivity of receptor is determined by the matrix presented in **Table 6.17**. Conservation values are based on **Table 6.9**. These receptors have varying levels of behavioural sensitivity to the effect pathway ranging from low to high (Garthe and Hüppop, 2004; Furness *et al.*, 2013; Fliessbach *et al.*, 2019; Goodship and Furness, 2022; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Note that where a species has been attributed different behavioural sensitivity scores between publications, the highest given behavioural sensitivity score has been used as a precautionary measure. Consequently, overall sensitivity of the receptors to this impact at the lowest is **negligible** and at highest is **medium to high**. Justification of the scoping of receptors for assessment is provided in **Table 6.27**.

Table 6.27: Summary of valued ornithological receptors within the Nearshore Marine Ornithology Study Area scoped in for assessment of disturbance and displacement from airborne noise, underwater noise and visual disturbance associated with the presence of vessels.

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
Long-tailed duck	Medium	Negligible	Negligible to Low	No	Although behavioural sensitivity is Medium based on literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Goodship and Furness, 2022), this receptor classified as Low overall sensitivity. The potential for a significant population level effect to occur can confidently be ruled out based on the very low likelihood of the receptor being consistently presented within the Nearshore Marine Ornithology Study Area, considering long-tailed duck were not present in the intertidal data or desk based review. Furthermore this species is not a qualifying feature of an SPA with connectivity to the MHPGC Project PEIR Red Line Boundary. Therefore the potential for a significant population level effect to occur can confidently be ruled out.
Eider	Medium	Local.	Low to Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies and / or overlap with known wintering grounds. Therefore potential for a material effect pathway to occur.
Common scoter	High	Regional	Medium to High	Yes	Receptor classified as High overall sensitivity based on High behaviour sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds.

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					Therefore, potential for a material effect pathway to occur.
Velvet scoter	Medium	Regional	Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Red-breasted merganser	Medium	Local	Low to Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Razorbill	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore, potential for a material effect pathway to occur.
Guillemot	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore, potential for a material effect pathway to occur.
Sandwich tern	Low	National	Low to Medium	No	Although the receptor is classified as Medium overall sensitivity, the behavioural sensitivity is classified as Low based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore,

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Arctic tern	Low	National	Low to Medium	No	Although the receptor is classified as Medium overall sensitivity, the behavioural sensitivity is classified as Low based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Common tern	Low	National	Low to Medium	No	Although the receptor is classified as Medium overall sensitivity, the behavioural sensitivity is classified as Low based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Roseate tern	Low	International	Medium	No	Although the receptor is classified as Medium overall sensitivity, the behavioural sensitivity is classified as Low based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					Working Group Organisations, 2023). Therefore, despite the international conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Little gull	Negligible	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023) and a conservation value of Negligible. Therefore, the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Kittiwake	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Black-headed gull	Low	Local	Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Low based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; FeAST Working Group

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					Organisations, 2023) and a Local conservation value. Therefore, the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Mediterranean gull	Low	Local	Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; FeAST Working Group Organisations, 2023) and a Local conservation value. Therefore, the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Common gull	Negligible	Regional	Negligible	No	The receptor is classified as Negligible overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the regional conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Herring gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Great black-backed gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Lesser black-backed gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Iceland gull	Negligible	Local	Negligible	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					Organisations, 2023) and a Local conservation value. Therefore, the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Red-throated diver	High	Negligible	Low	Yes	Although the receptor is classified as Low overall sensitivity, receptor has been scoped in on a precautionary basis owing to the receptor's high behavioural sensitivity to vessel disturbance and foraging preference in nearshore, sand, shallow marine waters and estuaries (Dierschke et al., 2017).
Great northern diver	High	Local	Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Black-throated diver	High	Local	Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Fulmar	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness et al., 2013; Fliessbach et al., 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be

Species	Behavioural sensitivity to effect pathway	Conservation value	Overall sensitivity	Scoped in for assessment	Justification
					ruled out considering there is no credible impact pathway.
Gannet	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on relevant literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Natural England, 2024a; Natural England 2024b; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value the potential for a significant population level effect to occur can confidently be ruled out considering there is no credible impact pathway.
Shag	Medium	Local	Low to Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies and overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Cormorant	Medium	Negligible	Negligible to Low	No	Although behavioural sensitivity is Medium based on literature (Garthe and Hüppop, 2004; Furness <i>et al.</i> , 2013; Fliessbach <i>et al.</i> , 2019; Goodship and Furness, 2022; FeAST Working Group Organisations, 2023), this receptor classified as Low overall sensitivity. The conservation value is classified a negligible as this species is not a qualifying feature of an SPA with connectivity to the MHPGC Project PEIR Red Line Boundary. Therefore, the potential for a significant population level effect to occur can confidently be ruled out.

Magnitude of impact:

- 6.8.2.12 The overall timeframe of the construction phase of the MHPGC Project is expected to be completed in a maximum of four years. Low Order clearance of 14 UXOs within English waters is expected to occur, with one detonation within a 24-hour period during the daylight hours. The pre-construction geophysical surveys include a maximum sonar operating frequency of 300 to 600kHz, with the potential of two survey vessels on site at one time. A maximum of 14 vessels may be operational at any one time during the construction phase in around Landfall which has the potential to include the Nearshore Marine Ornithology Study Area.
- 6.8.2.13 When considering the location of Nearshore Marine Ornithology Study Area, approximately 900m south of Seaham Harbour, with Sunderland's Rocker Marina approximately 7.0km north, and the busy shipping route of the Tynemouth, approximately 9.6km north, it can be assumed that there is frequent shipping activity in the area (see **Volume 2, Chapter 8: Shipping and Navigation, of the PEIR**). Large vessels (such as cargo, tanker and fishing) make up a 77% of the baseline in the vicinity of the Nearshore Marine Ornithology Study Area, with small recreational boats and tugs density highest close to the Nearshore Marine Ornithology Study Area due to its proximity to Seaham and Sunderland (see **Volume 2, Annex 8.1: Navigation Risk Assessment, of the PEIR**). The Nose's Point nature reserve and Blast Beach, both within the MHPGC Project PEIR Red Line Boundary at landfall, are also popular tourist destinations, meaning that generalised anthropogenic activity in the area is likely to be common throughout the year. When factoring these into the assessment, it can be assumed that any receptors using the area will either be tolerant to a high degree of anthropogenic disturbance or have already been displaced from the area. Therefore, any additional vessel presence associated with construction is not predicted to considerably increase disturbance and displacement in the Nearshore Marine Ornithology Study Area.
- 6.8.2.14 Receptors scoped in for assessment have the potential to spatially overlap with construction activities within the Nearshore Marine Ornithology Study Area. Abundance of receptors within the Nearshore Marine Ornithology Study Area can be inferred from intertidal bird survey data (see **Volume 3, Annex 3.13: Interim Wintering, Passage and Intertidal Birds Survey Technical Report, of the PEIR**). Whilst the Nearshore Marine Ornithology Study Area extends beyond the 1.5km offshore covered by the Intertidal Bird Survey Area, the intertidal survey characterises the receptors using the nearshore environment (and when supplemented by appropriate pre-existing offshore datasets [see **Section 6.4.4**] provides characterisation of the Nearshore Marine Ornithology Study Area).
- 6.8.2.15 During the breeding season, guillemot and razorbill have extensive foraging ranges (MM+1SD of 153.7km and 164.9km, respectively (Woodward *et al.*, 2019)), providing them with an abundance of suitable alternative habitat and reducing the potential for interactions with proposed construction activities. This is similarly true for the non-breeding season as both species disperse widely across the North Sea (Buckingham *et al.*, 2022) during this period and so are unlikely to be present within the Nearshore Marine Ornithology Study Area in significant numbers. In addition, even if a minor displacement effect occurs, the abundance of alternative suitable habitat beyond the Nearshore Marine Ornithology Study Area allows these species to relocate without significant energetic costs. Therefore, the magnitude of disturbance and displacement from airborne noise, underwater sound and visual disturbance associated with the presence of vessels, during the construction phase for guillemot and razorbill considered for assessment within the Nearshore Marine Ornithology Study Area is **negligible**.
- 6.8.2.16 Seaducks, mergansers, divers and shag prefer foraging in shallower, inshore areas, (Kasier *et al.*, 2006; Degraer *et al.*, 1999; Bustnes and Lønne, 1997; Petersen *et al.*, 2010; Daunt *et al.*, 2012; O'Brien *et al.*, 2012; Kleinschmidt *et al.*, 2019; Forni *et al.*, 2023), and therefore are more vulnerable to disturbance and displacement from the construction activities in the Nearshore Marine Ornithology Study Area. However, the intertidal survey results indicate that sea ducks (excluding common scoter), mergansers, divers and shag are observed in low abundances across the Nearshore Marine Ornithology Study Area.
- 6.8.2.17 For red-throated diver vessel activity is recognised as a key source of disturbance and has been shown to alter their distribution (Burger *et al.*, 2019; Mendel *et al.*, 2019; APEM Ltd, 2013, 2016; Schwemmer *et al.*, 2011). This species is highly sensitive to vessel presence, often flushing at distances greater than 1km (Gittings *et al.*, 2015; Schwemmer *et al.*, 2011). Evidence from the

German North and Baltic Seas indicate that 92% of individuals respond to approaching vessels by taking flight, expending more energy than diving (Fliebsbach *et al.*, 2019). However, the presence of red-throated diver is very low within the Nearshore Marine Ornithology Study Area [see **Section 6.4.5**], therefore this impact would only affect a small proportion of individuals and would not have a whole population effect.

- 6.8.2.18 Although all species considered have at maximum a high behavioural sensitivity to the effect pathway, the construction works are temporary and spatially limited in nature [see **Table 6.23**]. The overall construction phase is expected to occur over a four-year period and is therefore considered long-term at project level. However, the four-year construction period represents the maximum programme duration. Works in the Nearshore Marine Ornithology are expected to be completed in shorter timeframe than those within Offshore Marine Ornithology Study Area, as the nearshore study area is considerably smaller. The activities will be intermittent, only occurring during periods of active construction-related works, and will be confined to one section of the cable route at one time. As such, the resulting disturbance and displacement effects are expected to be short-term and localised at any one section of the route.
- 6.8.2.19 Furthermore, disturbance and displacement from underwater noise, airborne noise and vessels along the cable route would be reversible with impacts persisting only for the duration of the construction works within any section of the cable route. As construction works will progress along the route, previously affected areas would become available again, allowing birds to return to the area. Following the completion of the construction of the MHPGC Project, it is expected that bird presence would return to baseline conditions and as such, there are no permanent displacement effects or barriers for birds to access foraging areas.
- 6.8.2.20 Considering the baseline environment with existing vessel presence, along with the availability of suitable alternative nearshore habitat nearby, particularly the area stretching south from the MHPGC Project PEIR Red Line Boundary for approximately 12km to Hartlepool (Ecology Consulting, 2016), the magnitude of impact on sea ducks, mergansers and divers (including red-throated diver) is expected to be of very low magnitude and highly reversible. Furthermore, the commitment to a VTMP and RTDP (CoT30 and CoT54) [see **Section 6.7**] will ensure, where possible, that vessel transit routes and activities avoid any aggregations of sensitive species, further reducing the potential for disturbance and displacement impacts.
- 6.8.2.21 Therefore, the magnitude of disturbance and displacement from airborne noise, underwater sound and visual disturbance associated with the presence of vessels, during the construction phase for sea ducks, mergansers, divers and shag considered for assessment within the Nearshore Marine Ornithology Study Area is **negligible**.

Significance of effect:

- 6.8.2.22 Summary of the significance of effect for each species is presented in **Table 6.28**.
- 6.8.2.23 It is considered that the auk sensitivity in English waters is **medium** to **high** and the magnitude of indirect impacts from disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels is **negligible**. Therefore, when considering the above, the effect of disturbance and displacement on the receptors during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.
- 6.8.2.24 The sensitivity of sea ducks, mergansers divers (excluding red-throated diver) and shag, in English waters is **medium** to **high** and the magnitude of disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels is **negligible**. Therefore, when considering the above, the effect of disturbance and displacement on the receptor during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.
- 6.8.2.25 It is considered that red-throated diver sensitivity, in English waters is **low** and the magnitude of disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels is **negligible**. Therefore, when considering the above, the effect of indirect impacts from disturbance and displacement on the receptors during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.

Secondary mitigation and residual effect:

6.8.2.26 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant in EIA terms. Therefore, residual effects are concluded to be minor, which is not significant in EIA terms.

Table 6.28: Summary of the significant of effect in relation to disturbance and displacement from airborne noise, underwater sound and visual disturbance associated with the presence of vessels for each Nearshore Marine Ornithology receptors.

Species	Overall Sensitivity	Magnitude of Impact	Significance of the effect
Eider	Low to Medium	Negligible	Minor
Common scoter	Medium to High	Negligible	Minor
Velvet scoter	Medium	Negligible	Minor
Red-breasted merganser	Low to Medium	Negligible	Minor
Razorbill	Medium to High	Negligible	Minor
Guillemot	Medium to High	Negligible	Minor
Red-throated diver	Low	Negligible	Negligible or minor
Great northern diver	Medium	Negligible	Minor
Black-throated diver	Medium	Negligible	Minor
Shag	Low to Medium	Negligible	Minor

Indirect impacts from underwater sound affecting prey species

6.8.2.27 There is potential for indirect impacts to VORs arising from mortality, injury or disturbance to sensitive fish and shellfish prey species during the construction phase of the Scottish and English sections of the MHGPC Project.

6.8.2.28 Impacts on prey species can be a result of underwater noise from construction activities such as pre-construction geophysical surveys and UXO clearance, as well as the presence of vessels. This may lead to reduced prey availability for avian receptors, resulting in a decrease of energy intake that can potentially affect the productivity rates or survival of birds. The reduction of prey availability may cause birds to travel further when foraging, driving up energetic costs. Species with a specialist diet will have a higher reliance on their particular food sources as they are unable to adapt when the abundance of prey items decreases as a more generalist species would.

Offshore Marine Ornithology Receptors (Scottish and English waters)

Receptor sensitivity:

6.8.2.29 The receptors considered for the assessment of potential impact on prey species is presented in

6.8.2.30 **Table 6.29**, based on information within **Section 6.4.5**. Overall sensitivity of receptor is determined by the matrix presented in **Table 6.17**. Conservation value is based on Only species with the potential to be present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas have been considered for assessment. Habitat specialisation scoring from Bradbury *et al.* (2014) and associated literature within FeAST tool (FeAST Working Group Organisations, 2023) was used as a guide to determine behavioural sensitivity, with habitat specialisation scored through a range from one (tend to forage over large marine areas with little known association with particular marine features) to five (tend to feed on very specific habitat features, such as shallow banks with bivalve communities, or kelp beds). With five being classified as high behavioural sensitivity. Consequently, overall sensitivity of the receptors to this impact ranges from **negligible** to **high**. Justification of the scoping of receptors for assessment provided in

6.8.2.31 **Table** 6.29.

Table 6.29: Summary of valued ornithological receptors within the Offshore Marine Ornithology Study Area (Scottish and English waters) scoped in for assessment of Indirect impacts from underwater noise affecting prey species and temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Common scoter	High	Regional	Medium to High	No	The receptor is classified as High overall sensitivity with a High behavioural sensitivity score (Bradbury <i>et al.</i> , 2014). However, the potential for a significant population level effect can be confidently ruled out, as the Offshore Marine Ornithology Study Area is not considered to be important foraging habitat for the receptor. Common scoter have a strong preference for foraging within open coastal habitats, typically with a depth of 20m or less (Woodward and Humphreys, 2018), rather than offshore waters.
Arctic skua	Low	National	Low to Medium	No	The receptor is classified as Medium overall sensitivity with a Negligible behavioural sensitivity (FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Long-tailed skua	Low	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with a Negligible behavioural sensitivity (lack of evidence so based on Arctic skua; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Pomarine skua	Low	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with a Negligible behavioural sensitivity (lack of evidence so based on Arctic skua; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Great skua	Low	National	Negligible	No	The receptor classified as Negligible overall sensitivity with a Negligible behavioural sensitivity based on relevant literature (Bradbury <i>et al.</i> , 2014). Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Puffin	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore there is the potential for indirect impacts on prey species to subsequently impact the receptor.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Black guillemot	High	Negligible	Low	No	The receptor is classified as Low overall sensitivity based on relevant literature (Bradbury <i>et al.</i> , 2014)). The potential for a significant population level effect can be confidently ruled out, based on the very low likelihood of the receptor being consistently present within the Offshore Marine Ornithology Study Area in significant numbers, as black guillemot typically forage in sheltered shallow coastal areas (Johnston <i>et al.</i> , 2018), rather than offshore waters. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Razorbill	Medium	National	Medium to High	Yes	Receptor classified as Medium to High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies and / or overlap with known wintering grounds. Therefore, there is the potential for indirect impacts on prey species to subsequently impact the receptor.
Little auk	Low	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with a behavioural sensitivity of negligible based on relevant literature (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, any localised change in prey availability within the Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Guillemot	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore, there is the potential for indirect impacts on prey species to subsequently impact the receptor.
Sandwich tern	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies and overlap with known wintering grounds. Therefore, there is the potential for indirect impacts on prey species to subsequently impact the receptor.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Arctic tern	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore, there is the potential for indirect impacts on prey species to subsequently impact the receptor.
Common tern	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies a. Therefore, there is the potential for indirect impacts on prey species to subsequently impact the receptor.
Roseate tern	Medium	International	High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore, there is the potential for indirect impacts on prey species to subsequently impact the receptor.
Little gull	Medium	Negligible	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Medium based on relevant literature Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). However, when taking into account the receptors conservation value and consideration that the receptor is likely to be present in very low abundance within the Offshore Marine Ornithology Study Area. Therefore, the potential for a significant population level effect to occur can confidently be ruled out.
Kittiwake	Low	National	Low to Medium	No	The receptor is classified as Medium overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Common gull	Low	Regional	Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the regional conservation value any localised change in prey availability within the Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Herring gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Great black-backed gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Lesser black-backed gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Offshore

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					Marine Ornithology Study Area is not expected to significantly effect the receptor.
Red-throated diver	High	Negligible	Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of High based on receptor being specialist forager within a certain marine area (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). However, the potential for a significant population level effect can be confidently ruled out, as the Offshore Marine Ornithology Study Area is not considered to be important foraging habitat for the receptor. Red-throated diver typically specialises in foraging in nearshore, sandy, shallow marine waters and estuaries (Dierschke <i>et al.</i> , 2017), rather than offshore waters.
Great northern diver	Medium	Local	Low to Medium	No	The receptor is classified as Medium overall sensitivity with a behavioural sensitivity of Medium based on receptor being specialist forager within a certain marine areas (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). However, the potential for a significant population level effect can be confidently ruled out, as the Offshore Marine Ornithology Study Area is not considered to be important foraging habitat for the receptor. Great northern diver typically specialise in foraging in inshore waters off the coast of Scotland, although low numbers of great northern diver have been recorded wintering within the Dogger Bank zone (BTO, 2026a; Burton <i>et al.</i> , 2013 & 2014; APEM, 2025). Potential for theoretical connectivity to occur is therefore concluded as highly limited.
White-billed diver	High	Negligible	Low	No	Within UK waters White-billed divers are classified as scarce migrants (BTO, 2026b) and winter visitors (British Birds, 2020), with UK records being limited to discrete areas along the Scottish coast and Dogger Bank zone (Burton <i>et al.</i> , 2013 & 2014; APEM, 2025). Given the level of scarcity of the receptor within UK waters the potential for theoretical connectivity is considered highly limited.
European storm petrel	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					specialist forager within a certain marine areas (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Despite the national conservation value, theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur.
Leach's storm petrel	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being specialist forager within a certain marine areas (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Despite the national conservation value, theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur.
Fulmar	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being specialist forager within a certain marine areas (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Despite the national conservation value, theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Sooty shearwater	Negligible	Negligible	Negligible	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being specialist forager within a certain marine areas (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023) and a Negligible conservation value. Theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur.
Manx shearwater	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being specialist forager within a certain marine areas (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Despite the national conservation value, theoretical connectivity to the Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur.
Gannet	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.

Magnitude of impact:

- 6.8.2.32 The overall timeframe of the construction phase is expected to be up to four years. Up to 8 and 14 UXOs are expected to be cleared using low order clearance techniques within the Scottish and English waters respectively, with a maximum of one detonation per 24-hour period during the daylight hours. The pre-construction geophysical surveys include an echosounder with an operating frequency of 200 to 400kHz, with the potential of two survey vessels on site at one time. Construction activities will be temporary and limited spatially, occurring in a relatively contained area of the offshore export cable.
- 6.8.2.33 Despite medium to high sensitivity, guillemot, razorbill and puffin have large foraging ranges (Woodward *et al.*, 2019) during the breeding season and so have an abundance of suitable alternative habitat, reducing the likelihood of prey species impacts as a result of the construction activities in the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas. This is also the case during the non-breeding season as both species disperse widely across the North Sea (Buckingham *et al.*, 2022) and so are unlikely to be impacted.
- 6.8.2.34 Tern species will only be present within the Offshore Marine Ornithology Study Areas during the breeding and post-breeding seasons, although have the potential to overlap with construction activities given the distance of the Offshore Marine Ornithology Study Areas to SPAs designated for Arctic tern, common tern and Sandwich tern. However, as these are highly mobile species, and construction works are spatially and temporarily restricted, it is unlikely for a significant impact to occur via impacts on prey, as there will be minimal energetic costs to move to abundant alternative habitat nearby.
- 6.8.2.35 Further, as discussed in **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR**, important prey species for receptors considered for assessment include herring, sandeel and sprat. The conclusion within the **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR**, determined that the significance of effect is considered to be **minor** from underwater sound excluding UXO, **minor** from low order UXO clearance for all fish and shellfish receptors during the construction phase. As such, it is concluded that there will be no significant indirect effects.
- 6.8.2.36 However, given the nature of the MHPGC Project construction works, any impacts will be extremely limited in scale, occurring at one section of the cable route at a time, with the effected receptors able to locate alternative foraging habitat and feed on different types of prey. Therefore, it is concluded that the magnitude of the indirect impact from underwater noise on prey species during the construction phase is **negligible**.

