

The Great Grid Upgrade

Western Link 2

National Grid Electricity Transmission (NGET)
and Scottish Power Energy Networks (SPEN)

Corridor Preliminary Routeing and Siting Study – Western Link 2

Marine Options Appraisal

June 2026

nationalgrid

EXECUTIVE SUMMARY

Western Link 2 (hereafter referred to as WL2, or the project) constitutes two proposed offshore high-voltage direct current energy links (previously referred to as AC5 and AC6), with associated onshore infrastructure between Ayrshire in Scotland and Gwynedd in Wales. The project is a joint venture between National Grid Electricity Transmission (NGET) and Scottish Power Transmission Plc (a subsidiary of SP Energy Networks, SPEN), where NGET will be responsible for the cabling sections in Welsh, Manx and Northern Irish waters and SPEN will be responsible for the cabling sections in Scottish waters. It is intended that AC5 will provide subsea transmission reinforcement between northern and southern Ayrshire, while AC6 will provide subsea transmission reinforcement between southern Ayrshire and Wales. The project is in the early stages of development. However, it is intended that the project will seek consent via marine licence application in Scottish, Welsh and Northern Irish waters; of relevance to the Isle of Man is marine infrastructure consent. Please note that only the marine components of the project are considered in this document.

The purpose of this marine corridor preliminary routeing and siting study (MCPRSS) is to detail the marine Options Appraisal approach and process that has been undertaken for the project to date to support the identification of suitable marine route corridor options. Potential marine route corridor alignments were developed by Evolv Energies. Due to the presence of several major offshore constraints, many of these options share similar alignments. Key environmental, socio-economic and technical constraints have been identified and assessed. For the purposes of the route Options Appraisal, the marine route corridor alignments have been assessed as segments to allow for the identification of specific constraints. These have then been appraised as complete route corridor options to identify an emerging preferred marine route corridor that balances these key constraints.

Based on the information presented in Chapters 6, 7 and Section 9.1, it has been determined that the emerging preference for AC5 is the routeing option from Monkton to Girvan. Similarly, based on the information presented in Chapters 6, 7, and Section 9.2, it has been determined that the routeing option from Girvan to Caernarfon (Central) is the emerging preference for WL2. The full detail of these emerging preferences is presented in Section 10. These preferences may be subject to modification following further consultation with stakeholders, survey results, public consultation and consideration alongside the terrestrial appraisals to identify the preferred end-to-end solution.

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ACRONYMS AND DEFINITIONS

Acronym	Definition
ADCP	acoustic doppler current profiler
AIS	automatic identification system
ANIFPO	Anglo-North Irish Fish Producers Organisation
AONB	Area of Outstanding Natural Beauty
BGS	British Geological Society
BRAG	Black-Red-Amber-Green
CBRA	cable burial risk assessment
CFA	Clyde Fishermen's Association
CIS	Celtic and Irish Seas
CWSH	Coastal West Scotland and Hebrides
DAERA	Department of Agriculture, Environment and Rural Affairs
DEFA	Department of Environment, Food and Agriculture
DESNZ	Department for Energy Security and Net Zero
DoI	Department of Infrastructure (Isle of Man)
EPS	European protected species
ESO	Electricity System Operator (National Grid)
FCS	Favourable Conservation Status
FEED	front-end engineering design
FIR	fisheries industry representatives
FLO	fisheries liaison officers
HDD	horizontal directional drilling
HND	holistic network design
HRA	Habitats Regulations assessment
HVAC	high-voltage alternating current
HVDC	high-voltage direct current
IAMMWG	Inter-Agency Marine Mammal Working Group
ICES	International Council for the Exploration of the Sea
IS	Irish Sea
JNCC	Joint Nature Conservation Committee
MCA	Maritime and Coastguard Agency
M CPRSS	Marine Corridor Preliminary Routeing and Siting Study
MCZ	Marine Conservation Zone
MD-LOT	Marine Directorate – Licensing Operations Team
MHWS	mean high water springs

Acronym	Definition
MMO	Marine Management Organisation
MNR	marine nature reserve
MPA	Marine Protected Area
MU	management units
NCMPA	Nature Conservation Marine Protected Area
NESO	National Energy System Operator
NGET	National Grid Electricity Transmission
NRW	Natural Resources Wales
OAST	Options Appraisal Summary Table
OREAP	Northern Ireland Offshore Renewable Energy Action Plan
PLB	post-lay burial
PLSS	Preliminary Landfall Siting Study
pUXO	potential unexploded ordnance
RCAHM	Royal Commission on the Ancient and Historical Monuments of Wales
RYA	Royal Yachting Association
ROV	remotely operated vehicle
SAC	Special Area of Conservation
SFF	Scottish Fishermen's Federation
SNIP	Scotland To N Ireland Pipeline
SOR	Strategic Options Report
SPA	Special Protection Area
SPEN	Scottish Power Energy Network
SSSI	Site of Special Scientific Interest
TCPRSS	Terrestrial Corridor Preliminary Routeing and Siting Study
UK	United Kingdom
UXO	unexploded ordnance
WS	West Scotland

GLOSSARY OF TERMS

Term	Definition
Annex I habitat	A benthic habitat type listed in Annex 1 of the EU Council Directive 92/43/EEC on the conservation of natural habitats, including wild animals and plants.
Auxiliary	Providing supplementary or additional support.
Birds Directive	Aiming to protect all naturally occurring wild bird species present in the EU along with their most important habitats.
Converter station	A specialised type of substation that forms the terminal equipment for a high-voltage direct current (HVDC) transmission line converting direct current to alternating current or the reverse.
Clyde Regional Marine Plan Pre-Consultation Draft	A draft regional plan for the Clyde Marine Region, developed to support sustainable and coordinated marine management. It reflects stakeholder input and aligns with Scotland's National Marine Plan.
Decarbonisation	Reduction or elimination of carbon dioxide emissions from a process (e.g., manufacturing, energy production).
Department of Agriculture, Environment and Rural Affairs	A UK ministerial department responsible for improving and protecting the environment, agriculture, fisheries and food production and standards – aiming to grow a green economy and sustain thriving rural communities.
Department for Energy Security and Net Zero (DESNZ)	The Department for Business, Energy and Industrial Strategy existed until 2023 when it split into the Department for Business and Trade, the DESNZ and Department for Business and Trade.
Draft Marine Plan for Northern Ireland	An inshore and offshore designed to guide sustainable use and protection of Northern Ireland's marine area. It integrates with the UK Marine Policy Statement and is a material consideration in marine-related decisions
Drumlin	A low oval mound or small hill consisting of compacted boulder clay moulded by past glacial action.
Electricity Act 1989	An act that applies to Great Britain to privatise the electricity supply industry. This act established a licensing regime and regulator for the industry known as the Office of Gas and Electricity Markets (OFGEM).
Esker	A long narrow ridge or mound of sand, gravel and boulders deposited by a stream flowing on, within or beneath a stagnant glacier.
European protected species	Plant and animals' species (excluding birds) that are protected by law throughout the European Union as listed in Annexes II and IV of the European Habitats Directive.
Evolv Energies	A new entity formed by Xodus to deliver a broader engineering service as developments ramp up globally, targeting energy transition contracts in the concept technology, pre-front-end engineering design (FEED), FEED and detailed design stages of offshore projects.
Habitat Regulations assessment	A process to determine the potential negative impacts that project plans may have on recognised protected European sites, including Judgement of Likely Significant Effect and Appropriate Assessment.

Term	Definition
Holistic design network	Providing a recommended onshore and offshore design to allow 23 GW of offshore wind energy to be added to the existing energy network, facilitating the UK Government's goal of achieving 50 GW of offshore wind energy for Great Britain by 2030.
Horizontal directional drilling	A minimal impact trenchless method of installing underground utilities (e.g., pipes, cables, conduits) at a relatively shallow depth without disturbing the ground surface using a surface-launched drilling rig.
Interconnector	A structure that allows HVDC electricity to flow between electrical grids, commonly used to connect two countries energy systems together.
International Council for the Exploration of the Sea	An intergovernmental organisation that was first established in 1902 in Copenhagen. Operating under the terms of the 1964 Convention, this global organisation is concerned with the development of marine and fisheries science and advice to support sustainable use of the oceans.
Joint Nature Conservation Committee	A public body that advises the UK Government and administrations to maintain and enrich biological diversity and conserve natural geological features.
Manx Marine Environmental Assessment and Isle of Man Marine Plan	A technical evidence base and planning framework for sustainable development in Manx territorial waters. It supports marine spatial planning and consenting processes under the Isle of Man Marine Plan Project
Marine (Scotland) Act 2010	An Act that provides the legislative framework for governing marine environments. It sets forth comprehensive measures aimed at the protection, management and sustainable use of marine resources. This act applies to Scotland.
Marine and Coastal Access Act 2009	An Act that provides the legislative framework for governing marine environments. It sets forth comprehensive measures aimed at the protection, management and sustainable use of marine resources. This act applies to England and Wales.
Marine Corridor Preliminary Routeing and Siting Study	A document that will set out the preferred marine cable routeing option for AC5 and AC6 based on an assessment of the biological, physical, historical and socio-economic marine environment.
Marine Conservation Zone	Areas that are protected due to the presence of nationally important, rare or threatened habitats and species; with 91 sites and 12 additional features being designated within English waters between 2013 and 2019.
Marine Directorate – Licensing Operations Team	The regulator responsible for determining marine licence applications on behalf of the Scottish Ministers in the Scottish inshore region (between 0 and 12 nautical miles [nm]) under the Marine (Scotland) Act 2010 and in the Scottish offshore region (between 12 and 200 nm) under the Marine and Coastal Access Act 2009.
Marine Infrastructure Management Act 2016	An act to make provision for a consenting process for certain activities in the Isle of Man marine environment. This act applies to the controlled marine area, defined as the area between mean high water and the seaward boundary of the Isle of Man territorial sea.
Marine Management Organisation	An executive non-departmental public body in the UK responsible for marine licensing in English waters, supporting sustainable economic growth, protecting marine environments for current and future growth and engaging with coastal communities. Established under the Marine and Coastal Access Act 2009.

Term	Definition
Marine Protected Area (MPA)	Areas of the ocean set aside for long-term conservation aims. MPAs involve the protective management of natural areas according to predefined management objectives. MPAs can be conserved for a number of reasons including economic resources, biodiversity conservation and species protection.
Marine route corridor	The marine corridor option that is being assessed. This constitutes a subsea cable to transfer power from Scotland to Wales.
Mean high water springs	An average height throughout the year of two consecutive high waters during a 24-hour period with the largest tidal range (during spring tides) – the average highest coastal water level.
National Energy System Operator	A publicly owned UK organisation responsible for managing the electricity market and balancing supply and demand since 2024, previously owned by National Grid plc (formally National Grid ESO).
National Grid Electricity Transmission (NGET)	A system operator responsible for the transmission of electricity in England and Wales.
Natural Resources Wales	A Welsh Government sponsored body responsible for the protection and regulation of the environment and the maintenance of natural resources throughout Wales.
Network Options Assessment	An evaluation to facilitate the development of an efficient, coordinated and economical system of electricity transmission consistent with the National Electricity Transmission System Security and Quality of Supply Standard and the development of efficient interconnection capacity.
Office of Gas and Electricity Markets (OFGEM)	The government regulator for the electricity and downstream natural gas markets in Great Britain.
Priority marine feature	Habitats or species within Scottish waters that are considered to have high conservation importance as designated by Marine Scotland, the JNCC and Scottish Natural Heritage – 81 priority marine features were identified in 2014.
RSK	The RSK Group is a well-established global leader in the delivery of environmental and engineering solution consultation, founded in 1989 and comprising over 200 companies.
Schedule 9	A requirement under the Electricity Act 1989 where NGET and Scottish Power Energy Transmission has a statutory obligation regarding the preservation of amenity.
Scottish Power Energy Network	A system operator responsible for the transmission of electricity in central and southern Scotland.
Scotland's National Marine Plan	A comprehensive policy framework for managing Scotland's inshore and offshore waters. It promotes sustainable development while protecting the marine environment and supports regional marine planning.
Scotland National Marine Plan 2 Strategic Environmental Assessment Scoping Report	A preparatory document outlining the scope and methodology for assessing environmental impacts of Scotland's upcoming National Marine Plan 2. It identifies key issues such as climate change and biodiversity loss.

Term	Definition
Sites of Special Scientific Interest (SSSI)	A designated area of particular importance to science due to the presence of rare plant or animal species, geological or physiological features (e.g., ancient woodland, grasslands, bogs).
Special Area of Conservation (SAC)	A designated site of community importance that is protected, maintained and restored due to the presence of one or more rare habitats or species listed in the Habitats Directive at sea or on land.
Special Protection Area (SPA)	A designated site under the European Union Directive on the Conservation of Wild Birds, safeguarding the habitats of migratory and threatened birds species – part of the Natura 2000 network.
Study area	A geographic boundary that defines the extent of the analysis or research.
Substation	A structure that transforms voltage from high to low or the reverse, as part of a larger electrical generation, transmission and distribution system.
Terrestrial	On or relating to dry land on earth.
Terrestrial cable preliminary routeing and siting study	A document that will set out the preferred terrestrial cable routeing option and siting for AC6 and associated supporting infrastructure based on an assessment of the biological, physical, historical, and socio-economic terrestrial environment.
Town and Country Planning Act 1990	An act to regulate the development of land and land-use planning in England and Wales.
Unexploded ordnance	An explosive weapon that is yet to detonate and still poses a risk (e.g., bombs, projectiles, explosives).
UK National Site Network	A network of protected areas (e.g., SACs and SPAs) that have been established under the Habitats and Birds Directives.
UK Biodiversity Action Plan Habitats	Cover a wide range of semi-natural habitat types that have been identified as being at threat and requiring conservation.
Welsh National Marine Plan	A strategic framework for the sustainable development of Welsh seas, covering both inshore and offshore waters. It sets out policies to guide marine activities and decision-making over a 20-year horizon.
Wildlife and Countryside Act 1981	An act to comply with the European Council Directive 79/409/EEC for the conservation of wild birds. This act gives protection to native species and controls the release of non-native species and enhances the protection of SSSIs.

1 INTRODUCTION

1.1 Overview

National Grid Electricity Transmission (NGET) and Scottish Power Transmission Plc (a subsidiary of SP Energy Networks, SPEN) are undertaking investigative constraints mapping and route corridor options appraisal works for an offshore high-voltage direct current (HVDC) electricity transmission reinforcement link project, referred to as Western Link 2 (hereafter referred to as WL2, or the project), formed from the previously referred to projects of 'AC5 and AC6', between the west coast of Scotland to either northern or southern Wales. However, during development of the project, a preferred landfall site in northern Wales was identified. For the purposes of both the Terrestrial Corridor Preliminary Routeing and Siting Study (TCPRSS) and Marine Corridor Preliminary Routeing and Siting Study (MCPRSS), the collective project is to be referred to as WL2; AC5 and AC6 may be referred to whereby specific reference is made to the north and south marine route corridor alignments.

The National Energy System Operator (NESO) (formerly the National Grid Electricity System Operator [ESO], before 2024) Network Options Assessment 2021/22 Refresh (National Grid ESO, 2022) identified the need for major reinforcement of the national electricity transmission system across the Anglo-Welsh-Scottish borders. There are high volumes of wind power generation in Scotland but a lower local electricity demand; inversely, south of the Scottish border in England and Wales, there is typically lower energy generation but higher electricity demand. This difference has historically led to an overall north to south power flow through the region.

The joint venture of SPEN and NGET on the development of WL2 has been identified as one of several essential holistic network design (HND) options within the 'Pathway to 2030' National Grid ESO Report (2022) and 'Beyond 2030' National Grid ESO Report (2024), through which this reinforcement will be delivered. The objective of these reports is to provide recommendations to support the large-scale delivery of electricity generated from offshore wind via a reinforced electricity transmission network between Scotland, England and Wales. The HND recommends that additional links between Scotland and Wales are needed to meet the decarbonisation of the UK's electricity grid while also meeting the energy demands of citizens and business.

The Options Appraisal process is an integral part of project development, as specified in National Grid's (2022) 'Our Approach to Consenting'. To date, WL2 has undergone strategic proposal works and is now undergoing options identification and selection. For further information on this process, please see Section 5.

1.2 Purpose of this report

The purpose of this MCPRSS is to detail the works undertaken to identify an emerging preference, the key biological, physical, historical, socio-economic and technical constraints present, and how these constraints have materially influenced marine route corridor and landfall siting decisions.

This M CPRSS has been developed to inform the preferred end-to-end solution for WL2 and aims to evaluate the marine route corridor options, considering both environmental and socio-economic constraints. The scope of this report focuses on the marine elements of the project in Scottish, Northern Irish, Manx and Welsh waters. For details on the terrestrial aspects of the AC6 element of WL2, please see the counterpart to this report, the TCPRSS.

It should be noted that the emerging preference and alternative options identified in this report and the TCPRSS may be subject to modification and design evolution following stakeholder engagement, public consultation, further design development, and environmental survey works.

1.3 AC6 project team

It is important to highlight the key organisations involved in the WL2 during Options Identification and Selection, as they are referenced throughout the M CPRSS. Table 1.1 summarises the core project team organisations and their respective roles.

Table 1.1: Key organisations involved in WL2

Organisation	Role
NGET	Project owner for terrestrial portion of AC6, leading Welsh terrestrial and marine works Marine responsibility split equally between NGET and SPEN
SPEN	Project owner for terrestrial portion of AC5, leading Scottish terrestrial and marine works Marine responsibility split equally between NGET and SPEN
AtkinsRéalis	Terrestrial engineering consultant
RSK Environment	Terrestrial environmental consultant
Evolv Energies	Marine technical consultant
RSK International Projects Group	Marine environmental consultant

This multidisciplinary team has collaborated to deliver the technical and environmental work required to inform the siting and appraisal processes outlined in the M CPRSS and TCPRSS.

1.4 Background and need case

1.4.1 Background

The electricity industry in Great Britain is undergoing unprecedented change. Closure of fossil fuel power stations and end of life nuclear power stations means significant additional investment in new generating and interconnection capacity will be needed to ensure existing minimum standards of security and supply are maintained. Growth in onshore green technologies, offshore wind power generation and interconnectors with

Europe has seen a significant number of connections planned in Scotland, England and, significantly, in areas of the East Coast of England.

The Climate Change Act 2008 (as amended) now commits the UK Government to reducing greenhouse gas emissions by at least 100% from the 1990 baseline by 2050 (this is referred to as “Net Zero”), strengthening the likelihood of most of these connections progressing to delivery. To achieve Net Zero, there will need to be a substantial shift away from the use of unabated fossil fuel-based power generation. This has led to investment in onshore green technologies and offshore wind generation, which will increase further in the future.

Historically, the electricity transmission system was supplied largely by coal fired power generating stations. The increasing importance of low carbon generation has driven the closure of these generating stations, with the UK’s last coal fire power generating station having closed in 2024. This generating capacity is being replaced by low carbon generation which is geographically located away from the coal powered generating stations. The transmission system must be updated to reflect the location of the new generation capacity.

1.4.2 Existing transmission network

The transmission network in Wales and England was primarily constructed in the 1960s. It was designed to connect the inland large coal fired power stations, Hydro Power and Nuclear Power Stations in the across Wales and England, with changes occurring in the later parts of the century connecting gas fired power stations in the South and North Wales in particular. Little or no transmission infrastructure was constructed in some areas, such as Mid Wales, so there is currently limited ability to support new connections.

The existing transmission system in Wales, Midlands and North of England is shown in Figure 1.1 and Figure 1.2.

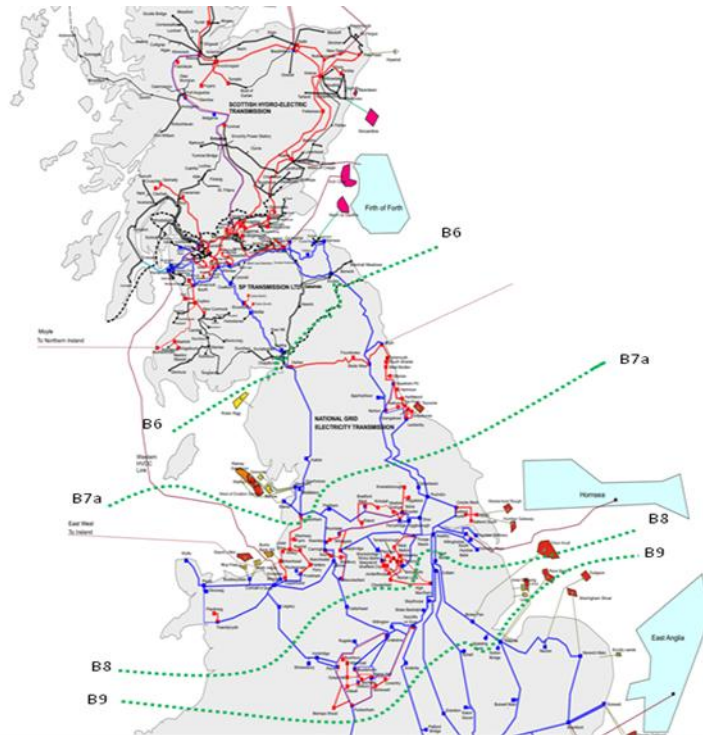


Figure 1.1: UK power boundaries

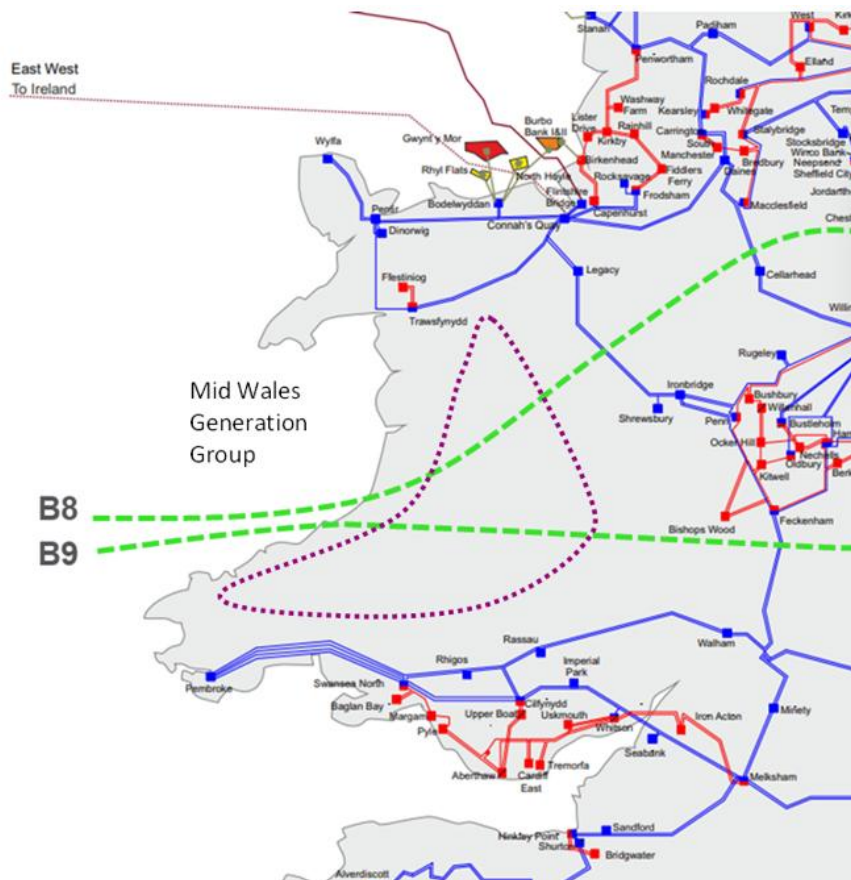


Figure 1.2: Welsh power boundaries

A boundary splits the system into two parts, crossing critical circuit paths that carry power between areas and where power flow limitations may be encountered. Boundaries help identify regions where reinforcement is most needed by enabling analysis of power transfers between separated areas. They can be local boundaries, which are small areas of the Transmission System with a high concentration of generation, or wider boundaries, which are large areas containing significant amounts of both generation and demand. Boundary definitions have evolved over many years of planning and operating the transmission system.

1.4.3 Needs case

The WL2 project will reinforce power transfer across the Scottish and Welsh national boundaries by increasing capacity and reinforcing existing systems. The project is essential to ensure effective transfer across B6 and B7a boundaries (Figure 1.1) to enable excess energy generated in Scotland to be exported to the south. The project will ensure suitable infrastructure is available to support acceleration of Welsh transmission projects and future export of excess energy from Wales. Additionally, the AC5 component of WL2 will support the reinforcement of the B5 boundary in Scotland.

1.5 Report structure

The report is structured as follows:

- **Section 2: Project description** – summarises the key components of the marine aspects of the project
- **Section 3: Legislation, policy and statutory duties** – an overview of relevant policy, NGET's statutory duties and NGET's guidance
- **Section 4: NGET's approach to consenting** – details the standard approach for project development and delivery within National Grid from inception to consent and construction
- **Section 5: Options Appraisal approach** – details the methodology used to identify, define and appraise the study area for the offshore components of the project and to define corridors and landfall areas for appraisal
- **Section 6: Options Appraisal: marine installation constraints** – provides detail on the key technical constraints considered when developing and appraising the marine route corridor alignments
- **Section 7: Options Appraisal: marine environmental and socio-economic constraints** – provides detail on the key biological, physical, historical and socio-economic constraints considered when developing and appraising the marine route corridor alignments
- **Section 8: Stakeholder engagement** – details stakeholder engagement undertaken to date
- **Section 9: Options Appraisal** – describes the appraisal process and summarises the conclusions reached
- **Section 10: Emerging preference** – presents the emerging preference for the marine cable routing and landfall siting
- **Section 11: Summary and next steps** – summarises the CPRSS and outlines the next steps in the offshore components of the project.

2 PROJECT DESCRIPTION

2.1 Introduction

Existing terrestrial electricity transmission systems in Scotland and Wales both operate using predominantly high-voltage alternating current (HVAC). Subsea transmission reinforcement links more commonly use HVDC cables due to their suitability for transmitting large amounts of electricity over longer distances. This reduces energy loss in comparison to HVAC systems while providing a greater degree of control over the magnitude and direction of power flow.

For context, this section provides detail of the associated terrestrial works in Scotland (SPEN) and Wales (NGET) for WL2, alongside its AC5 and AC6 elements. At this time, it is anticipated that the overall project will comprise construction of the following:

- SPEN WL2:
 - connection to the existing network in east Ayrshire, Scotland
 - underground HVAC cable route from the existing network to a new converter station adjacent to the existing network in Ayrshire
 - underground HVDC cable from the new converter station to the Ayrshire landfall location
 - underground HVDC cable route from the southern Ayrshire coast landfall point to Girvan¹
 - Girvan connection on the southern Ayrshire coast, which will allow for the connection of the AC5 and AC6 cables to an export cable from MachairWind
 - underground HVDC cable route from 'T-point'¹ to the landfall point on the southern Ayrshire coast
- AC5 element of WL2:
 - subsea HVDC cable route (AC5) between two locations on the northern and southern Ayrshire coast in Scotland
- AC6 element of WL2, marine:
 - subsea HVDC cable route (AC6) between a landfall on the Ayrshire coast in Scotland to a landfall on the Gwynedd coast in Wales
- AC6 element of WL2, terrestrial:
 - underground HVDC cable route from a landfall point near Caernarfon Bay, Gwynedd, Wales to a new converter station
 - new converter station within 2 km of the Pentir 400 kV substation and HVAC connection back to the existing Pentir 400 kV substation
 - extension of the existing Pentir 400 kV substation.

Figure 2.1 presents the generalised geographic layout for the proposed SPEN WL2 works, the AC5 and AC6 marine works, and the AC6 terrestrial works. The options appraised and summarised within this report only consider siting and routeing of the key components of the project as detailed above. They do not consider the details of any potential layouts, permanent access requirements or any auxiliary works that may be

¹ 'T-point' will act as a junction between the transition joint bays for the AC5 and AC6 cables (RSK, 2024a; 2024b).



required to connect to existing infrastructure. While such aspects are out of scope, they will be detailed and assessed further in subsequent project phases.