Significance of effect:

- 6.8.2.37 Summary of the significance of effect for each species is presented in **Table 6.26**.
- 6.8.2.38 Overall, it is considered that the receptor sensitivity, in the Offshore Marine Ornithology Study Area is **medium to high** and the magnitude of indirect impacts from impacts to prey species is **negligible**. Therefore, when considering the above, the effect of indirect impacts from impacts to prey species during the construction phase, is concluded to be **minor**, which is significant in EIA terms.

Secondary mitigation and residual effect:

- 6.8.2.39 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant. Therefore, residual effects in the Offshore Marine Ornithology Study Area are concluded to be **minor**, which is not significant in EIA terms.

Table 6.30: Summary of significance of effect in relation to indirect impacts from underwater noise for each scoped in Offshore Marine Ornithology receptors (Scottish and English water).

Species	Overall Sensitivity	Magnitude of Impact	Significance of the effect
Puffin	Medium to High	Negligible	Minor
Razorbill	Medium to High	Negligible	Minor

Species	Overall Sensitivity	Magnitude of Impact	Significance of the effect
Guillemot	Medium to High	Negligible	Minor
Sandwich tern	Medium to High	Negligible	Minor
Arctic tern	Medium to High	Negligible	Minor
Common tern	Medium to High	Negligible	Minor
Roseate tern	High	Negligible	Minor

Nearshore Marine Ornithology Receptors

Receptor sensitivity:

- 6.8.2.40 The receptors considered for the assessment of potential impact on prey species is presented in **Table 6.31**, based on information within **Section 6.4.5**. Overall sensitivity of receptor is determined by the matrix presented in **Table 6.17**. Only species with the potential to be present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas have been considered for assessment. Habitat specialisation scoring from Bradbury *et al.* (2014) and associated literature within FeAST tool (FeAST Working Group Organisations, 2023) was used as a guide to determine behavioural sensitivity, with habitat specialisation scored through a range from one (tend to forage over large marine areas with little known association with particular marine features) to five (tend to feed on very specific habitat features, such as shallow banks with bivalve communities, or kelp beds). With five being classified as high behavioural sensitivity. Consequently, overall sensitivity of the receptors to this impact ranges from **negligible** to **high**. Justification of the scoping of receptors for assessment provided in **Table 6.31**.

Table 6.31: Summary of valued ornithological receptors within the Nearshore Marine Ornithology Study Area scoped in for assessment of indirect impacts from underwater noise affecting prey species and temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Long-tailed duck	High	Negligible	Low	Yes	Although the receptor is classified as Low overall sensitivity, receptor has been scoped in on a precautionary basis owing to the receptors high behavioural sensitivity to indirect impacts.
Eider	High	Local	Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Common scoter	High	Regional	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Velvet scoter	Medium	Regional	Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Red-breasted merganser	High	Local	Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Razorbill	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore, potential for a material effect pathway to occur.
Guillemot	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore potential for a material effect pathway to occur.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Sandwich tern	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies and overlap with known wintering grounds. Therefore potential for a material effect pathway to occur.
Arctic tern	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore potential for a material effect pathway to occur.
Common tern	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore potential for a material effect pathway to occur.
Roseate tern	Medium	International	High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore potential for a material effect pathway to occur.
Little gull	Medium	Negligible	Negligible to Low	No	Receptor classified as Negligible / Low overall sensitivity, therefore the potential for a significant population level effect to occur can confidently be ruled out.
Kittiwake	Low	National	Low to Medium	No	The receptor is classified as Medium overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Black-headed gull	Low	Local	Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					the local conservation value any localised change in prey availability within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Mediterranean gull	Low	Local	Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the local conservation value any localised change in prey availability within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Common gull	Low	Regional	Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the regional conservation value any localised change in prey availability within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Herring gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Great black-backed gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the regional conservation value any localised change in prey availability

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Lesser black-backed gull	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Iceland gull	Negligible	Local	Negligible	No	The receptor is classified as Negligible overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the local conservation value any localised change in prey availability within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Red-throated diver	High	Negligible	Low	Yes	Although the receptor is classified as Low overall sensitivity, receptor has been scoped in on a precautionary basis owing to the receptors high behavioural sensitivity to indirect impacts.
Great northern diver	Medium	Local	Low to Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore potential for a material effect pathway to occur.
Black-throated diver	High	Local	Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore potential for a material effect pathway to occur.
Fulmar	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Gannet	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Shag	Medium	Local	Low to Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies and overlap with known wintering grounds. Therefore potential for a material effect pathway to occur.
Cormorant	Medium	Negligible	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Medium based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Bradbury <i>et al.</i> , 2014; FeAST Working Group Organisations, 2023). The conservation value is classified a negligible as this species is not a qualifying feature of an SPA with connectivity to the MHPGC Project PEIR Red Line Boundary. Therefore, any localised change in prey availability within the Nearshore Marine Ornithology Study Area is not expected to significantly effect the receptor.

Magnitude of impact:

- 6.8.2.41 The overall timeframe of the construction phase across Scottish and English waters is expected to be up to four years. Low Order clearance of 14 UXOs within the English waters is expected to occur, with one detonation within a 24-hour period during the daylight hours. The pre-construction geophysical surveys include a maximum echosounder operating frequency of 200 to 400kHz, with the potential of two survey vessels on site at one time. Construction activities will be temporary and limited spatially, occurring in a relatively contained area of the offshore export cables.
- 6.8.2.42 The sensitivity of receptors to a reduction in prey availability varies, although auks and tern species considered for this assessment are not habitat specialist, and are able to forage for a range of prey species across different locations (Del Hoyo *et al.*, 1992; Bradbury *et al.*, 2014; Kleinschmidt *et al.*, 2019).
- 6.8.2.43 The sea ducks (excluding common scoter), mergansers and shag are species considered with specific foraging habitat requirements as they are tied to locations of their main prey source. However, the available data in **Section 6.4.5**, which recorded infrequent and / or low numbers of sea ducks (excluding common scoter) and red-breasted merganser. This suggests the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas do not overlap with key prey supporting habitats for these species. Therefore, it is concluded that the magnitude of the indirect impact from underwater noise on, sea ducks (excluding common scoter), mergansers and shag during the construction phase is **negligible**.
- 6.8.2.44 Common scoter were observed in a high abundance in the intertidal surveys, and subsequently Nearshore Marine Ornithology Study Area. However, the high abundance observed (117 individuals) was only observed once in October 2025, with results from 2023 to 2024 intertidal surveys reporting a lower abundance (84 individuals over two years). Their specialised diet consists of bivalves (Kaiser *et al.*, 2006; Breen *et al.*, 2022), which are considered tolerant to underwater noise given the lack of specialised hearing. Furthermore, this effect pathway has not been assessed in **Volume 2, Chapter 3: Benthic Subtidal and Intertidal Ecology, of the PEIR**. Therefore, it is concluded that the magnitude of the indirect impact from underwater noise on common scoter during the construction phase is **negligible**.
- 6.8.2.45 Although, red-throated diver, black throated-diver and great northern diver are classified as having low and medium vulnerability to the pressure, this does not translate to their choice of prey items, which is notably diverse and consists of several benthic and pelagic fish species (Kleinschmidt *et al.*, 2019). Considering these species are limited by water depth (Kleinschmidt *et al.*, 2019; Jardine, 2024), they may occur within the Nearshore Marine Ornithology Study Area, although available data suggests significant abundances are unlikely [see **Section 6.4.5**]. In addition, considering there is suitable alternative nearshore habitat nearby, particularly the area stretching south from the MHPGC Project PEIR Red Line Boundary for approximately 12km to Hartlepool (Ecology Consulting, 2016), divers are able to relocate to adjacent alternative areas. Given the mobility of divers and the availability of suitable foraging habitat within close proximity, any energetic costs for relocations are expected to be negligible. This is true of other generalist piscivorous species, such as cormorant and shag, and therefore impacts as a result of impacts to prey species are considered very unlikely for these species. Therefore, it is concluded that the magnitude of the indirect impact from underwater noise on divers during the construction phase is **low**.
- 6.8.2.46 Despite medium sensitivity, both guillemot and razorbill have large foraging ranges (Woodward *et al.*, 2019) during the breeding season and so have an abundance of suitable alternative habitat, reducing the likelihood of prey species impacts as a result of the construction activities in the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas. This is also the case during the non-breeding season as both species disperse widely across the North Sea (Buckingham *et al.*, 2022) and so are unlikely to be impacted. Therefore, it is concluded that the magnitude of the indirect impact from underwater noise on guillemot and razorbill during the construction phase is **negligible**.
- 6.8.2.47 Tern species will only be present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas during the breeding and post-breeding seasons. Although terns have the potential to overlap with construction activities given the distance of the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas to SPAs designated for Arctic tern, common tern and Sandwich tern. However, as these are highly mobile species, and construction

works are spatially and temporarily restricted, it is unlikely for a significant impact to occur via impacts on prey, as there will be minimal energetic costs to move to abundant alternative habitat nearby. Therefore, it is concluded that the magnitude of the indirect impact from underwater noise on terns during the construction phase is **negligible**.

6.8.2.48 As previously discussed in the Nearshore Marine Ornithology Study Area, and within **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR**, the indirect impact on these prey species from underwater noise are not significant in EIA terms on all fish and shellfish receptors during the construction phase.

6.8.2.49 Moreover, given the nature of the MHPGC Project construction works, any impacts will be extremely limited in scale and reversible following completion of the construction phase.

Significance of effect:

6.8.2.50 Summary of the significance of effect for each species is presented in **Table 6.32**.

6.8.2.51 It is considered that the sea ducks (excluding common scoter), mergansers and shag sensitivity, in English waters is **medium to high** and the magnitude of indirect impacts from impacts to prey species is **negligible**. Therefore, when considering the above, the effect of indirect impacts from impacts to prey species during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.

6.8.2.52 It is considered that the auk sensitivity, in English waters is **medium to high** and the magnitude of indirect impacts from impacts to prey species is **negligible**. Therefore, when considering the above, the effect of indirect impacts from impacts to prey species during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.

6.8.2.53 It is considered that the divers sensitivity, in English waters is at most **medium** and the magnitude of indirect impacts from impacts to prey species is **low**. Therefore, when considering the above, the effect of indirect impacts from impacts to prey species during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.

6.8.2.54 It is considered that the tern sensitivity, in English waters is **medium to high** and the magnitude of indirect impacts from impacts to prey species is **negligible**. Therefore, when considering the above, the effect of indirect impacts from impacts to prey species during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.

Secondary mitigation and residual effect:

6.8.2.55 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant. Therefore, residual effects in English waters are concluded to be **minor**, which is not significant in EIA terms.

Table 6.32: Summary of the significance of effect in relation to indirect impacts from underwater noise for each Nearshore Marine Ornithology receptors.

Species	Overall Sensitivity	Magnitude of Impact	Significance of the effect
Long-tailed duck	Low	Negligible	Minor
Eider	Low to Medium	Negligible	Minor
Common scoter	Medium to High	Negligible	Minor
Velvet scoter	Medium	Negligible	Minor
Red-breasted merganser	Low to Medium	Negligible	Minor
Razorbill	Medium to High	Negligible	Minor

Species	Overall Sensitivity	Magnitude of Impact	Significance of the effect
Guillemot	Medium to High	Negligible	Minor
Sandwich tern	Medium to High	Negligible	Minor
Arctic tern	Medium to High	Negligible	Minor
Common tern	Medium to High	Negligible	Minor
Roseate tern	High	Negligible	Minor
Red-throated diver	Low	Low	Negligible or minor
Great northern diver	Medium	Low	Minor
Black-throated diver	Medium	Low	Minor
Shag	Low to Medium	Negligible	Minor

Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species

- 6.8.2.56 There is potential for elevated turbidity level within the water column caused by increased SSC during construction within the MHPGC Project PEIR Red Line Boundary. The resulting potential impact of increased turbidity can indirectly affect the foraging efficiency of certain diving species by temporarily clouding the water column and can result in a smothering effect of prey items on the seabed. Species which rely on sight to locate prey can be sensitive to changes in turbidity as they require sufficient water clarity to successfully detect and capture prey (Cook and Burton, 2010).
- 6.8.2.57 The magnitude and overall sensitivity conclusions was deemed to be the same for both the Nearshore Ornithology Study Area and Offshore Marine Ornithology. Therefore, to reduce repetition of information, potential temporary habitat loss/disturbance from increased SSCs has been assessed on a receptor group basis for both Nearshore Ornithology Study Area and Offshore Marine Ornithology. Conclusions are based on both study areas.

Nearshore Ornithology Study Area and Offshore Marine Ornithology (Scottish and English waters)

Receptor sensitivity:

- 6.8.2.58 The receptors considered for the assessment of temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species is presented in **Table 6.33**, based on information within **Section 6.4.5**. Only species with the potential to be present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas have been considered for assessment.
- 6.8.2.59 Cook and Burton (2010) and Natural England's Advice on Operation (Natural England, 2024a; 2024b, 2024c) for English SPAs (Coquet Island SPA, Flamborough and Filey SPA and Greater Wash SPA) and associated literature within FeAST tool (FeAST Working Group Organisations, 2023) were used to determine species vulnerability to the effect pathway, namely changes in suspended solids (water clarity) resulting from power cable laying, burial and protection. Additionally, consideration has been given to receptors habitat specialisation based on scoring from Bradbury *et al.* (2014). Consequently, overall sensitivity of the receptors to this impact ranges from **negligible** to **high**. Justification of the scoping of receptors for assessment provided in **Table 6.33**.

Table 6.33: The overall sensitivity of receptors considered for the assessment of temporary habitat loss from increased SSCs in both the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area (Scottish and English waters)

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Long-tailed duck	Medium	Negligible	Negligible to Low	No	Although behavioural sensitivity is Medium based on literature (Cook and Burton, 2010; FeAST Working Group Organisations, 2023), this receptor classified as Low overall sensitivity. The potential for a significant population level effect to occur can confidently be ruled out based on the very low likelihood of the receptor being consistently present within the Nearshore Marine Ornithology Study Area, considering long-tailed duck were not observed in the intertidal data or desk based review. Furthermore, this species is not a qualifying feature of an SPA with connectivity to the MHPGC Project PEIR Red Line Boundary. Therefore, the potential for a significant population level effect to occur can confidently be ruled out.
Eider	High	Local	Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Common scoter	High	Regional	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Velvet scoter	High	Regional	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Red-breasted merganser	High	Local	Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area based on

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
Arctic skua	Low	National	Low to Medium	No	The receptor is classified as Medium overall sensitivity with a Low behavioural sensitivity based on relevant literature (Cook and Burton, 2010; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Long-tailed skua	Low	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with a Negligible behavioural sensitivity (lack of evidence so based on Arctic skua; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area..
Pomarine skua	Low	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with a Negligible behavioural sensitivity (lack of evidence so based on Arctic skua; FeAST Working Group Organisations, 2023) . Theoretical connectivity to the Nearshore Ornithology Study Area

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					and Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Great skua	Low	National	Negligible	No	The receptor is classified as Negligible overall sensitivity with a Low behavioural sensitivity based on relevant literature (Cook and Burton, 2010; FeAST Working Group Organisations, 2023). Theoretical connectivity to the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is expected to be limited to migratory passage only, with breeding colonies and wintering areas located beyond the expected maximum theoretical connectivity distance to Offshore Marine Ornithology Study Area (Woodward <i>et al.</i> , 2019; Wernham <i>et al.</i> , 2002). Migratory movements usually occur over a short time period, limiting the potential for theoretical connectivity and thus an effect to occur. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area.
Puffin	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore potential for a material effect pathway to occur.
Black guillemot	High	Negligible	Low	No	Receptor classified as Low behavioural sensitivity based on relevant literature (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023), The potential for a significant population level effect can be confidently ruled out,

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					based on the very low likelihood of the receptor being consistently present within the Offshore Marine Ornithology Study Area in significant numbers, as black guillemot typically forage in sheltered shallow coastal areas (Johnston <i>et al.</i> , 2018), rather than offshore waters. Furthermore, this species is not a qualifying feature of designated sites which have potential connectivity to the Offshore Marine Ornithology Study Area. Therefore, the potential for a significant effect to occur can confidently be ruled out.
Razorbill	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore potential for a material effect pathway to occur.
Little auk	Low	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with a behavioural sensitivity of negligible based on relevant literature (Cook and Burton, 2010; FeAST Working Group Organisations, 2023). Therefore any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor
Guillemot	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area based on proximity to known breeding colonies and. Therefore potential for a material effect pathway to occur.
Sandwich tern	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area based on proximity to known breeding colonies and overlap with known wintering grounds. Therefore potential for a material effect pathway to occur.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Arctic tern	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore potential for a material effect pathway to occur.
Common tern	Medium	National	Medium to High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore potential for a material effect pathway to occur.
Roseate tern	Medium	International	High	Yes	Receptor classified as High overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known breeding colonies. Therefore potential for a material effect pathway to occur.
Little gull	Medium	Negligible	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Medium based on relevant literature (Cook and Burton, 2010; FeAST Working Group Organisations, 2023). However, when taking into account the receptors conservation value and consideration that the receptor is likely to be present in very low abundance within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area. Therefore, the potential for a significant population level effect to occur can confidently be ruled out.
Kittiwake	Low	National	Low to Medium	No	The receptor is classified as Medium overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Black-headed gull	Low	Local	Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the local conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Mediterranean gull	Low	Local	Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the local conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Common gull	Low	Regional	Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the regional conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Herring gull	Low	National	Low to Medium	No	The receptor is classified as Medium overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Great black-backed gull	Negligible	National	Negligible to Low	No	The receptor is classified as Medium overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Lesser black-backed gull	Low	National	Low to Medium	No	The receptor is classified as Medium overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Iceland gull	Negligible	Local	Negligible	No	The receptor is classified as Negligible overall sensitivity with a behavioural sensitivity of Negligible based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the local conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Red-throated diver	High	Negligible	Low	Yes	Although the receptor is classified as Low overall sensitivity, receptor has been scoped in on a precautionary basis owing to the receptors high behavioural sensitivity to indirect impacts.
Great northern diver	Medium	Local	Low to Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore, potential for a material effect pathway to occur.
White-billed diver	High	Negligible	Low	No	Within UK waters White-billed divers are classified as scarce migrants (BTO, 2026b) and winter visitors (British Birds, 2020), with UK records being limited to discrete areas along the Scottish coast and Dogger Bank zone (Burton <i>et al.</i> , 2013 & 2014; APEM, 2025). Given the level of scarcity of the receptor within UK waters the potential for theoretical connectivity is considered highly limited.
Black-throated diver	High	Local	Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on overlap with known wintering grounds. Therefore potential for a material effect pathway to occur.
European storm petrel	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on the receptor not being a visual forager and is able to forage over large marine areas with little known association with particular marine

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Leach's storm petrel	Negligible	National	Negligible to Low	No	The receptor is classified as Medium overall sensitivity with a behavioural sensitivity of Low based on receptor being able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Fulmar	Low	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on the receptor not being a visual forager and is able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Sooty shearwater	Negligible	Negligible	Negligible	No	The receptor is classified as Negligible overall sensitivity with a behavioural sensitivity of Negligible based on the receptor not being a visual forager and is able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
					Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Furthermore this species has a negligible conservation value Therefore, any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Manx shearwater	Negligible	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on the receptor not being a visual forager and is able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Gannet	Low	National	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Negligible based on the receptor not being a visual forager and is able to forage over large marine areas with little known association with particular marine features and employing a generalist foraging strategy (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c; FeAST Working Group Organisations, 2023). Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.
Shag	Medium	Local	Low to Medium	Yes	Receptor classified as Medium overall sensitivity and may be consistently present within the Offshore Marine Ornithology Study Area based on proximity to known overlap with known wintering grounds. Therefore potential for a material effect pathway to occur.

Species	Behaviour Sensitivity to effect pathway	Conservation Value	Overall Sensitivity	Scoped in for assessment	Justification
Cormorant	Medium	Negligible	Negligible to Low	No	The receptor is classified as Low overall sensitivity with a behavioural sensitivity of Medium based on relevant literature (Cook and Burton, 2010; Natural England, 2024a; Natural England 2024b, Natural England 2024c). The conservation value is classified a negligible as this species is not a qualifying feature of an SPA with connectivity to the MHPGC Project PEIR Red Line Boundary. Therefore, despite the national conservation value any localised change in prey availability within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Area is not expected to significantly effect the receptor.

Magnitude of impact:

- 6.8.2.60 Sandwave clearance activities are to be undertaken over a four month period during which sediment disturbance rate is expected to be 1,000kg/s. Installation of cables through trenching in the offshore will cover an area up to 324.67km with a trenching rate of 400m/hr. Up to 4,090,842m³ of the seabed is expected to be disturbed across the construction phase in both Scottish and English waters. However, as construction vessels and trenching equipment move progressively along the offshore export cable route increased SSCs and resulting plumes are expected to be highly temporary (short-term) and localised. Within 500m to the tidal excursion distance, sediments are expected to increase only by low to intermediate levels during construction works and return to baseline conditions between 24 to 48 hours after cessation of activities. To note, tidal excursion distances vary by location and tide, ranging from 3km to 6km in Scottish and English offshore waters, and 5km to 9km in English nearshore waters. Considering this, it is expected that increases in SSCs will be highly limited within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas.
- 6.8.2.61 It should also be noted that increased water turbidity from SSCs occurs naturally in the North Sea. This region is a dynamic environment where wave action, tidal current and storm events frequently disturb sediment. Further, as discussed in **Volume 2, Chapter 3: Benthic Subtidal and Intertidal Ecology, of the PEIR** and **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR**, the predicted impacts of increased SSC on benthic, fish and shellfish receptors during the construction phase are concluded to be not significant in EIA terms.
- 6.8.2.62 The sensitivity of receptors to temporary habitat loss varies, although most considered for this assessment are not habitat specialists, and are able to forage for a range of prey species across different locations (Del Hoyo *et al.*, 1992; Bradbury *et al.*, 2014; Kleinschmidt *et al.*, 2019). sea ducks, mergansers and shag are species considered with specific foraging habitat requirements as they are tied to locations of their main prey source. However, as the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas do not overlap with any SPAs designated for these species (excluding common scoter), it is unlikely that they occur in significant abundance. This is supported by the available data in **Section 6.4.5**, which recorded infrequent and / or low numbers of all species across the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas and suggests the study areas do not overlap with key prey supporting habitats for these species. Therefore, it is concluded that the magnitude of temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species the on sea ducks (excluding common scoter) and mergansers during the construction phase is **negligible**.
- 6.8.2.63 Common scoter however was observed in a high abundance (with low frequency) in the Nearshore Marine Offshore Study Area. This species distribution is based on the abundance of their specialised prey item; bivalves (Kaiser *et al.*, 2006; Breen *et al.*, 2022). As per **Volume 2, Chapter 3: Benthic Subtidal and Intertidal Ecology, of the PEIR**, the benthic feature (which includes bivalves) are able to withstand temporary SSC, therefore the conclusion of significance of effect was minor. Furthermore, considering the construction activities will be short-term and temporary any affected species from increase SSC are expected to recover to baseline levels. As such, significant prey reduction for common scoter is not anticipated. Given the nature of these construction works turbidity is also expected to decline once construction works are completed within the affected area. Therefore, the magnitude of temporary habitat loss/disturbance from increased SSCs during the construction phase is **negligible**.
- 6.8.2.64 Although red-throated diver, black throated-diver and great northern diver are classified as having high vulnerability to the temporary habitat loss from suspended sediment, their diverse selection of prey species, including benthic and pelagic fish, means they can utilise a range of habitats for foraging (Kleinschmidt *et al.*, 2019; Jardine, 2024). Moreover, considering these species are limited by water depth (Kleinschmidt *et al.*, 2019), they are unlikely to occur in significant abundance throughout most of the Offshore Marine Ornithology Study Area but may occur within the Nearshore Marine Ornithology Study Area, although available data [see **Section 6.4.5**] suggests significant abundances are unlikely. As there is suitable alternative nearshore habitat nearby, particularly the area stretching south from the MHPGC Project PEIR Red Line Boundary for approximately 12km to Hartlepool (Ecology Consulting, 2016), divers are able to relocate to adjacent alternative areas. Given the mobility of divers and the availability of suitable foraging habitat within close proximity, any energetic costs for relocations are expected to be negligible. This is true of other piscivorous species with generalist habitat requirements such as cormorant and shag and therefore impacts as a result

of temporary habitat loss are considered very unlikely for these species. Therefore, it is concluded that the magnitude of temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species the on divers during the construction phase is **low**.

6.8.2.65 Despite medium sensitivity, both guillemot and razorbill have large foraging ranges during the breeding season and so have an abundance of suitable alternative habitat, reducing the likelihood of impacts from temporary habitat loss as a result of the construction activities in the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas. This is also the case during the non-breeding season as both species disperse widely across the North Sea (Buckingham *et al.*, 2022) and so are unlikely to be impacted. Therefore, it is concluded that the magnitude of temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species the on auks during the construction phase is **negligible**.

6.8.2.66 Tern species will only be present within the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas during the breeding and post-breeding seasons. As the Nearshore Ornithology Study Area and Offshore Marine Ornithology Study Areas either overlaps or is within 4.5km of the Northumbria Coast SPA and Teesmouth and Cleveland SPA, there is potential for spatial overlap between construction activities and birds designated at these SPAs. Both SPAs designated for breeding Arctic tern, common tern and sandwich tern. However, as these are highly mobile species, and construction works are spatially and temporarily restricted, it is unlikely any temporary habitat loss will result in a significant impact to these species, as there will be minimal energetic costs to move to abundant alternative habitat nearby. Therefore, it is concluded that the magnitude of temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species on the terns during the construction phase is **negligible**.

Significance of effect:

6.8.2.67 Summary of the significance of effect for each species is presented in **Table 6.34**.

6.8.2.68 It is considered that the sea ducks, mergansers and shag sensitivity, both in Scottish and English waters is **medium to high** and the magnitude of temporary habitat loss is **negligible**. Therefore, when considering the above, the effect of temporary habitat loss/disturbance from increased SSCs during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.

6.8.2.69 It is considered that the auk sensitivity, both in Scottish and English waters is **medium to high** and the magnitude of temporary habitat loss is **negligible**. Therefore, when considering the above, the effect of temporary habitat loss/disturbance from increased SSCs during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.

6.8.2.70 It is considered that the divers sensitivity, both in Scottish and English waters is at most **medium** and the magnitude of temporary habitat loss is **low**. Therefore, when considering the above, the effect of temporary habitat loss/disturbance from increased SSCs during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.

6.8.2.71 It is considered that the tern sensitivity, both in Scottish and English waters is **medium to high** and the magnitude of temporary habitat loss is **negligible**. Therefore, when considering the above, the effect of temporary habitat loss/disturbance from increased SSCs during the construction phase, is concluded to be **minor**, which is not significant in EIA terms.

Secondary mitigation and residual effect:

6.8.2.72 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant. Therefore, residual effects both in Scottish and English waters are concluded to be **minor**, which is not significant in EIA terms.

Table 6.34: Summary of the significance of effect in relation to temporary habitat loss/disturbance from increased SSCs for each Nearshore Marine Ornithology receptors.

Species	Overall Sensitivity	Magnitude of Impact	Significance of the effect
Eider	Medium	Negligible	Minor

Species	Overall Sensitivity	Magnitude of Impact	Significance of the effect
Common scoter	Medium to High	Negligible	Minor
Velvet scoter	Medium to High	Negligible	Minor
Red-breasted merganser	Medium	Negligible	Minor
Razorbill	Medium to High	Negligible	Minor
Guillemot	Medium to High	Negligible	Minor
Sandwich tern	Medium to High	Negligible	Minor
Arctic tern	Medium to High	Negligible	Minor
Common tern	Medium to High	Negligible	Minor
Roseate tern	High	Negligible	Minor
Red-throated diver	Low	Low	Negligible or minor
Great northern diver	Low to Medium	Low	Minor
Black-throated diver	Medium	Low	Minor
Shag	Low to Medium	Negligible	Minor

6.8.3 O&M phase

Disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels.

6.8.3.1 During the O&M phase there is the potential for disturbance and displacement arising from vessels undertaking maintenance activities. As outlined in the MDS [see **Table 6.23**], over the 35-year operational lifetime of the MHPGC Project, routine maintenance activities may comprise up to 41 export cable repairs to be expected over the lifetime of the MHPGC Project with 4% of the cable route length potentially required for remediation per year. It is expected that up to 245 operational and maintenance vessel movements will occur over the operational lifetime. The potential for impact is concluded as equal to or less than the predicted level of impact during the construction phase.

Nearshore Marine Ornithology and Offshore Marine Ornithology (Scottish and English waters)

Receptor sensitivity:

6.8.3.2 The sensitivities of the receptors assessed for this effect pathway both in Scottish and English waters during the O&M phase are analogous with the construction phase, as per **Section 6.8.2**.

Magnitude of impact:

6.8.3.3 Considering the factors described above, disturbance and displacement arising from vessel activity during the O&M phase are expected to be lower compared to the construction phase. Despite the O&M phase extending across the 35-year operational lifetime of the MHPGC Project, these activities will be highly localised and infrequent, short-term events. In addition, there will be no UXO clearance during the O&M phase.

6.8.3.4 Furthermore, the commitment to a VTMP and RTDP (CoT30 and CoT54) [see **Section 6.7**] will ensure, where possible, vessel transit routes and activities avoid any aggregations of sensitive species, further reducing the potential for disturbance and displacement impacts.

- 6.8.3.5 Therefore, when considering the above in conjunction with the construction phase assessment [see **Section 6.8.2**], it is concluded that the magnitude of disturbance and displacement associated with the presence of vessels during the O&M phase is **negligible**.

Significance of effect:

- 6.8.3.6 Overall, it is considered that the VORs sensitivity both in Scottish and English waters range is at most **high**, and the magnitude of the impact is **negligible**. Therefore, the effect of disturbance and displacement, during the O&M phase is concluded to be **negligible** or **minor**, which is not significant in EIA terms.

Secondary mitigation and residual effect:

- 6.8.3.7 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant. Therefore, residual effects both in Scottish and English waters are concluded to be **negligible** or **minor**, which is not significant in EIA terms.

Indirect impacts from underwater sound affecting prey species

- 6.8.3.8 During the O&M phase of the MHPGC Project, there is the potential for indirect impact from underwater noise to prey species arising from the presence of vessels undertaking maintenance activities. As outlined in the MDS [see **Table 6.23**], up to five geophysical surveys are proposed each year (equipment same as within construction) with a total of 245 vessel movements expected to occur across the operational lifetime of the MHPGC Project. Therefore, the potential for impact is concluded as equal to or less than the predicted level of impact during the construction phase.

Nearshore Ornithology Study Area and Offshore Marine Ornithology (Scottish and English waters)

Receptor sensitivity:

The sensitivities of the receptors assessed for this effect pathway both in Scottish and English waters during the O&M phase are analogous with the construction phase, as per **Section 6.8.2**.

Magnitude of impact:

- 6.8.3.9 During the O&M phase of the MHPGC Project both in Scottish and English waters, the potential impact on prey species from underwater noise will be of a lower magnitude than during the construction phase [see **Table 6.23**]. Underwater noise during O&M will be greatly reduced, with less vessels present and no UXO works during this period. Despite the potential for maintenance activities to take place throughout the 35-year operational lifetime of the MHPGC Project, these activities will be intermittent, with no UXO clearance and less vessels present at one time compared to the construction phase.
- 6.8.3.10 Furthermore, the **Volume 2, Chapter 4: Fish and Shellfish Ecology, of the PEIR**, concludes that the potential impacts on prey species from underwater sound are not significant in EIA terms for all fish and shellfish receptors during the O&M phase. Therefore, it is concluded that the magnitude of the impact during the O&M phase is **negligible**.

Significance of effect:

- 6.8.3.11 Overall, it is considered that the VORs sensitivity both in Scottish and English waters ranges is at most **high**, and the magnitude of the impact is **negligible**. Therefore, the effect of disturbance and displacement, during the O&M phase is concluded to be **negligible** or **minor**, which is not significant in EIA terms.

Secondary mitigation and residual effect:

- 6.8.3.12 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant. Therefore, residual effects both in Scottish and English waters are concluded to be **negligible** or **minor**, which is not significant in EIA terms.

Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species

- 6.8.3.13 There is potential for elevated turbidity level within the water column caused by increase SSC during O&M. The resulting impact of increased turbidity can indirectly affect the foraging efficiency of certain diving species by temporarily clouding the water column and can result in a smothering effect

of prey items on the seabed. Species which rely on sight to locate prey can be sensitive to changes in turbidity as they require sufficient water clarity to successfully detect and capture prey (Cook and Burton, 2010).

- 6.8.3.14 As outlined in the MDS [see **Table 6.23**], over the 35-year operational lifetime of the MHPGC Project, routine maintenance activities may comprise up to up to 41 cable repairs covering a total area of 40,000m² while 4% of the cable route length may require remediation are expected to occur across an area of 522,240m² annually. Activities will be undertaken using a similar approach to installation, with the intention to reinstate the seabed to its post-construction condition therefore disturbance will be confined to areas previously affected by installation.

Nearshore Ornithology Study Area and Offshore Marine Ornithology (Scottish and English waters)

Receptor sensitivity:

The sensitivities of the receptors assessed for this effect pathway both in Scottish and English waters during the O&M phase are analogous with the construction phase, as per **Section 6.8.2**.

Magnitude of impact:

- 6.8.3.15 The magnitude of impact both in Scottish and English waters will be less during O&M than during the construction phase, albeit still with the potential for temporary and localised increases in turbidity during maintenance activities. The O&M activities are not expected to occur at the extent of the construction phase, rather intermittently when maintenance is required (41 repairs across the operational lifetime, and up to 13km requiring remediation per year [see **Section 6.6.2**]).
- 6.8.3.16 It should also be noted that increased water turbidity from SSCs occurs naturally in the North Sea. This region is a dynamic environment where wave action, tidal current and storm events frequently disturb sediment.
- 6.8.3.17 As discussed in **Volume 2, Chapter 3: Benthic Subtidal and Intertidal Ecology** and **Volume 2 Chapter 4: Fish and Shellfish Ecology, of the PEIR**, the predicted impacts of increased SSC on benthic, fish and shellfish receptors during O&M are concluded to be not significant in EIA terms. Therefore, it is considered that the magnitude of temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species, during the O&M phase is **negligible**.

Significance of effect:

- 6.8.3.18 Overall, it is considered that the VORs sensitivity both in Scottish and English waters ranges is at most **high**, and the magnitude of temporary habitat loss/disturbance from increased SSCs is **negligible**. Therefore, the effect of temporary habitat loss/disturbance from increased SSCs, during the O&M phase, is concluded to be **negligible** or **minor**, which is not significant in EIA terms.

Secondary mitigation and residual effect:

- 6.8.3.19 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant. Therefore, residual effects both in Scottish and English waters are concluded to be **negligible** or **minor**, which is not significant in EIA terms.

6.8.4 Decommissioning phase

Disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels.

- 6.8.4.1 During the decommissioning phase of the MHPGC Project, there is the potential for disturbance and displacement arising from the presence of vessels and associated decommissioning activities. As outlined in the MDS [see **Table 6.23**], the number of vessels for the decommissioning phase is assumed to be as that described for the construction phase. Closer to the time of decommissioning, it may be decided that removal would lead to a greater environmental impact than leaving some components *in situ*, in which case certain components may be left buried (e.g. in the case of sub-sea cables). This may reduce the amount of decommissioning activity required, however the worst case is assumed to be removal of all infrastructure, with this scenario forming the basis of this assessment.

Receptor sensitivity:

- 6.8.4.2 The sensitivities of all (nearshore and offshore marine ornithology) receptors assessed for this effect pathway both in Scottish and English waters during the decommissioning phase are analogous with the construction phase, as presented in **Section 6.8.2**. Consequently, overall sensitivity of the VORs to this impact ranges from **negligible to high**.

Magnitude of impact:

- 6.8.4.3 The magnitude of this impact both in Scottish and English waters during the decommissioning phase will be analogous with the construction phase, as presented in **Section 6.8.2**. Consequently, the magnitude of the impact is concluded as **negligible to low**.

Significance of effect:

- 6.8.4.4 It is considered that the auk sensitivity, both in Scottish and English waters is **medium to high** and the magnitude of indirect impacts from disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels is **negligible**. Therefore, when considering the above, the effect of disturbance and displacement on the receptors during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.
- 6.8.4.5 The sensitivity of sea ducks, mergansers, divers (excluding red-throated diver) and shag, both in Scottish and English waters is **medium to high** and the magnitude of disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels is **negligible**. Therefore, when considering the above, the effect of disturbance and displacement on the receptor during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.
- 6.8.4.6 It is considered that red-throated diver sensitivity, both in Scottish and English waters is **low** and the magnitude of disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels is **negligible**. Therefore, when considering the above, the effect of indirect impacts from disturbance and displacement on the receptors during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.

Secondary mitigation and residual effect:

- 6.8.4.7 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant. Therefore, residual effects both in Scottish and English waters are concluded to be minor, which is not significant in EIA terms.

Indirect impacts from underwater sound affecting prey species

- 6.8.4.8 During the decommissioning phase of the MHPGC Project, there is the potential for indirect impacts from underwater noise to affect prey species arising from the presence of vessels and associated decommissioning activities. As outlined in MDS [see **Table 6.23**], for sound from vessels for the decommissioning phase is assumed to be as that described for the construction phase.

Receptor sensitivity:

- 6.8.4.9 The sensitivities of all (nearshore and offshore marine ornithology) receptors assessed for this effect pathway both in Scottish and English waters during the decommissioning phase are analogous with the construction phase, as presented in **Section 6.8.2**. Consequently, overall sensitivity of the VORs to this impact ranges from **negligible to high**.

Magnitude of impact:

- 6.8.4.10 The magnitude of this impact both in Scottish and English waters during the decommissioning phase will be analogous with the construction phase, as presented in **Section 6.8.2**. Consequently, the magnitude of the impact is concluded as **negligible to low**.

Significance of effect:

- 6.8.4.11 It is considered that the sea ducks and mergansers sensitivity, both in Scottish and English waters is **medium to high** and the magnitude of indirect impacts from impacts to prey species is **low**. Therefore, when considering the above, the effect of indirect impacts from impacts to prey species during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.

- 6.8.4.12 It is considered that the auk sensitivity, both in Scottish and English waters is **medium to high** and the magnitude of indirect impacts from impacts to prey species is **negligible**. Therefore, when considering the above, the effect of indirect impacts from impacts to prey species during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.
- 6.8.4.13 It is considered that divers sensitivity, both in Scottish and English waters is at most **medium** and the magnitude of indirect impacts from impacts to prey species is **low**. Therefore, when considering the above, the effect of indirect impacts from impacts to prey species during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.
- 6.8.4.14 It is considered that the tern sensitivity, both in Scottish and English waters is **medium to high** and the magnitude of indirect impacts from impacts to prey species is **negligible**. Therefore, when considering the above, the effect of indirect impacts from impacts to prey species during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.

Secondary mitigation and residual effect:

- 6.8.4.15 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant. Therefore, residual effects both in Scottish and English waters are concluded to be minor, which is not significant in EIA terms.

Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species

- 6.8.4.16 There is potential for elevated turbidity level within the water column caused by increased SSCs during the decommissioning phase. The resulting impact of increased turbidity can indirectly affect the foraging efficiency of certain diving species by temporarily clouding the water column and can result in a smothering effect of prey items on the seabed. Diving seabird species can be sensitive to changes in turbidity as they often forage visually and require sufficient water clarity to successfully detect and capture prey (Cook and Burton, 2010). As outlined in MDS [see **Table 6.23**], for increased SSC decommissioning phase is assumed to be as that described for the construction phase with additional all export cables and cable production removed.

Receptor sensitivity:

- 6.8.4.17 The sensitivities of all (nearshore and offshore marine ornithology) receptors assessed for this effect pathway both in Scottish and English waters during the decommissioning phase are analogous with the construction phase, as presented in **Section 6.8.2**. Consequently, overall sensitivity of the VORs to this impact ranges from **low to high**.

Magnitude of impact:

- 6.8.4.18 The magnitude of this impact both in Scottish and English waters during the decommissioning phase will be analogous with the construction phase, as presented in **Section 6.8.2**. Consequently, the magnitude of the impact is concluded as **negligible to low**.

Significance of effect:

- 6.8.4.19 It is considered that the sea ducks and mergansers sensitivity, both in Scottish and English waters is **medium to high** and the magnitude of temporary habitat loss is **negligible**. Therefore, when considering the above, the effect of temporary habitat loss/disturbance including indirect impacts on prey species from increased SSCs during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.
- 6.8.4.20 It is considered that the auk sensitivity, both in Scottish and English waters is **medium to high** and the magnitude of temporary habitat loss is **negligible**. Therefore, when considering the above, the effect of temporary habitat loss/disturbance including indirect impacts on prey species from increased SSCs during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.
- 6.8.4.21 It is considered that the divers sensitivity, both in Scottish and English waters is at most **medium** and the magnitude of temporary habitat loss is **low**. Therefore, when considering the above, the effect of temporary habitat loss/disturbance including indirect impacts on prey species from increased SSCs during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.

- 6.8.4.22 It is considered that the tern sensitivity, both in Scottish and English waters is **medium** to **high** and the magnitude of temporary habitat loss is **negligible**. Therefore, when considering the above, the effect of temporary habitat loss/disturbance including indirect impacts on prey species from increased SSCs during the decommissioning phase, is concluded to be **minor**, which is not significant in EIA terms.

Secondary mitigation and residual effect:

- 6.8.4.23 There are no additional commitments employed for this potential impact, as the residual level of effect is concluded as not significant. Therefore, residual effects both in Scottish and English waters are concluded to be minor, which is not significant in EIA terms.

6.9 Whole project assessment and Cumulative Effects Assessment methodology

6.9.1 Methodology

- 6.9.1.1 The Morven Programme comprises four distinct projects: Morven North, Morven South, MHPGC Project, and Morven Branxton Area Grid Connection Project (MBAGC Project).
- 6.9.1.2 The following assessment scenarios have been considered to identify the Likely Significant Effects (LSE) of MHPGC Project in combination with other projects on the same receptor, as follows (and summarised in **Table 6.35**):
- Whole project assessment: to identify the potential impacts associated with MHPGC Project together with Morven North and Morven South in turn, (Scenario 1: Morven North and Scenario 2: Morven South), each of which would comprise a “Whole Project”;
 - Morven Programme assessment: to identify potential impacts associated with all four components of the Morven Programme (Morven North, Morven South, MHPGC Project, and MBAGC Project) together with other relevant projects, plans and activities (Scenario 3);
 - Cumulative Effects Assessment (CEA): to identify the potential impacts associated with MHPGC Project together with relevant projects, plans and activities, including other components of the Morven Programme, using a tiered approach (Scenario 4).
- 6.9.1.3 The whole project assessment and CEA have been undertaken in accordance with the methodology described in **Volume 1, Chapter 4: Approach to Environmental Impact Assessment, of the PEIR**.