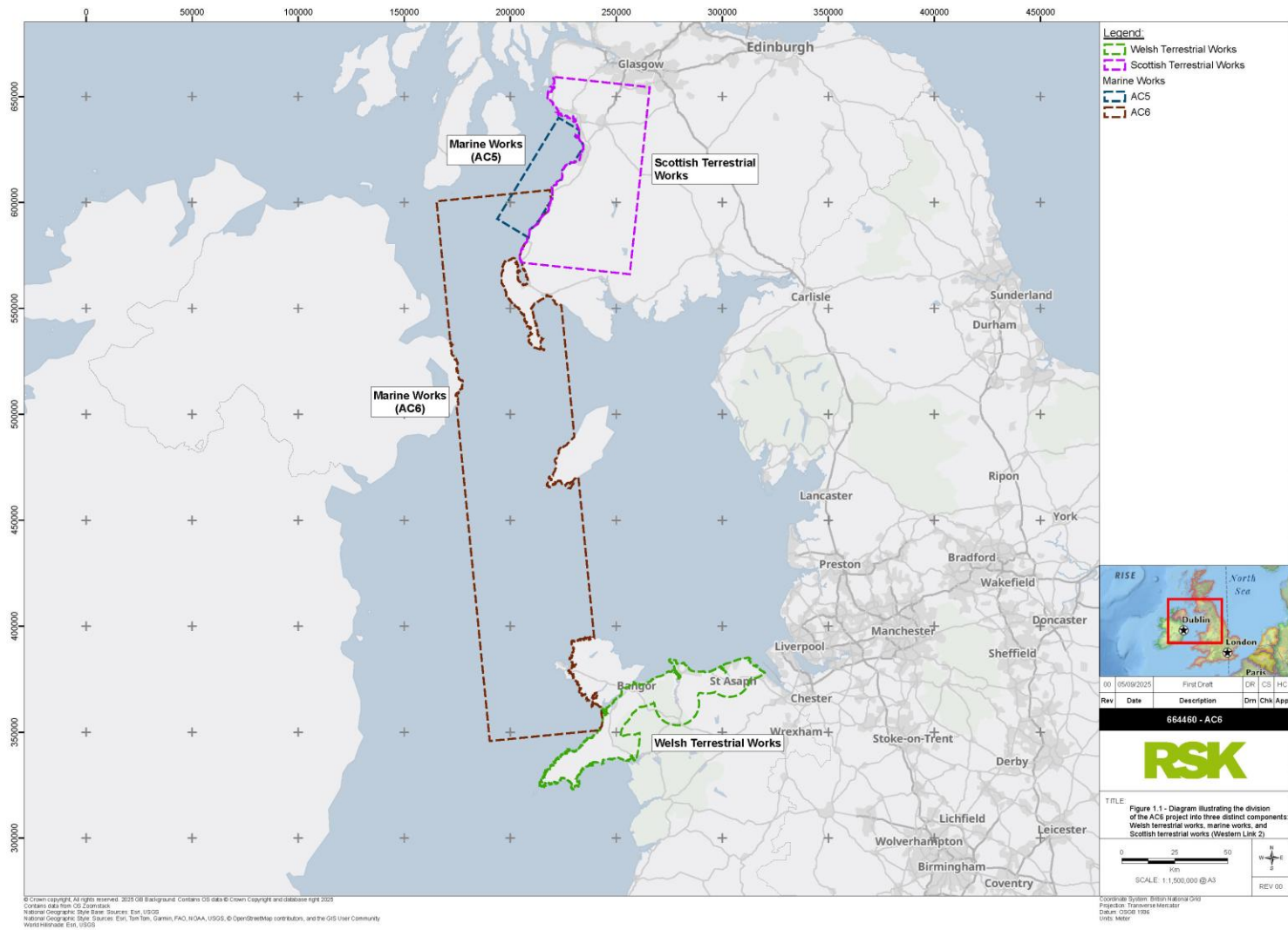


Figure 2.1: Schematic of the proposed project works

The purpose of the existing marine cable routeing and landfall siting works to date has been to identify preferential locations for: (a) the AC5 submarine HVDC cable between landfall points in Scotland and (b) the AC6 submarine HVDC cable between landfall points between Scotland and North Wales, south of the Isle of Anglesey, with both aspects being elements of the wider WL2 project. This AC5 element of the wider WL2 project has been developed in collaboration with SPEN. The Options Appraisal summarised in this report only considers the marine components of the project. The terrestrial components are considered in the TCPRSS, which has been developed for National Grid by RSK.

2.2 Welsh landfall development

The potential landfall areas along the Caernarfon Bay coastline were identified by RSK in the 'Preliminary Landfall Siting Study (PLSS) Report' (RSK, 2024a). This report was developed in collaboration with RSK's terrestrial environmental consultant to ensure that identified areas were mutually beneficial to both the marine and terrestrial components of the proposed works. Four areas have been identified by RSK as potentially suitable for landfall, they extend across a 5.5 km stretch of the Caernarfon Bay coastline between Dinas Dinlle and Clynnog Fawr.

Following identification of the preferred landfall locations, indicative landfall compound locations were developed inland to account for the point at which the cable would re-emerge onshore. Each landfall compound is assumed to have a conservative area requirement of 150 m x 150 m (2.25 ha) which allows for additional space for pipe or cable storage, depending on the landfall installation technique method adopted. This area is proposed here to facilitate flexibility in project design and construction options.

The landfall compounds and associated onshore infrastructure remains subject to refinement as further environmental, technical and land-related information becomes available. For further information on the terrestrial landfall works, please see the TCPRSS.

Detail with regard to the Scottish landfall siting is provided in Section 5.5.1.

2.3 Offshore cabling

The technical design for the offshore cabling works is still in early stages of development and is subject to design development and evolution. As such, a series of assumptions have been made in relation to the marine cable routeing and landfall siting works; these are as follows:

- It has been assumed that all works within the marine environment will be conducted within a 500 m wide corridor (please refer to Section 6).
- The marine HVDC cables will be buried in the seabed, wherever feasible, along the cable route. There may be some areas where burial is not possible due to ground conditions (e.g., areas of sub cropping or outcropping) or the presence of third-party assets (e.g., existing cables or pipelines). Where this is the case and the required burial depth cannot be achieved, additional post lay burial protection will be used (e.g., rock placement, concrete mattresses or rock/grout bags).
- It has been assumed that either simultaneous cable lay and burial or post-lay burial of the cable will be used.

- It has been assumed that seabed preparation methods will largely consist of the following activities:
 - pre-lay grapnel run
 - pre-sweeping of sand waves using trailing suction hopper dredger or controlled/mass flow excavator
 - boulder removal
 - unexploded ordnance (UXO) identification and clearance, where required
- The following burial tools may be used:
 - cable burial plough
 - jet trencher
 - mechanical trencher
 - mass or controlled flow excavator.
- There is a preference that trenchless installation methods, such as HDD, will be used at landfall to minimise the disturbance to the intertidal area and adjacent terrestrial habitats, however this is yet to be confirmed. The marine HVDC cable would extend to a transition joint bay where it would join the terrestrial underground cables. The HDD landward extent from mean high water springs (MHWS) is yet to be determined. However, it is acknowledged that trenched techniques may be required; the determination of installation method will be finalised as the project develops. For the purposes of this MCPRSS, the intertidal zone is considered only in so far as it informs offshore route corridor feasibility and marine construction constraints at the landfall interface. Detailed landfall siting, intertidal crossing design and onshore transition to the terrestrial cable system are addressed within the TCPRSS. References to the intertidal zone within this report are therefore intended to support offshore option appraisal only and do not constitute landfall option selection or onshore design.

3 LEGISLATION, POLICY AND STATUTORY DUTIES

3.1 Overview

There are several different licensing and consenting requirements within the marine environment, controlled by a number of different regulators. Due to the WL2 potential marine route corridors crossing multiple jurisdictions, there will be various licensing and consenting requirements in relation to survey activities and construction works.

The marine route corridor options, show that WL2 traverses Welsh inshore and offshore waters, Manx waters, Northern Irish inshore and offshore waters and Scottish inshore waters. Based on this information, engagement with the statutory bodies outlined in Table 3.1 is anticipated, alongside other key stakeholders. Please note this list is non-exhaustive, and it is anticipated that additional stakeholders may be identified throughout the consultation process.

Table 3.1: Key statutory bodies and stakeholders

Jurisdiction	Stakeholder
All	Department for Energy Security and Net Zero (DESNZ) Maritime and Coastguard Agency (MCA)* Royal Yachting Association (RYA) UK Chamber of Shipping
Scotland	Marine Directorate – Licensing Operations Team (MD-LOT)* NatureScot Crown Estate Scotland* Northern Lighthouse Board*
Wales	Natural Resources Wales (NRW)* Joint Nature Conservation Committee (JNCC)* The Crown Estate* Trinity House* Cadw Royal Commission on the Ancient and Historical Monuments of Wales (RCAHMW)
Northern Ireland	Department of Agriculture, Environment and Rural Affairs (DAERA)* Northern Ireland Environment Agency* JNCC* Marine Management Organisation (MMO)* The Crown Estate*
Isle of Man	Isle of Man Department of Infrastructure (DoI)* Department of Environment, Food and Agriculture (DEFA)* Northern Lighthouse Board* Harbour Director

*Stakeholders already engaged with regard to WL2 in relation to the existing survey works.

Note: The above list of stakeholders is correct as of October 2025 in relation to the WL2 project.

As denoted above in Table 3.1, early consultation works with key stakeholders has been undertaken throughout the first half of 2025. To date, these works have included the introduction of the WL2 project (at the time of introduction, the project was referred to as the AC5 and AC6 projects) to MD-LOT, NRW, DAERA, DoI, DEFA, The Crown Estate, Trinity House, JNCC, the MCA and the Northern Lighthouse Board. Stakeholders were further consulted with regards to feedback on the marine route corridor option development. Follow-up discussions with these stakeholders have included the proposed geophysical and geotechnical survey works scheduled for autumn 2025 and spring/summer 2026, respectively. For further details on stakeholder engagement, please see Chapter 8.

It is anticipated that the MCPRSS report will be used as supporting documentation during non-statutory consultation and as a means of facilitating engagement with key stakeholders.

3.2 Relevant legislation, policy and guidance

At the time of writing, it is assumed that the primary route for marine consent in each jurisdiction will be executed through the Marine (Scotland) Act 2010, the Marine and Coastal Access Act 2009 and the Marine Infrastructure Management Act 2016. It is anticipated that secondary consenting requirements will also be required to support the works (European protected species [EPS] licence, marine works licence, seabed survey licence, etc.).

As part of the licensing process, consideration will be given to UK Policy Statements to ensure project compliance. These may include but are not limited to those identified in Table 3.2. Further information on the marine plans is detailed in Appendix 4.

Table 3.2: Marine policy considerations

Jurisdiction	Policy
UK	Energy National Policy Statement Marine Policy Statement British energy security strategy 2022 Transmission Acceleration Action Plan Clean Power 2030 Action Plan
Scotland	Scotland’s National Marine Plan ² Clyde Regional Marine Plan (Pre-Consultation Draft) Scottish Planning Policy National Planning Framework 4 The future of energy in Scotland: Scottish energy strategy
Wales	Welsh National Marine Plan Future Wales: The National Plan 2040 Planning Policy Wales

² It is noted that there is currently a new National Marine Plan in development for Scotland

Jurisdiction	Policy
Northern Ireland	Marine Plan for Northern Ireland
Isle of Man	Isle of Man Marine Plan (Manx Marine Environmental Assessment)

3.3 Statutory duties (Electricity Act 1989)

Under Schedule 9 of the Electricity Act 1989 (see Appendix 5), transmission operators (i.e., NGET and SPEN) have a statutory obligation regarding the preservation of amenity. NGET is legally obligated to distribute electricity through England and Wales via cost-effective manners to persons seeking connection. Specifically where transmission operators develop new infrastructure, they are required to have regard to the following statutory duties:

- Section 9 (general duties of licence holders) of the Electricity Act states:
 - *“It shall be the duty of the holder of a licence authorising him to participate in the transmission of electricity:*
 - *(a) to develop and maintain an efficient, co-ordinated and economical system of electricity transmission”*
- Schedule 9 (preservation of amenity including: considering impacts upon communities, landscape, visual amenity, cultural heritage, and ecological resource)
- Section 38 and Schedule 9:
 - *“In formulating any relevant proposals, a licence holder or a person authorised by exemption to generate, distribute and supply or participate in the transmission of electricity”* as detailed below.

As per Schedule 9, Paragraph 1 of the Electricity Act 1989, Transmission Operators are legally obligated to

“...have regard to the desirability of preserving natural beauty of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest”

and must also

“...do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.”

To discharge this Schedule 9 obligation, NGET has produced a Schedule 9 statement (National Grid, n.d.) that sets out a series of commitments. This includes the following:

“[NGET] Will seek to avoid, where reasonably practicable, the installation of new infrastructure in areas which are nationally or internationally designated for their landscape, wildlife, historic or cultural significance: National Parks; Areas of Outstanding Natural Beauty; Sites of Special Scientific Interest including Special Protection; Areas, Special Areas of Conservation and RAMSAR sites; National Nature Reserves; Heritage Coasts; World Heritage Sites; scheduled ancient monuments, listed buildings, registered parks and gardens, registered battlefields and conservation areas. WPD will seek to avoid significant impacts on regional and

local sites, protected species and to biodiversity and geological interests within the wider environment, and take measures to safeguard landscape character, the historic environment, heritage assets and their settings. Where reasonably practicable, opportunities to enhance biodiversity, geological features and the historic environment of such sites will be exploited.”

Similarly, SPEN has also produced a Schedule 9 statement (SP Transmission Limited, 2022), which sets out a series of commitments in relation to this obligation. This includes the following:

“We [SPEN] will pay due regard to the need to preserve and maintain amenity, particularly within the areas of the greatest landscape, wildlife or cultural amenity, such as National Parks, National Scenic Areas, Sites of Special Scientific Interest, Scheduled Ancient Monuments and other national or international designated areas.

For new transmission infrastructure we will investigate the possibility of alternative routes or sites outwith the designated area...

We [SPEN] will seek to minimise the effects of new transmission infrastructure at or near both designated sites and also other sites valued for their general amenity, such as areas of archaeological interest, battlefields, local nature reserves, playing fields and water bodies. We will also take into account the significance of sites valued for their amenity through consultation with statutory bodies and local authorities.

We [SPEN] will carry our environmental assessments in accordance with relevant legislation prior to developing proposals for new lines or plant.

In the preparation of plans and programmes we will seek to avoid, so far as is possible, causing injury to fisheries or to the stock of fish in any waters within our licensed area.”

To date, the existing works conducted by RSK under the Strategic Optioneering Process for WL2 have been carried out with this commitment in mind. The Strategic Option routes were developed to consider avoidance of these sites/areas as the primary mitigation method. In instances where these sites/areas could not be avoided, this has been captured within the existing reporting and detail on the potential impacts, mitigation methods, and residual effects have been identified. Further information on the environmental and socio-economic constraints considered during routeing and siting is supplied in Section 5.3.

4 NGET’S APPROACH TO CONSENTING

As detailed in NGET’s ‘Approach to Consenting’ (National Grid, 2022), a standard project development and delivery approach has been developed for major infrastructure projects by NGET and SPEN, from inception to consent and construction. This process can be divided into six stages as follows:

- Strategic Proposal:
 - identify network options to meet the needs case
 - undertake Strategic Options Appraisal and select a Strategic Proposal
- Options Identification and Selection:
 - identify and appraise project options
 - engage with stakeholders and use consultees’ feedback to shape project development
- Defined Proposal:
 - develop the project design in response to feedback
 - identify the scope of the environmental assessment
 - undertake consultation on the proposal
- Assessment and Land Rights:
 - refine the project design in response to feedback
 - assess the projects impacts
 - prepare application documents
- Application and Decision:
 - submit application and respond to questions from the relevant licensing authorities
- Construction:
 - discharge licence conditions
 - deliver project
 - implement reinstatement, mitigation and post-construction monitoring.

Present works in relation to WL2 are currently in the options identification and selection stage. Within this stage, a stepped approach is used to support the identification of potential routing and siting options for the project. The outputs from this second stage consider the potential impacts on environmental, historical and socio-economic receptors as well as technical and engineering design considerations (Table 4.1).

Table 4.1: Appraisal topics that have been considered as part of options identification and selection stage of the project

Environment	Socio-economic	Technical	Cost
Biological environmental	Infrastructure (marine)	Technical complexity	Capital cost
Physical environmental	Shipping and navigation	Construction/project delivery issues	Lifetime cost

Environment	Socio-economic	Technical	Cost
Historic environment	Restricted areas	Suitability of technology	
	Commercial fisheries, restricted fishing areas and relevant byelaws	Network capacity	
	Shellfish waters	Network efficiencies/ benefits	
	Bathing waters	Commercial/regulatory/third-party issues	
	Marine planning		
	Additional major projects		

As detailed in Section 3.3, National Grid has a series of statutory obligations that must be considered as part of the routeing and siting process. With these obligations in mind, the aim of this rounded appraisal approach is to achieve a balanced consideration of these factors and identify emerging preferences for cabling corridors, landfalls and siting zones/areas for the project.

This process allows for documentation of key project option decisions and allows for opportunity to back-check ruled-out options throughout the project’s development. This approach means that an auditable, robust, transparent and consistent manner can be presented for the identification of routeing and siting of National Grid projects.

To support the progression of environmental and socio-economic works within the options identification and selection stage, the following step-by-step process was followed by RSK (Figure 4.1); this report executes Stage 2. This is further detailed in Section 5.

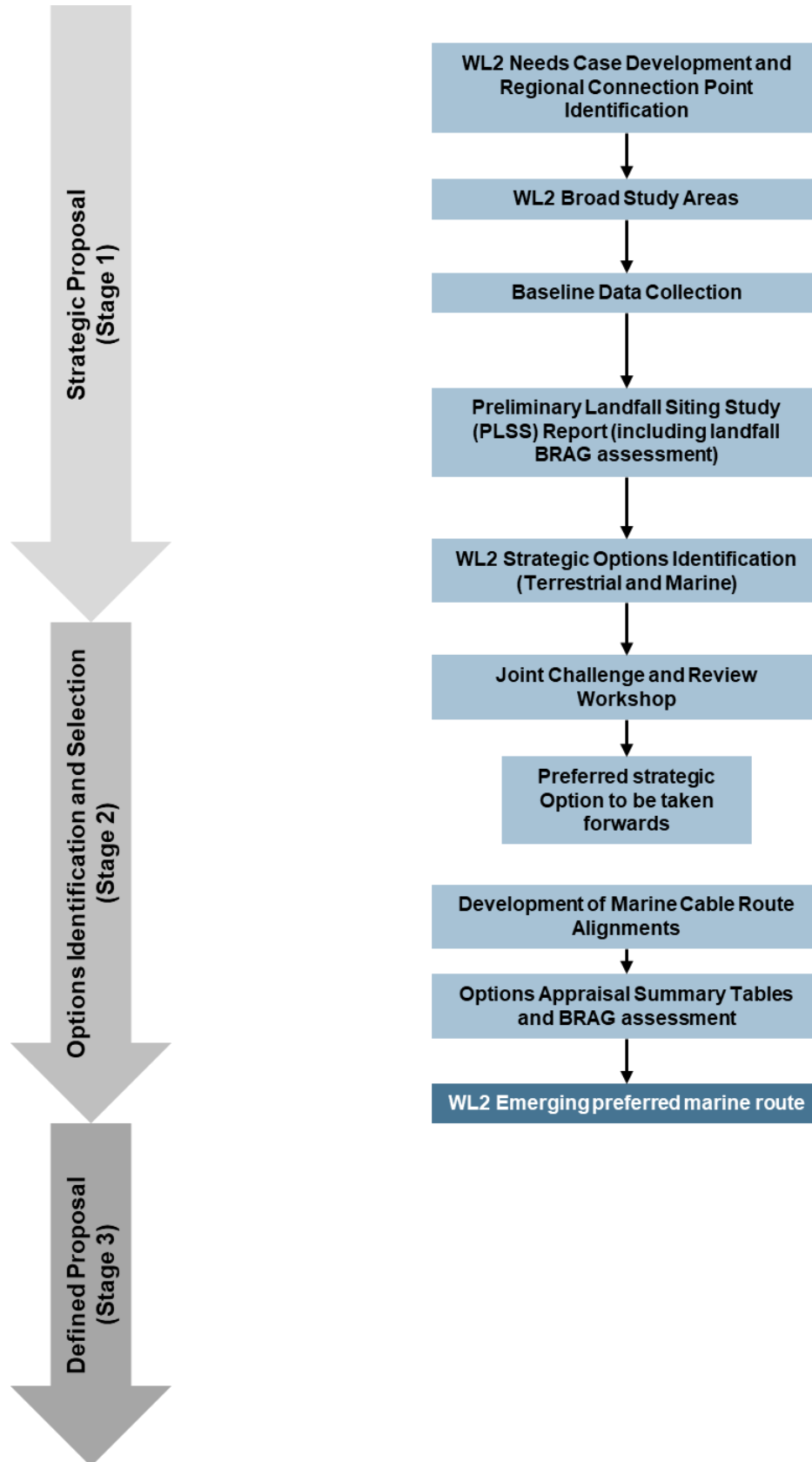


Figure 4.1: Overview of the phased approach to landfall and marine route corridor alignment appraisal for WL2

5 OPTIONS APPRAISAL APPROACH

5.1 Overview

This CPRSS presents the findings of the Options Identification and Selection Stage (Stage 2, Figure 4.1). This section details the stepwise approach taken within the Options Appraisal.

The approach taken is further detailed in Figure 5.1.



Figure 5.1: CPRSS methodology

5.2 Step 1 – Identification and definition of study areas

The initial study area identifies the broad area within which the transmission infrastructure will be located. This should be designed to encompass the maximum extent within which the project may be situated. It is also the area for which initial baseline data will be gathered for as part of Step 2. The study areas identified for WL2 were informed by the following:

- broad connection areas and strategic zones identified by SPEN and NGET during the early works of the strategic proposal stage
- location of infrastructure projects (at all stages of development) that may affect the availability or competition for potential landfall areas and seabed areas
- location of environmentally sensitive areas of high amenity value, such as internationally designated sites
- receptors associated with environmentally sensitive areas
- the nature of seabed conditions, such as bathymetric features and sediment type.

Two broad study areas were developed between Ayrshire, Scotland and the northern and southern Welsh coastlines (Figure 5.2).

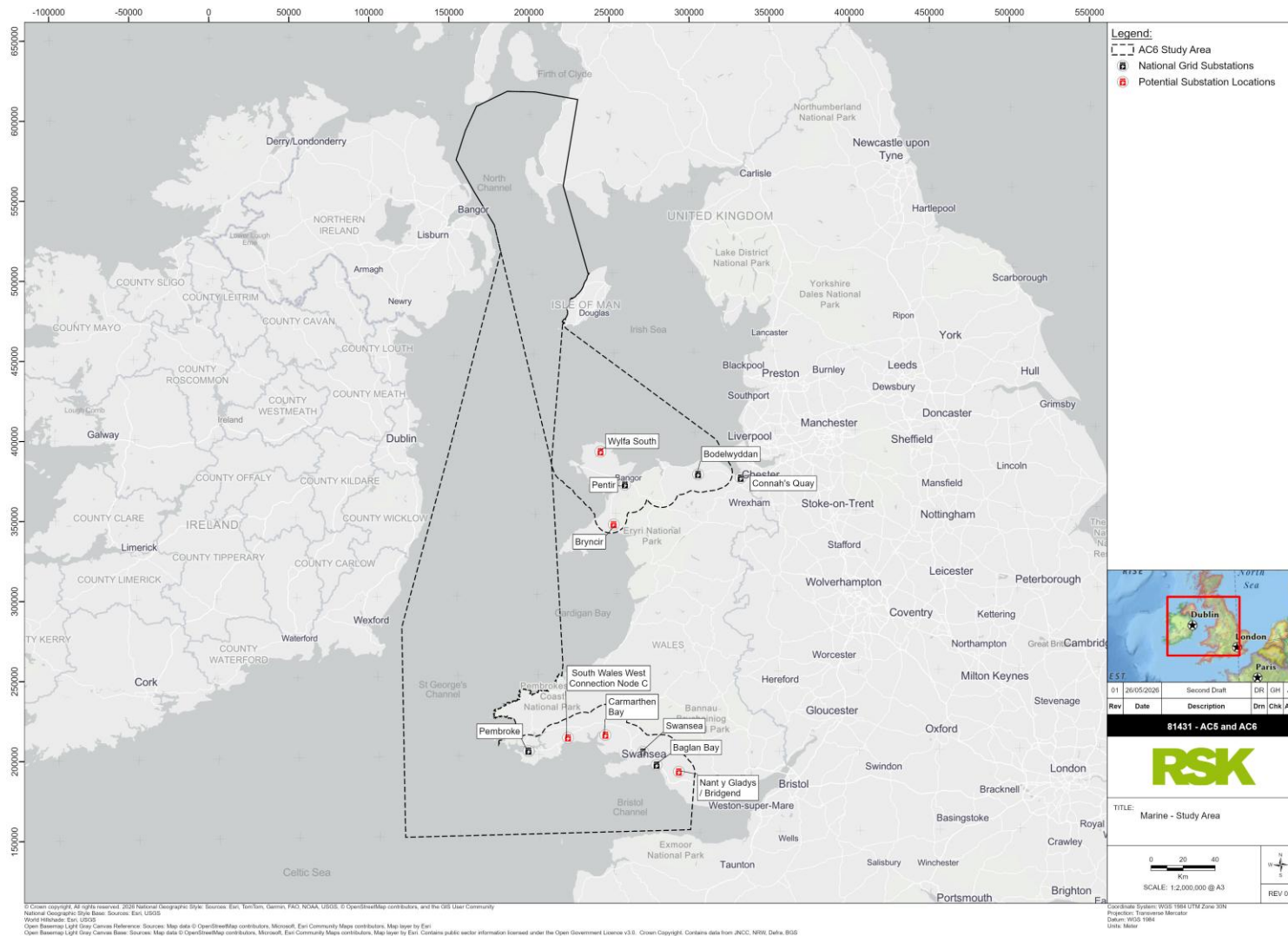


Figure 5.2: Marine study area

5.3 Step 2 – Scoping of environmental topics and baseline data-gathering

NGET’s approach to the Options Appraisal process considers the topics and sub-topics outlined in Table 5.1. The inclusion of these sub-topic areas aligns with best practice informed by the requirements of the EIA Regulations. It should be noted that, during future appraisal works, it may be determined that some of these sub-topics should be scoped out.

A broad study area was developed with reference to the relevant environmental and socio-economic constraints, which is detailed further after the table.

Table 5.1: Marine environmental and socio-economic constraints

Sub-topic/constraint	Description
Biological environment	
Annex I habitats: <ul style="list-style-type: none"> Annex I Reef Annex I Sandbanks Annex I Submarine Features. 	Annex I habitats are natural habitat types of community interest whose conservation requires the designation of Special Areas of Conservation (SACs) under the Habitats Regulations. These habitats may include reefs, sandbanks and submarine features made by leaking gases.
Marine Conservation Zones (MCZs)	MCZs are a type of marine protected areas (MPAs) that can be designated in England, Welsh and Northern Irish territorial and offshore waters. MCZs protect a range of nationally important habitats and species under the Marine and Coastal Access Act (2009) and the Marine Act (Northern Ireland) 2013.
Marine Nature Reserves (MNRs)	MNRs are a conservation designation under the Wildlife and Countryside Act 1981 and the Wildlife Act 1990 (Isle of Man) for the conservation of marine flora and fauna and geological or physical features of special interest. They may be established within 3 nautical miles (nm) of the coast.
Internationally designated sites that form part of the UK National Site Network: <ul style="list-style-type: none"> SACs Special Protection Areas (SPAs). 	The National Site Network in the UK comprises SACs and SPAs, which are designated under the Habitats Directive and Birds Directive. These sites provide protection to vulnerable habitats and species.
Nature Conservation Marine Protected Areas (NCMPAs)	NCMPAs are a type of MPA that can be designated in Scottish territorial and offshore waters. They protect a range of nationally important habitats under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act (2009).
Priority marine features/species of conservation interest	Priority marine features are a prioritised list of habitats and species of conservation importance developed by NatureScot and the JNCC. There are 81 priority marine features. Species of Conservation Interest (also known as Features of Conservation Interest) are marine features

Sub-topic/constraint	Description
	that are particularly threatened, rare, or declining species or habitats. The list was developed to support the identification of MCZs in England and Wales by Natural England and JNCC.
Sites of Special Scientific Interest (SSSIs)	An SSSI is a UK conservation designation for areas of land, water or coast that are considered to represent the best examples of natural features, habitats and species. These may be designated under the Wildlife and Countryside Act (1981) in Wales and the Nature Conservation (Scotland) Act (2004) in Scotland.
Physical environment	
Bathymetry	Seabed bathymetry in relation to the marine route corridors was considered. Suitable depths were chosen based on feasible technical and cost constraints.
Coastal height	British Geological Survey data was used to determine the coastal height along potential landfall areas.
Intertidal expanse (distance to 10 m water depth contour)	The area between mean low water and MHWS is known as the intertidal area. The expanse between these two areas was measured due to the potential length of trenchless installation method that would be required.
Mobile sediments (sandbanks, sand waves)	Mobile sediments and features such as sand banks, sand waves and mega ripples have been identified using available bathymetry data.
Sub-cropping or outcropping bedrock	British Geological Survey data has been used to identify the depth of quaternary sediments along the marine route corridor alignments and identify areas of exposed bedrock.
Superficial sediments	British Geological Survey data has been used to identify and characterise superficial (surface) sediments along the marine route corridor alignments.
Historic environment	
Chartered wrecks	Chartered wrecks are included within the UK Admiralty Wrecks Database. This database contains information about wrecks within north-west Europe and the Mediterranean. The records contain a wide range of data, including the position of the wreck, the type of vessel, vessel name, nationality and dimensions.
Protected wrecks	Protected wrecks are protected by designation under the Protection of Wrecks Act 1973. This allows for a restricted area to be assigned around a wreck to prevent interference. These are typically assigned due to the nature of the vessel, which may have artistic, archaeological or historic importance.
Socio-economic environment	
Commercial fisheries	Commercial fisheries includes areas used for static and mobile gears.
Infrastructure: <ul style="list-style-type: none"> • cables 	Infrastructure includes existing assets and assets under construction or in development. It also considers

Sub-topic/constraint	Description
<ul style="list-style-type: none"> • pipelines • offshore wind farms • tidal • oil and gas. 	<p>areas of the seabed that may have been identified for future development zones.</p>
<p>Major projects</p>	<p>Major projects identifies projects in developmental stages using the Marine Case Management System and Marine Licensing Portal.</p>
<p>Marine plans</p>	<p>Relevant policies within regional and national marine plans relating to marine interconnectors have been considered for the study area. For further information on these plans, please see Section 3.2 and Appendix 3.</p>
<p>Restricted areas:</p> <ul style="list-style-type: none"> • marine aggregate extraction • aquaculture sites • disposal sites • dumping grounds • military practice and exercise areas. 	<p>Restricted areas include both operational/licensed and closed areas.</p>
<p>Shipping and navigation:</p> <ul style="list-style-type: none"> • shipping density • navigational features (e.g., traffic separation schemes, restricted navigation channels, navigational buoys) • port authority/harbour limits • anchorages • navigational dredging areas. 	<p>Shipping and navigation includes shipping density information supplied from automatic identification system (AIS) data to identify specific vessel types.</p>

To better visualise and understand the spatial distribution of these constraints within the broad study area, an ArcGIS Online web map was developed comprising available environmental, socio-economic and technical data. Datasets for each topic were gathered through a desk-based review of third-party international, national, regional and locally important features. It should be noted that, at this stage, no project-specific data was collated or used for the assessment.