Table 6.35: Scenarios to be considered in the MHPGC Project whole project assessment and Cumulative Effects Assessment for marine ornithology

Whole project assessment		Morven Programme assessment (Offshore Ornithology and Shipping and Navigation chapters only)	CEA
Scenario 1	Scenario 2	Scenario 3	Scenario 4
MHPGC Project and Morven North	MHPGC Project and Morven South	MHPGC Project, Morven North, Morven South and MBAGC Project	MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2 and Tier 3 (including MBAGC Project) projects and plans screened in

- 6.9.1.4 The projects and plans selected as relevant to the CEA presented within this chapter are based upon the results of a screening exercise (see **Volume 1, Annex 4.3: Cumulative Screening and Location Plan, of the PEIR**). Each project or plan has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.
- 6.9.1.5 In undertaking the CEA for MHPGC Project, it should be noted that other projects and plans under consideration will have differing potential for proceeding to an operational stage and hence a differing potential to ultimately contribute to a cumulative impact alongside MHPGC Project. Therefore, a tiered approach has been adopted, whereby all third-party projects and plans considered have been allocated into ‘tiers’ reflecting their current stage within the planning and development process. This provides a framework for placing relative weight upon the potential for each project/plan included in the CEA to ultimately be realised, based upon the project/plan's current stage of maturity and certainty in the project/plan's parameters. The tiered approach utilised within the MHPGC Project CEA employs the following tiers:

- Tier 1 assessment – Existing developments either built (operational) or under construction¹; approved developments awaiting implementation; and permitted/submitted application(s), but not yet determined, plus Morven North and Morven South;
 - Tier 2 assessment – All plans/projects assessed under Tier 1, plus plans/projects where a scoping report has been submitted and is in the public domain;
 - Tier 3 assessment – All plans/projects assessed under Tier 1 and 2, plus MBAGC Project, and plans/projects that are reasonably foreseeable (e.g. projects identified in development plans, projects in other plans and programmes, offshore renewable energy projects that have a Crown Estate Scotland Lease Option Agreement).
- 6.9.1.6 All potential impacts from the MHPGC Project alone assessment have been scoped into to the CEA [see **Table 6.21**].
- 6.9.1.7 Some of the potential impacts considered within the MHPGC Project alone assessment are specific to a particular phase of development (e.g. construction, O&M or decommissioning). Where cumulative effects with other plans or projects only have potential to occur where there is spatial or temporal overlap with MHPGC Project during certain phases of development, impacts associated with a certain phase may be omitted from further consideration where no plans or projects have been identified that have the potential for cumulative effects during this period.
- 6.9.1.8 Projects and plans were screened into the CEA for marine ornithology on a receptor-based basis (rather than a distance-based basis). Projects are screened in when there is a cumulative pathway, based on:
- The potential to affect the same receptors;
 - Having the same impact pathway(s);
 - Temporal overlap for the relevant phases;
 - Spatial overlap;
 - Data availability.
- 6.9.1.9 The approach to screening in projects for the CEA for marine ornithology is set out in further detail per receptor group below.
- 6.9.1.10 For disturbance-sensitive divers (red-throated diver, great northern diver, and black-throated diver), sea ducks (long-tailed duck, eider, common scoter, velvet scoter and red-breasted merganser) and shag, projects and plans within 15km were included. This reflects the generally coastal distribution of these species and their relatively constrained foraging and habitat-use patterns compared with wider-ranging offshore seabirds. The screening distance was selected to capture projects with the greatest potential for spatial overlap in areas used by these receptors and therefore the greatest potential for cumulative disturbance, displacement or indirect effects via prey resources. Projects beyond 15km were considered unlikely to interact cumulatively with the MHPGC Project. This distance is recommended within the NatureScot Guidance Note 4 to determine connectivity of inshore waterfowl and non-breeding seabirds to SPAs (NatureScot, 2023d).
- 6.9.1.11 For terns (Sandwich tern, arctic tern, common tern and roseate tern), projects and plans within a precautionary 58km of the MHPGC Project were screened in, reflecting the 57.5km MM+1SD foraging range of Sandwich tern, the largest foraging range of the four tern species considered. This screening distance was selected to reflect their relatively constrained foraging and habitat-use patterns compared with wider-ranging offshore seabirds, thus capturing projects with the greatest

¹ Note that existing developments are included in Tier 1 CEA long list but are generally screened out of the CEA assessments, aside from the following exceptions:

1) Existing developments which were not present at the time of baseline characterisation, where a potential cumulative impact-receptor pathway has been identified.

2) Existing developments are screened into tier 1 assessments for specific topics where there is a large conceptual, temporal and spatial overlap between project impacts. In these instances, the potential for ongoing effects through cumulative impact-receptor pathways throughout project lifetime, across the development phases, means that they are considered within quantitative assessment for these topic CEAs (e.g., offshore ornithology assessments consider the cumulative effects of operational offshore wind farms).

potential for spatial overlap in areas used by these receptors and therefore the greatest potential for cumulative disturbance, displacement or indirect effects via prey resources. Projects beyond 58km were considered unlikely to interact cumulatively with the MHPGC Project.

- 6.9.1.12 Based on the same reasoning, for auks (puffin, razorbill, guillemot), projects and plans within a precautionary 266km of the MHPGC Project were screened in, reflecting the 265.4km MM+1SD foraging range of Puffin, the largest foraging range of the auk species considered.
- 6.9.1.13 Projects identified within these search areas were then screened further, and projects included only when there was receptor overlap, temporal overlap and pathway overlap or both (for impact pathways, see **Table 6.21**). Locations of the other plans and projects in relation to the MHPGC PEIR Red Line Boundary is presented in **Figure 6.3**.
- 6.9.1.14 Only projects with overlapping construction schedules were screened in. No significant impacts were determined in the MHPGC Project alone assessment, and during the operation and maintenance phase of the offshore wind farms and their associated cables, vessel and maintenance activities are infrequent, intermittent and highly localised, with activity lower compared to the construction phase. Any overlap in maintenance activities between projects would therefore result in only a small increase in disturbance and indirect effects through underwater sound and increases in SSC above the MHPGC Project alone. Vessel movements would remain transient in nature, with effects limited to the period of activity and no UXO clearance anticipated during operation. For these reasons, projects with overlap during the operation and maintenance phase were not screened in for the cumulative impact assessment.
- 6.9.1.15 The specific projects and plans screened into the CEA for marine ornithology are outlined in **Table 6.36**. Whilst a broad range of projects and plans were considered during cumulative screening, only offshore wind projects and their associated cables met the screening criteria set out below, and are thus the only project type screened in and included in **Table 6.36**. It should be noted that despite only Scottish plans and project taken forward to the CEA. English plans and projects were considered during the longlisting, but no overlapping construction schedules were identified.
- 6.9.1.16 For brevity, nearshore marine ornithology and offshore marine ornithology are considered together in the CEA, referred to collectively as “marine ornithology”.

Table 6.36: List of other projects and plans considered within the Cumulative Effects Assessment for marine ornithology

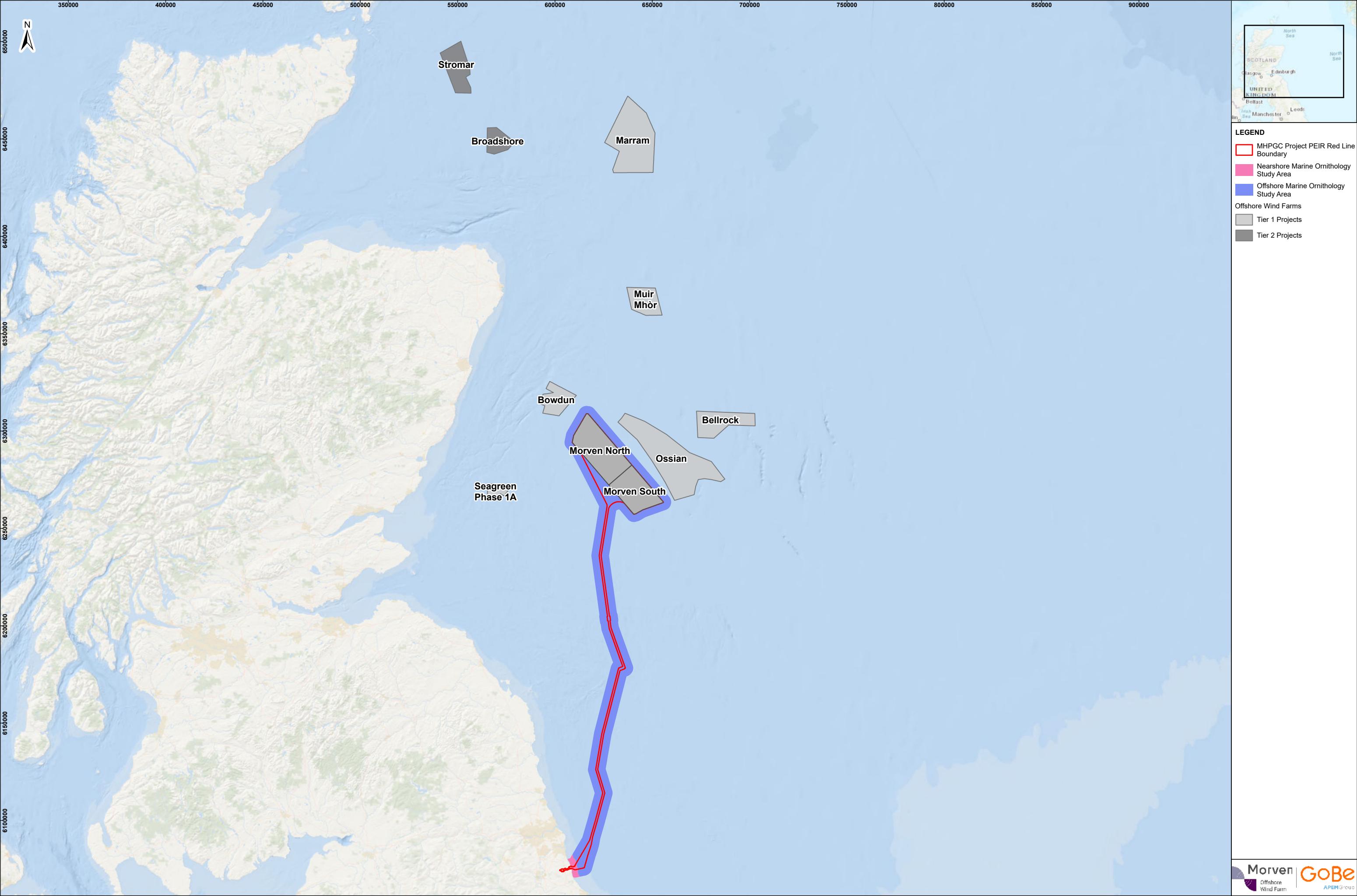
Project/plan	Status	Distance from MHPGC Project PEIR Red Line Boundary (km)	Screened in for which receptor groups	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Tier 1							
Offshore wind projects and associated cables							
Morven North	Application submitted	0	Diver, sea ducks and shag; Terns; and Auks	Proposed for up to 96 turbines.	2033-2042	2038 to 2073-2077	Yes. Overlap of construction phase with the construction or operational phases of MHPGC Project.
Morven South	Application submitted	0	Diver, sea ducks and shag; Terns; and Auks	Proposed for up to 95 turbines.	2033-2042	2038 to 2073-2077	Yes. Overlap of construction phase with the construction or operational phases of MHPGC Project.
Ossian OWF	Application submitted, (pre-application for English transmission infrastructure DCO paused).	6 (OWF) 34 (ECC)	Diver, sea ducks and shag; Terns; and Auks	Ossian OWF is proposed for up to 265 turbines at a capacity of 3600 MW.	2031-2034	2035 onwards	Yes. Overlap of construction phase with the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from MHPGC Project PEIR Red Line Boundary (km)	Screened in for which receptor groups	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Bowdun OWF	Application submitted	10 (OWF) 20 (ECC)	Diver, sea ducks and shag; Terns; and Auks	Bowdun OWF is proposed for 40-67 turbines at a capacity of 1000 MW.	2031-2034	2035 onwards	Yes. Overlap of construction phase with the construction or operational phases of MHPGC Project.
Bellrock OWF	Application submitted	25 (ECC) 35 (OWF)	Terns; and Auks	Bellrock OWF is proposed for 90-132 turbines at a capacity of 1800 MW.	2029-2033	2034 onwards	Yes. Overlap of construction phase with the construction or operational phases of MHPGC Project.
Seagreen Phase 1A	Consented	41 (OWF) 49 (ECC)	Terns; and Auks	Up to 36 turbines at a capacity of up to 500 MW.	2029-2033	2033 onwards	Yes. Overlap of construction phase with the construction or operational phases of MHPGC Project.

Project/plan	Status	Distance from MHPGC Project PEIR Red Line Boundary (km)	Screened in for which receptor groups	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Muir Mhòr OWF	Application submitted	59 (OWF) 61 (ECC)	Auks	Muir Mhòr OWF is proposed for up to 67 turbines at a capacity of 1000 MW.	2029-2033	2034 onwards	Yes. Overlap of construction phase with the construction or operational phases of MHPGC Project.
Marram OWF	Application submitted	125 (OWF & ECC)	Auks	Marram OWF is proposed for 126-225 turbines at a capacity of 3000 MW.	2028-2035	2036 onwards	Yes. Overlap of construction phase with the construction or operational phases of MHPGC Project.

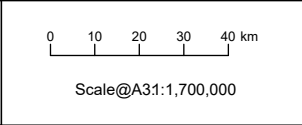
Project/plan	Status	Distance from MHPGC Project PEIR Red Line Boundary (km)	Screened in for which receptor groups	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
Tier 2							
Offshore wind projects and associated cables							
Stromar OWF	Scoping report submitted	175 (OWF) 107 (ECC)	Auks	Scoping report proposes up to 71 turbines.	2028-2034	2034 onwards	Yes. Overlap of construction phase with the construction or operational phases of MHPGC Project.
Broadshore OWF	Scoping report submitted	142 (OWF & ECC)	Auks	Scoping report proposes 32-60 turbines.	2030-2033	2034 onwards	Yes. Overlap of construction phase with the construction or operational phases of MHPGC Project.
Tier 3							
Offshore wind projects and associated cables							

Project/plan	Status	Distance from MHPGC Project PEIR Red Line Boundary (km)	Screened in for which receptor groups	Description of project/plan	Estimated dates of construction (If applicable)	Estimated dates of operation (If applicable)	Overlap with MHPGC Project
MBAGC Project	Pre-application	0	Diver, sea ducks and shag; Terns; and Auks	Potential transmission for Morven North or Morven South	Unknown	Unknown	Unknown. Construction, O&M and decommissioning phases may overlap with MHPGC Project construction, O&M and decommissioning phases.



Project Name:
MORVEN HAWTHORN PIT GRID
CONNECTION PROJECT

Drawing Title:
OTHER PROJECTS AND PLANS CONSIDERED WITHIN THE CES FOR MARINE
ORNITHOLOGY



Geodetic Information:
Datum: European 1950
Projection: ED 1950 UTM Zone 30N

Data Sources:
BP, Ordnance Survey

Service Layer Credits:
World Topographic Map: Esri, HERE, Garmin, FAO, NOAA, USGS
World Ocean Base: OceanWise, Esri, GEBCO, Garmin, NaturalVue

Drawing Number: FIGURE 6-3				
VER	DATE	DETAILS	BY	CHECK
00	18/08/2025	Initial Issue	GB	SZ
-	-	-	-	-



LEGEND

- MHPGC Project PEIR Red Line Boundary
- Nearshore Marine Ornithology Study Area
- Offshore Marine Ornithology Study Area
- Offshore Wind Farms
 - Tier 1 Projects
 - Tier 2 Projects



6.9.2 Maximum Design Scenario – Whole project assessment and Cumulative Effects Assessment

- 6.9.2.1 The MDSs identified in **Table 6.37** have been selected as those having the potential to result in the greatest potential effect on an identified receptor or receptor group in relation to the whole project assessment and CEA. The MDSs have been based on the MHPGC Project alone assessment MDS [see **Table 6.23**], as well as publicly available information on other third-party projects and plans that have been screened into the CEA [see **Table 6.36**]. Where applicable, the Morven North and Morven South alone assessment MDSs, and project information available for MBAGC Project have also informed the MDSs outlined in **Table 6.37**.

Table 6.37: Maximum Design Scenario considered for the assessment of potential whole project and cumulative effects on marine ornithology

Potential Effect	Phase ²³			Maximum Design Scenario	Justification
	C	O	D		
Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species	✓	x	✓	Scenario 1 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with Morven North. Scenario 2 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with Morven South. Scenario 3 MDS as described for MHPGC Project (Table 6.39), assessed cumulatively with Morven North, Morven South, and MBAGC Project. Scenario 4 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with the following other projects and plans: Tier 1 Offshore wind projects and associated cables: Morven North (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Morven South (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Ossian Offshore Wind Farm (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Bowdun Offshore Wind Farm (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Bellrock Offshore Wind Farm Offshore Wind Farm (Construction phase) (Terns and Auks); Seagreen Phase 1A (Construction phases) (Terns and Auks);	Projects and plans included within these scenarios involve activities that may result in temporary habitat loss within the study area. Where spatial or temporal overlap occurs with MHPGC Project, these activities may act cumulatively and are therefore considered to represent a precautionary MDS.

² C= Construction, O= Operations and maintenance, D= Decommissioning phases³ "✓" is used to denote the phase the potential impact can occur, "X" outlines there is no impact within this project phase

Potential Effect	Phase ²³			Maximum Design Scenario	Justification
	C	O	D		
				Muir Mhòr Offshore Wind Farm (Construction phase) (Auks); Marram Offshore Wind Farm (Construction phase) (Auks). Tier 2 Offshore wind projects and associated cables: Stromar Offshore Wind Farm (Construction phase) (Auks); Broadshore Offshore Wind Farm (Construction phase) (Auks). Tier 3 MBAGC Project.	
Indirect impacts from underwater sound affecting prey species	✓	✗	✓	Scenario 1 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with Morven North. Scenario 2 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with Morven South. Scenario 3 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with Morven North, Morven South, and MBAGC Project. Scenario 4 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with the following other projects and plans: Tier 1 Offshore wind projects and associated cables: Morven North (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Morven South (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Ossian Offshore Wind Farm (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Bowdun Offshore Wind Farm (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Bellrock Offshore Wind Farm Offshore Wind Farm (Construction phase) (Terns and Auks);	Projects and plans included within these scenarios involve activities that may result in indirect impacts on prey within the study area. Where spatial or temporal overlap occurs with MHPGC Project, these activities may act cumulatively and are therefore considered to represent a precautionary MDS.

Potential Effect	Phase ²³			Maximum Design Scenario	Justification
	C	O	D		
				Seagreen Phase 1A (Construction phase) (Terns and Auks); Muir Mhòr Offshore Wind Farm (Construction phase) (Auks); Marram Offshore Wind Farm (Construction phase) (Auks). Tier 2 Offshore wind projects and associated cables: Stromar Offshore Wind Farm (Construction phase) (Auks); Broadshore Offshore Wind Farm (Construction phase) (Auks). Tier 3 MBAGC Project.	
Disturbance and displacement from airborne noise, underwater sound and visual disturbance associated from the presence of vessels	✓	✗	✓	Scenario 1 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with Morven North. Scenario 2 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with Morven South. Scenario 3 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with Morven North, Morven South, and MBAGC Project. Scenario 4 MDS as described for MHPGC Project (Table 6.23), assessed cumulatively with the following other projects and plans: Tier 1 Offshore wind projects and associated cables: Morven North (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Morven South (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Ossian Offshore Wind Farm (Construction phase) (Divers, sea ducks and shag; Terns; and Auks); Bowdun Offshore Wind Farm (Construction phase) (Divers, sea ducks and shag; Terns; and Auks);	Projects and plans included within these scenarios involve activities that may result in disturbance and displacement within the study area. Where spatial or temporal overlap occurs with MHPGC Project, these activities may act cumulatively and are therefore considered to represent a precautionary MDS.

Potential Effect	Phase ²³			Maximum Design Scenario	Justification
	C	O	D		
				Bellrock Offshore Wind Farm Offshore Wind Farm (Construction phase) (Terns and Auks); Seagreen Phase 1A (Construction phases) (Terns and Auks); Muir Mhòr Offshore Wind Farm (Construction phase) (Auks); Marram Offshore Wind Farm (Construction phase) (Auks). Tier 2 Offshore wind projects and associated cables: Stromar Offshore Wind Farm (Construction phase) (Auks); Broadshore Offshore Wind Farm (Construction phase) (Auks). Tier 3 MBAGC Project	

6.10 Whole project assessment and Cumulative Effects Assessment

6.10.1 Overview

- 6.10.1.1 A description of the significance of whole project and cumulative effects upon marine ornithology receptors arising from each identified impact is given below. The whole project assessment and CEA for MHPGC Project is presented in **Table 6.38** to **Table 6.46**.

6.10.2 Disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels

- 6.10.2.1 There is potential for cumulative disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels as a result of activities associated with MHPGC Project and other projects that are under construction, in operation or with planned decommissioning.
- 6.10.2.2 The summary of the whole project assessment for disturbance and displacement is presented in **Table 6.38** and **Table 6.39**, and the summary of the Cumulative Effects Assessment is presented in **Table 6.40**.