5.4 Step 3 – Assign Black-Red-Amber-Green (BRAG) ranking categories to key features

Each identified constraint, as detailed in Table 5.1, was assigned a BRAG ranking based on a review of available environmental and socio-economic information, expert interpretation and the potential risk it may pose to project development from a technical and consenting perspective. The rationale for assigning risk categories is outlined in Table 5.2.

Table 5.2: Risk categories

Ranking	Description
High risk	<p>Constraints that must be avoided</p> <p>Subjects that cannot be physically moved/removed to install a cable(s) or platform or will have severe financial and legal implications</p> <p>Examples include location of wrecks and planned/constructed/existing offshore renewable energy installations; infrastructure supporting nuclear power stations, offshore oil and gas platforms and highly protected marine areas.</p>
Medium risk	<p>Constraints that should be avoided where feasible as a result of anticipated risk posed by environmental, commercial, engineering or legal requirements that would likely require significant mitigation measures, where avoidance cannot be achieved. These may be subject to negotiation or require further information, surveying/technical studies or consultation. These constraints have the potential to impact development timescales or costs of and/or risk development and construction of the cable route.</p> <p>Examples could include foul ground areas, cables and pipeline crossings, anchorages, development sites/agreement to lease areas, Annex I habitats and marine designations.</p> <p>Note that the initial categorisation of a medium risk constraint in environmental areas assumes that no rock protection will be required within the protected site. If rock protection is required e.g., at a third-party crossing, the project will need to demonstrate:</p> <ul style="list-style-type: none"> • that there are no suitable feasible alternatives both in terms of the route and installation method selected • whether there is any suitable mitigation that could be proposed to avoid an adverse effect on site integrity.
Medium–low risk	<p>Constraints that are less susceptible to the potential effects of cable siting and operation and, as such, will have little legal, financial, environmental or physical impact on cable routeing or platform siting. Understanding of these areas will benefit from additional information, surveying or consultation. However, any potential effects are presumed to be mitigated during micro-routeing after marine survey. These constraints could be routed through where there is no alternative available.</p> <p>Examples include out-of-service cables, seasonally environmentally designated areas (e.g., marine mammal migration routes), shipping routes (e.g., route with temporal variations) and small mobile seabed features (e.g., bedforms less than 1 m in height).</p>
Low risk	<p>Constraints that do not feasibly or practically prohibit cable installation</p>

To identify potential landfall options, the BRAG ranking of these constraints were analysed within ArcGIS Pro to create an overall BRAG ranking layer for landfall areas (also referred to as a head map).

5.5 Step 4 – Identification and definition of landfalls and Strategic Options in Wales

As part of NGETs Strategic Optioneering process, nine potential regional connection points were identified by NGET and provided to RSK to support the development of Strategic Options between Scotland and Wales. The Welsh regional connections were as follows:

- Northern coastline:
 - AC6-1 Pentir (existing substation)
 - AC6-2 Wylfa South (potential new substation)
 - AC6-3 Bodelwyddan (existing substation)
- Southern coastline:
 - AC6-4 Pembroke (existing substation)
 - AC6-5 Llanteg (potential new substation)
 - AC6-6 Carmarthen/Llandyfaelog (potential new substation)
 - AC6-7 Swansea North (existing substation)
 - AC6-8 Baglan Bay (existing substation)
 - AC6-9 Bridgend (potential new substation).

Through subsequent follow-up work, an additional two Welsh regional connections in North Wales were also appraised:

- AC6-10 Bryncir (substation in development)
- AC6-11 Connaah's Quay (existing substation).

The identification of landfalls and preliminary routeing options at this stage was led by environmental specialists and therefore involved no detailed engineering design input. The aim at this stage in the process was to identify broad corridors, also known as Strategic Options, which take the constraints identified in Step 2 and the rationale for their ranking developed in Step 3 into account.

5.5.1 Identifying landfalls

The identification of potential landfall locations for each of the regional connections in Wales was developed in collaboration with the terrestrial team to ensure a consistent and coordinated approach was taken to routeing and siting works. When identifying landfall areas, preference was given to areas of coastline where there was appropriate topography, presence of soft sediment to allow for burial of assets and a narrow intertidal area. The PLSS report (RSK, 2024b) presents the outcomes of this work. All proposed regional connection points were identified as being potentially feasible and had potentially suitable landfall areas (Figure 5.3 and Figure 5.4).

Scottish landfall siting works were undertaken by SPEN and RSK's terrestrial team (Figure 5.5). The identified landfalls were then appraised by Evolv Energies as part of the marine technical consultant works.

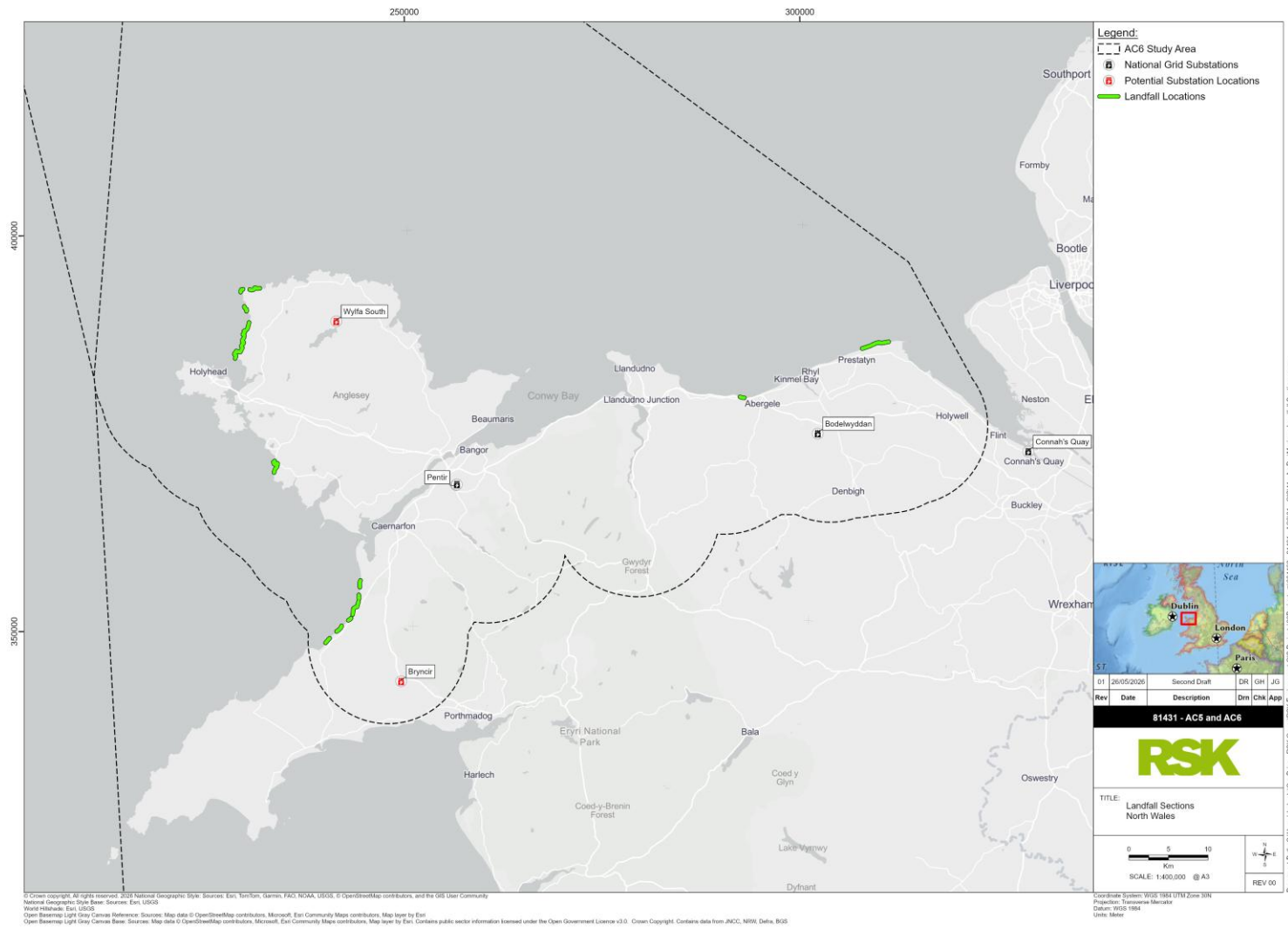


Figure 5.3: North Wales landfall locations identified during the PLSS

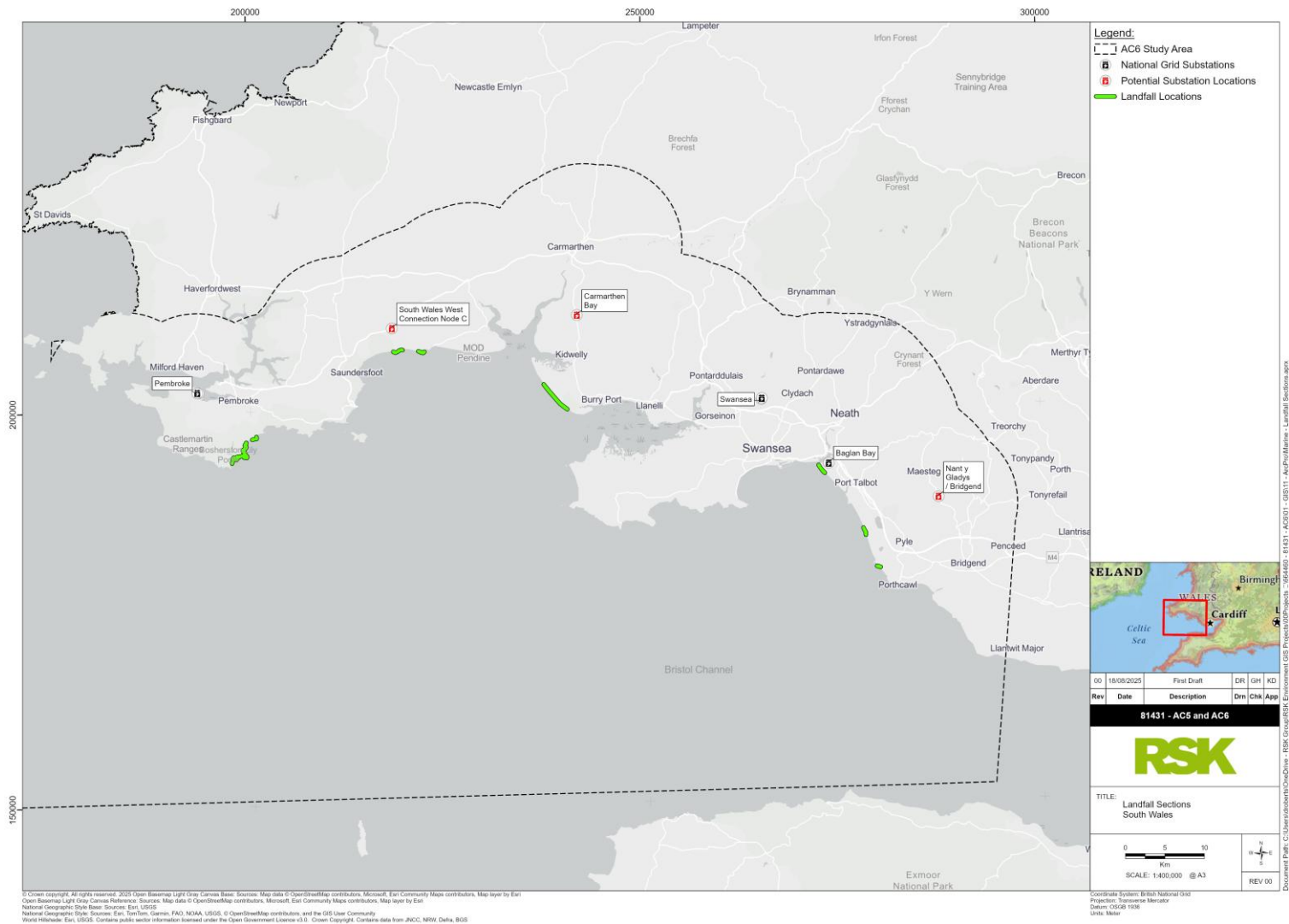


Figure 5.4: South Wales landfall locations identified during the PLSS



Figure 5.5: Scotland landfall locations supplied by SPEN

5.5.2 Identifying Strategic Options

Using the constraints identified in Step 2, the BRAG rankings developed in Step 3 and the landfall area identified as part of Step 4, the broad study areas identified in Step 1 were refined to develop a series of Strategic Options between Scotland and Wales. One Strategic Option was developed per regional connection point. The Strategic Options were developed with the aim to minimise interaction with environmental and socio-economic constraints, while also keeping technical considerations such as overall route length into account. Specific consideration was also given to engineering constraints that were identified early in the appraisal process, most notably Beaufort's Dyke, which is a prominent glacially formed trench and munitions disposal site situated within the North Channel between Northern Ireland and Scotland.

The Strategic Options identified by RSK (Figure 5.6) were reviewed by the wider NGET and SPEN project team for potential amendments such as refinement or expansion. For example, the corridors were amended to limit the number of jurisdictional waters that were crossed to minimise the number of required consent applications.

The development of Strategic Options using this method allows for the continual appraisal of multiple and interrelated options during the early stages of project development should one or more of these options later be identified as unsuitable for development and required being parked.

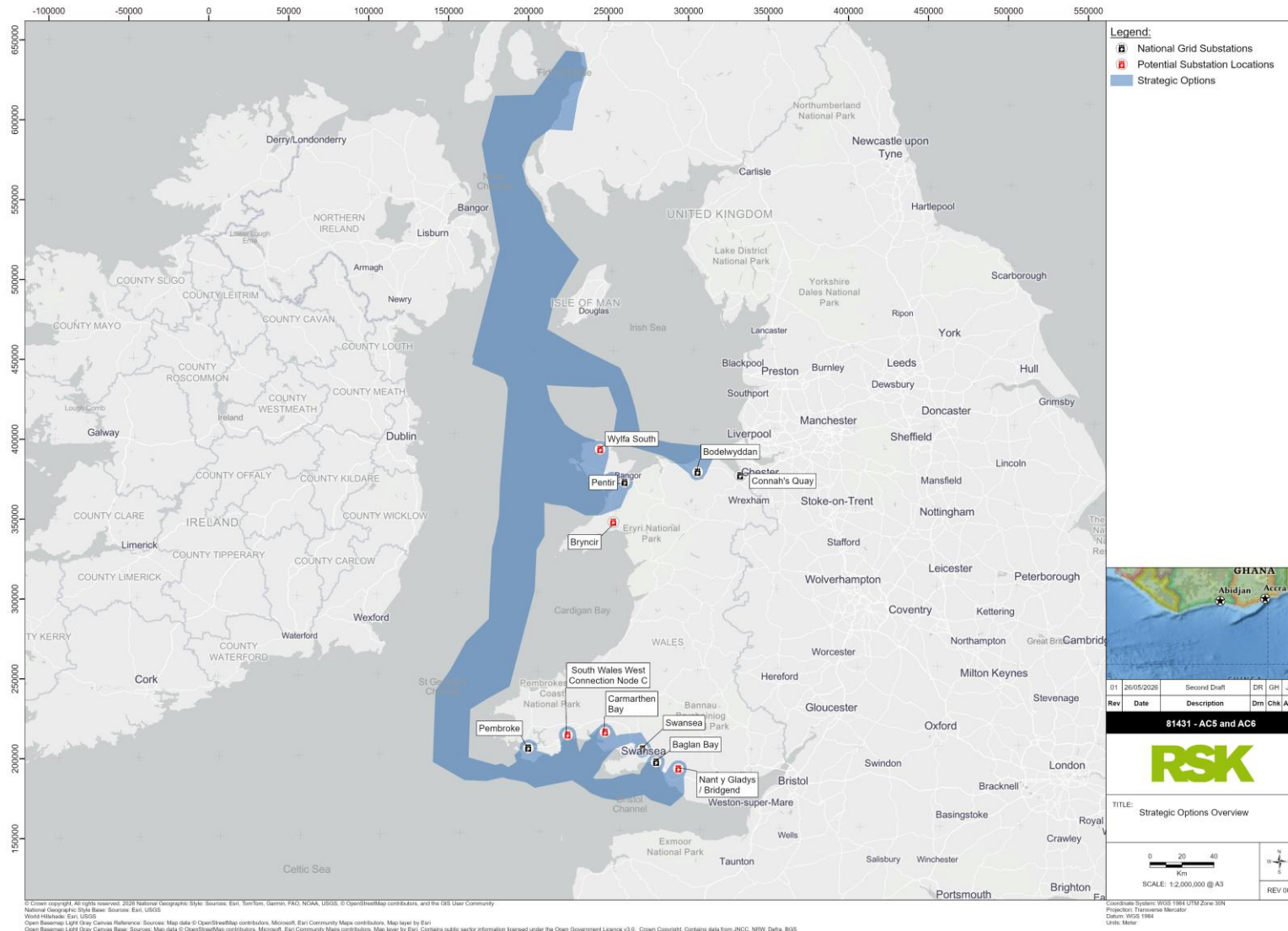


Figure 5.6: Strategic Options overview

National Grid Electricity Transmission
 Corridor Preliminary Routeing and Siting Study – Marine Options Appraisal
 81431

5.6 Step 5 – Strategic Options Appraisal

The Strategic Option corridors for each regional connection point (as identified within Step 4) underwent an Options Appraisal in accordance with NGET’s Approach to Consenting. The aim of this process was to consider known environmental and socio-economic factors to minimise the risk of significant adverse impacts from each option. This appraisal process is carried out for each of the relevant environmental and socio-economic sub-topics identified in Table 5.3 and considers the impacts on these features and identifies appropriate mitigation measures that may be required such as routeing to avoid the feature or receptor specific mitigation measures.

During this process, RSK developed an Options Appraisal Summary Table (OAST) for each Strategic Option, which collates these findings into a standardised, proportionate resource to support decision-making. The outputs of the OASTs were incorporated into a Strategic Options Report (SOR) by AtkinsRealis, which further considered the technical and engineering constraints associated with each of the Strategic Options. Terrestrial works were carried out in parallel to the marine works and were also captured in this report.

Table 5.3: Strategic Options status

Coastline	Name	Status	Reason
North Wales	AC6-1 (Pentir)	Carried forwards	Provides opportunity from both marine and terrestrial perspectives
	AC6-2 (Wylfa South)	<i>Discounted</i>	Terrestrial constraints – there is an Area of Outstanding Natural Beauty (AONB) around the entire Anglesey coastline and Anglesey is a GeoMôn site
	AC6-3 (Bodelwyddan)	Parked	Potentially feasible, although the coastline in this area is constrained and could present competition for landfall
South Wales	AC6-4 (Pembroke)	Parked	Difficult area of Annex I habitat Terrestrial constraints – there is a military site and National Park around the landfall area
	AC6-5 (Llanteg)	Parked	Development of this option would require traversal of an SAC with no existing marine infrastructure in it,

Coastline	Name	Status	Reason
			which is a higher consenting risk
	AC6-6 (Carmarthen/Llandyfaelog)	Parked	Development of this option would require traversal of an SAC with no existing marine infrastructure in it, which is a higher consenting risk
	AC6-7 (Swansea North)	<i>Discounted</i>	Large intertidal expanse at landfall Development of this option would require traversal of an SAC with no existing marine infrastructure in it, which is a higher consenting risk
	AC6-8 (Baglan Bay)	<i>Discounted</i>	Technical constraint – discounted by NGET on technical grounds
	AC6-9 (Bridgend)	Carried forwards – later parked	Provides opportunity from both marine and terrestrial perspectives
	AC6-10 (Bryncir)	<i>Discounted</i>	Terrestrial constraints – large areas of peatland expanse
	AC6-11 (Connah's Quay)	<i>Discounted</i>	Constrained coastline area, high landfall competition. Other landfall options around here are not supported due to large intertidal expanse.

Notes: 'Parked' refers to when an option does not have considerations sufficient to discount it, but the option is nevertheless a not a preferred option. Hence a 'parked' option may become a candidate option should there be a change in circumstance. 'Discounted' refers to when an option is not considered further due to identified constraints.

At this stage, AC6-1 (Pentir) and AC6-9 (Bridgend) were identified as the as two options to be carried forwards into the Options Identification and Selection phase.

However, during the Options Identification and Selection phase, it was determined by NGET as part of the needs case that the North Wales AC6-1 (Pentir) option should be carried forwards for appraisal due to a need to prioritise capacity across the B6 and B7a boundaries and that AC6-9 (Bridgend) should be parked for future works to increase capacity across the B8 and B9 boundaries.

As such, the remainder of this appraisal focuses only on the North Wales AC6-1 (Pentir) Strategic Option.

5.7 Step 6 – Site visits, refinement of corridors and landfalls, and development of marine route corridor alignments

5.7.1 Site visits

Following on from the outcomes of Step 5 and the identification of AC6-1 (Pentir) as the preferred Strategic Option, site visits were undertaken by the front-end engineering design (FEED) contractor (AtkinsRealis and Evolv Energies) and NGET. The purpose of this site visit was to ground truth the local environment and technical features to identify additional constraints and design hazards that may have not been previously identified during the earlier steps. Based on these works, two of the potential southernmost landfall options for AC6-1, landfall 5 and 6. These two landfall options were discounted from further consideration at this stage due to significant HDD limitations and engineering feasibility constraints identified during early assessment. Four potential landfall options for AC6-1 in Wales were carried forwards.

5.7.2 Development of marine route corridor alignments

Based on works carried out during the previous steps and phases of this project, marine route corridor alignments for WL2 were developed through the joint works undertaken by RSK and Evolv Energies for the Strategic Option Area identified in Step 5. When developing the marine route corridor alignments, the following rationale was used:

- Identify routing options that accommodate the previously identified landfall options from existing terrestrial works.
- Where possible, avoid technical and environmental constraints that may pose a risk to project development and/or construction. Where this is not possible, minimise the overlap between these and the cable route.
- Minimise the overall route length.
- Consider the crossing locations of WL1.
- Minimise the number of crossing points of existing assets and optimise crossing angles.
- Minimise interaction with other offshore developments.
- Consider the potential for a future power interconnector traversing the same regional interest.

In addition to this, the following additional rationale was considered in relation to the AC6 marine route corridor alignments:

- Identify multiple route options through the North Channel.
- Avoid Beaufort's Dyke as far as possible in order to mitigate the risk associated with historic munitions disposal and the challenging seabed of the trench.

5.7.3 Marine route corridor alignment naming convention

To support consistency and clarity across project documentation, RSK and Evolv Energies have developed a naming convention for the WL2 project. This convention applies to the offshore cabling sections.

As part of the appraisal process, a distinction has been made between **cable corridor sections** and **cable corridor combinations**. Cable corridor sections are the individual,

discrete lengths of the offshore corridor that have been identified and coded for the appraisal.

Each section name follows the agreed naming convention:

- the combined project:
 - WL2
- the cable reference:
 - AC5
 - AC6
- the area reference:
 - SCO – Scotland
 - NC – North Channel
 - IS – Irish sea
 - WAL – Wales
- the geographical reference:
 - BAR – Barassie
 - MON – Monkton
 - OFF – Offshore
 - GIR – Girvan
 - BAL – Ballantrae
 - N – north
 - S – south
 - C – central
 - CAE – Caernarfon
- numerical identifier (e.g., 1, 2, etc.).

These cable corridor section names are presented in Table 5.4.

Table 5.4: Summary of marine cable route section names

Route Section	Route Name	Cable route section length (km)
AC5 – Scotland – north landfalls	AC5-SCO-BAR	19.922
	AC5-SCO-MON	17.423
AC5 – Scotland – offshore	AC5-SCO-OFF-1	11.204
	AC5-SCO-OFF-2A	4.365
	AC5-SCO-OFF-2B	15.696
AC5 – Scotland – south landfalls	AC5-SCO-GIR	9.045
	AC5-SCO-BAL-1	11.540
	AC5-SCO-BAL-2	14.998
AC5 Alternative Route	AC5-SCO-OFF-1-ALT	21.840
AC6 – Scotland – nearshore and landfall	AC6-SCO-GIR	3.548
	AC6-SCO-BAL	6.920
AC6 – North Channel – North	AC6-NC-N-1A	33.902

Route Section	Route Name	Cable route section length (km)
	AC6-NC-N-1B	8.852
	AC6-NC-N-1C	11.595
	AC6-NC-N-2A-1	8.641
	AC6-NC-N-2A-2	7.295
	AC6-NC-N-2B	22.317
	AC6-NC-N-2C	17.936
	AC6-NC-N-3A	15.374
	AC6-NC-N-3B	2.011
	AC6-NC-N-4	7.097
AC6 – North Channel – South	AC6-NC-S-1A	23.463
	AC6-NC-S-1B	22.947
	AC6-NC-S-1C	18.952
	AC6-NC-S-2	34.878
AC6 – Irish Sea – North	AC6-IS-N-1	103.672
	AC6-IS-N-2	107.180
	AC6-IS-N-3	138.953
AC6 – Irish Sea – Central	AC6-IS-C-1A	18.556
	AC6-IS-C-1B	29.794
	AC6-IS-C-2	44.079
	AC6-IS-C-3	20.920
	AC6-IS-C-4A	17.524
	AC6-IS-C-4B	21.694
	AC6-IS-C-5	22.650
AC6 – Irish Sea – South	AC6-IS-S-1	33.550
	AC6-IS-S-2A	25.219
	AC6-IS-S-2B	24.811
AC6 – Wales – Nearshore and Landfalls	AC6-WAL-CAE-1	10.947
	AC6-WAL-CAE-2	11.109
	AC6-WAL-CAE-3	11.242
	AC6-WAL-CAE-4	11.115
AC6 Alternative Route	AC6-IS-S-1-ALT	15.650

In contrast, the cable corridor combinations are used to describe the complete route between landfall points and are therefore made up of multiple cable corridor sections linked together. For the AC5 element of WL2, the cable corridor combination names identify both landfall points. For the AC6 element of WL2, the cable corridor combination names identify both the landfall points and the alignment that the corridor traverses (e.g., west, central, or east). This system provides a clear framework for differentiating between

the building blocks of the corridor (sections) and the potential end-to-end alignments under consideration (combinations).

5.7.4 AC5

The following AC5 marine route corridor option elements of WL2 have been developed by Evolv Energies as part of the marine technical consultant works for the project (Table 5.5). Marine routes were developed and split into sections with multiple routing options developed for each section. These route options for the AC5 element underwent a challenge and review period from the wider project team and minor amendments before being agreed for appraisal under Step 7. Figure 5.7 further highlights the AC5 marine route option elements of WL2.

Table 5.5: AC5 marine route corridor options

	Route			
	AC5 BAR to GIR	AC5 MON to GIR	AC5 BAR to BAL	AC5 MON to BAL
Start	Barassie	Monkton	Barassie	Monkton
End	Girvan	Girvan	Ballantrae	Ballantrae
Route sections	AC5-SCO-BAR	AC5-SCO-MON	AC5-SCO-BAR	AC5-SCO-MON
	AC5-SCO-OFF-1	AC5-SCO-OFF-1	AC5-SCO-OFF-1	AC5-SCO-OFF-1
	AC5-SCO-OFF-2A	AC5-SCO-OFF-2A	AC5-SCO-OFF-2A	AC5-SCO-OFF-2A
	AC5-SCO-GIR	AC5-SCO-GIR	AC5-SCO-BAL-1	AC5-SCO-BAL-1
	-	-	AC5-SCO-BAL-2	AC5-SCO-BAL-2
Total route length	39.04 km	42.04 km	62.03 km	59.53 km

5.7.5 AC6

The following AC6 marine route corridor option elements of WL2 were also developed by Evolv Energies as part of the marine technical consultant works for this project (Table 5.6). Marine routes were developed and split into sections with multiple routing options developed for each section. Like the AC5 portion, the route options for the AC6 element underwent a challenge and review period from the wider project team and minor amendments before being agreed for appraisal under Step 7. Figure 5.8 further highlights the AC6 marine route corridor option elements of WL2.

Table 5.6: AC6 marine route corridor options

Routes					
	AC6 GIR to CAE-4 (West)	AC6 GIR to CAE-4 (Central)	AC6 BAL to CAE-4 (Central)	AC6 GIR to CAE-4 (East)	AC6 BAL to CAE-4 (East)
Start	Girvan	Girvan	Ballantrae	Girvan	Ballantrae
End	Caernarfon	Caernarfon	Caernarfon	Caernarfon	Caernarfon
Route sections	AC6-SCO-GIR	AC6-SCO-GIR	AC6-SCO-BAL	AC6-SCO-GIR	AC6-SCO-BAL
	AC6-NC-N-1A	AC6-NC-N-2A-1	AC6-NC-N-3A	AC6-NC-N-2A-1	AC6-NC-N-4
	AC6-NC-N-1B	AC6-NC-N-2A-2	AC6-NC-N-3B	AC6-NC-N-2A-2	AC6-IS-N-3
	AC6-NC-S-1A (option)	AC6-NC-N-2B	AC6-NC-S-2	AC6-NC-N-2C	AC6-IS-C-3
	AC6-NC-S-1B (option)	AC6-NC-N-3B	AC6-IS-N-2	AC6-IS-N-3	AC6-IS-C-4A (option)
	AC6-NC-S-1C	AC6-NC-S-2	AC6-IS-C-3	AC6-IS-C-3	AC6-IS-C-4B (option)
	AC6-IS-N-1	AC6-IS-N-2	AC6-IS-C-4A (option)	AC6-IS-C-4A (option)	AC6-IS-C-5
	AC6-IS-C-1A (option)	AC6-IS-C-3	AC6-IS-C-4B (option)	AC6-IS-C-4B (option)	AC6-IS-S-1
	AC6-IS-C-1B (option)	AC6-IS-C-4A (option)	AC6-IS-C-5	AC6-IS-C-5	AC6-IS-S-2A (option)
	AC6-IS-C-2	AC6-IS-C-4B (option)	AC6-IS-S-1	AC6-IS-S-1	AC6-IS-S-2B (option)
	AC6-IS-S-1	AC6-IS-C-5	AC6-IS-S-2A (option)	AC6-IS-S-2A (option)	AC6-WAL-CAE-1 to 4 (options)
	AC6-IS-S-2A (option)	AC6-IS-S-1	AC6-IS-S-2B (option)	AC6-IS-S-2B (option)	-
	AC6-IS-S-2B (option)	AC6-IS-S-2A (option)	AC6-WAL-CAE-1 to 4 (options)	AC6-WAL-CAE-1 to 4 (options)	-
	AC6-WAL-CAE-1 to 4 (options)	AC6-IS-S-2B (option)	-	-	-
-	AC6-WAL-CAE-1 to 4 (options)	-	-	-	
Total route length*	335.35 km	321.15 km	301.64 km	311.65 km	288.25 km

*Longest potential route based on the options selected

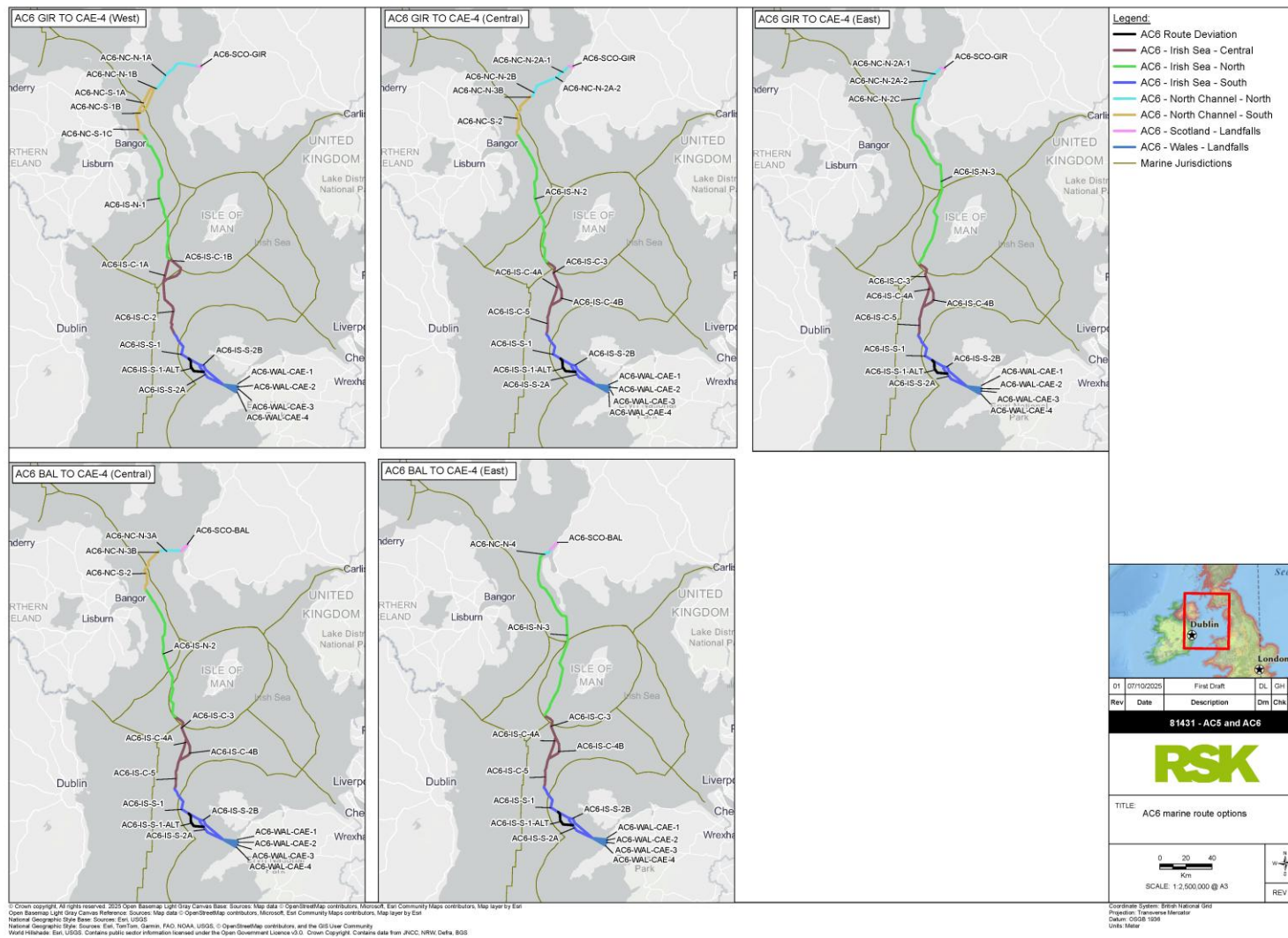


Figure 5.8: AC6 marine route corridor options

5.8 Step 7 – Options Appraisal of marine route corridor alignments

The marine route corridor alignments developed and agreed in Step 6 were also appraised in accordance with NGET's Approach to Consenting as previously detailed in Section 5.6 (Step 5) via the development of OASTs for each cable route section. Additional summary findings were added to these OASTs based on the FEED contractor's landfall site-visit works completed in Step 6. These observations provided an additional evidence base to inform the landfall assessment piece of this work.

The objective of the OAST appraisal stage was to provide a detailed level of assessment of the key environmental and socio-economic factors, identify potential risks and impacts, and consider appropriate mitigation measures in relation to each of the cable route sections identified by Evolv Energies to allow for the identification of potential residual impacts. These residual impacts do not take into account further project specific mitigation measures likely to be included as part of the Non-Statutory Environmental Appraisal works undertaken at the Defined Proposal and Statutory Consultation Stage.

In addition, throughout this step, stakeholder engagement was carried out with the relevant consultees and regulators as identified in Table 3.1 (please note this list is non exhaustive).

The findings of the WL2 marine route corridor alignment Options Appraisal for the relevant sub-topics are detailed within Chapters 6, 7, 8.2, and 10. As the project progresses and additional information of made available from the planned survey works, there will be a project team back-check by RSK and Evolv Energies of these routes to ensure that the most appropriate option has been selected.

5.9 Step 8 – Confirmation of emerging preferences for the cable corridor(s) for consultation

Marine route corridor alignments were subsequently reviewed from an environmental, technical and cost perspective, leading to identification of a preferred route.

5.10 Step 9 – Conduct pre-application consultation

It is intended that this MCPRSS will be used to inform documents that will be prepared for pre-application consultation discussion and engagement in relation to the project. The MCPRSS process and outcomes are captured within this report. Additionally, this report is intended to inform documents that will be prepared for public consultation and to engage stakeholders, statutory consultees and interested parties, including the public.

6 OPTIONS APPRAISAL: MARINE INSTALLATION CONSTRAINTS

6.1 Introduction

This section highlights the constraints that have been considered as part of the Options Appraisal for the project. Such constraints may relate to the installation methods to be used, technical complexity of project design, suitability of technology and network capacity/efficiencies, alongside the potential for third-party issues.

6.2 Cable and pipeline separation

The following assets lie within the marine study area:

- three gas pipelines
- four active power cables
- fifteen active telecoms cables.

Crossing agreements are required to protect all parties during the construction, operation and maintenance of new assets that cross existing ones. Separation distances are detailed as part of this process. Early engagement with the relevant asset owners and fisheries engagement has already commenced at the time of writing. Please see Table A4.3 for a list of asset owner stakeholder engagement.

An appropriate working corridor for installation and burial operations and cable maintenance activities should be considered as well as the positional accuracy of existing cables and pipelines. Design for managing the electromagnetic fields and thermal independence between assets should also be considered.

Cable separation distances of three times the water depth are generally considered to provide appropriate space for potential repair activities and laydown of a repair bight. However, individual distances are specific to water depth; repair vessel deck height and deck length, and crown radius of the bight. Consideration of bight space becomes more critical if there are multiple cables in parallel.

Maximum water depth along the marine route corridors is 147.8 m, and therefore a minimum separation of 443.4 m separation between assets would be required (Evolv Energies, 2025b). This separation is based on International Cable Protection Committee guidance, which recommends a separation distance of three times water depth. The Western Link 1 cable lies parallel to the proposed WL2 link for significant lengths through the Firth of Clyde and the North Channel. The results of the cable burial risk assessment (CBRA) may indicate an increased risk of impacting both cables. Therefore, an increased separation distance may be considered appropriate in this area.

Estimated anchor drag distances were calculated (Evolv Energies, 2025b) from a dataset of 6,236 unique vessels observed in the study area in 2024. Most vessels were small (81% <10,000 dead weight tonnage), although a small number of large vessels were observed with a maximum vessel size of 318,980 dead weight tonnage. Maximum drag distances were calculated to be 453.6 m in soft soil (low-strength clays, typically <45 kPa) and 196.2 m in hard soil (sands and high strength clays, typically >48 kPa). The

frequency of vessel activity was not identified during this study and will be researched during the CBRA. It is therefore recommended that a minimum separation distance be finalised by the route engineer after the CBRA is complete.

Minimum cable separation distances of three times water depth are generally considered an initial starting discussion where a cable route runs parallel to an existing pipeline. However, the final proximity agreement will determine the specific distance for each asset. It may be necessary to cease burial operations when working near a pipeline to reduce the risk of accidental damage. The cable route should be designed so that ploughing operations move away from adjacent pipelines rather than towards them to avoid accidental runout.

6.3 Cable burial

The results of the geophysical survey will be used to provide information for the CBRA and an Employer's Burial Assessment Study, which will ascertain the minimum depth of burial along the final design route and the burial equipment best suited to the encountered ground conditions.

An overview of the regional geology, divided into four separate regional and geological areas for consideration, is presented in Section 7.3. Evolv Energies has described the following potential suitable trenching methodology for each region:

- The Firth of Clyde is an area dominated by very soft, occasionally sandy, clays with the exception of areas of sand near the landfalls and areas of sub-cropping/outcropping glacial till and bedrock. Jetting is considered suitable in the inshore sands and potentially in areas of low-strength clays. Jetting, however, becomes limited as clay strength exceeds 15 to 40 kPa. A cable plough is also likely to be suitable in sands and clays, with risk of sinkage in low strength clays. Mechanical cutters are likely to be an effective trenching method in areas of stiff to hard boulder clay and bedrock, although progress rates are likely to be slower and only suitable for weaker rock. The Western Link 1 asset was jetted for the initial 70 km of the cable route, with minimal external remediation required. Ploughing techniques were used for the remainder of this route section, into the North Channel.
- The North Channel is characterised by a veneer of mobile sand/gravel overlying glacial till and bedrock. Extensive boulder fields are also noted in this region. Jetting is unlikely to be effective in these sediments, so cable ploughing and mechanical cutters may be considered. A better rate of progress is anticipated with ploughing. The Western Link 1 asset was buried with ploughing techniques in this area, with challenging progress. A total of 15.9 km of rock dump was also required to protect this asset in this area.
- The Western Irish Sea is dominated by very soft clays with occasional rock outcrops. Jetting and ploughing are likely to be effective, although there is potential for sinkage in very-low-strength clays (which could potentially be mitigated with buoyancy). Jetting techniques were employed on the Western Link 1 asset with burial depths exceeding 1.5 m and only 360 m of rock dump required.
- The Southern Irish Sea lies to the south-west and the south of the Isle of Man and is characterised by a veneer of very loose to loose mobile sand/gravel overlying glaciogenic sediments comprising glacial till or dense to very dense sand and occasional soft to firm clays. An area of sand lies to the south-west of the Isle of Man with isolated sand waves. Extensive boulder fields associated with paleo-glacial features are noted across this area. A combination of jetting and

ploughing is likely to be required in this route section, with jettors suitable in the softer sediments and ploughs across the more consolidated sediments.

6.4 Remediation

Alternative cable protection may be required where burial is not possible due to the presence of shallow or outcropping rock or areas of dense boulder fields. Rock placement is a remedial trenching technique. Approximately 35.4 km of rock protection (9.1% of the total route length) was installed across the Western Link 1 (Evolv Energies, 2025b). For the purposes of WL2 it has been conservatively estimated that 20% of the total route length may require rock protection; noting that this estimate is preliminary and will be further refined once the CBRA is undertaken.

Given the lengths required, rock berm is likely to be the most feasible solution and will require a marine licence prior to installation. Typical gradings range from 1" to 3" to 1" to 5" for water depths >80 m with use of larger rock (3" to 9") in shallow water where hydrodynamics conditions are more onerous.

A typical rock berm profile may have a 1-in-3 side slope with a 1 m wide crest and a height approximately equal to the depth of lowering or depth of cover required. This can be modified if hydrodynamic stability is challenging or there is an alternative requirement for local fisheries. Rock grading is based on detailed engineering and subject to rock impact and hydrodynamic stability assessments.

Alternative protection for shorter sections also includes rock bags, mattresses or external cable protection such as polyurethane half shells or cast-iron articulated pipe.

6.5 Crossing locations

Potential crossing locations across the WL2 marine route corridors are presented in Appendix 4.

In general, crossing angles should be 60° or more where feasible, with a minimum of 45°, to ensure maintenance and recoverability. This is a typical approach taken; however shallow crossings can be made if this is unavoidable and an agreement is made with the crossed asset. Crossing angles identified by Evolv Energies were based on the marine route corridor centreline. These angles ranged between 54° and 89°. There will likely be further refinement and micro-routing of these as the project develops, although crossing angles should be as close to 90° as possible. (Evolv Energies, 2025a).

Pipeline crossings requirements are often subject to specific crossing agreements with the asset owner.

Additional protection can be used to protect the new cable at each cable or pipeline crossing location. The total length of this protection should be designed by the route engineer. Protection such as rock or concrete mattresses is typically required for pipeline crossings, although other methods may also be used (i.e., polyurethane ducting or articulated pipe).

6.6 Mobile bedforms

As indicated in Section 7.3.4, areas of sand wave have been identified within the Central Irish Sea and Southern Irish Sea. These sand waves are up to 8 m high in the Central Irish Sea and up to 10 m high in the Southern Irish Sea (Evolv Energies, 2025). The southern field is located near the Welsh landfall area, and the proposed routeing section for AC6-IS-S-2A also runs parallel to this area.

These areas have been avoided in the marine cable routeing as far as possible. However, interaction may not always be unavoidable in areas where the route is constrained and the location of migrating bedforms is not known.

The following mitigation measures may be considered to reduce the risk to the cable in areas where the geophysical survey identifies a potential risk:

- pre-sweep of the seabed prior to installation
- recommended cable burial depth measured with consideration of the lowest anticipated seabed level (e.g., the reference stable seabed level)
- cable design that withstands burial activities and manages the thermal performance of cable to an acceptable level
- inspection, maintenance and repair activities to monitor span development.

7 OPTIONS APPRAISAL: MARINE ENVIRONMENTAL AND SOCIO-ECONOMIC CONSTRAINTS

7.1 Introduction

This section highlights the marine environmental and socio-economic constraints that have been considered as part of the Options Appraisal for the project. These constraints have been provided to inform the emerging preference of the marine route corridor options based on the presence and type of constraint (i.e., designated sites) in relation to the options. It aims to identify the best feasible route in the context of minimising impacts to the biological, physical, historical and socio-economic environment.

7.2 Biological environment

This section presents the biological constraints that are located with the marine study area, notably highlighting those that directly overlap with the marine route corridors (Table 5.5 and Table 5.6). Such aspects have informed the marine routeing appraisal process with reference to the biological environment.

Further detailed information on biological constraints is presented within Appendix 1 Biological environment, key information is outlined below.

7.2.1 Designated and protected sites

A number of designated sites were identified to be of potential relevance to the project (Figure 7.1). Designated sites that form part of the UK National Site Network, MCZs, MPAs and SSSIs are noted where there is direct overlap or sites are located in the immediate vicinity due to potential impact pathway distances. Ramsar sites remain protected in the same way as SAC and SPA sites, although they do not form part of the National Site Network. Sites were noted whereby their boundary exceeded MHWS.

The marine route corridors directly intersect the following designated sites:

- Clyde Sea Sill NCMPA – a number of marine route corridors intersect this NCMPA; the site cannot be avoided
- Queenie Corner MCZ – one marine route corridor intersects this MCZ (AC6-IS-C-1A); the site can be avoided by alternative route corridors (AC6-IS-C-B and AC6-IS-C-3)
- North Channel SAC – two marine route corridors (AC6-IS-N-2 and AC6-IS-N-1) intersect this SAC; the site can be avoided by an alternative corridors (AC6-IS-N-3)
- North Anglesey Marine/Gogledd Môn Forol SAC – a number of marine route corridors intersect this SAC; this site cannot be avoided
- Irish Sea Front SPA – three marine route corridors intersect this SPA (AC6-IS-4A, AC6-IS-C-4B and AC6-IS-C-5); the site can be avoided by an alternative route (AC6-IS-C-2)
- Anglesey Terns/Morwenoliaid Ynys Môn SPA – one marine route corridor intersects this SPA (AC6-IS-S-2B); the site can be avoided by an alternative route (AC6-IS-S-2A)

- Dinas Dinlle SSSI – one marine route corridor interests this SSSI, on the cusp of its boundary (AC6-WAL-CAE-1); the site can be avoided by a number of alternative routes.

At the Welsh landfall marine route corridors, there is intersection with the Llŷn AONB and Heritage Coast.

While not directly overlapping, a number of further designated sites were appraised due to their proximity to the proposed marine routeing corridors. The following sites were considered due to distance (within 10 km) and potential for connectivity with the construction of the project:

- Ailsa Craig SPA
- Copelands Islands SPA
- Outer Ards SPA and Ramsar
- Larne Lough SPA and Ramsar
- Loch of Inch and Torrs Warren SPA and Ramsar
- The Maidens SAC
- Pisces Reef Complex SAC
- Croker Carbonate Slabs SAC
- Luce Bay and Sands SAC
- Mull of Galloway SAC and SSSI
- Afon Gwyrfai a Llyn Cwellyn SAC
- Abermenai to Aberffraw Dunes/Y Twyni o Abermenai i Aberffraw SAC
- Anglesey Coast: Saltmarsh/Glannau Mon: Cors Heli SAC
- Holy Island Coast/Glannau Ynys Gybi SAC
- South Rigg MCZ
- South Arran MPA
- Calf and Wart Bank MNR
- West Coast MNR
- Port Erin Bay MNR
- Morfa Dinlle SSSI
- Gwydir Bay SSSI
- Port Logan SSSI
- Grennan Bay SSSI
- Morroch Bay SSSI
- Salt Pans Bay SSSI
- Corsewall Point to Milleur Point SSSI
- Ballantrae Shingle Beach SSSI
- Girvan to Ballantrae Coast Section SSSI
- Turnberry Dunes SSSI
- Troon Golf Links and Foreshore SSSI
- Western Gales SSSI
- Bogside Flats SSSI
- Ardrossan to Saltcoats Coast SSSI
- Maidens to Doonfoot SSSI
- Turnberry Lighthouse to Port Murray SSSI
- Holy Island Coast/Glannau Ynys Gybi SSSI
- Glannau Rhoscolyn SSSI
- Ynys Mon Ty Croes SSSI
- Tywyn Aberffraw SSSI
- Penrhynoedd Llangadwaladr SSSI
- Y Foryd SSSI
- Newborough Warren - Ynys Llanddwyn SSSI
- Yr Eifl SSSI.

A number of additional designated sites may need to be considered in relation to the project whereby they are designated for mobile features (i.e., bird, fish and marine mammal features). This is due to potential connectivity of further afield designated sites with impacts associated with the project. Such designated sites would be considered as



part of the Habitats Regulations assessment (HRA) or MCZ/MPA assessment process and as such are not noted within this report.

For further details on the designated and protected sites of relevance to the project, please refer to Appendix 1 Biological environment, Designated and protected sites descriptions.

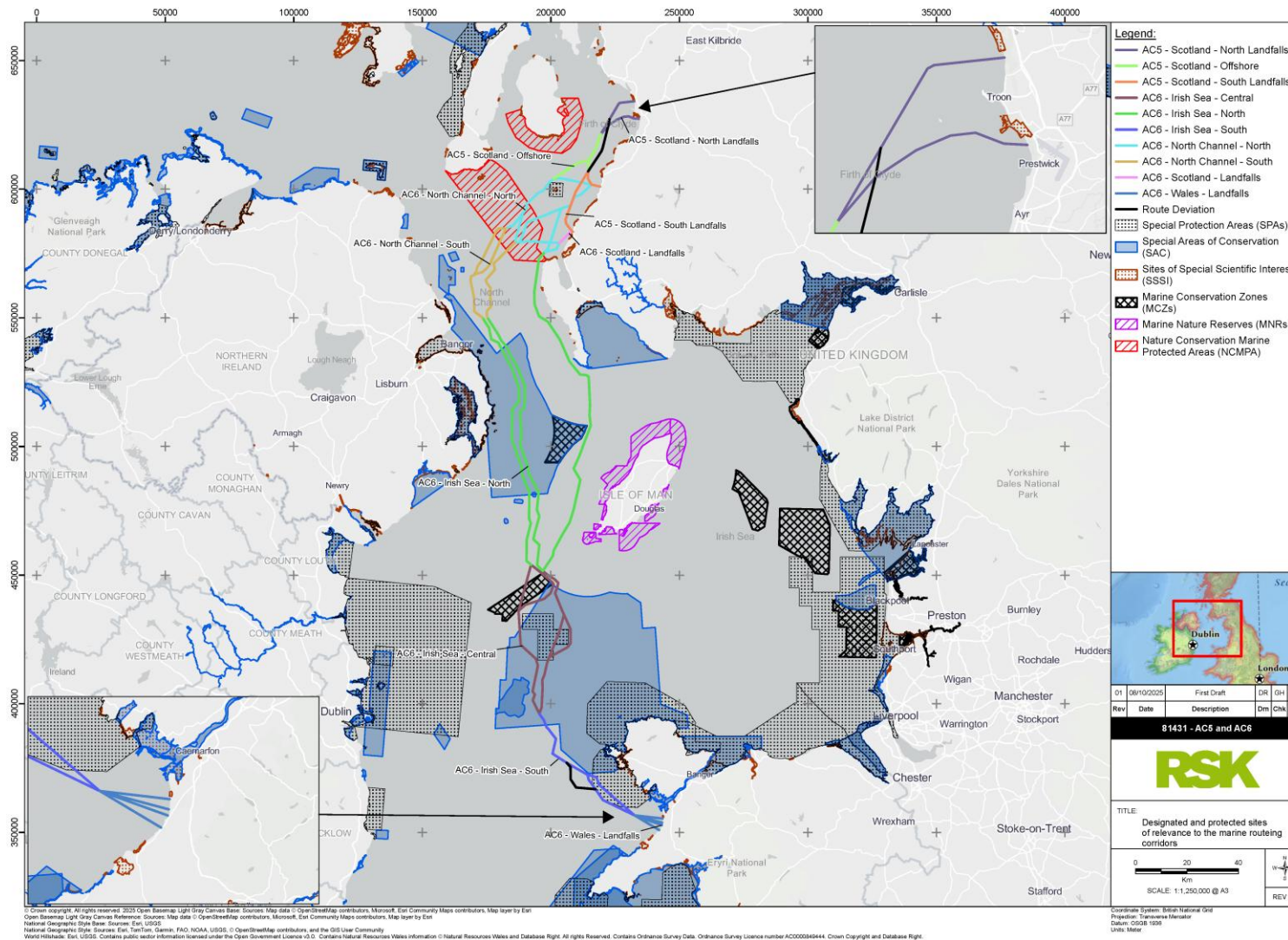


Figure 7.1: Designated and protected sites of relevance to the marine route corridors

7.2.2 Annex I habitats

A number of Annex I habitats are present within the marine route corridors (Figure 7.2), including the following:

- reef, i.e., rocky marine habitats or biological concretions that rise from the seabed (1170).

Several marine route corridors intersect areas of reef habitat. This is largely concentrated at the Welsh landfall, not associated with any SAC designation. Specifically areas of 'potential subtidal reef' have been identified in the nearshore of all Welsh landfall marine route corridors; however, this data is 'very poor confidence'. 'High' confidence and 'potential' reef habitat is also present in the nearshore of the Welsh and Scottish landfall route options comprising biogenic, bedrock and/or stony reefs. Further potential Annex I bedrock and/or stony reef habitat is noted to intersect with the cusp of a marine route corridor (AC6-NC-S-2).

The Pisces Reef Complex SAC, designated for Annex I reef habitats is located near two marine route corridors (AC6-IS-N-1 and AC6-IS-N-2). While the marine route corridors do not directly intersect this SAC, there may be potential for interaction with the SAC consequent of project construction. The SAC is located approximately 0.8 km from the marine route corridors, with habitat types noted as 'high confidence' bedrock and/or stony reef with Atlantic and Mediterranean low-energy circalittoral rock (A4.3) habitats. It should further be noted there are areas of Annex I reef habitats located near a number of other marine route corridors not associated with SAC designation. While the marine route corridors avoid such areas, the potential for connectivity with the project should be considered.

Additional Annex I habitats have been avoided by the marine route corridors (i.e., sandbanks and submarine structures) but may still be impacted via indirect impacts and sediment resuspension.

For further detail on Annex I habitats with potential to be impacted by project activities, please refer to Appendix 1 Biological environment, Annex I habitats.

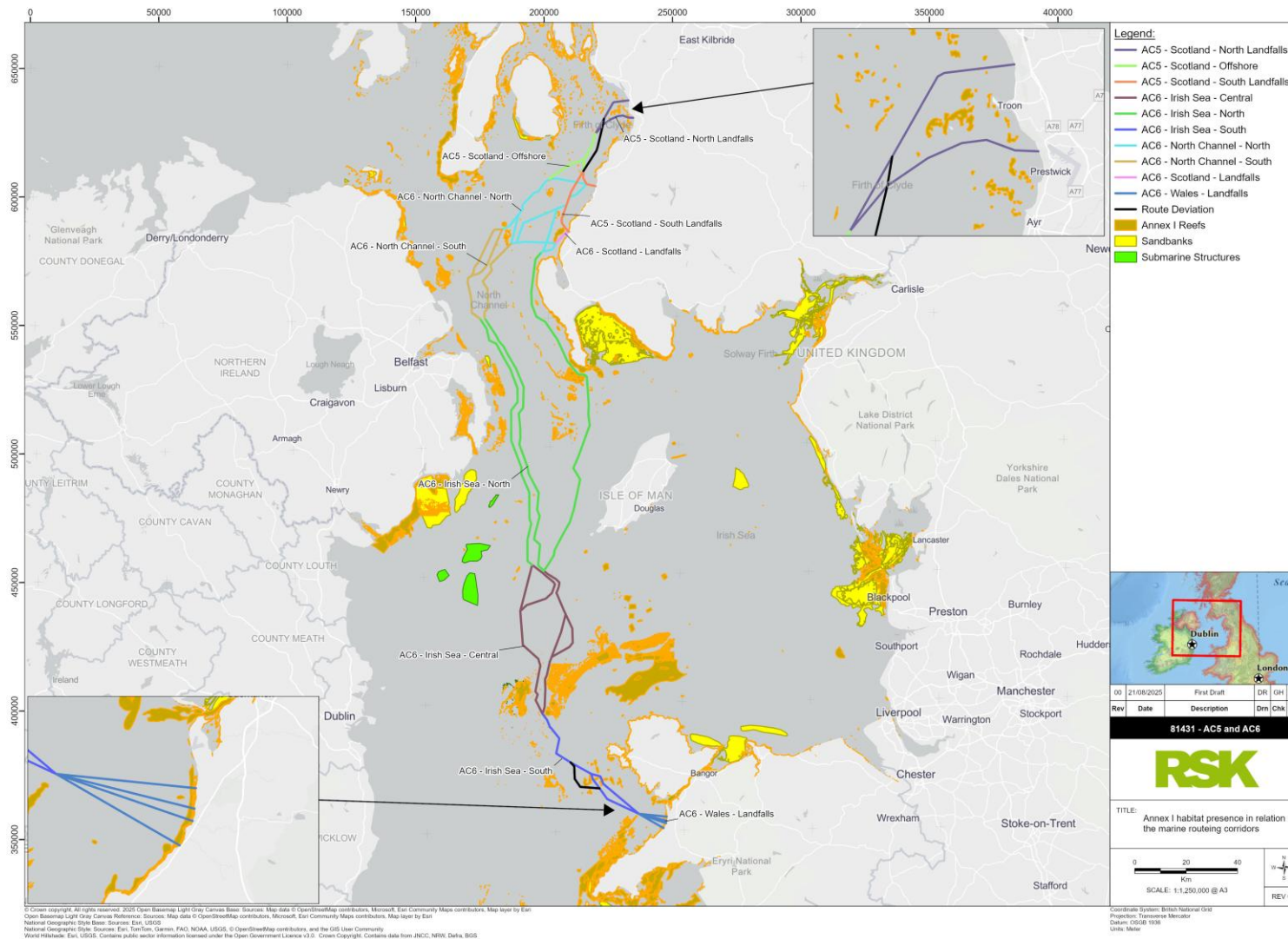


Figure 7.2: Annex I habitat presence in relation to the marine route corridors

7.2.3 Priority coastal habitats

The marine route corridors do not include any priority coastal habitats. Although there is a noted presence of dune habitats located within approximately 5 km of route, such habitats are largely associated with SAC and/or SSSI designation (see Section 7.2.1 and Appendix 1 Biological environment, Designated and protected sites).