Table 6.38: MHPGC Project whole project assessment for disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Magnitude of impact	This assessment is applicable to both Scenario 1 (MHPGC Project and Morven North) and Scenario 2 (MHPGC Project and Morven South). MHPGC Project activities will be spatially limited to the MHPGC Project PEIR Red Line Boundary, and vessels will gradually travel along the route rather than remaining in one location over the whole construction period. Disturbance and displacement occurring as a result of the MHPGC project will be additional to the disturbance and displacement from Morven North and Morven South, and baseline levels of shipping activities. <u>Nearshore Marine Ornithology Study Area</u> Divers, sea ducks and shag: As these receptors are restricted to coastal waters, their distributions do not overlap spatially with Morven North and Morven South. The cumulative disturbance pathway arises from the potential for construction and support vessels associated with the MHPGC Project, Morven North and Morven South to operate concurrently within the same broad coastal region, resulting in repeated or overlapping disturbance events. Although the cumulative assessment considers the addition of Morven North and Morven South, the nature of the effect remains unchanged. Given the localised and short-term nature of vessel disturbance, together with the availability of alternative habitat within the wider coastal environment, the cumulative disturbance arising from multiple projects is not expected to result in ecologically significant displacement. The magnitude of the cumulative impact is therefore considered to remain low in English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, given their foraging ranges). <u>Offshore Marine Ornithology Study Area</u> Auks: Disturbance events associated with vessel activity are expected to be short-term, temporary and reversible, and opportunities for the MHPGC Project, Morven North and Morven South to generate disturbance concurrently are limited. Consequently, while Morven North and Morven South may marginally increase the frequency of disturbance events within the wider region, they do not materially increase the duration or severity of the effect. The additional disturbance pressure introduced through Morven North and Morven South remains highly localised, temporary and reversible, with vessel activity associated with all projects being transient in nature and disturbance effects not expected to persist beyond the period of activity. Although birds may exhibit behavioural responses to vessel presence and temporarily avoid affected areas, it is important to distinguish between a behavioural response and an ecological effect. Displacement only constitutes an ecological impact where it results in	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	measurable consequences for survival or productivity. Given the localised, short-term, temporary and reversible nature of vessel activity, the availability of alternative habitat, and the absence of measurable consequences for survival or productivity, cumulative disturbance associated with Morven North and Morven South is not expected to result in an ecological effect at the population level. The magnitude of the cumulative impact is therefore considered to remain negligible in both Scottish and English waters.	
Sensitivity of receptor	Receptor sensitivity is determined as per the alone assessment and is the same for both English and Scottish waters [see Section 6.8.2]. To summarise, receptor sensitivity was defined based on behavioural sensitivity to the effect pathway and conservation value. Sensitivity of divers, sea ducks, and shags ranged from low to medium sensitivity. Auks have a medium to high sensitivity.	
Significance of effect	Divers, sea ducks and shag: the magnitude of the cumulative impact is deemed to be low, and the sensitivity of the receptors in this receptor group of no greater than medium. A low magnitude and medium sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to both Scenario 1 and Scenario 2 in English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, given their nearshore ecology). Auks: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance (for both Scenario 1 and Scenario 2, and for both English and Scottish waters), which is not significant in EIA terms.	
Further mitigation and residual significance	No mitigation measures for marine ornithology receptors are considered necessary because the likely effect in the absence of further mitigation (beyond the designed in measures outlined in Table 6.24), is not significant in EIA terms.	
Operations and maintenance phase		
N/A		
Decommissioning phase		
Magnitude of impact	As per construction phase.	
Sensitivity of receptor	During the decommissioning phase of the MHPGC Project, there is the potential for disturbance and displacement arising from the presence of vessels and associated decommissioning. As outlined in the MDS [see Table 6.23], the number of vessels for the decommissioning phase is assumed to be as that described for the construction phase. Closer to the time of decommissioning, it may be decided that removal would lead to a greater environmental impact than leaving some components <i>in situ</i> , in which case certain components may be left buried (e.g. in the case of sub-sea cables). This may reduce the amount of decommissioning activity required, however the worst case is assumed to be removal of all infrastructure.	
Significance of effect		
Further mitigation and residual significance		

Table 6.39: Morven Programme assessment for disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels

Morven Programme assessment	
Scenario 3: MHPGC Project, Morven North, Morven South and MBAGC Project	
Construction phase	
Magnitude of impact	As per the magnitude set out for the whole project assessment [Scenario 1 and 2, see Table 6.38]; the impact of Morven North plus Morven South plus the MBAGC Project is not considered likely to raise the impact magnitude rating concluded in the whole project assessment. Should construction timelines (currently unknown) of the MBAGC Project overlap with the MHPGC Project, there may be concurrent impacts, most notably in the area nearer to the Morven North and Morven South array areas, where the MBAGC Project and MHPGC Project are likely to be in closer proximity to one another. For divers, sea ducks and scoters, there is unlikely to be concurrent impacts, as within the coastal area within these species are distributed, the MBAGC Project and MHPGC Project are further than 15km apart (the screening distance used for the CEA, and as recommended by NatureScot Guidance (NatureScot, 2023d). For auks, given the localised and short-term nature of vessel disturbance, together with the extensive availability of alternative habitat within the wider offshore environment, the addition of the MBAGC project is not considered likely to raise the impact magnitude rating applied in Scenarios 1 and 2 [see Table 6.38].
Sensitivity of receptor	Receptor sensitivity is determined as per the alone assessment and is the same for both English and Scottish waters [see Section 6.8.2]. In short, receptor sensitivity was defined based on behavioural sensitivity to the effect pathway and conservation value. Sensitivity of divers, sea ducks, and shags ranged from low to medium sensitivity. Auks have a medium to high sensitivity.
Significance of effect	Divers, sea ducks and shag: the magnitude of the cumulative impact is deemed to be low, and the sensitivity of the receptors in this receptor group of no greater than medium. A low magnitude and medium sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, given their nearshore ecology). Auks: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance (for both English and Scottish waters), which is not significant in EIA terms.
Further mitigation and residual significance	No mitigation measures for marine ornithology receptors are considered necessary because the likely effect in the absence of further mitigation (beyond the designed in measures outlined in Table 6.24), is not significant in EIA terms.
Operations and maintenance phase	
N/A	
Decommissioning phase	
Magnitude of impact	As per construction phase.

Morven Programme assessment	
Scenario 3: MHPGC Project, Morven North, Morven South and MBAGC Project	
Sensitivity of receptor	During the decommissioning phase of the MHPGC Project, there is the potential for disturbance and displacement arising from the presence of vessels and associated decommissioning. As outlined in the MDS [see Table 6.23], the number of vessels for the decommissioning phase is assumed to be as that described for the construction phase. Closer to the time of decommissioning, it may be decided that removal would lead to a greater environmental impact than leaving some components <i>in situ</i> , in which case certain components may be left buried (e.g. in the case of sub-sea cables). This may reduce the amount of decommissioning activity required, however the worst case is assumed to be removal of all infrastructure.
Significance of effect	
Further mitigation and residual significance	

Table 6.40: MHPGC Project CEA for disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels

Cumulative Effects Assessment	
Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects	
Construction phase	
Magnitude of impact	MHPGC activities will be spatially limited to the construction area footprint, and vessels will gradually travel along the route rather than remaining in one location over the whole construction period. Disturbance and displacement occurring as a result of the MHPGC project will be additional to disturbance and displacement from other projects and plans, and baseline levels of shipping activities. The CEA has been carried out by receptor groups, using the screening distances set out in the methodology in Section 6.9.1. <u>Tier 1</u> <i>Nearshore Marine Ornithology Study Area</i> For divers, sea ducks and shag, only Morven North, Morven South, Ossian OWF and Bowdun OWF and their associated cables fall within the 15km screening distance and could overlap temporally, and are therefore considered. As divers, sea ducks and shag are restricted to coastal waters, their distributions do not overlap with offshore wind farms in the region. The cumulative disturbance pathway arises from the potential for construction and support vessels associated with multiple projects to operate concurrently within the same broad coastal region, resulting in repeated or overlapping disturbance events. Although the cumulative assessment considers the addition of other screened projects, the nature of the effect remains unchanged. Given the localised and short-term nature of vessel disturbance, together with the availability of alternative habitat within the wider coastal environment, the cumulative disturbance arising from multiple projects is not expected to result in ecologically significant displacement. The magnitude of the cumulative impact is therefore considered to remain low for Tier 1 projects in English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, given their foraging ranges). <i>Offshore Marine Ornithology Study Area</i> Additionally for auks, Bellrock OWF, Seagreen Phase 1A, Muir Mhòr OWF and Marram OWF could overlap temporally and fall within the 266km screening distance for this receptor group and are thus considered. Disturbance events associated with vessel activity are expected to be short-term, temporary and reversible, and opportunities for multiple projects to generate disturbance concurrently are limited. Consequently, while additional projects may marginally increase the frequency of disturbance events within the wider region, they do not materially increase the duration or severity of the effect. The additional disturbance pressure introduced through the cumulative assessment remains highly localised, temporary and reversible, with vessel activity associated with all projects being transient in nature and disturbance effects not expected to persist beyond the period of activity. Although birds may exhibit behavioural responses to vessel presence and temporarily avoid affected areas, it is important to distinguish between a behavioural response and an ecological effect. Displacement only constitutes an ecological impact where it results in measurable consequences for survival or productivity. Given the localised, short-term, temporary and reversible nature of vessel

Cumulative Effects Assessment	
	activity, the availability of alternative habitat, and the absence of measurable consequences for survival or productivity, cumulative disturbance is not expected to result in an ecological effect at the population level. The magnitude of the cumulative impact is therefore considered to remain negligible for Tier 1 projects in both Scottish and English waters. <u>Tier 2</u> <i>Nearshore Marine Ornithology Study Area</i> For divers, sea ducks and shag, Tier 2 adds no further projects within the 15km screening distance. <i>Offshore Marine Ornithology Study Area</i> For auks, Tier 2 adds consideration of Stromar OWF and Broadshore OWF. This increases the regional footprint (with Stromar OWF and Broadshore OWF located 175km and 142km from the MHPGC Project respectively), but does not alter the short-term, temporary and reversible nature of the impact, with the magnitude therefore remaining negligible. <u>Tier 3</u> Tier 3 adds consideration of the MBAGC Project. As set out in the Morven Programme assessment [see Table 6.39], this does not alter the short-term, temporary and reversible nature of the impact, with the magnitude therefore remaining the same as set out for Tier 1 above.
Sensitivity of receptor	Receptor sensitivity is determined as per the alone assessment and is the same for both English and Scottish waters [Section 6.8.2]. In short, receptor sensitivity was defined based on behavioural sensitivity to the effect pathway and conservation value. Sensitivity of divers, sea ducks, and shags ranged from low to medium sensitivity. Auks have a medium to high sensitivity.
Significance of effect	Divers, sea ducks and shag: the magnitude of the cumulative impact is deemed to be low, and the sensitivity of the receptors in this receptor group of no greater than medium. A low magnitude and medium sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, given their nearshore ecology). Auks: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance (for both English and Scottish waters), which is not significant in EIA terms.
Further mitigation and residual significance	No mitigation measures for marine ornithology receptors are considered necessary because the likely effect in the absence of further mitigation (beyond the designed in measures outlined in Table 6.24), is not significant in EIA terms.
Operations and maintenance phase	
N/A	
Decommissioning phase	

	Cumulative Effects Assessment
Magnitude of impact	As per construction phase. During the decommissioning phase of the MHPGC Project, there is the potential for disturbance and displacement arising from the presence of vessels and associated decommissioning activities. As outlined in the MDS [see Table 6.23], the number of vessels for the decommissioning phase is assumed to be as that described for the construction phase. Closer to the time of decommissioning, it may be decided that removal would lead to a greater environmental impact than leaving some components in situ, in which case certain components may be left buried (e.g. in the case of sub-sea cables). This may reduce the amount of decommissioning activity required, however the worst case is assumed to be removal of all infrastructure.
Sensitivity of receptor	
Significance of effect	
Further mitigation and residual significance	

6.10.3 Indirect impacts from underwater sound affecting prey species

- 6.10.3.1 There is potential for cumulative indirect impacts from underwater sound affecting prey species as a result of activities associated with MHPGC Project and other projects that are under construction, in operation or with planned decommissioning.
- 6.10.3.2 The summary of the whole project assessment for indirect impacts from underwater sound affecting prey species is presented in **Table 6.41** and **Table 6.42**, and the summary of the Cumulative Effects Assessment is presented in **Table 6.40**.

Table 6.41: MHPGC Project whole project assessment for indirect impacts from underwater sound affecting prey species

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Magnitude of impact	This assessment is applicable to both Scenario 1 (MHPGC Project and Morven North) and Scenario 2 (MHPGC Project and Morven South). Impacts on prey species can be a result of underwater noise from construction activities such as pre-construction geophysical surveys and Low Order UXO clearance, as well as the presence of vessels. MHPGC activities will be spatially limited as vessels will gradually travel along the route rather than remaining in one location over the whole construction period. Impacts on prey species occurring as a result of the MHPGC project will be additional to impacts on prey species from will be additional to disturbance and displacement from Morven North or Morven South, and baseline levels of shipping activities. <u>Nearshore Marine Ornithology Study Area</u> Divers, sea ducks and shag: As these receptors are restricted to coastal waters, their distributions do not overlap with offshore wind farms in the region. The cumulative disturbance pathway arises from the potential for construction and vessels presence associated with the MHPGC Project, Morven North or Morven South to operate concurrently within the same broad coastal region, resulting in overlapping noise-generating activities potentially affecting prey availability. Although the cumulative assessment considers the addition of Morven North or Morven South, the nature of the effect remains unchanged. Impacts are expected to be short-term, temporary and reversible, and opportunities for multiple projects to generate underwater sound concurrently are limited. Consequently, while additional projects may marginally increase the frequency of underwater noise events within the wider region, they do not materially increase the duration or severity of the effect. The additional pressure introduced through the cumulative assessment remains highly localised, temporary and reversible, with construction and vessel activity associated with all projects being transient in nature and effects not expected to persist beyond the period of activity. Given the localised and short-term nature of underwater sound impacts, together with the availability of alternative habitat within the wider coastal environment and the negligible energetic cost for relocation, the cumulative underwater sound events arising from Morven North or Morven South is not expected to result in ecologically significant impacts on marine ornithological receptors. The magnitude	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	of the cumulative impact is therefore considered to remain low for English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, given their foraging ranges). <u>Offshore Marine Ornithology Study Area</u> Terns: As explained in further detail for diver, sea ducks and shag for Nearshore Marine Ornithology Study Area, given the localised, short-term, temporary and reversible nature of underwater sound events, the availability of alternative habitat, and the negligible energetic cost for relocation, cumulative underwater sound events are not expected to result in an ecological effect at the population level. The magnitude of the cumulative impact is therefore considered to remain negligible for English waters (noting that only conclusions for English waters are relevant for terns, based on their breeding season foraging ranges). Auks: Given the localised, short-term, temporary and reversible nature of underwater sound events, the extensive foraging ranges, availability of alternative habitat, and the negligible energetic cost for relocation, cumulative underwater sound events are not expected to result in an ecological effect at the population level. The magnitude of the cumulative impact is therefore considered to remain negligible for both Scottish and English waters.	
Sensitivity of receptor	Receptor sensitivity is determined as per the alone assessment and is the same for both English and Scottish waters [Section 6.8.2]. In short, receptor sensitivity was defined based on behavioural sensitivity to the effect pathway and conservation value. Sensitivity of divers, sea ducks, and shags ranged from low to medium sensitivity. Sensitivity of terns ranged from medium-to-high to high. Auks have a medium to high sensitivity.	
Significance of effect	Divers, sea ducks and shag: the magnitude of the cumulative impact is deemed to be low, and the sensitivity of the receptors in this receptor group of no greater than medium. A low magnitude and medium sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to both Scenario 1 and Scenario 2 in English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, based on their breeding season foraging ranges). Terns: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to both Scenario 1 and Scenario 2 in English waters (noting that only conclusions for English waters are relevant for terns, based on their breeding season foraging ranges). Auks: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance (for both Scenario 1 and Scenario 2, and for both English and Scottish waters), which is not significant in EIA terms.	
Further mitigation and residual significance	No mitigation measures for marine ornithology receptors are considered necessary because the likely effect in the absence of further mitigation (beyond the designed in measures outlined in Table 6.24), is not significant in EIA terms.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Operations and maintenance phase		
N/A		
Decommissioning phase		
Magnitude of impact	As per construction phase.	
Sensitivity of receptor	During the decommissioning phase of the MHPGC Project, there is the potential for indirect impacts from underwater sound on prey species arising from associated decommissioning activities. As outlined in the MDS [see Table 6.23], the number of vessels for the decommissioning phase is assumed to be as that described for the construction phase, with no expected Low Order UXO clearance. Closer to the time of decommissioning, it may be decided that removal would lead to a greater environmental impact than leaving some components in situ, in which case certain components may be left buried (e.g. in the case of sub-sea cables). This may reduce the amount of decommissioning activity required, however the worst case is assumed to be removal of all infrastructure.	
Significance of effect		
Further mitigation and residual significance		

Table 6.42: Morven Programme assessment for indirect impacts from underwater sound affecting prey species

	Morven Programme assessment
	Scenario 3: MHPGC Project, Morven North, Morven South and MBAGC Project
Construction phase	
Magnitude of impact	As per the magnitude set out for the whole project assessment [Scenario 1 and 2, see Table 6.41]; the impact of the Morven North plus Morven South plus MBAGC Project is not considered likely to raise the impact magnitude rating concluded in the whole project assessment. Should construction timelines (currently unknown) of the MBAGC Project overlap with the MHPGC Project, there may be concurrent impacts, most notably in the area nearer to the Morven North and Morven South array areas, where the MBAGC Project and MHPGC Project are in closer proximity to one another. For divers, sea ducks and scoters, there is unlikely to be concurrent impacts, as within the coastal area within these species are distributed, the MBAGC Project and MHPGC Project are further than 15km apart (the screening distance used for the CEA). Concurrent impacts for terns are likely minimal or non-existent based on the locations of the MHPGC Project and Braxton (the approximate landfall location for the MBAGC Project) and tern foraging ranges (58km for Sandwich tern, the largest foraging range of the four tern species considered, see Section 6.9.1.11). For auks, given the localised and short-term nature of vessel disturbance, together with the extensive availability of

Morven Programme assessment	
Scenario 3: MHPGC Project, Morven North, Morven South and MBAGC Project	
	alternative habitat within the wider offshore environment, the addition of the Morven North, Morven South and MBAGC project is not considered likely to raise the impact magnitude rating applied in Scenarios 1 and 2 [see Table 6.41].
Sensitivity of receptor	Receptor sensitivity is determined as per the alone assessment and is the same for both English and Scottish waters [see Section 6.8.2]. In short, receptor sensitivity was defined based on behavioural sensitivity to the effect pathway and conservation value. Sensitivity of divers, sea ducks, and shags ranged from low to medium sensitivity. Sensitivity of terns ranged from medium-to-high to high. Auks have a medium to high sensitivity.
Significance of effect	Divers, sea ducks and shag: the magnitude of the cumulative impact is deemed to be low, and the sensitivity of the receptors in this receptor group of no greater than medium. A low magnitude and medium sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, based on their breeding season foraging ranges). Terns: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to English waters (noting that only conclusions for English waters are relevant for terns, based on their breeding season foraging ranges). Auks: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance (for both English and Scottish waters), which is not significant in EIA terms.
Further mitigation and residual significance	No mitigation measures for marine ornithology receptors are considered necessary because the likely effect in the absence of further mitigation (beyond the designed in measures outlined in Table 6.24), is not significant in EIA terms.
Operations and maintenance phase	
N/A	
Decommissioning phase	
Magnitude of impact	As per construction phase.
Sensitivity of receptor	During the decommissioning phase of the MHPGC Project, there is the potential for indirect impacts from underwater sound on prey species arising from associated decommissioning activities. As outlined in the MDS [see Table 6.23], the number of vessels for the decommissioning phase is assumed to be as that described for the construction phase, with no expected Low Order UXO clearance. Closer to the time of decommissioning, it may be decided that removal would lead to a greater environmental impact than leaving some components in situ, in which case certain components may be left buried (e.g. in the case of sub-sea cables). This may reduce the amount of decommissioning activity required, however the worst case is assumed to be removal of all infrastructure.
Significance of effect	
Further mitigation and residual significance	

Table 6.43: MHPGC Project CEA for indirect impacts from underwater sound affecting prey species

	Cumulative Effects Assessment
	Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects
Construction phase	
Magnitude of impact	Impacts on prey species can be a result of underwater noise from construction activities such as pre-construction geophysical surveys and Low Order UXO clearance, as well as the presence of vessels. MHPGC activities will be spatially limited as vessels will gradually travel along the route rather than remaining in one location over the whole construction period. Impacts on prey species occurring as a result of the MHPGC project will be additional to impacts on prey species from other projects and plans, and baseline levels of shipping activities. The CEA has been carried out by receptor groups, using the screening distances set out in the methodology in Section 6.9.1. <u>Tier 1</u> <i>Nearshore Marine Ornithology Study Area</i> For divers, sea ducks and shag, only Morven North, Morven South, Ossian OWF and Bowdun OWF and their associated cables fall within the 15km screening distance and could overlap temporally, and are therefore considered. As these receptors are restricted to coastal waters, their distributions do not overlap with offshore wind farms in the region. The cumulative disturbance pathway arises from the potential for construction and vessels presence associated with multiple projects to operate concurrently within the same broad coastal region, resulting in overlapping noise-generating activities potentially affecting prey availability. Although the cumulative assessment considers the addition of other screened projects, the nature of the effect remains unchanged. Impacts are expected to be short-term, temporary and reversible, and opportunities for multiple projects to generate underwater sound concurrently are limited. Consequently, while additional projects may marginally increase the frequency of underwater noise events within the wider region, they do not materially increase the duration or severity of the effect. The additional pressure introduced through the cumulative assessment remains highly localised, temporary and reversible, with construction and vessel activity associated with all projects being transient in nature and effects not expected to persist beyond the period of activity. Given the localised and short-term nature of underwater sound impacts, together with the availability of alternative habitat within the wider coastal environment and the negligible energetic cost for relocation, the cumulative underwater sound events arising from multiple projects is not expected to result in ecologically significant impacts on marine ornithological receptors. The magnitude of the cumulative impact is therefore considered to remain low for Tier 1 projects in English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, given their foraging ranges). <i>Offshore Marine Ornithology Study Area</i>

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	For terns, Bellrock OWF and Seagreen Phase 1A could overlap temporally and fall within the 58km screening distance for this receptor group and are thus considered. As explained in further detail for diver, sea ducks and shag above, given the localised, short-term, temporary and reversible nature of underwater sound events, the availability of alternative habitat, and the negligible energetic cost for relocation, cumulative underwater sound events are not expected to result in an ecological effect at the population level. The magnitude of the cumulative impact is therefore considered to remain negligible for Tier 1 projects in English waters (noting that only conclusions for English waters are relevant for terns, based on their breeding season foraging ranges). In addition to the OWFs and associated cables considered for terns, divers, sea ducks and shag, Muir Mhòr OWF and Marram OWF could overlap temporally and fall within the 266km screening distance for auks and are thus considered for that receptor group. Given the localised, short-term, temporary and reversible nature of underwater sound events, the extensive foraging ranges, availability of alternative habitat, and the negligible energetic cost for relocation, cumulative underwater sound events are not expected to result in an ecological effect at the population level. The magnitude of the cumulative impact is therefore considered to remain negligible for Tier 1 projects in both Scottish and English waters. <u>Tier 2</u> For terns, divers, sea ducks and shag, Tier 2 adds no further projects within the 15km screening distance. For auks, Tier 2 adds consideration of Stromar OWF and Broadshore OWF. This increases the regional footprint (with Stromar OWF and Broadshore OWF located 175km and 142km from the MHPGC Project respectively), but does not alter the short-term, temporary and reversible nature of the impact, with the magnitude therefore remaining negligible in both Scottish and English waters. <u>Tier 3</u> Tier 3 adds consideration of the MBAGC Project. As set out in the Morven Programme assessment [see Table 6.42], this does not alter the short-term, temporary and reversible nature of the impact, with the magnitude therefore remaining the same as set out for Tier 1 above.
Sensitivity of receptor	Receptor sensitivity is determined as per the alone assessment and is the same for both English and Scottish waters [see Section 6.8.2]. In short, receptor sensitivity was defined based on behavioural sensitivity to the effect pathway and conservation value. Sensitivity of divers, sea ducks, and shags ranged from low to medium sensitivity. Sensitivity of terns ranged from medium-to-high to high. Auks have a medium to high sensitivity.
Significance of effect	Divers, sea ducks and shag: the magnitude of the cumulative impact is deemed to be low, and the sensitivity of the receptors in this receptor group of no greater than medium. A low magnitude and medium sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, based on their breeding season foraging ranges). Terns: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor

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	significance, which is not significant in EIA terms. This conclusion applies to English waters (noting that only conclusions for English waters are relevant for terns, based on their breeding season foraging ranges). Auks: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance (for both English and Scottish waters), which is not significant in EIA terms.
Further mitigation and residual significance	No mitigation measures for marine ornithology receptors are considered necessary because the likely effect in the absence of further mitigation (beyond the designed in measures outlined in Table 6.24), is not significant in EIA terms.
Operations and maintenance phase	
N/A	
Decommissioning phase	
Magnitude of impact	As per construction phase. During the decommissioning phase of the MHPGC Project, there is the potential for indirect impacts from underwater sound on prey species arising from associated decommissioning activities. As outlined in the MDS [see Table 6.23], the number of vessels for the decommissioning phase is assumed to be as that described for the construction phase, with no expected Low Order UXO clearance. Closer to the time of decommissioning, it may be decided that removal would lead to a greater environmental impact than leaving some components in situ, in which case certain components may be left buried (e.g. in the case of sub-sea cables). This may reduce the amount of decommissioning activity required, however the worst case is assumed to be removal of all infrastructure.
Sensitivity of receptor	
Significance of effect	
Further mitigation and residual significance	

6.10.4 Temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species

- 6.10.4.1 There is potential for cumulative temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species as a result of activities associated with MHPGC Project and other projects that are under construction, in operation or with planned decommissioning.
- 6.10.4.2 The summary of the whole project assessment temporary habitat loss/disturbance from increased SSCs is presented in **Table 6.44** and **Table 6.45**, and the summary of the Cumulative Effects Assessment is presented in **Table 6.46**.