7.2.4 Priority marine features and UK Biodiversity Action Plan habitats

There are priority marine features and UK Biodiversity Action Plan habitats associated with SAC, MCZ or MPA designations of relevance to the project. As these have already been identified above in Section 7.2.1 and Appendix 1 Biological environment, such features are not noted here again to avoid duplication.

The marine route corridors do not intersect any additional known priority marine features and UK Biodiversity Action Plan habitats.

There are records of horse mussel (*Modiolus modiolus*) beds across the Irish Sea. While isolated records of the north-west coast of Anglesey have previously been recorded, these are not expected to overlap with the marine route corridors (Ivor and Rees, 2005). Further records of horse mussel beds are concentrated to the south-west of the Welsh landfall, also avoided by the marine route corridors.

Maerl beds are located off the coast of Arran. However, such habitats have been avoided by the marine route corridors (NatureScot, 2018).

UK Biodiversity Action Plan habitats in relation to the marine route corridors are illustrated in Figure 7.3.

Sandeel (*Ammodytes* spp.) are additionally noted as a priority marine feature; the potential for project interaction with these species is discussed in Section 7.2.5, alongside other fish species of relevance. A number of marine mammal species and other species of conservation interest are also noted as priority marine features; those of relevance are detailed in Section 7.2.6 and Appendix 1 Biological environment.

For further detail in relation to relevant UK Biodiversity Action Plan habitats, please refer to Appendix 1 Biological environment, Priority marine features and UK Biodiversity Action Plan habitats.

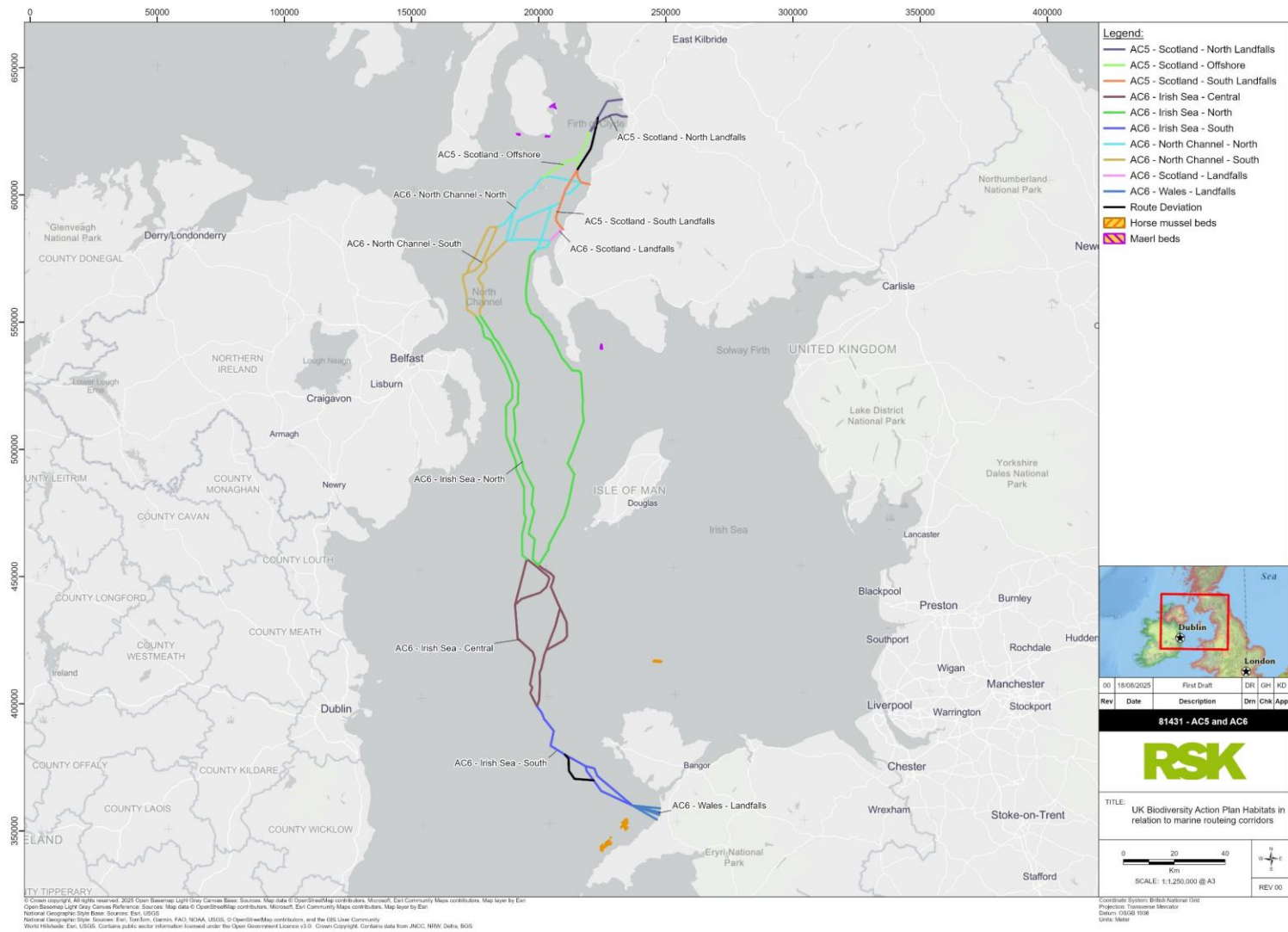


Figure 7.3: UK Biodiversity Action Plan habitats in relation to marine route corridors

7.2.5 Sensitive fish habitats

Species require certain habitats to spawn, this is notable for sandeel and Atlantic herring (*Clupea harengus*). Sandeel are highly dependent on sandy seabed habitats, while herring illustrate preference for gravel/sand habitats. The wider area is noted to support suitable habitats for the spawning of both species.

A study was undertaken for the project in relation to the analysis and mapping of potential herring and sandeel spawning habitats. It was concluded that the marine route corridors are low to medium confidence in the context of optimal herring spawning habitats. The majority of the marine route corridors were deemed unsuitable spawning habitat. The wider area was concluded to be more suitable for sandeel spawning with greater concentrations of medium confidence of optimal spawning habitat areas, specifically in the North Channel (RSK, 2025a).

It is acknowledged that the marine route corridors directly intersect a number of potential spawning and nursery ground for a number of species (Coull et al., 1998; Ellis et al., 2012; Aires et al., 2014).

However, in a recent study by Aires et al. (2014) the overall probability of presence for group 0 individuals³ has been deemed low for the majority of species that were previously considered to overlap with the marine route corridors. Probabilities of presence was highest (medium to high) for whiting (*Merlangius merlangus*), haddock (*Melanogrammus aeglefinus*), herring, horse mackerel (*Trachurus trachurus*), European hake (*Merluccius merluccius*), sprat (*Sprattus sprattus*) and Norway pout (*Trisopterus esmarkii*); highest probabilities were associated with the North Channel and north-west Irish Sea (Aires et al., 2014). However, it should be noted the outputs of the study were limited in their temporal extent, not illustrating annual variations, rather highlighting an average across the studies period (1970 to 2012); the data is further limited by the availability of environmental data.

Appendix 1 Biological environment, Sensitive fish habitats presents an overview of the study with respect to the noted species, alongside providing further detail on sensitive fish habitats as a whole.

7.2.6 Species of conservation interest

7.2.6.1 Marine mammals

A number of marine mammal species with both national and international protection may overlap with marine route corridors at any given time. Such species are largely associated with site designation due to their conservation importance (see Section 7.2.1).

Species of relevance to the project may include those protected under the Habitats Directive. Cetaceans are protected under Annex IV as EPS, while seals are protected under Annex II. Species are also protected under the Wildlife and Countryside Act 1981. Certain designated sites identified in Section 7.2.1 are for the protection of such species; however, this is non-exhaustive.

A total of 19 cetacean species have been known to occur in the Irish Sea. Of these, the most common species (based on abundance and density estimates, Gilles et al., 2023;

³ A group 0 individual refers to fish within the first year of their lives.

Gilles et al., 2025) that may overlap with the marine route corridors at any given time are as follows:

- harbour porpoise (*Phocoena phocoena*)
- bottlenose dolphin (*Tursiops truncatus*)
- common dolphin (*Delphinus delphis*)
- minke whale (*Balaenoptera acutorostrata*)
- Risso's dolphin (*Grampus griseus*)
- beaked whale (*Hyperoodontidae* spp.).

Otters (*Lutra lutra*) are known to occur across the western coastline of Scotland and have been recorded in survey sightings around Ailsa Craig (Petty, 2007). Otters have also been recorded along the coastline of North Wales. During the most recent NRW survey, evidence of otter was observed at 62% of sites surveyed within the Glaslyn hydrometric area; this is inclusive of the potential Welsh landfall route options (Natural Resources Wales, 2021).

Grey seals (*Halichoerus grypus*) are the most common seal species to overlap with marine route corridors, with 3–4% of the UK population residing in Welsh waters and around 90% breeding at Scottish colonies (Robinson et al., 2023; NatureScot, 2025).

7.2.6.2 Seal haul-out sites

The marine route corridors do not intersect any seal haul-out sites (Figure 7.4).

The closest documented sites are Lady Isle, Firth of Clyde; Sound of Pladda Skerries, Isle of Arran; Porth Terfyn, Anglesey; and Porthdinllaen, Gwynedd. Lady Isle is located approximately 2.5 km from marine route corridor AC6-SCO-BAR, while Porth Terfyn is located approximately 9.3 km from AC6-IS-S-2B (Marine Directorate, 2019; ABPmer, 2022).

Further detail on marine mammal species of relevance to the project, with potential to be impacted, is considered within Appendix 1 Biological environment, Species of conservation interest, Marine mammals.

7.2.6.3 Bird species

Birds are protected by the Birds Directive, under Annex I, the Wildlife and Countryside Act 1981 and the Wildlife (Northern Ireland) Order 1985. The birds deemed to have potential to interact with the marine route corridors are protected under SPA sites noted in Section 7.2.1. Of relevance are breeding seabird species and wintering waterfowl species, including but not limited to:

- Manx shearwater (*Puffinus puffinus*)
- northern gannet (*Morus bassanus*)
- common guillemot (*Uria aalge*)
- black guillemot (*Cepphus grylle*)
- gull species
- black-legged kittiwake (*Rissa tridactyla*)
- tern species.

For further detail on bird species of relevance to the project, please refer to Appendix 1 Biological environment, Species of conservation interest, Bird species.

7.2.6.4 Fish species

Fish species of conservation interest are commonly associated with SAC designation, specifically those listed under Annex II of the Habitats Directive. These species include:

- river lamprey (*Lampetra fluviatilis*)
- sea lamprey (*Petromyzon marinus*)
- allis shad (*Alosa alosa*)
- twaite shad (*Alosa fallax*)
- Atlantic salmon (*Salmo salar*).

For detail on these species, please refer to Appendix 1 Biological environment, Species of conservation interest, Fish species.

7.2.6.5 Basking shark and other conservation interest species

Basking shark (*Cetorhinus maximus*) presence in UK waters is seasonal, with presence around the Scottish south-west coast recorded in summer and autumn (Paxton, 2014). In the winter months, individuals move into waters off the continental shelf and shelf edge (Sims et al., 2008).

Coastal areas around the Isle of Man and within the Celtic Sea note areas of high densities for this species (Howe, 2018a).

Five marine turtle species are documented as occasional visitors to UK waters (Howe, 2018b). Species include the leatherback (*Dermochelys coriacea*), loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempii*), green turtle (*Chelonia mydas*) and Hawksbill turtle (*Eretmochelys imbricata*). The leatherback turtle is the most common species, adapted for the colder Scottish seas (Scottish Government, 2011), although sightings are still rare. As a result, there is perceived to be limited potential for impacts to occur to these species.

For further detail on basking shark and marine turtle species in relation to project activities, please refer to Appendix 1 Biological environment, Species of conservation interest, Basking shark and other conservation interest species.

7.3 Physical environment

The physical constraints that are located within the wider marine study area are described in this section, notably highlighting those that directly overlap with the marine route corridors (Table 5.5 and Table 5.6). Such aspects have informed the cable routeing corridor interim appraisal process with reference to the physical environment.

7.3.1 Bathymetry

Water depths reach a maximum of approximately 68.3 m across the AC5 marine route corridors. Shallower environments are found on the approach to the Scottish landfall with no significant variation in bathymetry between the Monkton, Barassie and Girvan landfall locations. A 12.5-m-deep seabed depression lies on the approach to Ballantrae, across approximately 300 m. The seabed gradients associated with this do not appear to be significant; however, geophysical survey works are required to confirm this. Cable landings in this area can be routed around this feature.

The AC6 marine route corridor options cover a large geographical area between Scotland and Wales, covering a wide range of bathymetric and geomorphological features. The bathymetry across the AC6 marine route corridors is characterised by varying water depths, which are shallower towards the Scottish and Welsh landfall areas and deeper through the North Channel and Central Irish Sea. The maximum water depth is approximately 153 m along the AC6-NC-S-1B route section.

Beaufort's Dyke is the most significant bathymetric feature present within the AC6 marine study area. Beaufort's Dyke is a large north–south orientated trench, approximately 50 km long and 2.5 km wide, and is situated within the North Channel. Water depths within this feature exceed 300 m, and the dyke is characterised by steep seabed slopes and thin or absent sediment on the trench sides. Routes through the North Channel have been developed to the east and west of Beaufort's Dyke to avoid this engineering constraint and because it has historically been used as a munitions dumping site (see Section 7.5.3.3).

Figure 7.5 illustrates the seabed bathymetry in relation to the marine route corridors.

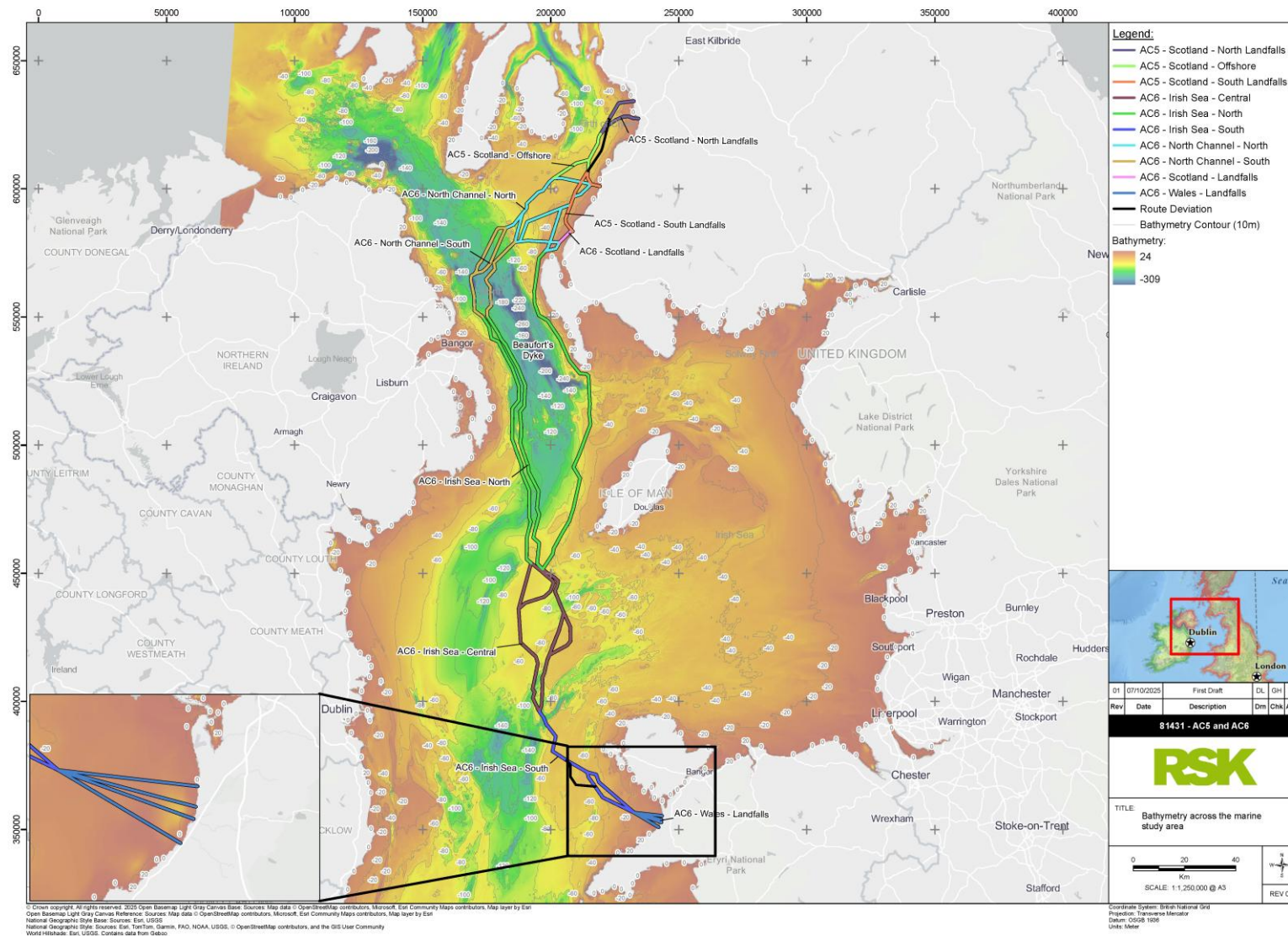


Figure 7.5: Seabed bathymetry

Seabed slopes across the WL2 marine route corridor, noted in publicly available data, were generally noted to be less than 5° (Evolv Energies, 2025). Localised areas of moderate and high slopes were noted within parts of the North Channel, Central Irish Sea and Southern Irish Sea routeing sections. There is a larger variation in bathymetry across the eastern marine route corridor as the route crosses the seabed between Beaufort's Dyke and the Scottish coastline, when compared to the central route (see Appendix 2). Steeper seabed slopes associated with this variation may limit trenching/burial equipment and recommended burial depths may not be achievable in areas. This implies a higher risk of remedial activity required in sections of the route.

The marine route corridor sections AC6-IS-N-2, AC6-IS-N-3 and AC6-IS-C-2 have been identified as having the highest variability of water depth over short distances where they cross ridges, valleys and mobile bedforms.

The public bathymetric data has a resolution of ~30 m and therefore may not identify local slopes likely to be more onerous, particularly in areas of outcropping rock. The acquisition of high-resolution bathymetric data will allow detailed consideration of seabed slopes across the final route.

7.3.2 Coastal height

Coastal profiles have been assessed from the British Geological Society's (BGS) GeoCoast data.

The landing areas around Troon and Monkton are assessed as having a very low height and low range (typically backed by low cliffs, hills, prominent gravel ridges or sand dunes) to coastlines with a low height and high range (typically backed by moderate to steep cliffs).

The landing area around Girvan has a low to moderate coastal profile, described as ranging between very low heights and low range coastlines (typically backed by low cliffs, hills, prominent gravel ridges or sand dunes) to coastlines with a moderate height with a high range (typically backed by moderate cliffs).

The coastline around Ballantrae is predominantly described as moderate coastline with a low range (backed by moderate steep cliffs) to coastlines with a moderate height and a high range (typically backed by moderate cliffs).

Finally, the landings around Caernarfon are all described as having a very low height and low range (typically backed by low cliffs, hills, prominent gravel ridges or sand dunes) to coastlines with a low height and high range (typically backed by moderate to steep cliffs).

7.3.3 Intertidal expanse

The intertidal expanse is the distance from the 10 m LAT contour to landfall (0 m LAT), taken from publicly available bathymetric data and indicating the length of potential shore-end installations. Distances are taken from publicly available data and best estimates provided where the 0 m contour is not consistent.

Table 7.1: Distance to 10 m LAT at each landing area

Landing area	Distance (km)
Troon (AC5-SCO-BAR)	1.50
Troon (AC5-SCO-MON)	1.44
Girvan (AC6-SCO-GIR)	0.95
Ballantrae (AC5-SCO-BAL-2)	0.74
Ballantrae (AC5-SCO-BAL)	1.03
Caernarfon (AC6-WAL-CAE-1)	10.95
Caernarfon (AC6-WAL-CAE-2)	10.93
Caernarfon (AC6-WAL-CAE-3)	10.79
Caernarfon (AC6-WAL-CAE-4)	10.85

7.3.4 Mobile sediments

Areas where significant mobile bedforms were noted, by Evolv Energies, across the marine study area are presented below (Figure 7.6):

- Central Irish Sea, south-west of the Isle of Man, where public data indicates sand wave heights are up to 8 m high and have wavelengths of approximately 400 m
- Southern Irish Sea – sand wave heights west of the Caernarfon landfalls are up to 10 m high, with wavelengths of approximately 800 m
- Northern part of the North Channel where sand waves identified in the CBRA for Western Link 1 are typically 5–6 m in height with one 16-m-high wave also noted (Evolv Energies, 2025b).

Such data has been informed by best available public data at the time of writing; it will be further refined by survey data obtained for the project. These areas have been avoided in the marine cable routing as far as possible. However, interaction may not always be unavoidable in areas where the route is constrained and the location of migrating bedforms is not known.

As indicated in Section 6.6, there is potential for the sand waves to be mobile, with migration patterns changing over time, which could increase the risk to larger areas of the marine route corridors. The combination of geophysical survey works and route engineering may be able to identify potential issues with bedforms. However, seabed modelling and in-situ current measurements should be considered to fully evaluate this risk.

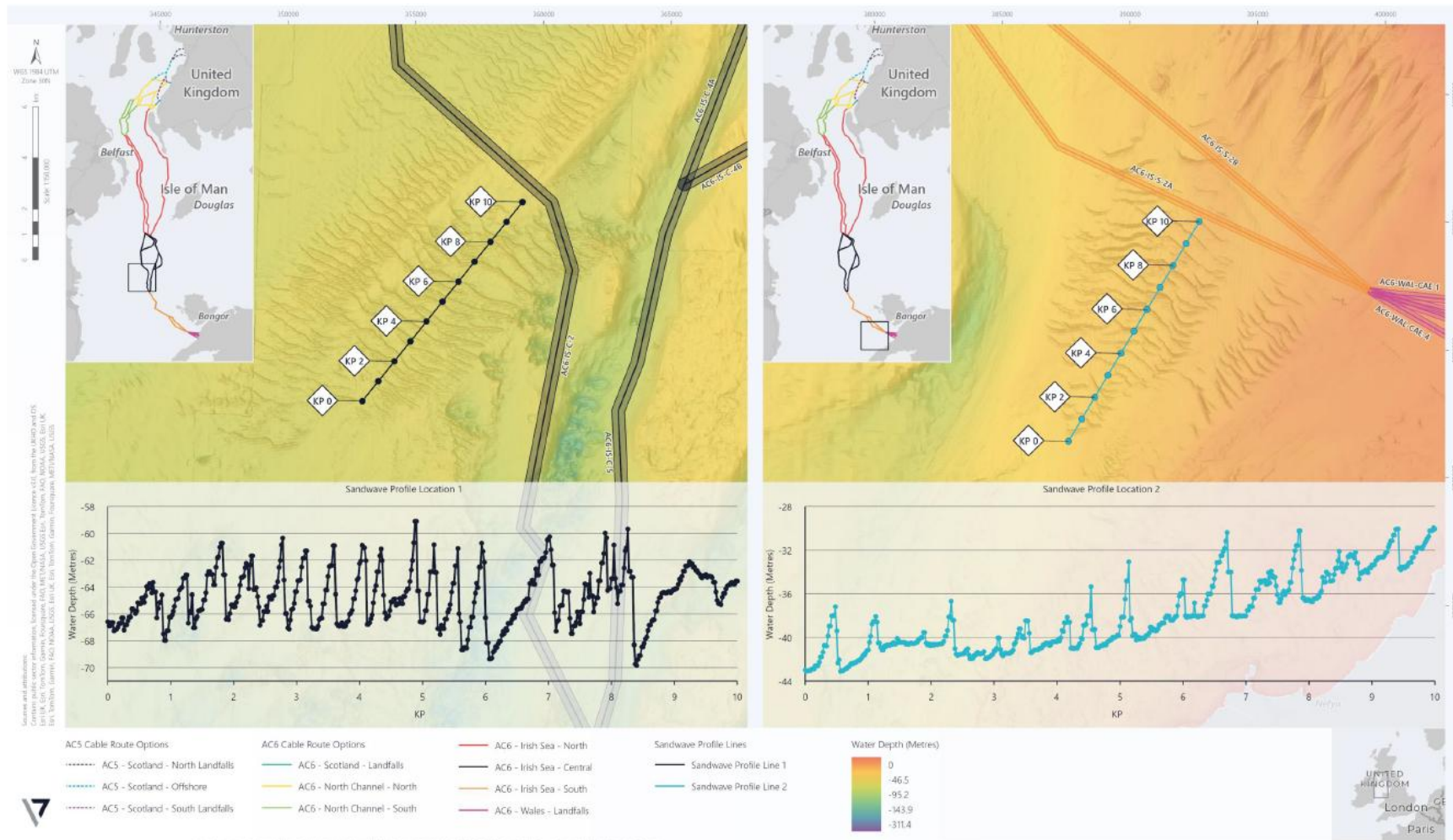


Figure 7.6: Mobile bedforms

Source: Evolv Energies (2025a)

7.3.5 Sub-cropping and outcropping bedrock

Bedrock lithologies across the AC5 marine route corridors comprise Palaeozoic sedimentary rocks in the north with Mesozoic and metamorphic rocks to the south. Areas of igneous intrusions were noted in the sedimentary rocks around Troon.

Bedrock across the AC6 marine route corridors comprise mostly Mesozoic interbedded rocks in the northern section and across the North Channel. Metamorphic rocks are also anticipated around the Scottish and Irish coastline in these areas. Palaeozoic sedimentary and metamorphic rocks dominate the southern portion of the AC6 routes.

Exposed bedrock is not anticipated across the AC5 marine route corridors. Outcropping and sub-cropping rock is noted throughout the North Channel and Irish Sea; however, initial routeing has avoided these outcrops noted on publicly available data (see Figure 7.7). The geophysical survey will provide more detail to inform route engineering.

7.3.6 Superficial sediments

The sediments overlying this bedrock can be split into four separate regional and geological considerations:

- The Firth of Clyde area primarily comprises very soft, occasionally sandy, clays with the exception of the landfall where inshore sediments are likely to comprise sands and area of outcropping/subcropping glacial till and bedrock.
- The North Channel is largely characterised by a veneer of mobile sands and gravels overlaying glacial till or bedrock. There are also extensive boulder fields in this area.
- The Western Irish Sea is dominated by very soft clays with occasional outcrops of rock.

The Southern Irish Sea, to the south-west and south of the Isle of Man, is characterised by a veneer of very loose and loose mobile sands and gravels that overlay glacial tills, dense to very dense glacial sands and occasionally soft to firm glacio-lacustrine clays. An expanse of sand with isolated sand waves lies to the south-west of the Isle of Man. Paleoglacial features and extensive boulder fields are also noted across this area. Figure 7.7 illustrates the seabed sediments in relation to the marine route corridors.

Quaternary sediments are generally noted to be between 5 and >50 m across the WL2 marine route corridors. However, areas with thicknesses <5 m were noted across parts of AC6-IS-N-3, AC6-IS-N-1B, AC6-IS-S-1A, AC6-IS-S-1B, AC6-IS-N-1, AC6-IS-N-2, AC6-IS-S-1 and AC6-IS-S-1-ALT. This reduction in sediment thickness implies a reduced potential for cable burial in these areas, which may increase the likelihood of additional protection.

Hard substrate was noted in isolated areas across the WL2 marine study areas. The majority of areas were noted around the coastline, in the North Channel and south-west of Anglesey.

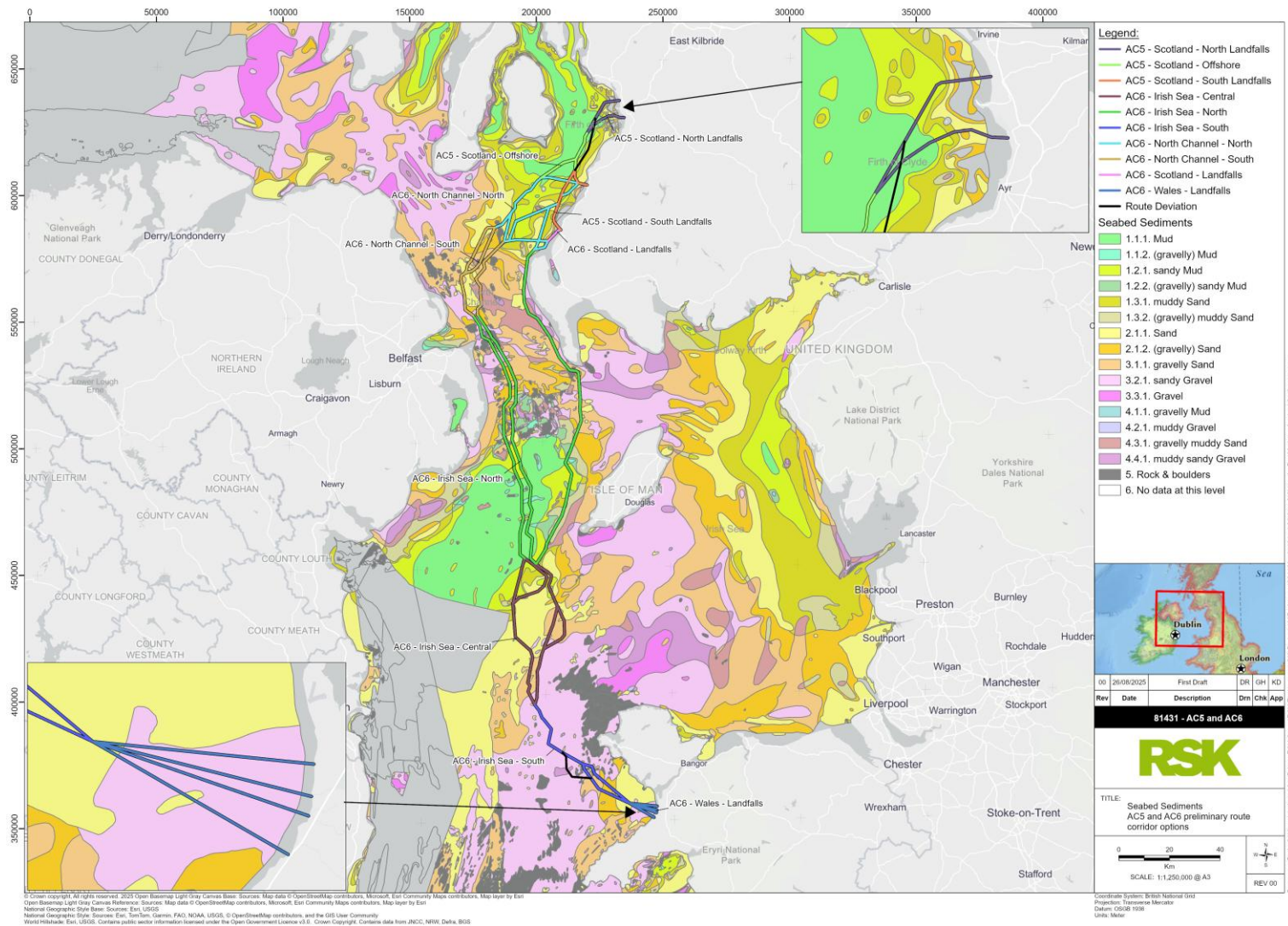


Figure 7.7: Seabed sediments

7.4 Historic environment

The marine route corridors do not intersect any protected wreck sites. However, there are some intersections with wreck and obstruction points. A ‘dangerous’ wreck site is noted to overlap with the AC6-WAL-CAE-2 corridor. Additional wrecks and obstructions that intersect the marine route corridor options are detailed in Appendix 3. It should be noted that wreck and obstruction locations are largely approximate and will be confirmed by pre-installation surveys.

7.5 Socio-economic environment

This section presents the socio-economic constraints that are located within the wider marine study area, notably highlighting those that directly overlap with the marine route corridor options (Table 5.5 and Table 5.6). Such aspects have informed the marine route corridor appraisal process with reference to the socio-economic environment.

7.5.1 Infrastructure

7.5.1.1 Cables

Several cables intersect with multiple marine route corridor options that cannot be avoided (Figure 7.8).

It is acknowledged that a number of renewable energy developments are proposed in relation to the wider marine study area (see Section 7.5.9). As a result, export cables associated with these third-party projects may overlap with marine route corridor options once developed.

The MaresConnect power cable is proposed between Ireland and North Wales; the cable will likely make landfall between Rhyl and Prestatyn to access the existing Bodelwyddan National Grid substation extending north-west across the marine survey area. It is currently in the permitting stages of development, and it is anticipated that the existing AC6 routeing options will cross this cable.

As part of the ongoing engagement works with NRW, two additional potential cabling corridors have been identified. SOBR1 is a fibre optic cable from Dublin Bay, Republic of Ireland to Trearddur Bay, Holy Island, Anglesey, Wales. SOBR2 is a fibre-optic cable from Portmarnock/Malahide, Republic of Ireland to Abergele, Wales. It is anticipated that the existing AC6 marine route corridor options in Welsh waters will cross both these cables.

An additional cable corridor has been identified in Scotland for the LirIC Interconnector via a Notification to Mariners; this would cross the current AC5 marine route corridor option. Accordingly, an alternative AC5 route has been revised to prevent an additional crossing in this area; this is shown in Figure 5.7 as ‘Route Deviation’.

No future cable agreements have been identified at the time of writing.

7.5.1.2 Renewables

Several operational and planned offshore wind farms are in the wider region. These include both fixed-bottom and floating technologies, with infrastructure such as export

cables and substations already present or under development. Their presence informs the planning and routing of new marine infrastructure to avoid potential conflicts and cumulative impacts.

The North Channel Wind 1 is a prospective floating offshore wind farm. The lease site of this wind farm intersects with marine route corridor AC6-NC-S-1A. The marine route corridor options do not directly intersect any other lease area sites for renewable energy, at the time of writing.

However, several lease area sites are located nearby (Figure 7.8):

- North Channel Wind 2 (minimum distance of 1.9 km) – conceptual offshore wind farm
- Walney Phase 1 (minimum distance of 4.2 km) – operational offshore wind farm
- Morlais (previously known as West Anglesey Demonstration Zone), minimum distance of 4.6 km) – planned tidal stream project, consent obtained in 2021 construction due to commence 2025 (starting onshore)
- Holyhead Deep (minimum distance of 5.8 km) – operational 0.5 MW tidal stream project, plans to expand to installed capacity of 80 MW
- Draig Y Môr (minimum distance of 0.2 km) – dormant offshore wind farm.

It is acknowledged that the Northern Ireland Offshore Renewable Energy Action Plan identified potential Resource Zones for potential future developments. The boundaries of these zones are not currently present within the public domain. However, technically suitable Resource Zones presented within the report overlap with the marine route corridor options. As a result, future developments may be consented close to the project (RPS, 2024). Hence, there may be future crossing considerations and seabed works near the marine route corridors.

During consultation with NRW, the Welsh Tidal Stream Energy Strategic Resource Areas (Welsh Government, 2025) were identified. AC6 marine route corridor options traverse the Tidal Stream Energy Strategic Resource Area identified to the south-west of Anglesey. An alternative AC6 marine route corridor option has been created to avoid crossing this area (Figure 5.8). It should be noted that the SOBR1 fibre-optic cable corridor identified in Section 7.5.1.1 also crosses this area.

A number of additional renewable energy projects are located at greater distances from the marine route options, both operational and in the conceptual/early planning phases. The marine route corridors avoids such third-party projects.

7.5.1.3 Oil and gas

The wider marine study area is located within blocks 126, 111, 112, 108 and 109. Within these blocks, the marine route corridor options directly intersects several oil and gas pipelines (Figure 7.8):

- PL982: Scotland To N Ireland Pipeline (SNIP) – active gas pipeline, intersects AC6-NC-S-2 and AC6-NC-S-1C
- PL938: Interconnector 1 Scotland to Ireland IC1 – active gas pipeline, intersects AC6-IS-N-3, AC6-IS-N-2 and AC6-IS-N-1
- PL1890: Interconnector 2 Scotland to Ireland IC2 – active gas pipeline, intersects AC6-IS-N-3, AC6-IS-N-2 and AC6-IS-N-1.



No other oil and gas infrastructure is intersected by the marine route corridor options nor is there overlap with active oil and gas blocks.

The marine route corridor options, however, are located near (0.9 km) active subsea rock installation associated with the SNIP.

No future oil and gas licences have been identified at the time of writing.

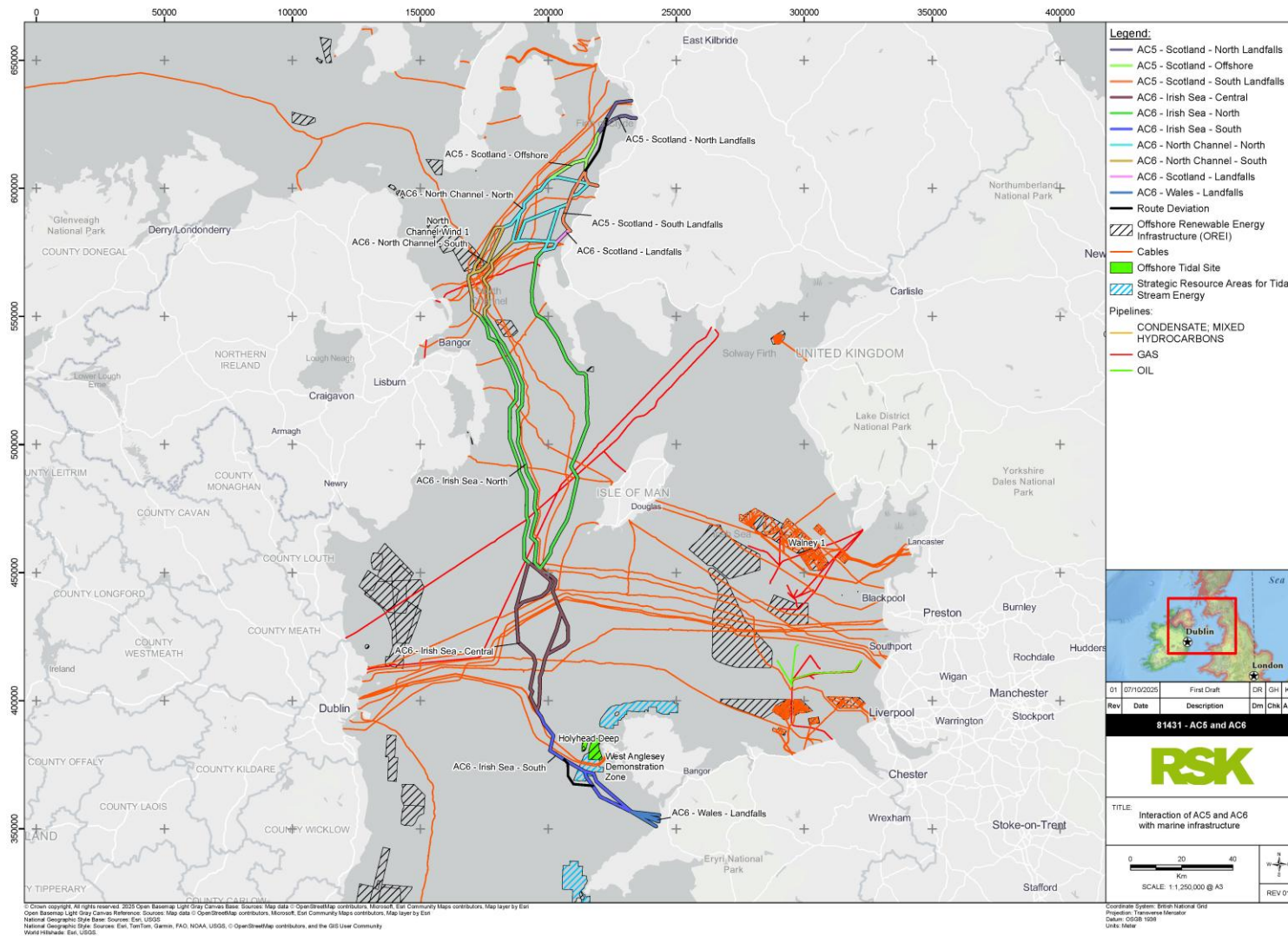


Figure 7.8: Interaction of WL2 with marine infrastructure

7.5.2 Shipping and navigation

There are several marine shipping harbours, ports, ferry routes and marine navigation aspects that intersect with multiple marine route corridor options that cannot be avoided (Figure 7.9).

The marine route corridor options fall within the Clyde Port harbour limit, Irvine (competent harbour area) and Caernarfon Harbour area (Marine Directorate, 2021; Welsh Government, 2025). Marine route corridor options do not intersect any other harbour/port limits.

Predominant ferry routes, i.e., Liverpool to Dublin, Liverpool to Belfast, Cairnryan to Larne and Cairnryan to Belfast, are observed intersecting marine route corridors.

Pre-existing vessel density is moderate to high and concentrated to dedicated transit corridors; this moderate–high vessel density overlaps with the marine route corridor options in multiple locations.

Cargo vessels contribute to the highest vessel density, adhering to both dedicated corridors and unofficial routes. Fishing vessels are concentrated south-east of Northern Ireland, with high densities also present in the North Chanel and Firth of Clyde. Tanker density is concentrated to the southern portion of the marine study area around North Wales, with passenger vessels adhering to dedicated ferry routes across the Irish Sea (EMODnet, 2019).

Shipping activity across the marine route corridors has the potential to cause anchoring hazards to the cable. A transiting vessel will not anchor under standard conditions, and anchoring is a managed process. However, there are instances where emergency or accidental anchoring activity may occur. The potential risk associated with anchoring hazards will be assessed in the CBRA.

It should be acknowledged that all marine route corridor options cross shipping lanes at some point along the route. Route engineering means that the majority of cable routeing options largely cross perpendicular, as much as practically feasible, to high-density shipping lanes in order to minimise distance through such areas. In addition, consideration has been given to cable design, specifically in shallow water such that under keep clearance of vessels is kept to a maximum, subsequently minimising the risk to shipping and navigation.

In addition, the following potential future marine energy development sites are identified in the marine study area. All of these are at an early development/screening stage with none awarded at the time of writing:

- North Channel Wind 1: proposed wind site located 9 km off the coast of County Antrim
- North Channel Wind 2: proposed floating offshore wind site located approximately 25 km offshore of the east coast of County Antrim and north coast of County Down, Northern Ireland
- Northern Ireland Offshore Renewable Energy Action Plan (OREAP) II: In February 2025 the Department for the Economy of Northern Ireland released OREAP II, which, following identification of ‘Technically Suitable Resource Zones’, contained a constraints screening that aimed to identify sites that limit the environmental impacts of offshore renewable energy in Northern Ireland. The



assessment provided Resource Zones, which are deemed to represent the least environmentally constrained/sensitive areas for future development.

There is a risk that future shipping transits across the marine study area could be altered and concentrated across specific areas of the marine route corridor if these sites were to be developed. These changes in vessel traffic could change the risk of anchor strikes across the cable route. In addition, changes in future shipping forecasts may also change the risk profile when considering vessel collisions. The risk to the cable will be assessed during the CBRA. However, post-construction vessel movements would not be modelled in the associated historical AIS data, and therefore this may be considered when undertaking the CBRA.

7.5.3 Restricted areas

7.5.3.1 Aquaculture

There are no aquaculture sites that intersect with the marine route corridor options nor are sites located within the marine study area.

7.5.3.2 Aggregate extraction

There are no aggregate extraction sites that intersect with the marine route corridor options nor are sites located within the marine study area.

7.5.3.3 Disposal and dumping sites

The wider marine study area intersects the Beaufort's Dyke (IS280) dumping and disposal site (Figure 7.10), although it is noted as disused/closed. The site was previously used as the UK's largest offshore dump site for munitions. The site can largely be avoided by all identified routeing options. However, the presence of potential munitions cannot be ruled out as indicated in earlier routeing and siting works carried out in relation to Western Link 1. Notably, no known mine lays directly intersect the cable route with many concentrated around strategic waterways and ports (e.g., the entrance to Belfast Harbour and the Firth of Clyde) (Ordtek, 2025). It should be noted that previous side-scan sonar data indicates that there are large quantities of dumped munitions, munitions-related materials and unidentified man-made debris located outside the chartered boundary of Beaufort's Dyke (Marine Laboratory, 1996). Therefore, UXOs may be encountered within the marine study area, though the likelihood of encounter of various items of UXO may differ across the site (Ordtek, 2025). A detailed project UXO assessment and mitigation plan should be undertaken.

The operational Belfast Dredgings C (IS591) and Ayr Bay (MA050) dumping and disposal sites are located nearby (<1 km away); however, these sites can be avoided. These areas are outlined in Appendix 4.

7.5.3.4 PEXA

The marine route corridor options intersect military exercise and danger areas (PEXA) and practice areas that cannot be avoided. These areas are typically subject to restrictions due to ongoing variable defence activities such as live-firing exercises, underwater ordnance testing or vessel manoeuvres. Therefore, access may be limited or require coordination with relevant defence authorities. While complete avoidance is challenging based on the current options, routeing through these areas could pose operational risks, including potential delays, safety concerns and the need for additional permitting or mitigation measures. These areas are outlined in Appendix 4.

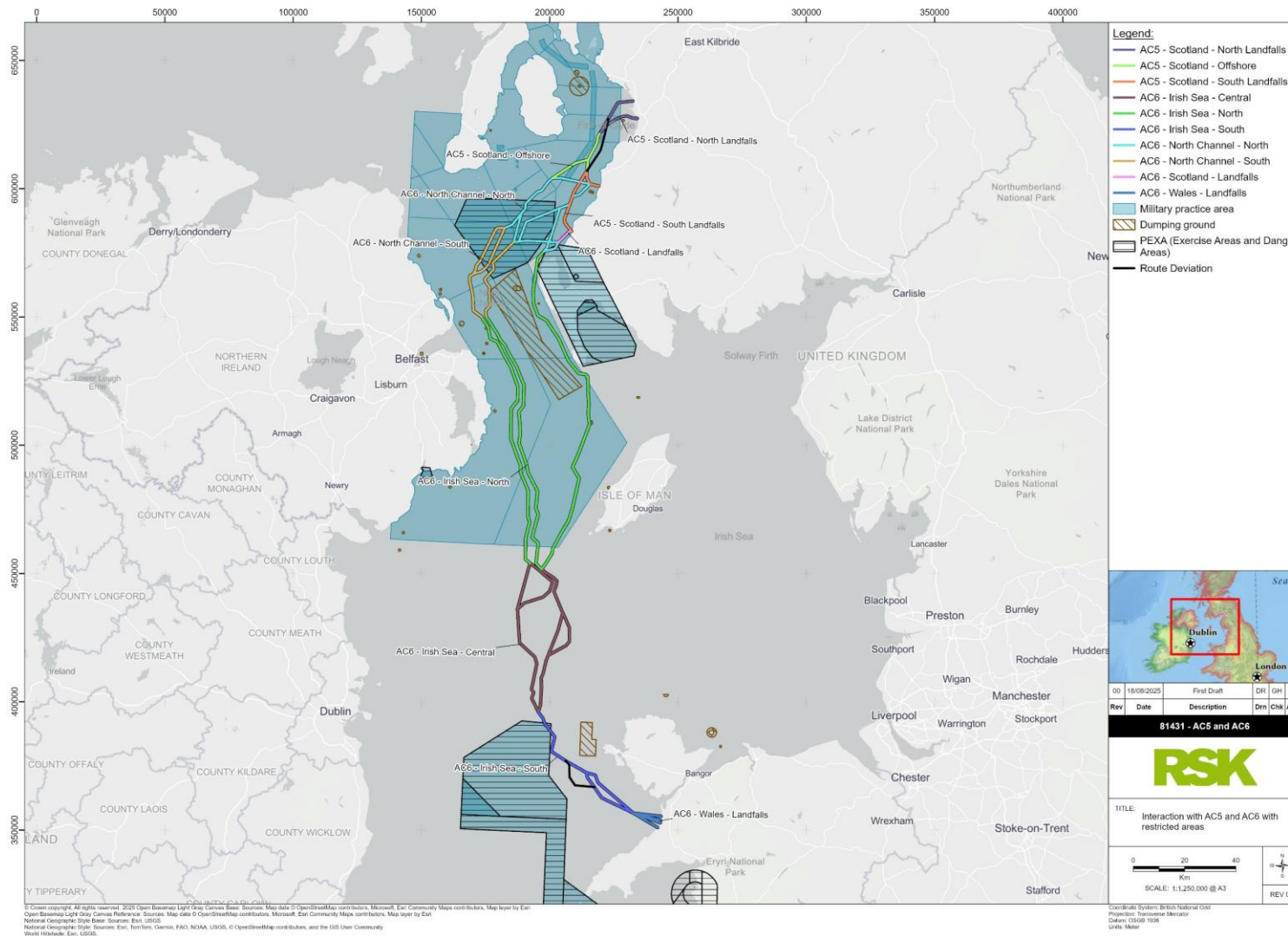


Figure 7.10: Interaction between WL2 and restricted areas

7.5.4 Commercial fisheries

NGET commissioned Brown and May Marine to undertake a preliminary review of the commercial fishing activity that takes place in the study area to inform decision-making on the proposed marine route corridor alignments for WL2. The report categorised fishing activity by vessel country of origin, specifically UK, Belgian, French and Irish vessels (Brown and May Marine, 2024).

France, Ireland and Belgium hold historic fishing rights within the 6–12 nm limit in areas relevant to potential landfalls of the project, particularly around northern and southern Wales. As a result, vessels from these countries may operate in inshore waters near the project area, as well as beyond the 12 nm limit.

Surveillance data indicates limited activity by UK fishing vessels within offshore sections of the marine study area with most sightings concentrated near the Scottish coast, the Isle of Man and landfall areas in Wales (ICES rectangles 39E4, 35E5, 35E6, 32E4 and 32E5). Belgian vessels are the most recorded non-UK fleet within these areas, especially around southern Wales (rectangles 32E4 and 31E4). French and Irish vessels are also present but show minimal overlap with the marine route corridor option areas.

To characterise baseline fisheries activity, landings data by the ICES rectangles have been analysed for the key active fleets using the most recent available datasets:

- UK fleet: 2018–2022 average (MMO, 2024)
- Belgian fleet: 2012–2016 average (STECF, 2017)
- French fleet: 2012–2016 average (STECF, 2017)
- Irish fleet: 2015–2019 average (Marine Institute, 2020).

The following noted fishing activity takes place within the wider marine study area and the associated ICES rectangles 39E5, 39E4, 38E4, 38E5, 37E4, 37E5, 36E4, 36E5, 35E4 and 35E5:

- beam trawls
- bottom otter trawls
- bottom seines
- dredges
- pelagic trawls
- pelagic seines
- static gear.

Beam and bottom otter trawls are the most common fishing methods within the wider marine study area. Beam trawling effort is concentrated to the central Irish Sea, while bottom otter trawl effort is concentrated to south-west Northern Ireland, North Channel and Firth of Clyde (Figure 7.11) (EMODnet, 2022). However, it is appreciated that fishing vessel density may be underrepresented due to smaller vessels not possessing the requirement to utilise AIS systems.

Fishing gear snagging poses a significant risk to subsea cables, particularly from demersal gear types that maintain continuous contact with the seabed. Otter trawls, beam trawls, dredges and demersal seines all have components, such as trawl doors, chains, ground-ropes and dredge frames, that penetrate the seabed to varying depths, with maximum penetration reaching up to 0.35 m (otter trawls). If cables are exposed or

surface laid, these components can snag, lift or drag the cable, potentially causing structural damage or complete failure. Gear types vary in terms of the impacts they can cause; dredges are heavy and rigid, and snagging incidents may not only damage infrastructure but also endanger vessel safety. Beam trawls can disturb sediment and expose buried cables, increasing vulnerability. Otter trawl doors are especially prone to snagging due to their depth of penetration and sweeping motion, making them the most likely point of interaction with subsea cables.

To mitigate this risk and protect the cable from gear strike and snagging, a sufficient depth of lowering and/or cable protection methods will be required. The most appropriate mitigation methods will be identified through project design and evolution.

7.5.5 Restricted fishing areas and relevant byelaws

Inshore and coastal fisheries legislation in Wales is managed via the Welsh Government, with responsibility shared between Welsh Ministers and NRW; inshore fisheries legislation and associated byelaws applies up to 6 nm of the coastline (Welsh Assembly Government, 2011). Scottish Ministers are responsible for the regulation of sea fishing around Scotland and within 12 nm of Scotland's coast, working closely with the Scottish Regional Inshore Fisheries Group (Scottish Government, 2025). This responsibility falls to DAERA in Northern Ireland (with support of the Sea Fisheries Policy branch) and the Isle of Man Government and DEFA (Fisheries Division) in the Isle of Man.

Across all jurisdictions a number of byelaws, national and international legislation applies to fishing activities. The marine route corridor options intersect with a number of these legislative requirement areas (Seafish Kingfisher Information Service, 2025).

Several fisheries restricted areas are documented within the wider marine study area. This includes both gear type, vessel and species-specific restrictions; these restrictions range from seasonal to year-round. Though concentrated to within 12 nm, a restricted area, the Irish Cod Box is also present in the western Irish Sea that intersects the marine route corridor options (Seafish Kingfisher Information Service, 2025).

7.5.6 Shellfish waters

The marine study area does not intersect any shellfish protected waters.

However, the following shellfish protected waters are located near the Welsh landfall marine route corridor options (Welsh Government, 2016):

- Melltreat Sands
- Menai Strait (West).

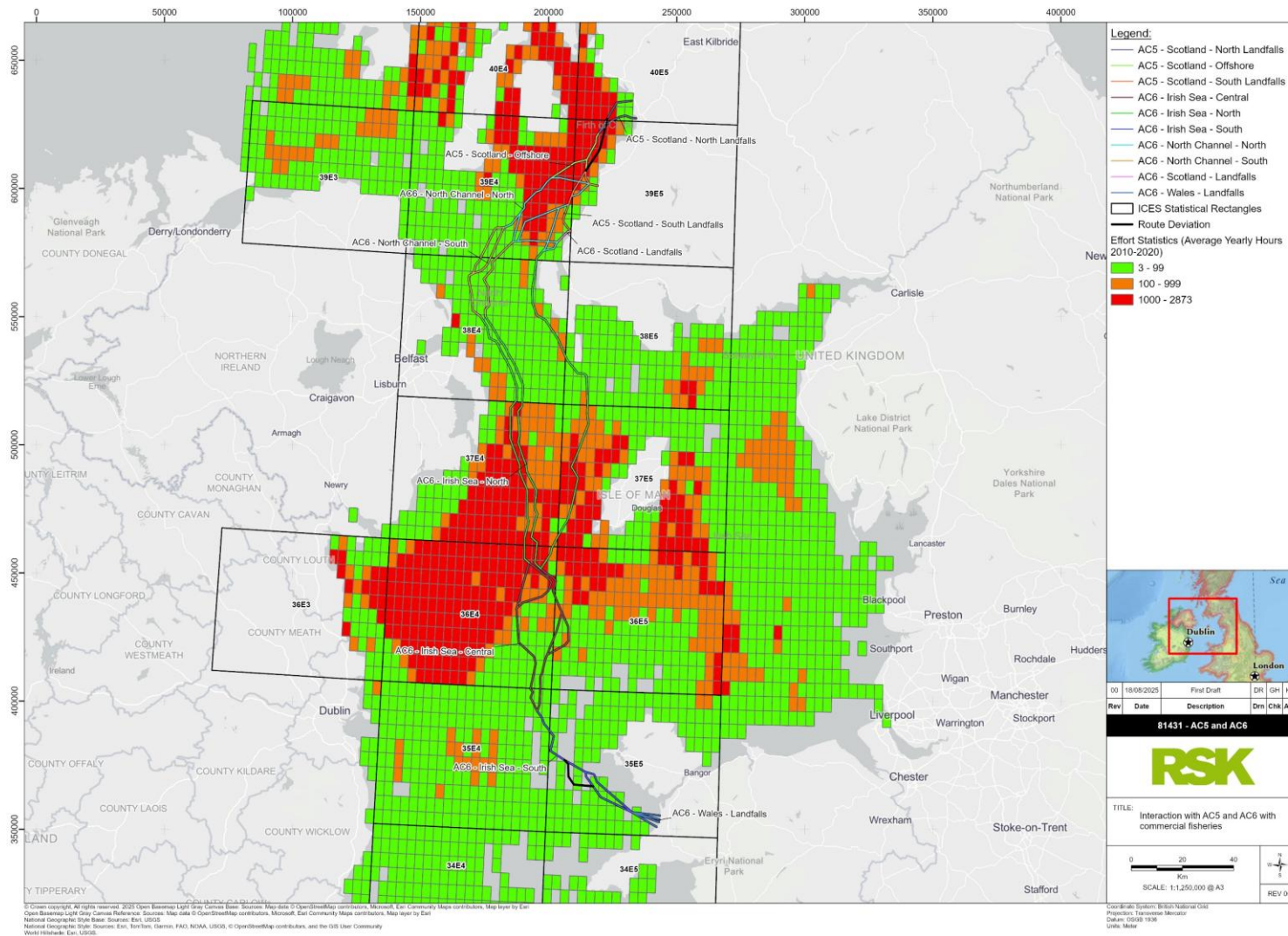


Figure 7.11: Interaction with WL2 with commercial fisheries

7.5.7 Bathing waters

The marine study area intersects the following bathing waters at Scottish landfall marine route options AC5-SCO-MON:

- Prestwick (UKS7616046) – excellent condition (SEPA, 2025).

No other bathing waters are intersected in the marine study area. However, the Morfa Dinlle/Dinas Dinlle bathing water is located near AC6-WAL-CAE-1, noted as excellent condition and is locally recognised as a bathing area (Natural Resources Wales, 2025).

7.5.8 Marine planning

During this appraisal, due consideration has been given to the following relevant marine plans for the wider marine study area across all jurisdictions:

- Welsh National Marine Plan (Welsh Government, 2019)
- Scotland’s National Marine Plan (Marine Scotland, 2015)
- Scotland National Marine Plan 2 Strategic Environmental Assessment Scoping Report (Scottish Government, 2023)
- Clyde Regional Marine Plan Pre-Consultation Draft (Clyde Marine Planning Partnership, 2019)
- Draft Marine Plan for Northern Ireland (Department of Agriculture, Environment and Rural Affairs, 2018)
- Manx Marine Environmental Assessment (as part of the ‘Isle of Man Plan Project’) and Isle of Man Marine Plan Marine Development Consenting Consultation (Isle of Man Government, 2012; Isle of Man Government, 2018).

Some of the marine planning documents listed above are still under development or do not yet include detailed sector-specific policies, such as those for subsea cables or marine infrastructure. As such, marine plans will be kept under regular review throughout this project’s lifetime to guarantee updated new or revised policies are incorporated. This will ensure that the appraisal remains aligned with the most current policy frameworks across all relevant jurisdictions.

7.5.9 Additional major projects

This section includes reference to other major projects that are currently in planning or are environmental restoration projects/schemes that have not been covered in other sections. Please refer to the above sections, in relation to potential cable, renewable and oil and gas projects with respect to the wider marine study area and marine route corridor options. These projects are:

- Holyhead harbour Expansion Project (Marine Management Organisation, 2018)
- Barrow Port Expansion (ABP, 2024)
- Woodside Ferry Terminal Upgrade (Merseyside) (Mersey Ferries, 2024)
- Mersey Estuary Habitat Restoration (Mersey Gateway Environmental Trust, 2024)
- Northwest England and North Wales SMP 2 and 3 (Halcrow Group Limited, 2011)
- Irish Sea MPA Monitoring (Devlin et al., 2025).