Table 6.44: MHPGC Project whole project assessment for temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Construction phase		
Magnitude of impact	This assessment is applicable to both Scenario 1 (MHPGC Project and Morven North) and Scenario 2 (MHPGC Project and Morven South). There is potential for elevated turbidity level within the water column caused by increased SSC to indirectly affect the foraging efficiency of certain diving species, with increased SSCs causing temporary habitat loss and/or disturbance (including through indirect impacts on prey species). As construction vessels and trenching equipment move progressively along the offshore export cable route increased SSCs and resulting plumes are expected to be highly temporary (short-term) and localised. Impacts on prey species occurring as a result of the MHPGC project will be additional to impacts on prey species from disturbance and displacement from Morven North or Morven South, and baseline levels of shipping activities. <u>Nearshore Marine Ornithology Study Area</u> Divers, sea ducks and shag: As these receptors are restricted to coastal waters, their distributions do not overlap with offshore wind farms in the region. The cumulative disturbance pathway arises from the potential for concurrent activities associated with the MHPGC Project, Morven North or Morven South causing overlapping sediment disturbance, and as a result, temporary impacts on habitats and prey species. Although the cumulative assessment considers the addition of Morven North or Morven South, the nature of the effect remains unchanged. Impacts are expected to be short-term, temporary and reversible, and opportunities for multiple projects to generate increased SSCs concurrently are limited. Consequently, while additional projects may marginally increase the frequency of increased SSC events within the wider region, they do not materially increase the duration or severity of the effect. The additional pressure introduced through the cumulative assessment remains highly localised, temporary and reversible, with construction and vessel activity associated with all projects being transient in nature and effects not expected to persist beyond the period of activity. Given the localised and short-term nature of increased SSC impacts, together with the availability of alternative habitat within the wider coastal environment and the negligible energetic cost for relocation, the cumulative increased SSCs arising from Morven North or Morven South is not expected to result in ecologically significant impacts on marine ornithological receptors. The magnitude of the cumulative impact is therefore considered to remain low for English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, given their foraging ranges). <u>Offshore Marine Ornithology Study Area</u> Terns: As explained in further detail for diver, sea ducks and shag in Nearshore Marine Ornithology Study Area, given the localised, short-term, temporary and reversible nature of increases in SSCs, the availability of alternative habitat, and the negligible energetic cost for relocation, cumulative underwater sound events are not expected to result in an ecological effect at the population level.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
	The magnitude of the cumulative impact is therefore considered to remain negligible for English waters (noting that only conclusions for English waters are relevant for terns, based on their breeding season foraging ranges). Auks: Given the localised, short-term, temporary and reversible nature of increases in SSCs, the extensive foraging ranges, availability of alternative habitat, and the negligible energetic cost for relocation, the cumulative increased SSCs arising from multiple projects are not expected to result in an ecological effect at the population level. The magnitude of the cumulative impact is therefore considered to remain negligible for both Scottish and English waters.	
Sensitivity of receptor	Receptor sensitivity is determined as per the alone assessment and is the same for both English and Scottish waters [see Section 6.8.2]. In short, receptor sensitivity was defined based on behavioural sensitivity to the effect pathway and conservation value. Sensitivity of divers, sea ducks, and shags ranged from low to medium sensitivity. Sensitivity of terns ranged from medium-to-high to high. Auks have a medium to high sensitivity.	
Significance of effect	Divers, sea ducks and shag: the magnitude of the cumulative impact is deemed to be low, and the sensitivity of the receptors in this receptor group of no greater than medium. A low magnitude and medium sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to both Scenario 1 and Scenario 2 in English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, based on their breeding season foraging ranges). Terns: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to both Scenario 1 and Scenario 2 in English waters (noting that only conclusions for English waters are relevant for terns, based on their breeding season foraging ranges). Auks: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance (for both Scenario 1 and Scenario 2, and for both English and Scottish waters), which is not significant in EIA terms.	
Further mitigation and residual significance	No mitigation measures for marine ornithology receptors are considered necessary because the likely effect in the absence of further mitigation (beyond the designed in measures outlined in Table 6.24), is not significant in EIA terms.	
Operations and maintenance phase		
N/A		
Decommissioning phase		
Magnitude of impact	As per construction phase.	

	Whole project assessment	
	Scenario 1: MHPGC Project and Morven North	Scenario 2: MHPGC Project and Morven South
Sensitivity of receptor	During the decommissioning phase of the MHPGC Project, there is the potential for temporary habitat loss/disturbance from increased SSC, including indirect impacts on prey species arising from associated decommissioning activities. As outlined in the MDS [see Table 6.23], the sandwave clearance activities for the decommissioning phase is assumed to be as that described for the construction phase. Closer to the time of decommissioning, it may be decided that removal would lead to a greater environmental impact than leaving some components in situ, in which case certain components may be left buried (e.g. in the case of sub-sea cables). This may reduce the amount of decommissioning activity required, however the worst case is assumed to be removal of all infrastructure.	
Significance of effect		
Further mitigation and residual significance		

Table 6.45: Morven Programme assessment for temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species

	Morven Programme assessment
Scenario 3: MHPGC Project, Morven North, Morven South and MBAGC Project	
Construction phase	
Magnitude of impact	As per the magnitude set out for the whole project assessment [Scenario 1 and 2, see Table 6.44]; the impact of Morven North plus Morven South plus the MBAGC Project is not considered likely to raise the impact magnitude rating concluded in the whole project assessment. Should construction timelines (currently unknown) of the MBAGC Project overlap with the MHPGC Project, there may be concurrent impacts, most notably in the area nearer to the Morven North and Morven South array areas, where the MBAGC Project and MHPGC Project are in closer proximity to one another. For divers, sea ducks and scoters, there is unlikely to be concurrent impacts, as within the coastal area within these species are distributed, the MBAGC Project and MHPGC Project are further than 15km apart (the screening distance used for the CEA). Concurrent impacts for terns are likely minimal or non-existent based on the locations of the MHPGC Project and Branxton (the approximate landfall location for the MBAGC Project) and tern foraging ranges (58km for Sandwich tern, the largest foraging range of the four tern species considered, see Section 6.9.1.11). For auks, given the localised and short-term nature of vessel disturbance, together with the extensive availability of alternative habitat within the wider offshore environment, the addition of the Morven North, Morven South and MBAGC project is not considered likely to raise the impact magnitude rating applied in Scenarios 1 and 2 [see Table 6.44].
Sensitivity of receptor	Receptor sensitivity is determined as per the alone assessment and is the same for both English and Scottish waters [see Section 6.8.2]. In short, receptor sensitivity was defined based on behavioural sensitivity to the effect pathway and conservation value. Sensitivity of divers, sea ducks, and shags ranged from low to medium sensitivity. Sensitivity of terns ranged from medium-to-high to high. Auks have a medium to high sensitivity.
Significance of effect	Divers, sea ducks and shag: the magnitude of the cumulative impact is deemed to be low, and the sensitivity of the receptors in this receptor group of no greater than medium. A low magnitude and medium sensitivity means the cumulative effect will therefore

Morven Programme assessment	
Scenario 3: MHPGC Project, Morven North, Morven South and MBAGC Project	
	be of minor significance, which is not significant in EIA terms. This conclusion applies to English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, based on their breeding season foraging ranges). Terns: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to English waters (noting that only conclusions for English waters are relevant for terns, based on their breeding season foraging ranges). Auks: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance (for both English and Scottish waters), which is not significant in EIA terms.
Further mitigation and residual significance	No mitigation measures for marine ornithology receptors are considered necessary because the likely effect in the absence of further mitigation (beyond the designed in measures outlined in Table 6.24), is not significant in EIA terms.
Operations and maintenance phase	
N/A	
Decommissioning phase	
Magnitude of impact	As per construction phase.
Sensitivity of receptor	During the decommissioning phase of the MHPGC Project, there is the potential for temporary habitat loss/disturbance from increased SSC, including indirect impacts on prey species arising from associated decommissioning activities. As outlined in the MDS [see Table 6.23], the sandwave clearance activities for the decommissioning phase is assumed to be as that described for the construction phase. Closer to the time of decommissioning, it may be decided that removal would lead to a greater environmental impact than leaving some components in situ, in which case certain components may be left buried (e.g. in the case of sub-sea cables). This may reduce the amount of decommissioning activity required, however the worst case is assumed to be removal of all infrastructure.
Significance of effect	
Further mitigation and residual significance	

Table 6.46: MHPGC Project CEA for temporary habitat loss/disturbance from increased SSCs, including indirect impacts on prey species

Cumulative Effects Assessment	
Scenario 4: MHPGC Project, Tier 1 (including Morven North and Morven South), Tier 2, and Tier 3 (including MBAGC Project) Projects	
Construction phase	
Magnitude of impact	There is potential for elevated turbidity level within the water column caused by increased SSC to indirectly affect the foraging efficiency of certain diving species, with increased SSCs causing temporary habitat loss and/or disturbance (including through indirect impacts on prey species). As construction vessels and trenching equipment move progressively along the offshore export cable route increased SSCs and resulting plumes are expected to be highly temporary (short-term) and localised. Impacts on prey species occurring as a result of the MHPGC project will be additional to impacts on prey species from other projects and plans, and baseline levels of shipping activities. The CEA has been carried out by receptor groups, using the screening distances set out in the methodology in Section 6.9.1. <u>Tier 1</u> <i>Nearshore Marine Ornithology Study Area</i> For divers, sea ducks and shag, only Morven North, Morven South, Ossian OWF and Bowdun OWF and their associated cables fall within the 15km screening distance and could overlap temporally, and are therefore considered. As these receptors are restricted to coastal waters, their distributions do not overlap with offshore wind farms in the region. The cumulative disturbance pathway arises from the potential for activities associated with multiple concurrent projects causing overlapping sediment disturbance, and as a result, temporary impacts on habitats and prey species. Although the cumulative assessment considers the addition of other screened projects, the nature of the effect remains unchanged. Impacts are expected to be short-term, temporary and reversible, and opportunities for multiple projects to generate increased SSCs concurrently are limited. Consequently, while additional projects may marginally increase the frequency of increased SSC events within the wider region, they do not materially increase the duration or severity of the effect. The additional pressure introduced through the cumulative assessment remains highly localised, temporary and reversible, with construction and vessel activity associated with all projects being transient in nature and effects not expected to persist beyond the period of activity. Given the localised and short-term nature of increased SSC impacts, together with the availability of alternative habitat within the wider coastal environment and the negligible energetic cost for relocation, the cumulative increased SSCs arising from multiple projects is not expected to result in ecologically significant impacts on marine ornithological receptors. The magnitude of the cumulative impact is therefore considered to remain low for Tier 1 projects in English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, given their foraging ranges). <i>Offshore Marine Ornithology Study Area</i> For terns, Bellrock OWF and Seagreen Phase 1A could overlap temporally and fall within the 58km screening distance for this receptor group and are thus considered. As explained in further detail for diver, sea ducks and shag above, given the localised, short-term, temporary and reversible nature of increases in SSCs, the availability of alternative habitat, and the negligible energetic

	Cumulative Effects Assessment
	cost for relocation, cumulative underwater sound events are not expected to result in an ecological effect at the population level. The magnitude of the cumulative impact is therefore considered to remain negligible for Tier 1 projects in English waters (noting that only conclusions for English waters are relevant for terns, based on their breeding season foraging ranges). In addition to the OWFs and associated cables considered for terns, divers, sea ducks and shag, Muir Mhòr OWF and Marram OWF could overlap temporally and fall within the 266km screening distance for auks and are thus considered for that receptor group. Given the localised, short-term, temporary and reversible nature of increases in SSCs, the extensive foraging ranges, availability of alternative habitat, and the negligible energetic cost for relocation, the cumulative increased SSCs arising from multiple projects are not expected to result in an ecological effect at the population level. The magnitude of the cumulative impact for auks is therefore considered to remain negligible for Tier 1 projects in both Scottish and English waters. <u>Tier 2</u> For terns, divers, sea ducks and shag, Tier 2 adds no further projects within the 15km screening distance. For auks, Tier 2 adds consideration of Stromar OWF and Broadshore OWF. This increases the regional footprint (with Stromar OWF and Broadshore OWF located 175km and 142km from the MHPGC Project respectively), but does not alter the short-term, temporary and reversible nature of the impact, with the magnitude therefore remaining negligible in both English and Scottish waters. <u>Tier 3</u> Tier 3 adds consideration of the MBAGC Project. As set out in the Morven Programme assessment [see Table 6.45], this does not alter the short-term, temporary and reversible nature of the impact, with the magnitude therefore remaining the same as set out for Tier 1 above.
Sensitivity of receptor	Receptor sensitivity is determined as per the alone assessment and is the same for both English and Scottish waters [see Section 6.8.2]. In short, receptor sensitivity was defined based on behavioural sensitivity to the effect pathway and conservation value. Sensitivity of divers, sea ducks, and shags ranged from low to medium sensitivity. Sensitivity of terns ranged from medium-to-high to high. Auks have a medium to high sensitivity.
Significance of effect	Divers, sea ducks and shag: the magnitude of the cumulative impact is deemed to be low, and the sensitivity of the receptors in this receptor group of no greater than medium. A low magnitude and medium sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to English waters (noting that only conclusions for English waters are relevant for divers, sea ducks and shag, based on their breeding season foraging ranges). Terns: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance, which is not significant in EIA terms. This conclusion applies to English waters (noting that only conclusions for English waters are relevant for terns, based on their breeding season foraging ranges).

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	Auks: the magnitude of the cumulative impact is deemed to be negligible, and the sensitivity of the receptors in this receptor group of no greater than high. A negligible magnitude and high sensitivity means the cumulative effect will therefore be of minor significance (for both English and Scottish waters), which is not significant in EIA terms.
Further mitigation and residual significance	No mitigation measures for marine ornithology receptors are considered necessary because the likely effect in the absence of further mitigation (beyond the designed in measures outlined in Table 6.24), is not significant in EIA terms.
Operations and maintenance phase	
N/A	
Decommissioning phase	
Magnitude of impact	As per construction phase. During the decommissioning phase of the MHPGC Project, there is the potential for temporary habitat loss/disturbance from increased SSC, including indirect impacts on prey species arising from associated decommissioning activities. As outlined in the MDS [see Table 6.23], the sandwave clearance activities for the decommissioning phase is assumed to be as that described for the construction phase. Closer to the time of decommissioning, it may be decided that removal would lead to a greater environmental impact than leaving some components in situ, in which case certain components may be left buried (e.g. in the case of sub-sea cables). This may reduce the amount of decommissioning activity required, however the worst case is assumed to be removal of all infrastructure.
Sensitivity of receptor	
Significance of effect	
Further mitigation and residual significance	

6.10.5 Proposed monitoring

- 6.10.5.1 Site specific monitoring is not proposed because the assessment concluded that MHPGC Project would not give rise to significant effects for marine ornithology, either alone or when considered cumulatively with other plans, projects or activities.

6.11 Transboundary effects

- 6.11.1.1 A screening of transboundary impacts has been carried out and any potential for significant transboundary effects with regard to marine ornithology from the construction, O&M and decommissioning phases of the MHPGC Project upon interests of other states. This has been assessed as part of the PEIR.
- 6.11.1.2 Transboundary effects may occur when a project in a European Economic Area (EEA) state has the potential to cause significant effect in another EEA state. These effects may occur on VORs of the Nearshore Marine Ornithology Study Area and Offshore Marine Ornithology Study Area due to the large dispersal and migratory ranges of some species. The assessment is based on regional population estimates derived from Furness (2015), which represent seabirds occurring across the wider North Sea and therefore include a proportion of individuals associated with colonies located within other EEA states. Potential transboundary effects are therefore inherently captured within the assessment framework, rather than requiring consideration through a separate species-specific approach. Furthermore, MD-LOT has concluded no potential transboundary impacts are to occur.
- 6.11.1.3 Therefore, the significance of all potential effects at a transboundary level is considered to be **negligible**, which is **not significant in EIA terms**.

6.12 Inter-related effects

- 6.12.1.1 Inter-related effects are the combined impact of multiple aspects of the MHPGC Project on a single receptor. These are as follows:
- **Project lifetime effects:** Assessment of the scope for effects that occur throughout more than one phase of the MHPGC Project (construction, O&M and decommissioning), to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in these three phases;
 - **Receptor led effects:** Assessment of the scope for all effects (including inter-relationships between environmental topics) to interact, spatially and temporally, to create inter-related effects on a receptor.
- 6.12.1.2 Inter-related effects are assessed within **Volume 4, Chapter 5: Inter-related Effects, of the PEIR**.

6.13 Summary

6.13.1 Summary of effects

- 6.13.1.1 This chapter has assessed the potential impacts on marine ornithology from the construction, O&M and decommissioning phases of the MHPGC Project, **Table 6.47** presents a summary of effects and confirms that there will be no residual effects. Assessment summaries are presented in **Table 6.47**, inclusive of information on relevant jurisdictions.

6.13.2 Summary of secondary mitigation and monitoring

- 6.13.2.1 No secondary mitigation measures or monitoring has been proposed.

Table 6.47: Summary of potential impacts and residual effects

Impact	Jurisdictional relevance	Receptor	Sensitivity of receptor	Magnitude of impact	Significance of impact	Secondary mitigation and monitoring	Residual effect
Construction phase							
Disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels	Scotland	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Nearshore Marine Ornithology receptors	Low to High	Negligible to Low	Minor	None	Minor
Temporary habitat loss/disturbance from increased SSC, including indirect impacts on prey	Scotland	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Nearshore Marine Ornithology receptors	Low to High	Negligible to Low	Minor	None	Minor
Indirect impacts from underwater sound affecting prey species	Scotland	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Nearshore Marine Ornithology receptors	Low to High	Negligible to Low	Minor	None	Minor
O&M phase							

Impact	Jurisdictional relevance	Receptor	Sensitivity of receptor	Magnitude of impact	Significance of impact	Secondary mitigation and monitoring	Residual effect
Disturbance and displacement from airborne noise, underwater sound, and visual disturbance associated with the presence of vessels	Scotland	Offshore Marine Ornithology receptors	Medium to High	Negligible	Negligible or minor	None	Negligible or minor
	England	Offshore Marine Ornithology receptors	Medium to High	Negligible	Negligible or minor	None	Negligible or minor
	England	Nearshore Marine Ornithology receptors	Low to High	Negligible	Negligible or minor	None	Negligible or minor
Temporary habitat loss/disturbance from increased SSC, including indirect impacts on prey	Scotland	Offshore Marine Ornithology receptors	Medium to High	Negligible	Negligible or minor	None	Negligible or minor
	England	Offshore Marine Ornithology receptors	Medium to High	Negligible	Negligible or minor	None	Negligible or minor
	England	Nearshore Marine Ornithology receptors	Low to High	Negligible	Negligible or minor	None	Negligible or minor
Indirect impacts from underwater sound affecting prey species	Scotland	Offshore Marine Ornithology receptors	Medium to High	Negligible	Negligible or minor	None	Negligible or minor
	England	Offshore Marine Ornithology receptors	Medium to High	Negligible	Negligible or minor	None	Negligible or minor
	England	Nearshore Marine Ornithology receptors	Low to High	Negligible	Negligible or minor	None	Negligible or minor
Decommissioning phase							
Disturbance and displacement from airborne noise,	Scotland	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor

Impact	Jurisdictional relevance	Receptor	Sensitivity of receptor	Magnitude of impact	Significance of impact	Secondary mitigation and monitoring	Residual effect
underwater sound, and visual disturbance associated with the presence of vessels	England	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Nearshore Marine Ornithology receptors	Low to High	Negligible to Low	Minor	None	Minor
Temporary habitat loss/disturbance from increased SSC, including indirect impacts on prey	Scotland	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Nearshore Marine Ornithology receptors	Low to High	Negligible to Low	Minor	None	Minor
Indirect impacts from underwater sound affecting prey species	Scotland	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Offshore Marine Ornithology receptors	Medium to High	Negligible	Minor	None	Minor
	England	Nearshore Marine Ornithology receptors	Low to High	Negligible to Low	Minor	None	Minor

6.14 References

AECOM Infrastructure & Environment UK Limited (2022) Scotland England Green Link 1 –English Onshore Scheme Environmental Appraisal Report Appendix 7D – Bird Survey Report. Leeds.

Anderson, H.B., Evans, P.G., Potts, J.M., Harris, M.P. and Wanless, S. (2014). The diet of Common Guillemot *Uria aalge* chicks provides evidence of changing prey communities in the North Sea. *Ibis* 156(1), 23-34

APEM (2023). Ornithological and Marine Mammal Baseline Characterisation Surveys for the POSEIDON project. APEM October-December (Seasonal) Report, Central North Sea, P000010669. Natural England, 21/07/23, v1.5, 32 pp.

APEM (2024a). Ornithological and Marine Mammal Baseline Characterisation Surveys for the POSEIDON project. APEM October-December (Seasonal) Report, Central North Sea, P000011683. Natural England, 03/05/24, v1.4, 34 pp.

APEM (2024b). Ornithological and Marine Mammal Baseline Characterisation Surveys for the POSEIDON project. APEM January – March (Seasonal) Report, Central North Sea, P000010669. Natural England, 25/04/24, v1.8 36 pp.

APEM (2024c). Ornithological and Marine Mammal Baseline Characterisation Surveys for the POSEIDON project. APEM January-March (Seasonal) Report, Central North Sea, P000011683. Natural England, 10/06/24, v1.3, 34 pp.

APEM (2024d). Ornithological and Marine Mammal Baseline Characterisation Surveys for the POSEIDON project. APEM April-June (Seasonal) Report, Central North Sea, P000010669. Natural England, 24/05/24, v1.8, 37 pp.

APEM (2024f). Ornithological and Marine Mammal Baseline Characterisation Surveys for the POSEIDON project. APEM April-June (Seasonal) Report, Central North Sea, P000011683. Natural England, 23/10/24, v1.2, 33 pp.

APEM (2024g). Ornithological and Marine Mammal Baseline Characterisation Surveys for the POSEIDON project. APEM July-September (Seasonal) Report, Central North Sea, P000010669. Natural England, 24/05/24, v1.5, 33 pp.

APEM (2024h). Ornithological and Marine Mammal Baseline Characterisation Surveys for the POSEIDON project. APEM July-September (Seasonal) Report, Central North Sea, P000011683. Natural England, 18/11/24, v1.2, 35 pp.

APEM. (2025). Morven Option Agreement Area 33 Month Report - Aerial Bird & Marine Mammal Digital Survey, Year 01-03 January 2021 – September 2023. APEM Scientific Report P16117, BP, 30/01/2025, p.624.

Atkinson, P. W. and Baillie, S. R. (2024) Jumping species and seasons – the spread and impact of highly pathogenic avian influenza on seabirds and waterbirds. *Bird Study*, 71(4), p.289–292.

Atterbury, A., Canning, S., Dinwoodie, K., Hall, R., Piesinger, N., Stewart, D., Thorpe, E. & West, L. (2021) Natural England and JNCC guidance on key sensitivities of habitats and Marine Protected Areas in English waters to aggregate resource extraction. JNCC Report No. 694. JNCC, Peterborough, ISSN 0963-8091.

Austin, G., Frost, T., Mellan, H. and Balmer, D. (2017). Results of the third Non-Estuarine Waterbird Survey, including Population Estimates for Key Waterbird Species. BTO National Grid Preliminary Environmental Information Report 57 Research Report No. 697.

Beaugrand, G. (2003). Long-term changes in copepod abundance and diversity in the north-east Atlantic in relation to fluctuations in the hydroclimatic environment. *Fisheries Oceanography*, 12(4-5), p.270-283.

Bibby, C., Burgess, N.D., Hill, D., & Mustoe, S. (2000) *Bird Census Techniques – Second Edition*. Academic Press, London, England.

BirdLife International (2021) *European Red List of Birds*. Luxembourg: Publications Office of the European Union.

Birkhead, T. and Hatchwell, B.J. (2025). The effects of the 2023 bird flu outbreak on the population biology of Common Guillemots on Skomer Island. 2025. *British Birds*, 118, p.8-19.

Bowey, K., and Newsome, M. (Eds.) (2012). *The Birds of Durham*. Durham Bird Club.

Breen, P., Clarke, S. and Tully, O. (2022). Modelling essential habitat for common scoter (*Melanitta nigra*) in a disturbed environment. *Estuarine, Coastal and Shelf Science*, 276, p.108007.

Bradbury, G., Trinder, M., Furness, B., Banks, A.N., Caldow, R.W.G. and Hume, D. (2014). Mapping Seabird Sensitivity to Offshore Wind farms, *PloS ONE* 9(9): e106366.

Brander, K.M., Ottersen, G., Bakker, J.P., Beaugrand, G., Herr, H., Garthe, S., Gilles, A., Kenny, A., Siebert, U., Skjoldal, H.R., Tulp, I. (2016), 'Environmental Impacts - Marine Ecosystems', in: Quante, M., Colijn, F. (Eds.), *North Sea Region Climate Change Assessment*. Springer International Publishing, Cham, p.241–274.

BTO (2017). *Wetland Bird Survey: Survey Methods, Analysis and Interpretation*. Available at: <https://cieem.net/resource/wetland-bird-survey-survey-methods-analysis-interpretation/> (Accessed: July 2026).

BTO (2025). *Seabird Monitoring Programme*. Available at: <https://app.bto.org/seabirds/public/data.jsp> (Accessed: July 2026).

BTO (2026) *Non-estuarine Waterbird Survey (NEWS) results*. Available at: <https://app.bto.org/webs-reporting/news.jsp> (Accessed July 2026).

BSI (2015). *Environmental impact assessment for offshore renewable energy projects - Guide*. Available at: <https://www.hsenode.com/NewSamples/BSI/146749974/PD-6900-2015-1.pdf> (Accessed: December 2025).

Buckingham, L., Bogdanova, M.I., Green, J.A., Dunn, R.E., Wanless, S., Bennett, S., Bevan, R.M., Call, A., Canham, M., Corse, C.J. and Harris, M.P., 2022. Interspecific variation in non-breeding aggregation: a multi-colony tracking study of two sympatric seabirds. *Marine Ecology Progress Series*, 684, pp.181-197.

Burnell, E., Austin, G.E., Bogdanova, M.I., Freeman, S.N., Harris, M.P., Newell, M.A., Parsons, M., Wanless, S., & Wernham, C.V. (2023). *Seabirds Count: The fourth census of breeding seabirds in Britain and Ireland 2015–2021*. JNCC, Peterborough.

Burton, N.H.K., Austin, G.E., Frost, T.M. and Pearce-Higgins, J.W. (2020). Impacts of climate change on UK's coastal and marine waterbirds. *MCCIP Science Review 2020*, p.400-420.

Burton, N.H.K., Daunt, F., Kober, K., Humphreys, E.M. and Frost, T.M. (2023). Impacts of climate change on seabirds and waterbirds in the UK and Ireland. MCCIP Science Review 2023, 26pp.

Burton Reid Associates (2020). Wildlife Corridors Network Review. Available at: https://www.southtyneside.gov.uk/media/3547/Wildlife-Corridors-Review%202020/pdf/Wildlife_Corridors_Review_Final_Report_A_1_qdmqozbpunoi.pdf?m=1658926846340 (Accessed: July 2026).

Bustnes, J.O. and Lønne, O.J. (1997). Habitat partitioning among sympatric wintering Common Eiders *Somateria mollissima* and King Eiders *Somateria spectabilis*. *Ibis*, 139(3), pp.549-554.

Calbrade, N.A., Birtles, G.A., Woodward, I.D., Feather, A., Hiza, B.M., Caulfield, E.B., Balmer, D.E., Peck, K., Wotton, S.R., Shaw, J.M. and Frost, T.M. (2025). Waterbirds in the UK 2023/24. BTO/RSPB/JNCC/NatureScot.

Cleasby, I.R., Owen, E., Butler, A., Baer, J., Blackburn, J., Bogdanova, M.I., Coledale, T., Daunt, F., Dodd, S., Evans, J.C. and Green, J.A. (2024). Assessing the importance of individual-and colony-level variation when using seabird foraging ranges as impact assessment and conservation tools. *Ibis*, 166(3), p.871-895.

CIEEM (2024). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Available at: <https://cieem.net/wp-content/uploads/2018/08/EclA-Guidelines-v1.3-Sept-2024.pdf> (Accessed July 2026).

Cook, A.S.C.P. and Burton, N.H.K. (2010). A review of the potential impacts of marine aggregate extraction on seabirds. Marine Environment Protection Fund (MEPF) Project 09/P130.

Cooper, N., Benson, N., McNeill, A. and Siddle, R. (2017). Changing coastlines in NE England: a legacy of colliery spoil tipping and the effects of its cessation. *Proceedings of the Yorkshire Geological Society*, 61(3), p.217-229.

Cornes, R.C., Tinker, J., Hermanson, L., Oltmanns, M., Hunter, W.R., LloydHartley, H., Kent, E.C., Rabe, B. and Renshaw, R. Climate change impacts on temperature around the UK and Ireland. MCCIP Science Review. 2023, 18pp.

Cornes, R.C., Tinker, J., Hermanson, L., Oltmanns, M., Hunter, W.R., LloydHartley, H., Kent, E.C., Rabe, B. and Renshaw, R. Climate change impacts on temperature around the UK and Ireland. MCCIP Science Review 2023, 18pp.

Cutts, N, Hemingway, K & Spencer, J (2013). Waterbird Disturbance Mitigation Toolkit Informing Estuarine Planning & Construction Projects Version 3.2, March 2013 Copyright University of Hull. Available at: https://gat04-live-1517c8a4486c41609369c68f30c8-aa81074.divio-media.org/filer_public/8f/bd/8fbdd7e9-ea6f-4474-869f-ec1e68a9c809/11367.pdf (Accessed: July 2026).

Davies, J.G., Humphreys, E.M. and Pearce-Higgins, J.W. (2021). Projected future vulnerability of seabirds within the INTERREG VA area to climate change. Report to AgriFood and Biosciences Institute and Marine Scotland Science as part of the MarPAMM Project. BTO. Thetford Committee. Peterborough

Daunt, F., Wanless, S., Greenstreet, S.P., Jensen, H., Hamer, K.C. and Harris, M.P. (2008). The impact of the sandeel fishery closure in the northwestern North Sea on seabird food consumption, distribution and productivity. *Canadian Journal of Fisheries and Aquatic Sciences*, 65(3), p.362-381.

Daunt F., Bogdanova M., McDonald C., Wanless S. (2012). Determining Important Marine Areas Used by European Shag Breeding on the Isle of May That Might Merit Consideration as Additional SPAs. JNCC Report No 556 (Peterborough, UK: Joint Nature Conservation Committee JNCC).

Degraer, S., Vincx, M., Miere, P. and Offringa, H. (1999). Macrozoobenthos of an important wintering area of the Common Scoter (*Melanitta nigra*). *Journal of Marine Biology, Assoc United Kingdom*, 79, p.243–251.

Del Hoyo, J., Elliott, A., Sargatal, J. and Christie, J. (Eds.) (1992). *Handbook of the Birds of the World*. Lynx Edicions: Barcelona, Spain.

Del Hoyo, J., Elliott, A. and Sargatal, J. (eds.) (1996) *Handbook of the Birds of the World. Volume 3: Hoatzin to Auks*. Lynx Edicions, Barcelona

Del Hoyo, J., Elliott, A. and Christie, D.A. (2010). *Handbook of the Birds of the World, Volume 15: Weavers to New World Warblers*. Barcelona, Spain.

Department for Energy Security and Net Zero (DESNZ) (2025a). Overarching National Policy Statement for Energy (EN-1). Available at: <https://assets.publishing.service.gov.uk/media/695d1015f41883f4e50ed9ab/overarching-national-policy-statement-for-energy-en-1-web-accessible.pdf> (Accessed: July 2026).

Department for Energy Security and Net Zero (DESNZ) (2025b). National Policy Statement for Renewable Energy Infrastructure (EN-3). Available at: <https://assets.publishing.service.gov.uk/media/695d1368b5c46330350ed9a2/national-policy-statement-for-renewable-energy-infrastructure-en-3-web-accessible.pdf> (Accessed: January 2026).

Department for Energy Security and Net Zero (DESNZ) (2025b). National Policy Statement for Electricity Networks Infrastructure (EN-5). Available at : <https://assets.publishing.service.gov.uk/media/695d12e1b5c46330350ed9a1/national-policy-statement-for-electricity-networks-infrastructure-en-5-web-accessible.pdf> (Accessed: July 2026).

Department for Environment, Food and Rural Affairs. (2020). Marine Policy Statement. Available at: <https://assets.publishing.service.gov.uk/media/5a795700ed915d042206795b/pb3654-marine-policy-statement-110316.pdf> (Accessed: July 2025).

Department for Environment, Food and Rural Affairs. (2023). High Pathogenicity Avian Influenza (HPAI) in the UK and Europe. Updated Outbreak Assessment #39, 6 February 2023. Available at: <https://assets.publishing.service.gov.uk/media/63eb651de90e077badb50c3f/hpai-europe-230206.pdf> (Accessed July 2026).

Department for Environment, Food and Rural Affairs. (2025a). High Pathogenicity Avian Influenza (HPAI) in Brazil. Preliminary Outbreak Assessment #1, 22 May 2025. Available at: https://assets.publishing.service.gov.uk/media/683dcbe572f067240eb90ba6/22_May_High_pathogenicity_avian_influenza_HPAI_in_Brazil.pdf (Accessed July 2026).

Department for Environment, Food and Rural Affairs. (2025b). High pathogenicity avian influenza (HPAI) in Great Britain and Europe. Updated Outbreak Assessment #4, 19 December 2025. Available at: https://assets.publishing.service.gov.uk/media/694c0e50efa61156e8a753ae/HPAI_Europe_4_December_2025.pdf (Accessed July 2026).

Department of Energy and Climate Change. (2026a). Overarching National Policy Statements for Energy (NPS EN-1). Available at: [Overarching National Policy Statement for energy \(EN-1\), 2025 - GOV.UK](#) (Accessed: February 2026).

Department of Energy and Climate Change. (2026b). National Policy Statement for Renewable Energy Infrastructure (EN-3). Available at: [National Policy Statement for renewable energy infrastructure \(EN-3\), 2025 - GOV.UK](#) (Accessed: July 2026).

Department of Energy and Climate Change. (2026c). National Policy Statements for Electricity Networks Infrastructure (NPS EN-5) Available at: [National Policy Statement for electricity networks infrastructure \(EN-5\), 2025 - GOV.UK](#) (Accessed: July 2026).

Drewitt, A.L. and Langston, R.H. (2006). Assessing the impacts of wind farms on birds. *Ibis*, 148, pp.29-42.

Dias, M.P., Martin, R., Pearmain, E.J., Burfield, I.J., Small, C., Phillips, R.A., Yates, O., Lascelles, B., Borboroglu, P.G. and Croxall, J.P. (2019). Threats to seabirds: a global assessment. *Biological Conservation* 237: 525-537

Dierschke, V., Furness, R. W. and Garthe, S. (2016). Seabirds and offshore wind farms in European waters: Avoidance and attraction. *Biological Conservation*, 202, p.59–68.

Dillon, I.A., Smith, T.D., Williams, S.J., Haysom, S. and Eaton, M.A. (2009). Status of Red-throated Divers *Gavia stellata* in Britain in 2006. *Bird Study*, 56(2), p.147-157.

Duckworth, J., Green, J., Daunt, F., Johnson, L., Lehtikainen, P., Okill, D., Petersen, A., Petersen, I.K., Väisänen, R., Williams, J. and William, S. (2020). Red-throated diver energetics project: preliminary results from 2018/19.

Durham County Council (2008). County Durham Landscape Strategy. Available at: <https://www.durham.gov.uk/article/2008/Landscape-character-strategies-and-guidelines> (Accessed: July 2026).

Durham County Council. (2020). County Durham Plan. Available at: <https://www.durham.gov.uk/media/34069/County-Durham-Plan-adopted-2020-/pdf/CountyDurhamPlanAdopted2020vDec2020.pdf> (Accessed: July 2026).

Ecology Consulting. (2016). Wintering Bird Survey to enable condition assessment of the wintering bird features of Durham Coast SSSI and co-located areas of SPAs: final report 2015-16.

EDF renewables (2022), Blyth Offshore Demonstrator Project - Post-construction Bird and Marine Mammal Monitoring Report 2020 - 2021 Array 2 (Year 3).

Falchieri, M., Reid, S.M., Ross, C.S., James, J., Byrne, A.M.P., Zamfir, M., Brown, I.H., Banyard, A.C., Tyler, G., Philip, E. and Miles, W. (2022), 'Shift in HPAI infection dynamics causes significant losses in seabird populations across Great Britain', *Veterinary Record*, 191, p.294-296.

FeAST Working Group Organisations, (2023). Feature Activity Sensitivity Tool (FeAST). Available at: <https://feature-activity-sensitivity-tool.scot/> (Accessed: 12 June 2026).

Fox, A.D. (2003). Diet and habitat use of scoters *Melanitta* in the Western Palearctic-a brief overview.

Fox, A.D., Mitchell, C., Stewart, A., Fletcher, J.D., Turner, J.V.N., Boyd, H., Shimmings, P., Salmon, D.G., Haines, W.G. and Tomlinson, C. (1994). Winter movements and site-fidelity of Pink-footed Geese *Anser*

brachyrhynchus ringed in Britain, with particular emphasis on those marked in Lancashire. *Bird Study*, 41(3), pp.221-234.

Fox, A. D., Jónsson, J. E., Aarvak, T., Bregnballe, T., Christensen, T. K., Clausen, K. K., Clausen, P., Dalby, L., Holm, T.E., Pavon-Jordan, D., Laursen, K., Lehikoinen, A., Lorentsen, S., Moller, A.P., Nordstrom, M., Ost, M., Soderquist, P., Therkildsen, O.R. (2015). Current and Potential Threats to Nordic Duck Populations – A Horizon Scanning Exercise. *Annales Zoologici Fennici* 52(4), p.193-220.

Frederiksen, M., Furness, R.W. and Wanless, S. (2007). Regional variation in the role of bottom-up and top-down processes in controlling sandeel abundance in the North Sea. *Marine Ecology Progress Series*, 337, p.279-286.

Fliessbach, K.L., Borkenhagen, K., Guse, N., Markones, N., Schwemmer, P. and Garthe, S. (2019). A ship traffic disturbance vulnerability index for Northwest European seabirds as a tool for marine spatial planning. *Frontiers in Marine Science*, 6, p.192.

Forni, P., Morkunas, J., and Daunys, D. (2023). Case report: first data on the foraging behaviour of velvet scoters (*Melanitta fusca*) in soft-bottom coastal waters of the southeast Baltic Sea. *Animal Biotelemetry*, 11(1), 43.

Furness, R.W., Wade, H.M. and Masden, E.A. (2013). Assessing vulnerability of marine bird populations to offshore wind farms. *Journal of environmental management*, 119, p.56-66.

Furness, R.W. (2015). Non-breeding season populations of seabirds in UK waters: Population sizes for Biologically Defined Minimum Population Scales (BDMPS).

Garthe, S. and Huppopp, O. (2004). Scaling possible adverse effects of marine wind farms on seabirds: Developing and applying a vulnerability index. *Journal of Applied Ecology*, 41(4), p.724–734.

Gilbert, G., Gibbons, D.W. & Evans, J. (1998). *Bird Monitoring Methods*, RSPB/BTO, p. 394-396.

Goodship, N.M. and Furness, R.W. (2022). Disturbance Distances Review: An updated literature review of disturbance distances of selected bird species. *NatureScot Research Report* 1283.

GPS Nautical Charts. (2026). England - East Coast - Seaham (Marine Chart : GB_GB50366C). Online: https://www.gpsnauticalcharts.com/main/nautical-chart/gb_gb50366c-england-east-coast-seaham-nautical-chart.html [Accessed: July 2026].

Greco, F., Ravenswater, H.M., Ruiz-Raya, F., D'Avino, C. (2024). Asymptomatic infection and antibody prevalence to co-occurring avian influenza viruses vary substantially between sympatric seabird species following H5N1 outbreaks. *Scientific Reports*, 15, 1435.

Hamer, K. C., Humphreys, E. M., Garthe, S., Hennicke, J., Peters, G., Grémillet, D., Phillips, R. A., Harris, M. P. and Wanless, S. (2007). Annual variation in diets, feeding locations and foraging behaviour of gannets in the North Sea: flexibility, consistency and constraint. *Marine Ecology Progress Series*, 338, pp.295-305.

Hiddink, J.G., Burrows, M.T. and García Molinos, J. (2015). Temperature tracking by North Sea benthic invertebrates in response to climate change. *Glob Change Biol*, 21: p.117-129.

HM Government (2017a). The Conservation of Offshore Marine Habitats and Species Regulations (2017) (as amended). Available at: <https://www.legislation.gov.uk/uksi/2017/1013/contents> (Accessed February 2026).