A summary of the projects, the developers and brief information are provided in Table 7.2 below. While accurate at the time of writing, project scope and schedules may evolve and



vary with time. It is anticipated that several of these projects will intersect in delivery phases, with overlapping workstreams occurring across sites and sectors throughout the coming years. As these efforts converge, their cumulative impacts—both ecological and operational—will be increasingly significant, shaping long-term outcomes. No other major developments have been confirmed at the time of writing, however the progression of each initiative and the development of emerging initiatives will be monitored throughout the project lifetime.

Table 7.2: Other major projects of relevance to the marine route corridors

Project type	Project name	Key details/status	Information and timeline	Jurisdiction and relevant parties
Harbour infrastructure (marine and terrestrial works)	Holyhead Harbour Expansion Project	Planning and investment underway to upgrade port facilities	Expansion aimed at increasing freight capacity and supporting trade routes between Wales and Ireland Authorisation of the Holyhead Harbour Revision Order 2023, permits Stena Line Ports Limited to begin necessary construction works	Welsh Government Isle of Anglesey County Council, Port of Holyhead
Harbour infrastructure (marine and terrestrial works)	Barrow Port Expansion	Planning consent granted for new berthing facilities	Extension of port facilities to support offshore wind farm maintenance and other maritime activities Plan announced 16 Sep 2024 EnergyDock consultation conducted late 2024 Delivery expected ~2045	English Government Cumbria County Council, Associated British Ports (ABP)
Harbour infrastructure (marine and terrestrial works)	Woodside Ferry Terminal Upgrade (Merseyside)	Marine licence granted; works involve new foundations and ferry landing replacement	Replacement of historic terminal at Woodside (the Wirral) to improve ferry infrastructure Completion expected autumn/winter 2025	English Government Wirral Council, Merseytravel (Liverpool City Region Combined Authority)
Coastal and habitat restoration (marine and terrestrial works)	Mersey Estuary Habitat Restoration	Various phases of wetland creation and enhancement underway	Habitat creation projects aimed at improving biodiversity and flood protection around the Mersey Estuary. 2025: Bollin to Mersey Nature Recovery Partnership launched 2025. 2026: Restoration of priority ponds and traditional hay meadows underway in Chorlton Ees and Millgate Fields Overall monitoring ongoing	English Government Environment Agency & Natural England, Mersey Gateway Environmental Trust

Project type	Project name	Key details/status	Information and timeline	Jurisdiction and relevant parties
Shoreline management (marine and terrestrial works)	Northwest England and North Wales SMP 2 and 3	Next iteration of SMP due for consultation; builds on SMP 1 and 2 findings	<p>Strategic plans to manage coastal erosion and flooding risk along the coastline, balancing protection and natural processes</p> <p>2023–2025: Coastal groups issuing updated guidance and leaflets (e.g., Wyre, Westmorland & Furness)</p> <p>Post-2027: SMPs expected to inform next-generation flood and coastal erosion risk management investment programmes</p>	<p>English Government (DEFRA)</p> <p>North West Coastal Group, Welsh Government, Natural Resources Wales</p>
Environmental monitoring (marine only works)	Irish Sea MPA Monitoring	Ongoing monitoring and assessment of designated MPAs in Irish Sea	<p>Government-led monitoring programmes to assess health and status of marine protected habitats and species</p> <p>2025: Integrated monitoring programme launched by Cefas, Environment Agency, Agri-Food and Biosciences Institute, Natural Resources Wales and others</p> <p>Overall monitoring ongoing towards 2030 MPA target</p>	<p>English Government (DEFRA, JNCC) and Irish Government (Department of Housing, Local Government and Heritage)</p> <p>DAERA (Northern Ireland), Marine Scotland</p>

8 STAKEHOLDER ENGAGEMENT

8.1 Regulatory engagement

Initial stakeholder engagement activities for WL2 commenced in April 2025 and are currently ongoing at the time of writing. To date, consultations have been undertaken with the following regulatory bodies for Wales, Isle of Man, Northern Ireland, and Scotland as identified below:

- CES (17/06/2025)
- DAERA (Northern Ireland) (23/04/2025 and 24/09/2025)
- Dol and DEFA (Isle of Man) (02/04/2025 and 16/04/2025)
- JNCC (07/07/2025)
- MCA (14/04/2025)
- MCA and Trinity House (19/06/2025)
- MD-LOT (25/04/2025)
- MMO (16/04/2025, 21/05/2025, 18/09/2025)
- NatureScot (30/07/2025)
- NRW (01/04/2025, 22/05/2025, 24/09/2025)
- The Crown Estate (03/04/2025)
- Welsh Government and NRW (05/06/2024)
- Welsh Heritage (30/06/2025).

8.2 Third party engagement

Additional routeing deviations were made based on the issue of a Notice to Mariners for the LirIC Interconnector on 23 May 2025. It was determined via this notice that the proposed route for the AC5 component of WL2 would cross the LirIC corridor and there is potential that an additional crossing agreement would be required. To potentially mitigate this risk, an additional routeing section was developed. This deviation is displayed in Figure 5.7.

Additional consultation is ongoing with third party asset owners and fishers. Details of identified third party asset owners is presented in Table A4.2 and detail of ongoing fisheries engagement is detailed in Appendix 4.

9 OPTIONS APPRAISAL

9.1 AC5 appraisal

The AC5 marine route corridor alignments (Table 5.5) were assessed using the risk categories detailed in Table 5.2 to develop OASTs for each marine route corridor as detailed in Section 5.8 (RSK, 2025b). As previously detailed, the findings of these OASTs have been presented in Sections 6 and 7. Table 9.1 below summarises the conclusions of the Options Appraisal process for the AC5 element of WL2.

Table 9.1: AC5 marine route corridor alignment summary of options assessment

	BAR to GIR	MON to GIR	BAR to BAL	MON to BAL
Start	Barassie	Monkton	Barassie	Monkton
End	Girvan	Girvan	Ballantrae	Ballantrae
Route length (km)	44.54	42.04	62.03	59.53
No. of cable crossings	1	0	3	2
No. of designated sites crossed	0	0	0	0
Technical	Medium–low risk	Medium–low risk	Medium risk	Medium risk
Biological environment	Medium–low risk	Low risk	Medium–low risk	Medium–low risk
Physical environment	Medium–low risk	Medium–low risk	Medium–low risk	Medium–low risk
Historic environment	Low risk	Low risk	Low risk	Low risk
Socio-economic environment	Medium–low risk	Medium–low risk	Medium–low risk	Medium–low risk
Overall implications	Medium–low risk	Medium–low risk	Medium risk	Medium risk

In general, the identified marine route corridor alignments for the AC5 element of WL2 are not heavily constrained and provide a generally favourable environment for cable routeing. The AC5 marine route corridors do not intersect any designated sites, although the Ailsa Craig SPA and South Arran MPA are located close to these marine route corridor options. In addition, there are small areas of Annex I habitat that drive the medium–low risk for the biological environment for these options. The physical environment rankings for all four routeing options are driven by the presence of potentially shallow sediments as indicated by third-party data from BGS. Socio-economic constraints can largely be attributed to the presence of fishing activity. The most

significant differences between each of these options arises when considering the different landfall options and the technical risk associated with these.

The appraisal of the AC5 marine route corridor options determined that the Girvan landfall options were preferable over the Ballantrae options, which were assigned a medium risk due to areas of hard substrate in shallow waters around landfall that would require long trenchless installation methods around landfall, alongside potential external remediation in shallower waters.

When comparing the two Girvan landfall options, there is a preference towards the Monkton to Girvan marine route corridor option. This is due to the reported presence of Annex I stoney reef habitat within the Barassie to Girvan marine route corridor. Additionally, the Barassie to Girvan marine route corridor option would require traversal of the LANIS 3 telecommunications cable and Troon to Brodick ferry route.

9.2 AC6 appraisal

The AC6 marine route corridor alignments detailed in Section 5.7.5 (Table 5.6) were assessed using the risk categories detailed in Table 5.2; these risk categories were subsequently used to develop OASTs for each marine route corridor as detailed in Section 5.8 (RSK, 2025b). As previously detailed, the findings of these OASTs have been presented in Sections 6 and 7. Table 9.2 below summarises the conclusions of the Options Appraisal process for the AC6 element of WL2.

Table 9.2: AC6 marine route corridor alignment summary of options assessment

	GIR to CAE (West)	GIR to CAE (Central)	BAL to CAE (Central)	GIR to CAE (East)	BAL to CAE (East)
Start	Girvan	Girvan	Ballantrae	Girvan	Ballantrae
End	Caernarfon	Caernarfon	Caernarfon	Caernarfon	Caernarfon
Route length (km)[†]	336.1	316.8	297.3	307.4	288.25
No. of cable crossings	22	22	20	18	16
No. of pipeline crossings	3	3	3	3	3
No. of designated sites crossed	5 (3)*	5 (4)*	5 (4)*	4 (3)*	4 (3)*
Technical	Medium risk	Medium risk	Medium risk	Medium risk	Medium risk
Biological environment	Medium risk	Medium risk	Medium risk	Medium risk	Medium risk
Physical environment	Medium risk	Medium risk	Medium risk	Medium risk	Medium risk

	GIR to CAE (West)	GIR to CAE (Central)	BAL to CAE (Central)	GIR to CAE (East)	BAL to CAE (East)
Historic environment	Medium–low risk	Medium–low risk	Medium–low risk	Medium–low risk	Medium–low risk
Socio-economic environment	Medium–low risk	Medium–low risk	Medium–low risk	Medium risk	Medium risk
Overall implications	Medium risk	Medium risk	Medium risk	Medium risk	Medium risk

† The total route length given here is the longest potential route based on the options selected.

* Numbers in brackets denote the number of designated site crossing requirements if additional sites can be avoided via selection of alternative route sections.

The identified marine route corridor alignment for the AC6 element of WL2 represent marine route corridors spanning from Scotland to Wales covering over 300 km, which involves traversing challenging and constrained areas of the seabed. The Options Appraisal of the AC6 marine route corridor alignments concluded that all proposed alignments have significant challenges associated with them, which resulted in a medium risk being assigned for all five options. Many of these marine route corridor alignments have the same constraints and challenges due to their similarities in geography, for example, all cross the Clyde Sea Sill MPA and all seek landfall in the Caernarfon Bay area; both of these drive this risk ranking. To help differentiate the marine route corridor alignments and avoid repetition, the discussion below instead focuses on the differentiating factors instead of listing all constraints for each option.

Based on the preference for a landfall of AC5 at Girvan, the two Ballantrae landfall options were determined to be the least preferred options for the AC6 element of WL2. There is a preference towards the three options that have a Girvan landfall.

Marine route corridors GIR to CAE (West), GIR to CAE (Central) and GIR to CAE (East) all share a series of common biological constraints, which drives the medium risk ranking (Figure 9.1). All three of these alignments are required to cross the Clyde Sea Sill MPA and North Anglesey Marine SAC.

Additionally, both GIR to CAE (West) and GIR to CAE (Central) traverse the North Channel SAC and are close (<1 km) to the Pisces Reef Complex SAC.

There are areas of Annex I reef habitat across the entirety of the AC6 marine route corridor portion of WL2. These areas have been avoided during the routeing development. Along the landfall options at Caernarfon, there are areas of Annex I habitat that will likely require a trenchless installation method to avoid.

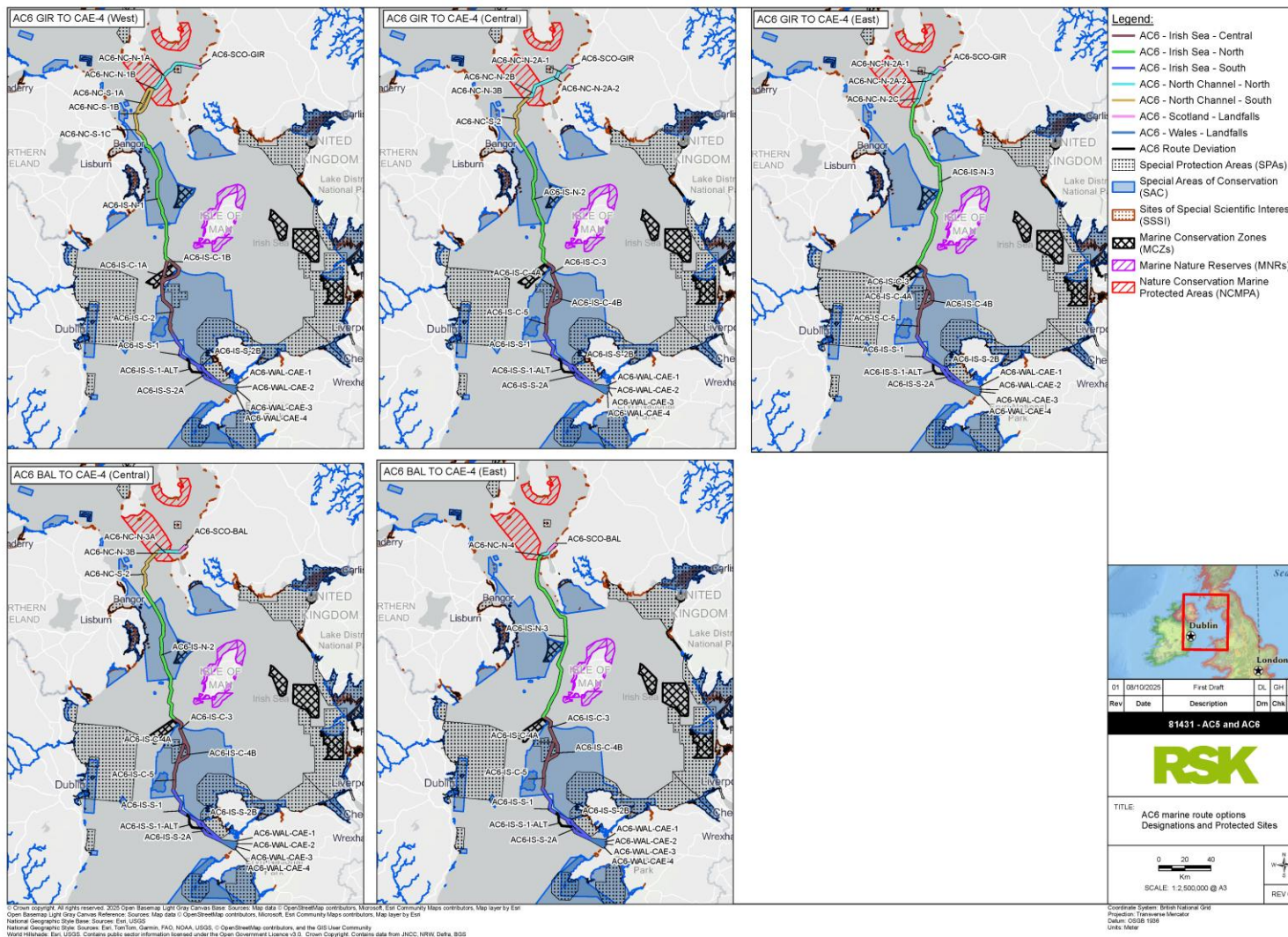


Figure 9.1: Marine designations and protected sites that are intersected by the marine route corridor options

Of these three options, GIR to CAE (West) is least preferable from a biological perspective. While it can avoid traversal of the Irish Sea Front SPA⁴, it will potentially require traversal of the Queenie Corner MCZ or pass close to the site. As detailed in Appendix 1, Queenie Corner MCZ is designated for subtidal mud and benthic communities. Due to the receptors of this site, there is potential that the conservation objectives of this site may be affected if the project was constructed through the MCZ due to the requirement for burial (ploughing/jetting/mechanical cutting) during installation. When comparing the Queenie Corner MCZ with the Irish Sea Front SPA, the potential for impact to the conservation objectives of the MCZ is greater. GIR to CAE (Central) and GIR to CAE (East) would both allow for avoidance of the Queenie Corner MCZ.

As previously detailed, GIR to CAE (Central) and GIR to CAE (East) both traverse the Irish Sea Front SPA for the same distance. However, GIR to CAE (East) provides an opportunity to reduce the traversal distance of the Clyde Sea Sill MPA from 18.69 km to 2.8 km, to avoid traversal of the North Channel SAC and to increase the distance from the Pisces Reef Complex SAC.

From a biological perspective, GIR to CAE (East) is preferable, as this option satisfies Schedule 9 requirements (please see Section 3.3) as far as possible.

The presence of Beaufort's Dyke within the North Channel provides a major constraint from a technical, physical and socio-economic perspective. As previously detailed in Section 7.3.1 and 7.5.3.3, Beaufort's Dyke is a large glacial trench characterised by steep banks and thin sediments. In addition to this, Beaufort's Dyke has previously been used as a licensed disposal site (IS280) for munitions, chemical and nuclear waste. This site has been avoided as far as practical, although the presence of munitions across this site cannot be ruled out. Previous survey works from 1996 identified that considerable quantities of munitions were dumped in the shallower waters adjacent to Beaufort's Dyke (Marine Laboratory, 1996).

GIR to CAE (West) and GIR to CAE (Central) both traverse to the western side of Beaufort's Dyke while GIR to CAE (East) traverses the eastern side of Beaufort's Dyke in shallower waters. All three options traverse areas that are anticipated to fall within a higher distribution area of potential unexploded ordnance (pUXO); however, the highest distribution areas have been avoided (Evolv Energies, 2025a; Evolv Energies 2025b; Marine Laboratory, 1996). All three options have pUXO risk associated with them. However, GIR to CAE (East) is anticipated to have the highest risk due to its traversal of these shallower waters (where previous disposal activity is likely to have occurred and/or munitions may have migrated to) and the greater distance that it traverses alongside the disposal site (86.9 km vs 38.1 km for GIR to CAE (Central)).

As previously detailed in Section 7.3.1, the marine route corridor alignment that runs closest to the Scottish nearshore area and makes up GIR to CAE (East) experience a greater level of localised bathymetric variation in comparison to GIR to CAE (Central). As a result, there is an increased risk that additional cable protection (e.g., rock placement or mattresses) may be required to achieve an appropriate burial depth for the cable for the GIR to CAE (East) option.

In addition, the GIR to CAE (East) option traverses through a potential pinch-point area of hard substrate around the Rhins of Galloway. While the route avoids crossing this hard

⁴ This site is designated for Manx shearwater (*Puffinus puffinus*)

substrate, it does traverse between two outcropping areas and increases the risk of traversing challenging geology. This also increases the risk that additional cable protection (e.g., rock placement or mattresses) may be required to achieve an appropriate level of protection for the cable for the GIR to CAE (East) option.

From a physical and socio-economic perspective, the GIR to CAE (Central) option is preferable due to its decreased traversal alongside the Beaufort's Dyke disposal site (which lowers the pUXO risk), preferred seabed conditions and increased water depths, and avoidance of hard substrate areas.

To achieve a balanced approach when considering the GIR to CAE (Central) and GIR to CAE (East) options, the environmental, physical, historical and socio-economic features and constraints need to be considered in their entirety. While GIR to CAE (East) is preferred from an environmental point of view, it has been determined by RSK and Evolv Energies that the potential engineering and technical risk surrounding installation due to challenging ground conditions and pUXO risk outweighs the environmental risk associated with traversal of the North Channel SAC and proximity to the Pisces Reef Complex SAC.

Following the landfall selection workshop and subsequent discussions on 16/10/2025, option GIR to CAE (Central) has been confirmed as the preferred marine corridor, supported by emerging landfall preferences. Among the options assessed, one landfall (AC6-WAL-CAE3) has been identified as the leading preference based on marine engineering considerations, reinforcing the suitability of option GIR to CAE (Central). Other landfall options (AC6-WAL-CAE2 and AC6-WAL-CAE4) on the same GIR to CAE (Central) route are also technically feasible and will be presented as part of the initial public consultation for WL2. Landfall Option 1 (AC6-WAL-CAE1) has been discounted due to a combination of marine and terrestrial constraints (Section 9.2).

Based on the review undertaken on best information available at the time of writing and the considerations presented within this report, GIR to CAE (Central) has been determined as the preferred option.

10 EMERGING PREFERENCE

10.1 AC5 emerging preference

All marine route corridors considered for the AC5 element of WL2 have been developed with the Schedule 9 commitments in mind, and have been developed to balance risk on technical, environmental and socio-economic constraints and receptors. **Based on this, and the information presented above in Chapters 6 and 7 and Section 9.1, it has been determined that the routeing option from Monkton to Girvan is the current emerging preference for the AC5 element of WL2.** It is important to note that the MCPRSS explicitly discusses preferences relating to offshore route corridor options only, and that landfall siting zone preference is addressed within the TCPRSS.

The AC5 Monkton to Girvan option is the second shortest option at 42.04 km long and benefits from avoiding protected sites and areas of Annex I habitat. This option also benefits from not crossing any existing cable assets or ferry routes. A route deviation has been included for the purpose of avoiding the proposed LirlC Interconnector in order to avoid additional crossings in this area.

The main technical constraint that would be required in relation to this option is the requirement for long trenchless installation methods at the two points of landfall to minimise disturbance to existing socio-economic considerations and Annex I habitat. Additional considerations such as early stakeholder engagement will also be required regarding commercial fisheries activity within the area.

Figure 10.1 illustrates the emerging AC5 preference.

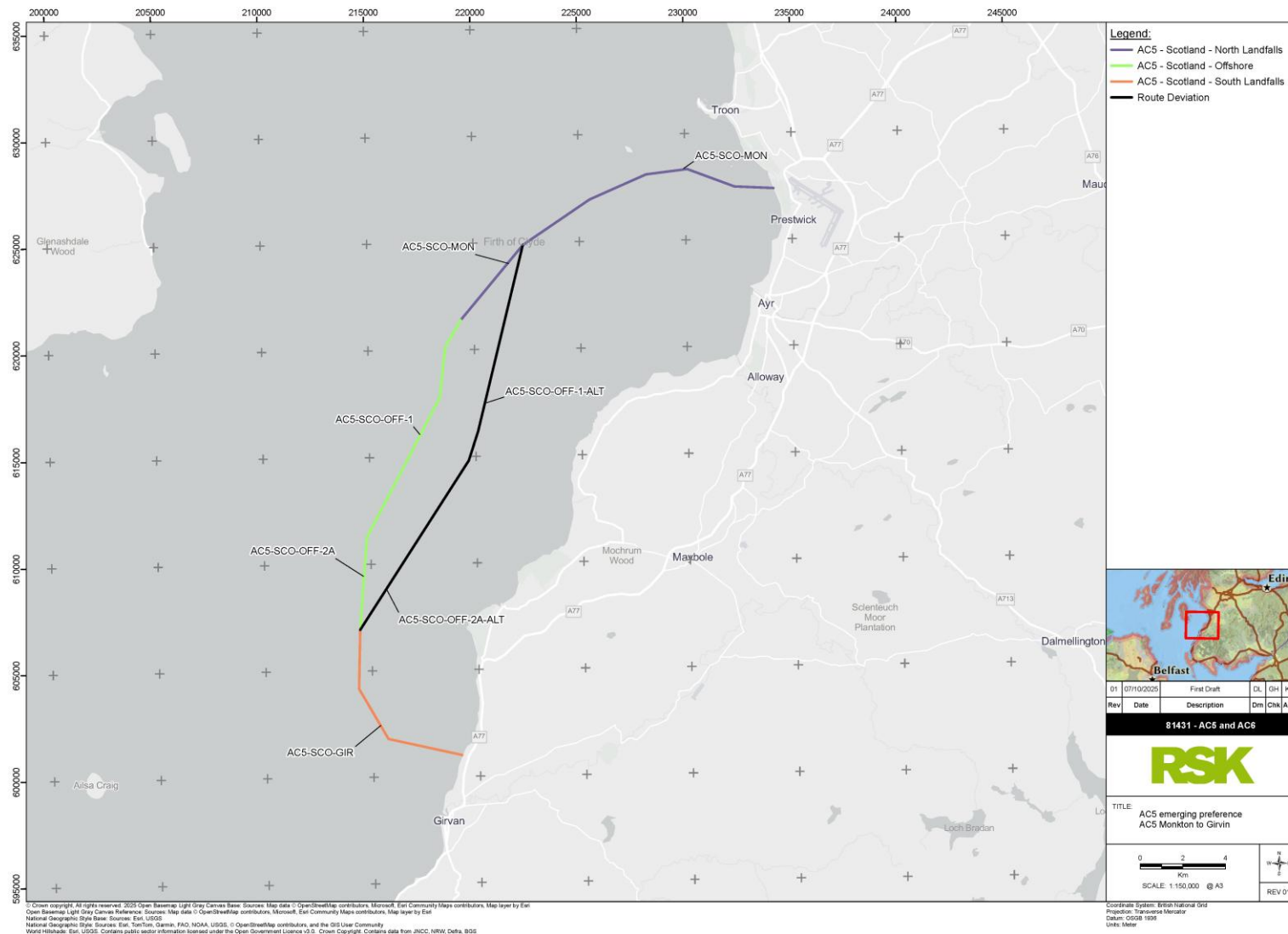


Figure 10.1: AC5 emerging preference – Monkton to Girvan

10.2 AC6 emerging preference

All marine route corridors considered for the AC6 element of WL2 have been developed with the Schedule 9 requirements in mind and to minimise risk on technical, environmental and socio-economic constraints and receptors. **Based on this, and the information presented above in Chapters 6 and 7 and Section 9.2, it has been determined that the routeing option from Girvan to Caernarfon (Central) is the current emerging preference for the AC6 element of WL2.**

The AC6 Girvan to Caernarfon (Central) option benefits from decreased traversal alongside the Beaufort's Dyke disposal site (which lowers the pUXO risk), preferred seabed conditions and increased water depths, and avoidance of hard substrate areas.

The main technical constraints in relation to this option would be the requirement for long trenchless installation methods at the two points of landfall to minimise disturbance to existing socio-economic considerations and Annex I habitat. Additional considerations such as early stakeholder engagement will also be required in relation to the UK National Site Network sites that will be traversed. Early engagement will also be required regarding commercial fisheries activity along the marine route corridor.

Following the landfall selection workshop and subsequent discussions on 16/10/2025, an emerging preference has been identified among the landfall options of the Girvan to Caernarfon (Central) route. The current position is as follows: Landfall option 3 (AC6-WAL-CAE3) has emerged as the preferred option from a marine engineering perspective and will be presented during consultation.. Landfall option 4 (AC6-WAL-CAE4) and Landfall option 2 (AC6-WAL-CAE2) will also be presented during consultation and considered at scoping. Landfall Option 1 (AC6-WAL-CAE1) has been discounted due to a combination of marine and terrestrial constraints. From a marine perspective, shallow bathymetry presents challenges for cable installation. On land, potential site access limitations, a low water table with associated flood risk, and the likelihood of impacts to sensitive habitats such as peatlands and bird populations have all contributed to the decision. While marine technical feasibility assessments are still ongoing, these combined factors have led to the option being discounted.

Figure 10.2 illustrates the emerging preference for AC6.

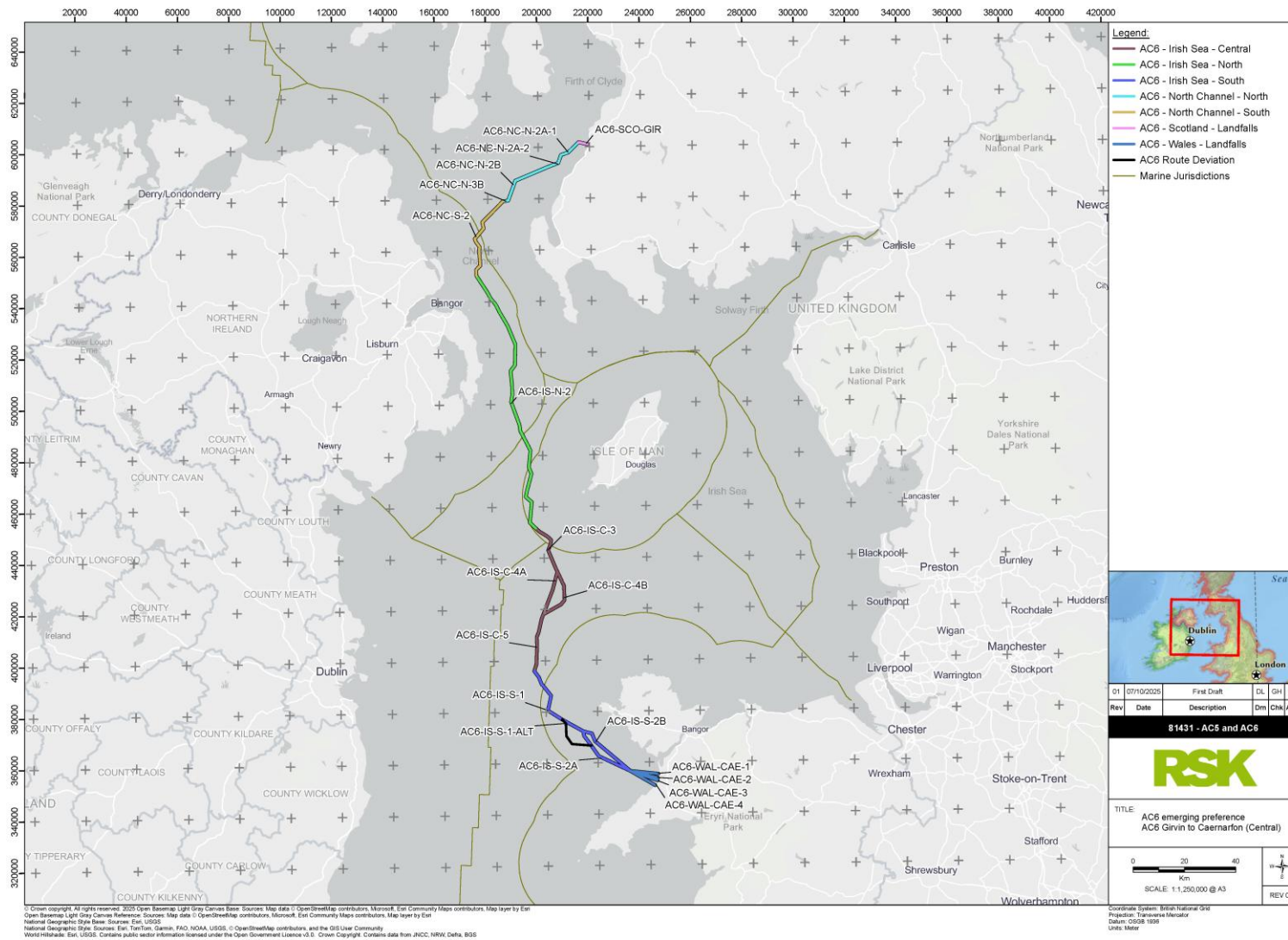


Figure 10.2: AC6 emerging preference – Girvan to Caernarfon (Central)

11 SUMMARY AND NEXT STEPS

11.1 Summary of options identification and selection process

As detailed in Section 4, a detailed options identification and selection process has been undertaken to support the development and identification of proposed marine route corridors for WL2 between the previously identified landfall areas in Scotland and Wales (see Section 2.2). The primary output of this process is the development of this MCPRSS.