HM Government (2017b). The Conservation of Habitats and Species Regulations (2017) (as amended). Available at: <https://www.legislation.gov.uk/ukxi/2017/1012/contents> (Accessed June 2026).

HM Government (1994). The Conservation (Natural Habitats, &c.) (as amended) Regulations 1994. Available at: <https://www.legislation.gov.uk/ukxi/1994/2716/contents/2010-04-01> (Accessed August 2026).

HM Government (2019). The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019). <https://www.legislation.gov.uk/ukxi/2019/579/contents/made> (Accessed June 2026).

Huntley B., Collingham Y.C., Green R.E., Hilton G.M., Rahbek C., Willis S.G. (2006). Potential impacts of climatic change upon geographical distributions of birds. *Ibis*, 148, 8-28.

Huntley, B., Collingham, Y.C., Green, R.E., Hilton, G.M., Rahbek, C. and Willis, S.G. (2006). Potential impacts of climatic change upon geographical distributions of birds. *Ibis*, 148, pp.8-28.

Huntley, B., Green, R.E., Collingham, Y.C., Willis, S.G., 2007. A climatic atlas of European breeding birds. Lynx Edicions, Barcelona.

Jardine, D.C. (2024). Feeding ecology of wintering great northern divers *Gavia immer* in Argyll, Scotland. *Seabird*, 36.

JNCC and Natural England (2022). Nature Conservation Considerations and Environmental Best Practice for subsea cable for English Inshore and UK Offshore Waters.

Johnston D.T., Humphreys E.M, Davies J.G., and Pearce-Higgins. J.W. (2021). Review of climate change mechanisms affecting seabirds within the INTERREGVA area.

Kaiser, M.J., Galanidi, M., Showler, D.A., Elliott, A.J., Caldow, R.W., Rees, E.I.S., Stillman, R.A. and Sutherland, W.J. (2006). Distribution and behaviour of Common Scoter *Melanitta nigra* relative to prey resources and environmental parameters. *Ibis*, 148, p.110-128.

Kleinschmidt, B., Burger, C., Dorsch, M., Nehls, G., Heinänen, S., Morkūnas, J., Žydelis, R., Moorhouse-Gann, R.J., Hipperson, H., Symondson, W.O. and Quillfeldt, P. (2019). The diet of red-throated divers (*Gavia stellata*) overwintering in the German Bight (North Sea) analysed using molecular diagnostics. *Marine Biology*, 166(6), p.77.

Kendall, M.A., Burrows, M.T., Southward, A.J. and Hawkins, S.J. (2004). Predicting the effects of marine climate change on the invertebrate prey of the birds of rocky shores. *Ibis*, 146, p.40-47.

Kober, K., Webb, A., Win, I., Lewis, M., O'Brien, S., Wilson, L.J. and Reid, J.B. (2010). An analysis of the numbers and distribution of seabirds within the British Fishery Limit aimed at identifying areas that qualify as possible marine SPAs. JNCC report, 431. Available at: https://www.researchgate.net/profile/Kerstin-Kober-2/publication/265077480_An_Analysis_of_the_Numbers_and_Distribution_of_Seabirds_within_the_British_Fishery_Limit_Aimed_at_Identifying_Areas_That_Qualify_as_Possible_Marine_SPAs/links/54f588070cf2ba61506664a9/An-Analysis-of-the-Numbers-and-Distribution-of-Seabirds-within-the-British-Fishery-Limit-Aimed-at-Identifying-Areas-That-Qualify-as-Possible-Marine-SPAs.pdf (Accessed July 2026).

Lane, J.V., Jeglinski, J.W., Avery-Gomm, S., Ballstaedt, E., Banyard, A.C., Barychka, T., Brown, I.H., Brugger, B., Burt, T.V., Careen, N. and Castenschiold, J.H., 2024. High pathogenicity avian influenza (H5N1) in Northern Gannets (*Morus bassanus*): Global spread, clinical signs and demographic consequences. *Ibis*, 166(2), pp.633-650.

Lane, J.V., Jeglinski, J.W.E., Avery-Gomm, S., Ballstaedt, E., Banyard, A.C., Barychka, T., Brown, I.H., Brugger, B., Burt, T.V., Careen, N., Castenschield, J.H.F., Christensen-Dalsgaard, S., Clifford, S., Collins, S.M., Cunningham, E., Danielsen, J., Daunt, F., D'entremont, K.J.N., Doiron, P., Duffy, S., English, M.D., Falchieri, M., Giacinti, J., Gjerset, B., Granstad, S., Grémillet, D., Guillemette, M., Hallgrímsson, G.T., Hamer, K.C., Hammer, S., Harrison, K., Hart, J.D., Hatsell, C., Humpidge, R., James, J., Jenkinson, A., Jessopp, M., Jones, M.E.B., Lair, S., Lewis, T., Malinowska, A.A., McCluskie, A., McPhail, G., Moe, B., Montevecchi, W.A., Morgan, G., Nichol, C., Nisbet, C., Olsen, B., Provencher, J., Provost, P., Purdie, A., Rail, J.-F., Robertson, G., Seyer, Y., Sheddan, M., Soos, C., Stephens, N., Strøm, H., Svansson, V., Tierney, T.D., Tyler, G., Wade, T., Wanless, S., Ward, C.R.E., Wilhelm, S.I., Wischnewski, S., Wright, L.J., Zonfrillo, B., Matthiopoulos, J. & Votier, S.C. 2024. High pathogenicity avian influenza (H5N1) in northern gannets (*Morus bassanus*): Global spread, clinical signs and demographic consequences. *Ibis* 166, p. 633–650.

Leopold, M.F. and Verdaat, H.J. (2018). Pilot field study: observations from a fixed platform on occurrence and behaviour of common guillemots and other seabirds in offshore wind farm Luchterduinen (WOZEP Birds-2). Wageningen, Wageningen Marine Research (University & Research centre), Wageningen Marine Research report C068/18. 27pp. Available at: <https://files01.core.ac.uk/download/pdf/162145157.pdf> (Accessed July 2026).

Lindgren, M., Van Deurs, M., MacKenzie, B.R., Worsoe Clausen, L., Christensen, A. and Rindorf, A. (2018). Productivity and recovery of forage fish under climate change and fishing: North Sea sandeel as a case study. *Fisheries Oceanography*, 27, p.212–221.

Maclean, I.M.D., Wright, L.J., Showler, D.A. and Rehfish, M.M. (2009). A review of assessment methodologies for offshore windfarms. British Trust for Ornithology Report Commissioned by Cowrie Ltd. Available at: <https://tethys.pnnl.gov/sites/default/files/publications/Maclean-et-al-2009.pdf> (Accessed: July 2026).

Marine Directorate – Licencing Operations Team. (2025). Scoping Opinion - Morven Offshore Wind Farm, Hawthorn Pit Grid Connection. Available at: https://marine.gov.scot/sites/default/files/morven_offshore_wind_farm_-_scop-0058_-_hawthorn_pit_grid_connection_-_scoping_opinion.pdf (Accessed: July 2026).

Marine Directorate. (2015). Scotland's National Marine Plan. Available at: <https://www.gov.scot/publications/scotlands-national-marine-plan/> (Accessed: July 2026).

Marine Management Organisation. (2024). Northeast Marine Plans. Available at: <https://www.gov.uk/government/collections/north-east-marine-plan> (Accessed: July 2026).

Marine Management Organisation. (2025). Scoping request under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 for the proposed Morven Offshore Windfarm Transmission Assets Project by Morven Offshore Wind Limited. MMO Reference: DCO/2025/00005.

Mendel, B., Schwemmer, P., Peschko, V., Müller, S., Schwemmer, H., Mercker, M. and Garthe, S. (2019). Operational offshore wind farms and associated ship traffic cause profound changes in distribution patterns of Loons (*Gavia* spp.). *Journal of environmental management*, 231, pp.429-438.

Miles, W.T., Mavor, R., Riddiford, N.J., Harvey, P.V., Riddington, R., Shaw, D.N., Parnaby, D. and Reid, J.M. (2015). Decline in an Atlantic puffin population: evaluation of magnitude and mechanisms. *PloS one* 10(7), 0131527.

Ministry of Housing, Communities & Local Government. (2025). National Planning Policy Framework. Available at: https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf (Accessed: July 2026).

Mitchell, P.I., Newton, S.F., Ratcliffe, N. & Dunn, T.E. (2004). Seabird Populations of Britain and Ireland, JNCC, Peterborough, ISBN 0 7136 6901 2.

Mitchell, I., Daunt, F., Frederiksen, M., & Wade, K. (2020). Impacts of climate change on seabirds, relevant to the coastal and marine environment around the UK.

Monaghan, P. (1992). Seabirds and sandeels: the conflict between exploitation and conservation in the northern North Sea. *Biodiversity & Conservation*, 1(2), p.98-111.

Natural England (2018). Northumbria Coast SPA citation 2017. Available at: <https://publications.naturalengland.org.uk/publication/6372874327687168?category=4698884316069888> (Accessed: July 2026).

Natural England and JNCC. (2019). Natural England and JNCC advice on key sensitivities of habitats and Marine Protected Areas in English Waters to offshore wind farm cabling within Proposed Round 4 leasing areas. Available at: <https://data.jncc.gov.uk/data/3c9f030c-5fa0-4ee4-9868-1debedb4b47f/NE-JNCC-advice-key-sensitivities-habitats-MPAs-offshore-windfarm-cabling.pdf> (Accessed: July 2026).

Natural England (2022a). Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications.

Natural England, (2022b) Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase II: Expectations for pre-application engagement and best practice guidance for the evidence plan process.

Natural England. (2022c). Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards Phase I: Expectations for pre-application baseline data for designated nature conservation and landscape receptors to support offshore wind applications. Available at: <https://naturalengland.blog.gov.uk/2022/04/13/offshore-wind-best-practice-advice-to-facilitate-sustainable-development> (Accessed July 2026).

NatureScot (2020). Seasonal Periods for Birds in the Scottish Marine Environment. Available at: <https://www.nature.scot/sites/default/files/2020-10/Guidance%20note%20-%20Seasonal%20definitions%20for%20birds%20in%20the%20Scottish%20Marine%20Environment.pdf> (Accessed: July 2026).

NatureScot (2023a). Guidance Note 2: Guidance to support Offshore Wind Applications: Advice for Marine Ornithology Baseline Characterisation Surveys and Reporting. Available at: [Guidance Note 2: Guidance to support Offshore Wind Applications: Advice for Marine Ornithology Baseline Characterisation Surveys and Reporting | NatureScot](#) (Accessed: July 2026).

NatureScot (2023b). Guidance Note 3: Guidance to support Offshore Wind applications: Marine Birds - Identifying theoretical connectivity with breeding site Special Protection Areas using breeding season foraging ranges. Available at: <https://www.nature.scot/doc/guidance-note-3-guidance-support-offshore-wind-applications-marine-birds-identifying-theoretical> (Accessed: July 2026).

NatureScot (2023c). Guidance Note 8: Guidance to support Offshore Wind Applications: Marine Ornithology Advice for assessing the distributional responses, displacement and barrier effects of Marine birds. Available at: <https://www.nature.scot/doc/guidance-note-8-guidance-support-offshore-wind-applications-marine-ornithology-advice-assessing> (Accessed: July 2026).

NatureScot (2023c). Guidance Note 4: Guidance to Support Offshore Wind Applications: Ornithology - Determining Connectivity of Marine Birds with Marine Special Protection Areas and Breeding Seabirds from Colony SPAs in the Non-Breeding Season. Available at: <https://www.nature.scot/doc/guidance-note-4-guidance-support-offshore-wind-applications-ornithology-determining-connectivity> (Accessed: August 2026).

Natural England (2024a). Greater Wash SPA: Advice on Operations. Available at: <https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9020329&SiteName=greater%20wash&SiteNameDisplay=Greater+Wash+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAAArea=&NumMarineSeasonality=6> (Accessed: July 2026).

Natural England (2024b). Flamborough and Filey Coast SPA: Advice on Operations. Available at: <https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9006101&SiteName=flam&SiteNameDisplay=Flamborough+and+Filey+Coast+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAAArea=&NumMarineSeasonality=4> (Accessed: July 2026).

Natural England (2024c). Coquet Island SPA: Advice on Operations. Available at: <https://designatedsites.naturalengland.org.uk/Marine/FAPMatrix.aspx?SiteCode=UK9006031&SiteName=coquet&SiteNameDisplay=Coquet+Island+SPA&countyCode=&responsiblePerson=&SeaArea=&IFCAAArea=&NumMarineSeasonality=4> (Accessed: July 2026).

O'Brien, S. H., Webb, A., Brewer, M. J. and Reid, J. B. (2012). Use of kernel density estimation and maximum curvature to set marine protected area boundaries: identifying a special protection area for wintering red-throated divers in the UK. *Biol. Conserv.* 156: 15–21.

Parker, J., Fawcett, A., Banks, A., Rowson, T., Allen, S., Rowell, H., Harwood, A., Ludgate, C., Humphrey, O., Axelsson, M., Baker, A., Copley, V., Robertson, A., Hodgkiss, R., Berridge, R. & Farmer R. (2025). Offshore Wind Marine Environmental Assessments: Best Practice Advice for Evidence and Data Standards. Phase III: Expectations for data analysis and presentation at examination for offshore wind applications. Natural England. Version 2. 140 pp

Pearce-Higgins, J.W., Beale, C.M., Oliver, T.H., August, T.A., Carroll, M., Massimino, D., Ockendon, N., Savage, J., Wheatley, C.J., Ausden, M.A., Bradbury, R.B., Duffield, S.J., Macgregor, N.A., McClean, C.J., Morecroft, M.D., Thomas, C.D., Watts, O., Beckmann, B.C., Fox, R., Roy, H.E., Sutton, P.G., Walker, K.J., Crick, H.Q.P., 2017. A national-scale assessment of climate change impacts on species: Assessing the balance of risks and opportunities for multiple taxa. *Biological Conservation* 213, p.124–134.

Petersen, I. K., Nielsen, R. D., Pihl, S., Clausen, P., Therkildsen, O., Christensen, T. K., Kahlert, J. and Hounisen, J. P (2010). Landsdakkende optalling av vandfugle i Danmark, vinteren 2007/2008. Working Report from DMU. – The Danish Environmental Research Inst., Aarhus Univ., Denmark.

Phillips, R.A., Petersen, M.K., Lilliendahl, K., Solmundsson, J., Hamer, K.C., Camphuysen, C.J. and Zonfrillo, B., (1999). Diet of the northern fulmar *Fulmarus glacialis*: reliance on commercial fisheries? *Marine Biology*, 135(1), p.159-170.

PINS (2024). UK Planning Inspectorate (PINS) Nationally significant infrastructure projects: advice on transboundary impacts and process Available at: <https://nbs.enterprises/publicationindex/documents/details?Pub=PINS&DocId=343532> (Accessed: February 2026).

PINS (2019). Advice Note Seventeen: Cumulative Effects Assessment. Available at: <https://nsip-documents.planninginspectorate.gov.uk/published-documents/TR050005-000330-Doc%206.2%20-%20ES%20Chp%2017%20-%20Cumulative%20Effects.pdf> (Accessed: July 2026).

PINS. (2025). Scoping Opinion: Proposed Morven Hawthorn Pit Grid Connection Project. Case Reference: EN0210005.

RPS (2024), Ossian- Appendix 11.1: Offshore Ornithology Baseline Report.

RPS. (2025). Morven Hawthorn Pit Grid Connection Project Environmental Impact Assessment Scoping Report. Available at: <https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN0210005-000004-Morven%20Hawthorn%20Pit%20Grid%20Connection%20Project%20Scoping%20Report.pdf> (Accessed: July 2026).

Russell, D., Wanless, S., Collingham, Y., Huntley, B., Hamer, K., 2015. Predicting Future European Breeding Distributions of British Seabird Species under Climate Change and Unlimited/No Dispersal Scenarios. *Diversity* 7, 342–359

Sandvik, H., Erikstad, K.E., Sæther, B.-E. (2012). Climate affects seabird population dynamics both via reproduction and adult survival. *Marine Ecology Progress Series*, 454, 273–284.

Scottish Government Marine Directorate (2026). Marine Scotland Information. Available at : <https://marine.gov.scot/> (Accessed: July 2026).

Searle, K.R., Butler, A., Waggitt, J.J., Evans, P.G.H., Quinn, L.R., Bogdanova, M.I., Evans, T.J., Braithwaite, J.E., Daunt, F. (2022). Potential climate-driven changes to seabird demography: implications for assessments of marine renewable energy development. *Marine Ecology Progress Series*, 690, 185-200. Siddiqi-Davies, K., Fisher-Reeves, L., Morford, J., Clucas, G. and Guilford, T., (2025). First description of Manx Shearwater *Puffinus puffinus* diet using DNA metabarcoding. *Seabird Journal*, 37.

Spencer, J., Coppack, T., Rogerson, K., Boyle, L. and Phelps, T. (Natural England) (2022). English Seabird Conservation and Recovery Plan – Seabird Sensitivity Evidence Review. Natural England Commissioned Report NECR456. Natural England, York.

SSE (2022), Berwick Bank Wind Farm - Appendix 11.1 Baseline Ornithology Technical Report.

SSE (2023), Cambois Connection - Marine Scheme, Environmental Statement - Volume 2, ES Chapter 10: Offshore and Intertidal Ornithology.

RPS (2024), Ossian - Chapter 11: Offshore Ornithology, Array EIA Report.

Scottish Government (2024). The Sandeel (Prohibition Of Fishing) (Scotland) Order 2024: business and regulatory impact assessment - final. Available at: <https://www.gov.scot/publications/sandeel-prohibition-fishing-scotland-order-2024-final-business-regulatory-impact-assessment/> (Accessed: July 2026).

Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. and Win, I. (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds*, 114: 25..

Stanbury, A. J., Burns, F., Aebischer, N. J., Baker, H., Balmer, D. E., Brown, A., Dunn, T., Lindley, P., Murphy, M., Noble, D. G. and Owens, R. (2024). The status of the UK's breeding seabirds: an addendum to the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds*, 117: 471-487.

SNCBS, (2022). Joint SNCB Interim Displacement Advice Note: Advice on how to present assessment information on the extent and potential consequences of seabird displacement from Offshore Wind Farm (OWF) developments. Marine Industry Group for ornithology.

Sunderland City Council (2023). Core Strategy and Development Plan 2015-2033. Available at: https://www.sunderland.gov.uk/media/22171/Core-Strategy-and-Development-Plan-2015-2033/pdf/CSDP_2015-2033.pdf?m=1580375786447 (Accessed: July 2026).

Tasker, M.L., Camphuysen, C.J., Cooper, J., Garthe, S., Montevecchi, W.A. and Blaber, S.J. (2000). The impacts of fishing on marine birds. *ICES journal of Marine Science*, 57(3), p.531-547.

The Institute of Environmental Management and Assessment. (2015). Environmental Impact Assessment. Guide to Delivering Quality Development.

Tremlett, C.J., Morley, N., and Wilson, L.J. (2024). UK seabird colony counts in 2023 following the 2021-22 outbreak of Highly Pathogenic Avian Influenza. RSPB Research Report 76. RSPB Centre for Conservation Science. RSPB. The Lodge. Sandy. Bedfordshire. SG19 2DL.

van de Wolfshaar, K.E., Brinkman, A.G., Benden, D.L.P., Craeymeersch, J.A., Glorius, S. and Leopold, M.F., 2023. Impact of disturbance on common scoter carrying capacity based on an energetic model. *Journal of Environmental Management*, 342, p.118255.

Wade, H. M., Masden, E. A., Jackson, A. C., and Furness, R. W. (2016). Incorporating data uncertainty when estimating potential vulnerability of Scottish seabirds to marine renewable energy developments. *Marine Policy*, 70, p.108-113.

Waggitt, J.J., Evans, P.G.H., Andrade, J., Banks, A.N., Boisseau, O., Bolton, M., Bradbury, G., Brereton, T., Camphuysen, C.J., Durinck, J., Felce, T., Fijn, R.C., Garcia-Baron, I., Garthe, S., Geelhoed, S.C.V., Gilles, A., Goodall, M., Haelters, J., Hamilton, S., Hartny-Mills, L., Hodgins, N., James, K., Jessopp, M., Kavanagh, A.S., Leopold, M., Lohrengel, K., Louzao, M., Markones, N., Martinez-Cediera, J., O'Cadhla, O., Perry, S.L., Pierce, G.J., Ridoux, V., Robinson, K.P., Santos, M.B., Saavedra, C., Skov, H., Stienen, E.W.M., Sveegaard, S., Thompson, P., Vanermen, N., Wall, D., Webb, A., Wilson, J., Wanless, S., and Hiddink, J.G. (2019) Distribution maps of cetacean and seabird populations in the North-East Atlantic. *Journal of Applied Ecology*, 57(2), p.253–269.

Wakefield, E.D., Bodey, T.W., Bearhop, S., Blackburn, J., Colhoun, K., Davies, R., Dwyer, R.G., Green, J.A., Grémillet, D., Jackson, A.L. and Jessopp, M.J. (2013). Space partitioning without territoriality in gannets. *Science*, 341(6141), pp.68-70.

Wakefield, E.D., Cleasby, I.R., Bearhop, S., Bodey, T.W., Davies, R.D., Miller, P.I., Newton, J., Votier, S.C. and Hamer, K.C. (2015). Long-term individual foraging site fidelity—why some gannets don't change their spots. *Ecology*, 96(11), pp.3058-3074.

Wernham, C. (2002). The migration atlas: movements of the birds of Britain and Ireland.

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

Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D.A. and Noble, D. (2020). Population estimates of birds in Great Britain and the United Kingdom. *British Birds*, 113, pp.69-104.

Woodward, I., Franks, S., Bowgen, K., Davies, J., Green, R., Griffin, L., Mitchell, C., O'Hanlon, N., Pollock, C., Rees, E., Tremlett, C., Wright, L. and Cook, A. (2023). Strategic study of collision risk for birds on migration and further development of the stochastic collision risk modelling tool. Report by Scottish Government.

Wright, P., Regnier, T., Eerkes-Medrano, D. and Gibb, F. (2018). Sandeels and their availability as seabird prey. MCCIP.