In summary and based on a balanced appraisal of technical, environmental, and socio-economic features and receptors, the emerging preferred AC5 and AC6 marine route corridors of WL2 are as follows:

- AC5 Monkton to Girvan
- AC6 Girvan to Caernarfon (Central).

11.2 Pre-application consultation

This report will be used as a supporting document during pre-application consultation and as a means of facilitating engagement with key stakeholders. It is anticipated that non-statutory consultation in relation to the outcomes of options identification and selection and progression into defined proposal and statutory consultation which will take place in 2026.

11.3 Analysing non-statutory consultation feedback

The feedback from non-statutory consultation will be used to inform further development of the marine components of the project. During the non-statutory consultation process, feedback on the preferences identified within this report will be collated.

Ongoing and upcoming marine and intertidal survey works will support the baseline data development and ongoing design studies. This information will also be used to support the development of the marine components of the project.

11.4 Defined proposal and statutory consultation

As detailed in Section 4 and Section 5, following the completion of non-statutory consultation and the analysis of feedback, this project will progress to the defined proposal and statutory consultation stage. As part of this process, the design will be subjected to scoping, a marine environmental appraisal, statutory consultation, and iterative design development prior to submission as part of the marine licensing application process.

12 REFERENCES

- ABPmer (2022), 'DataMapWales, Seal pupping and Haul-Out Sites'. Available online: https://datamap.gov.wales/layers/geonode:seal_pupping_sites (accessed July 2025).
- Aires, C., González-Irusta, J. M. and Watret, R. (2014), 'Updating Fisheries Sensitivity Maps in British Waters', *Scottish Marine and Freshwater Science Report*, 5/10.
- Associated British Ports (ABP) (2024), 'ABP unveils ambitious masterplan for Port of Barrow', Available online: <https://www.abports.co.uk/news-and-media/latest-news/2024/abp-unveils-ambitious-masterplan-for-port-of-barrow/> (accessed August 2025).
- Brown and May Marine (2024), 'AC6 HVDC Project – Strategic Options. Technical Note: Fishing Activity Overview', September.
- Clyde Marine Planning Partnership (2019), 'Clyde Regional Marine Plan Pre-Consultation Draft'.
- Coull, K. A., Johnstone, R. and Rogers, S. I. (1998), 'Fisheries Sensitivity Maps in British Waters', UKOOA Ltd.
- Department of Agriculture, Environment and Rural Affairs (DAERA) (2018), 'Draft Marine Plan for Northern Ireland, Public Consultation, April 2018'.
- Devlin, M., Greenwood, N., Graves, C., Brookes, R., Best, M., O'Kane, E., Mellor, A., Charlesworth, M. and Johns, D. (2025), 'Integrated marine monitoring to protect the Irish Sea', Marine Science Blog. Available online: <https://marinescience.blog.gov.uk/2025/05/13/integrated-marine-monitoring-to-protect-the-irish-sea/> (accessed August 2025).
- Ellis, J., Milligan, S. P., Readdy, L., Taylor, N. and Brown, M. J. (2012), 'Spawning and nursery grounds of selected fish species in UK waters', Cefas.
- EMODnet (2019), 'EMODnet Human Activities, EMSA Route Density Map'. Available online: <https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/metadata/74eef9c6-13fe-4630-b935-f26871c8b661> (accessed June 2025).
- EMODnet (2022), 'EMODnet Human Activities, Fisheries, Fishing Intensity'. Available online: <https://emodnet.ec.europa.eu/geonetwork/srv/eng/catalog.search#/metadata/d57fbdea-489e-4e11-9ff1-f0f706cfe783> (accessed June 2025).
- Evolv Energies (2025a), 'AC5 & AC6 Marine Cables: Marine Corridor & Preliminary Routeing Report'.
- Evolv Energies (2025b), 'Marine Corridor Technical Rationale and Challenges'.
- Gilles, A., Authier, M., Pigeault, R., Ramirez-Martinez, N. C., Benoit, V., Carlström, J., Eira, C., Geelhoed, S. C. V., Laran, S., Sequeira, M., Sveegaard, S., Taylor, N. L., Saavedra, C., Vazquez-Bonales, J. A. and Hammond, P. S. (2025), 'Spatial models of cetacean density in European Atlantic waters based on SCANS-IV summer 2022 survey data', final report published 14 May.
- Gilles, A., Authier, M., Ramirez-Martinez, N. C., Araújo, H., Blanchard, A., Carlström, J., Eira, C., Dorémus, G., FernándezMaldonado, C., Geelhoed, S. C. V., Kyhn, L., Laran, S., Nachtsheim, D., Panigada, S., Pigeault, R., Sequeira, M., Sveegaard, S., Taylor, N. L., Owen, K., Saavedra, C., Vázquez-Bonales, J. A., Unger, B. and Hammond, P. S. (2023), 'Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys', final report published 29 September.

- Halcrow Group Limited (2011) 'North West England and North Wales Shoreline Management Plan 2'. Available at: <https://environment.data.gov.uk/shoreline-planning/documents/SMP22/SMP%20Main%20Document%20FINALV2.pdf> (Accessed August 2025).
- Howe, V. L (2018a), 'Basking Sharks', Manx Marine Environmental Assessment, 1.1 Edition – partial update, Isle of Man Government.
- Howe, V. L (2018b), 'Sea Turtles in Manx Waters', Manx Marine Environmental Assessment, 2nd Ed). Isle of Man Government.
- Isle of Man Government (2012), 'Isle of Man Marine Plan, Marine Development Consenting Consultation, Summary of Responses, December 2012'.
- Isle of Man Government (2018), 'Manx Marine Environmental Assessment Report'.
- Ivor, E. and Rees, S. (2005), 'Assessment of the Status of Horse Mussel (*Modiolus modiolus*) Beds in the Irish Sea off NW Anglesey', DTI – SEA 6, Sub-contact Report.
- Marine Directorate (2019), 'Designated haul-out sites for seals (Protection of Seals Orders)'. Available online: <https://marine.gov.scot/?q=maps/446> (accessed July 2025).
- Marine Directorate (2021), 'Ports and Harbours - Statutory harbour limits'. Available online: <https://marine.gov.scot/maps/841> (accessed June 2025).
- Marine Laboratory (1996), 'Fisheries Research Services Report No 15/96 Surveys of the Beaufort's Dyke Explosives Disposal Site, November 1995 – July 1996. Final Report', The Scottish Office Agriculture, Environment and Fisheries Department.
- Marine Management Organisation (2018), 'Port of Holyhead Expansion: Environmental Impact Assessment Scoping Opinion', GOV.UK. Available at: <https://www.gov.uk/government/publications/port-of-holyhead-expansion> (accessed August 2025).
- Marine Scotland (2015), 'Scotland's National Marine Plan, A Single Framework for Managing Our Seas'.
- Mersey Gateway Environmental Trust (2024), 'Habitat Restoration Projects in the Upper Mersey Estuary'. Available at: <http://www.mget.org.uk> (accessed August 2025).
- Mersey Ferries (2024) *Woodside Ferry Terminal Upgrade*. Available at: <https://www.merseyferries.co.uk/blog/other/woodside-upgrade/> (accessed August 2025).
- National Grid (n.d.), 'Western Power Distribution (South West) plc, (South Wales) plc, (West Midlands) plc and (East Midlands) plc. Schedule 9 Statement'. Available online: <https://www.nationalgrid.co.uk/schedule-9> (accessed June 2025)
- National Grid (2022), 'Our approach to consenting'. Available online: <https://www.nationalgrid.com/document/342336/download>
- Natural Resources Wales (NRW) (2021), 'NRW Evidence Report Otter Survey Wales 2015-2018'. Available online: <https://cdn.cyfoethnaturiol.cymru/694539/osw-6th-report-final.pdf>
- Natural Resources Wales (NRW) (2025), '2025 Bathing Water Profile for Morfa Dinlle', Available online: <https://environment.data.gov.uk/wales/bathing-waters/profiles/profile.html?site=uk11200-39970> (accessed June 2025).

- NatureScot (2018), 'Maerl beds'. Available online: <https://marine.gov.scot/?q=maps/1140> (accessed July 2025).
- NatureScot (2025), 'Seals'. Available online: <https://www.nature.scot/plants-animals-and-fungi/mammals/marine-mammals/seals> (accessed July 2025).
- Ordtek (2025), 'Preliminary Marine UXO Threat And Risk Assessment', July 2025.
- Paxton, C. G. M., Scott-Hayward, L. A. S. and Rexstad, E. (2014), 'Statistical approaches to aid the identification of Marine Protected Areas for minke whale, Risso's dolphin, white-beaked dolphin and basking shark', Scottish Natural Heritage Commissioned Report No. 594.
- Petty, S. (2007), 'Two successful field trips to Ailsa Craig', *The Eider*. Available online: https://argyllbirdclub.org/wp-content/uploads/2011/03/eider_sept_2007.pdf.
- Robinson G. J., Clarke L. J., Banga R., Griffin R. A., Porter J., Morris C. W., Lindenbaum C. P. and Stringell T. B. (2023), 'Grey Seal (*Halichoerus grypus*) Pup Production and Distribution in North Wales during 2017'. NRW Evidence Report No. 293, Natural Resources Wales, Bangor.
- RPS (2024), 'Offshore Renewable Energy Action Plan, SEA Environmental Report'.
- RSK (2024a), 'Preliminary Landfall Siting Study (PLSS) Report'. August.
- RSK (2024b), 'Western Link 2: Strategic Options Review'.
- RSK (2025a), 'Atlantic Herring and Sandeel Spawning AC5 and AC6 Study Report.' April.
- RSK (2025b), 'AC5 and AC6 Options Appraisal Summary Tables – Marine Route Alignments'. May.
- Scottish Government (2023), 'National Marine Plan 2 – Strategic Environmental Assessment Scoping Report'. Available at: <https://www.gov.scot/publications/national-marine-plan-2-strategic-environmental-assessment-scoping-report/> (accessed August 2025).
- Scottish Government (2025), 'Inshore Fisheries and Coastal Communities'. Available online: <https://www.gov.scot/policies/inshore-fisheries/> (accessed June 2025).
- Scottish Power (2022), 'Statement on Preservation of Amenity in accordance with Schedule 9 of the Electricity Act 1989'. Available online: https://www.scottishpower.com/userfiles/document_library/Sched9SPTver9.pdf
- Seafish Kingfisher Information Service (2025), 'UK Fishing Restrictions from Kingfisher, Map'. Available online: <https://kingfisherrestrictions.org/> (accessed June 2025).
- Sims, D. W., Southall, E. J., Richardson, A. J., Reid, P. C. and Metcalfe, J. D. (2003), 'Seasonal movements and behaviour of basking sharks from archival tagging: no evidence of winter hibernation', Marine Ecology Progress Series, 248: 187–196.
- Welsh Assembly Government (2011), 'Inshore Fisheries Legislation (North Wales, 0-6 nautical miles) (Text of the saved Byelaws of the former North Western and North Wales Sea Fisheries Committee)', September.
- Welsh Government (2016), 'Shellfish Waters (Wales) 2016'.
- Welsh Government (2019), 'Welsh National Marine Plan'. Available at: <https://www.gov.wales/welsh-national-marine-plan> (accessed August 2025).



Welsh Government (2025), 'Written Statement: Introduction of Strategic Resource Areas for Tidal Stream Energy', January. Available online: <https://www.gov.wales/written-statement-introduction-strategic-resource-areas-tidal-stream-energy> (accessed June 2025).

APPENDIX 1 BIOLOGICAL ENVIRONMENT

Designated and protected sites summary

Qualifying features summary

Table A1.1 outlines the qualifying features of the identified designated sites noted within Section 7.2.1. Sites have been included whereby they support marine feature or habitats that extend to and beyond mean high water springs, which qualifying features are dependent on. All features have been noted for completeness.

A report was undertaken to identify highly sensitive designated sites associated with offshore wind farm development and associated marine route corridors. This can subsequently be attributed to other energy cable installations. None of the sites noted below were identified within the study (NE and JNCC, 2019)⁵.

Table A1.1: Qualifying features of identified designated sites

Site name	Jurisdiction	Distance and intersection*	Qualifying features
Special Area of Conservation (SAC) sites			
North Channel SAC	Northern Ireland	0 km (direct intersection)	Harbour porpoise
North Anglesey Marine/Gogledd Môn Forol SAC	Wales	0 km (direct intersection)	Harbour porpoise
Pisces Reef Complex SAC	UK offshore waters	720 m	Reefs
Croker Carbonate Slabs SAC	UK offshore waters	1.2 km	Submarine structures made by leaking gases
Mull of Galloway SAC	Scotland	1.63 km	Vegetated sea cliffs
Abermenai to Aberffraw Dunes/Y Twyni o Abermenai i Aberffraw SAC	Wales	2.36 km	Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) Humid dune slacks Natural eutrophic lakes with <i>Magnopotamion</i> or <i>Hydrocharition</i> – type vegetation Petalwort (<i>Petalophyllum ralfsii</i>)

⁵ Natural England (NE) and Joint Nature Conservation Committee (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'.

Site name	Jurisdiction	Distance and intersection*	Qualifying features
			Shoredock (<i>Rumex rupestris</i>)
The Maidens SAC	Northern Ireland	3.12 km	Grey seal Sandbanks that are slightly covered by sea water all the time Reefs
Luce Bay and Sands SAC	Scotland	3.05 km	Large shallow inlets and bays Embryonic shifting dunes Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) Fixed coastal dunes with herbaceous vegetation (grey dunes) Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>) Sandbanks that are slightly covered by sea water all the time Mudflats and sandflats not covered by seawater at low tide Reefs Great crested newt (<i>Triturus cristatus</i>)
Afon Gwyrfai a Llyn Cwellyn SAC	Wales	3.51 km	Atlantic salmon Otter Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or of the <i>Isoëto-Nanojuncetea</i> Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation Floating water-plantain (<i>Luronium natans</i>)
Anglesey Coast: Saltmarsh/Glannau Mon: Cors Heli SAC	Wales	5.47 km	Salicornia and other annuals colonising mud and sand Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) Estuaries Mudflats and sandflats not covered by seawater at low tide
Holy Island Coast/Glannau Ynys Gybi SAC	Wales	8.48 km	Vegetated sea cliffs of the Atlantic and Baltic Coasts European dry heaths Northern Atlantic wet heaths with <i>Erica tetralix</i>
Special Protection Area (SPA) and Ramsar sites			
Irish Sea Front SPA	UK offshore waters	0 km (direct intersection)	Manx shearwater, breeding
Anglesey Terns/Morwenoliaid Ynys Môn SPA	Wales	0 km (direct intersection)	Common tern, breeding Arctic tern, breeding

Site name	Jurisdiction	Distance and intersection*	Qualifying features
			Roseate tern, breeding Sandwich tern, breeding
Copelands Islands SPA	Northern Ireland	3.45 km	Arctic tern (<i>Sterna paradisaea</i>), breeding Manx shearwater, breeding
Outer Ards SPA and Ramsar	Northern Ireland	5.74 km	Arctic tern, breeding Golden plover (<i>Pluvialis apricaria</i>), wintering Light-bellied Brent goose (<i>Branta bernicla</i>), wintering Ringed plover (<i>Charadrius hiaticula</i>), wintering Turnstone (<i>Arenaria interpres</i>), wintering Manx shearwater, breeding ⁶
Larne Lough SPA and Ramsar	Northern Ireland	9.35 km	Sandwich tern (<i>Thalasseus sandvicensis</i>), breeding ⁷ Roseate tern (<i>Sterna dougallii</i>), breeding Common tern (<i>Sterna hirundo</i>), breeding Light-bellied Brent goose, wintering
Ailsa Craig SPA	Scotland	0 km (direct intersection)	Seabird assemblage, breeding: <ul style="list-style-type: none"> • common guillemot • herring gull (<i>Larus argentatus</i>) • black-legged kittiwake (<i>Rissa tridactyla</i>) Northern gannet, breeding Lesser black-backed gull (<i>Larus fuscus</i>), breeding
Loch of Inch and Torrs Warren SPA and Ramsar	Scotland	9.9 km	Greenland white-fronted goose (<i>Anser albifrons</i>), wintering Hen harrier (<i>Circus cyaneus</i>), wintering
Sites of Special Scientific Interest (SSSI)			
Dinas Dinlle SSSI	Wales	0 km (direct intersection)	Pleistocene/Quaternary landform assemblage and associated subsurface stratigraphical profile
The Gobbins SSSI	Northern Ireland	7.14 km	Basalt sea cliffs Breeding seabird colony: <ul style="list-style-type: none"> • black-legged kittiwake • razorbill (<i>Alca torda</i>) • Atlantic puffin (<i>Fratercula arctica</i>) • northern fulmar (<i>Fulmarus glacialis</i>) • cormorant (<i>Phalacrocorax carbo</i>) • European shag (<i>Phalacrocorax aristotelis</i>)

⁶ Only a feature of the Ramsar site.

⁷ Only a feature of the SPA site.

Site name	Jurisdiction	Distance and intersection*	Qualifying features
			<ul style="list-style-type: none"> • common guillemot Maritime plant communities
Portmuck SSSI	Northern Ireland	8.39 km	Cretaceous Hibernian Sea cliff communities Limited saltmarsh and calcareous grassland Breeding seabirds: <ul style="list-style-type: none"> • razorbill • common guillemot • Atlantic puffin • black-legged kittiwake • northern fulmar
Larne Lough SSSI	Northern Ireland	9.34 km	Sea lough Jurassic rocks of planorbis zone age Brackish lagoon Mudflats Rocky shores Saltmarsh Breeding tern and common gull (<i>Larus canus</i>) populations Nationally important wintering birds: <ul style="list-style-type: none"> • goldeneye (<i>Bucephala clangula</i>) • great crested grebe (<i>Podiceps cristatus</i>) • red-breasted merganser (<i>Mergus serrator</i>) • shelduck (<i>Tadorna tadorna</i>) • greenshank (<i>Tringa nebularia</i>) • redshank (<i>Tringa totanus</i>)
Cloghfin Port SSSI	Northern Ireland	8.48 km	Mesozoic (Triassic and Cretaceous) strata
Outer Ards SSSI	Northern Ireland	6.73 km	Ordovician rock Maritime vegetation communities Dune habitat Maritime grassland Maritime heath and cliff ledge vegetation Saltmarsh Tidal and non-tidal ferns
Copeland Islands SSSI	Northern Ireland	3.54 km	Breeding seabirds: <ul style="list-style-type: none"> • Manx shearwater • Arctic tern • mediterranean gull (<i>Ichthyaetus melanocephalus</i>) • common gull • eider duck (<i>Somateria mollissima</i>).

Site name	Jurisdiction	Distance and intersection*	Qualifying features
			Maritime cliff vegetation Saltmarsh
Ailsa Craig SSSI	Scotland	3.18 km	Breeding seabird colony: <ul style="list-style-type: none"> • razorbill • common guillemot • black-legged kittiwake • herring gull • lesser black-backed gull • Northern gannet, breeding Beetles Flies Tertiary Igneous
Mull of Galloway SSSI	Scotland	1.60 km	Northern fulmar, breeding Black-legged kittiwake, breeding
Port Logan SSSI	Scotland	4.25 km	Quaternary of Scotland
Grennan Bay SSSI	Scotland	4.24 km	Caledonian Structures of the Southern Uplands
Morroch Bay SSSI	Scotland	4.37 km	Llandeilo
Salt Pans Bay SSSI	Scotland	2.16 km	Maritime cliff
Corsewall Point to Milleur Point SSSI	Scotland	1.77 km	Caradoc - Ashgill
Girvan to Ballantrae Coast Section SSSI	Scotland	0.11 km	Arenig – Llanvirn Caradoc – Ashgill Llandovery Ordovician Igneous
Turnberry Dunes SSSI	Scotland	2.63 km	Beetle assemblage
Troon Golf Links and Foreshore SSSI	Scotland	0 km (direct intersection)	Sand dunes
Western Gailes SSSI	Scotland	0 km (direct intersection)	Sand dunes Invertebrate assemblage
Bogside Flats SSSI	Scotland	3.79 km	Mudflats Saltmarsh
Ardrossan to Saltcoats Coast SSSI	Scotland	7.41 km	Carboniferous - Permian Igneous
Maidens to Doonfoot SSSI	Scotland	4.77 km	Carboniferous - Permian Igneous Invertebrate assemblage Lower Carboniferous (Dinantian - Namurian (part)) Maritime cliff Old Red Sandstone Igneous

Site name	Jurisdiction	Distance and intersection*	Qualifying features
			Shingle Upland mixed ash woodland
Turnberry Lighthouse to Port Murray SSSI	Scotland	3.88 km	Old Red Sandstone Igneous
Morfa Dinlle SSSI	Wales	2.42 km	Sand dune Shingle plant communities Geomorphological interest
Gwydir Bay SSSI	Wales	2.90 km	Soft piddock (<i>Pholadidae</i> spp.) bored substrata
Holy Island Coast/Glannau Ynys Gybi SSSI	Wales	8.70 km	Intertidal Caves and overhangs Rockpools Under boulders Invertebrate communities Sea cliffs Cambrian rocks Coastal heaths Lowland heaths Breeding bird populations: <ul style="list-style-type: none"> • common guillemot • razorbill • Atlantic puffin • northern fulmar • peregrine (<i>Falco peregrinus</i>) • chough (<i>Pyrrhocorax pyrrhocorax</i>).
Glannau Rhoscolyn SSSI	Wales	8.59 km	Intertidal Saltmarsh Eel grass (<i>Zostera</i> spp.) Exposed rock Precambrian rocks Lowland and coastal heathland and associated communities Chough and peregrine populations Breeding European shag, raven (<i>Corvus corax</i>) and kestrel (<i>Falco tinnunculus</i>) Diverse algal communities Specialised communities (i.e., bedrock overhangs)
Ynys Mon Ty Croes SSSI	Wales	8.91 km	Precambrian mica schist of the Mona complex Coastal heathland Rockpools

Site name	Jurisdiction	Distance and intersection*	Qualifying features
			Surge gullies Grassland flushes Cliff communities Chough Marsh fritillary (<i>Euphydryas aurinia</i>)
Tywyn Aberffraw SSSI	Wales	9.90 km	Calcareous dune system with dune ridges Damp slacks Saltmarsh Dune grassland
Penrhynoedd Llangadwaladr SSSI	Wales	8.39 km	Exposed rocky coast Rockpools Tide-swept algae Under boulders Sub maritime grassland Sand dune Dune grassland Rare plant communities Breeding European shag and lesser black-backed gull
Y Foryd SSSI	Wales	2.26 km	Eurasian wigeon (<i>Mareca penelope</i>) Eel grass
Newborough Warren - Ynys Llanddwyn SSSI	Wales	6.03 km	Dunes Northern pintail Saltmarsh Moderately exposed sand Rockpools Gwna Group on Llanddwyn Island Coastal geomorphological features and processes
Yr Eifl SSSI	Wales	7.04 km	Heathland and heather species Chough
Marine Conservation Zone (MCZ) sites			
Queenie Corner MCZ	UK offshore waters	0 km (direct intersection)	Subtidal mud Seapen and burrowing megafauna communities
South Rigg MCZ	UK offshore waters	1.12 km	Moderate energy circalittoral rock Subtidal coarse sediment Subtidal sand Subtidal mud Subtidal mixed sediment Seapen and burrowing megafauna communities

Site name	Jurisdiction	Distance and intersection*	Qualifying features
Marine Protected Area (MPA) sites			
Clyde Sea Sill NCMPA	Scotland	0 km (direct intersection)	Black guillemot Circalittoral and offshore sand and coarse sediment communities Fronts Marine geomorphology of the Scottish shelf seabed
South Arran MPA	Scotland	7.76 km	Burrowed mud Kelp and seaweed communities on sublittoral sediment Maerl beds Maerl or coarse shell gravel with burrowing sea cucumbers Ocean quahog (<i>Arctica islandica</i>) aggregations Shallow tide-swept coarse sands with burrowing bivalves Seagrass beds
Marine nature reserve (MNR) sites			
Calf and Wart Bank MNR	Isle of Man	6.59 km	Rocky reefs Sandbanks Kelp forests Sea caves Manx shearwater Atlantic puffin Seal species (grey and harbour) Basking shark Risso's dolphin Minke whale Crayfish (<i>Austropotamobius pallipes</i>) Sandeel
West Coast MNR	Isle of Man	7.85 km	Rocky reefs Intertidal blue mussel beds Mixed soft sediments Kelp forests Basking shark European eel (<i>Anguilla anguilla</i>) Seabirds Harbour porpoise Sandeel Grey seal European bass (<i>Dicentrarchus labrax</i>)

Site name	Jurisdiction	Distance and intersection*	Qualifying features
Port Erin Bay MNR	Isle of Man	9.32 km	Rocky reefs Kelp forests Brittlestar (<i>Ophiuroidea</i> spp.) beds Nursery areas Basking shark Northern fulmar European shag Herring gull Bottlenose dolphin Stalked jellyfish (<i>Stauromedusae</i> spp.) Flame shell (<i>Limaria hians</i>)
Area of Outstanding Natural Beauty (AONB) and Heritage Coast			
Llŷn	Wales	0 km (direct intersection)	Designated exceptional landscape whose distinctive character and natural beauty are precious enough to be safeguarded in the national interest, including: <ul style="list-style-type: none"> • 60 nesting pairs of chough • 15,500 hectares of land • 70% of the area's population are Welsh speakers • 242 listed buildings and structures • 22 SSSI • 55 mile section designated as a Heritage Coast.

Notes: Please note that distances are based on approximate estimates.

Intersection summary

Where it has been identified that marine route corridors directly intersect a designated site, the specific route intersection is noted in Table A1.2.

Table A1.2: Marine route corridor intersection summary for identified designated sites

Route	Designated site								Total
	Clyde Sea Sill NCMPA	Queenie Corner MCZ	North Channel SAC	North Anglesey Marine/ Gogledd Môn Forol SAC	Irish Sea Front SPA	Anglesey Terns/Morwenoliaid Ynys Môn SPA	Dinas Dinlle SSSI	Llyn AONB and Heritage Coast	
AC5-SCO-BAR									0
AC5-SCO-MON									0
AC5-SCO-OFF-1									0
AC5-SCO-OFF-2A									0
AC5-SCO-OFF-2B									0
AC5-SCO-GIR									0
AC5-SCO-BAL-1									0
AC5-SCO-BAL-2									0
AC6-SCO-GIR									0
AC6-SCO-BAL									0
AC6-WAL-CAE-1									2
AC6-WAL-CAE-2									1
AC6-WAL-CAE-3									1
AC6-WAL-CAE-4									1
AC6-NC-N-1A									1
AC6-NC-N-1B									1
AC6-NC-N-1C									1
AC6-NC-N-2A-1									0

Route	Designated site								Total
	Clyde Sea Sill NCMPA	Queenie Corner MCZ	North Channel SAC	North Anglesey Marine/ Gogledd Môn Forol SAC	Irish Sea Front SPA	Anglesey Terns/Morwenoliaid Ynys Môn SPA	Dinas Dinlle SSSI	Llyn AONB and Heritage Coast	
AC6-NC-N-2A-2									0
AC6-NC-N-2B									1
AC6-NC-N-2C									0
AC6-NC-N-3A									1
AC6-NC-N-3B									1
AC6-NC-N-4									0
AC6-NC-S-1A									1
AC6-NC-S-1B									1
AC6-NC-S-1C									0
AC6-NC-S-2									1
AC6-IS-N-1									1
AC6-IS-N-2									1
AC6-IS-N-3									1
AC6-IS-C-1A									1
AC6-IS-C-1B									2
AC6-IS-C-2									1
AC6-IS-C-3									1
AC6-IS-C-4A									2
AC6-IS-C-4B									2
AC6-IS-C-5									1
AC6-IS-S-1									1

Route	Designated site								Total
	Clyde Sea Sill NCMPA	Queenie Corner MCZ	North Channel SAC	North Anglesey Marine/ Gogledd Môn Forol SAC	Irish Sea Front SPA	Anglesey Terns/Morwenoliaid Ynys Môn SPA	Dinas Dinlle SSSI	Llyn AONB and Heritage Coast	
AC6-IS-S-2A									0
AC6-IS-S-2B									1
Total									29

Designated and protected site descriptions

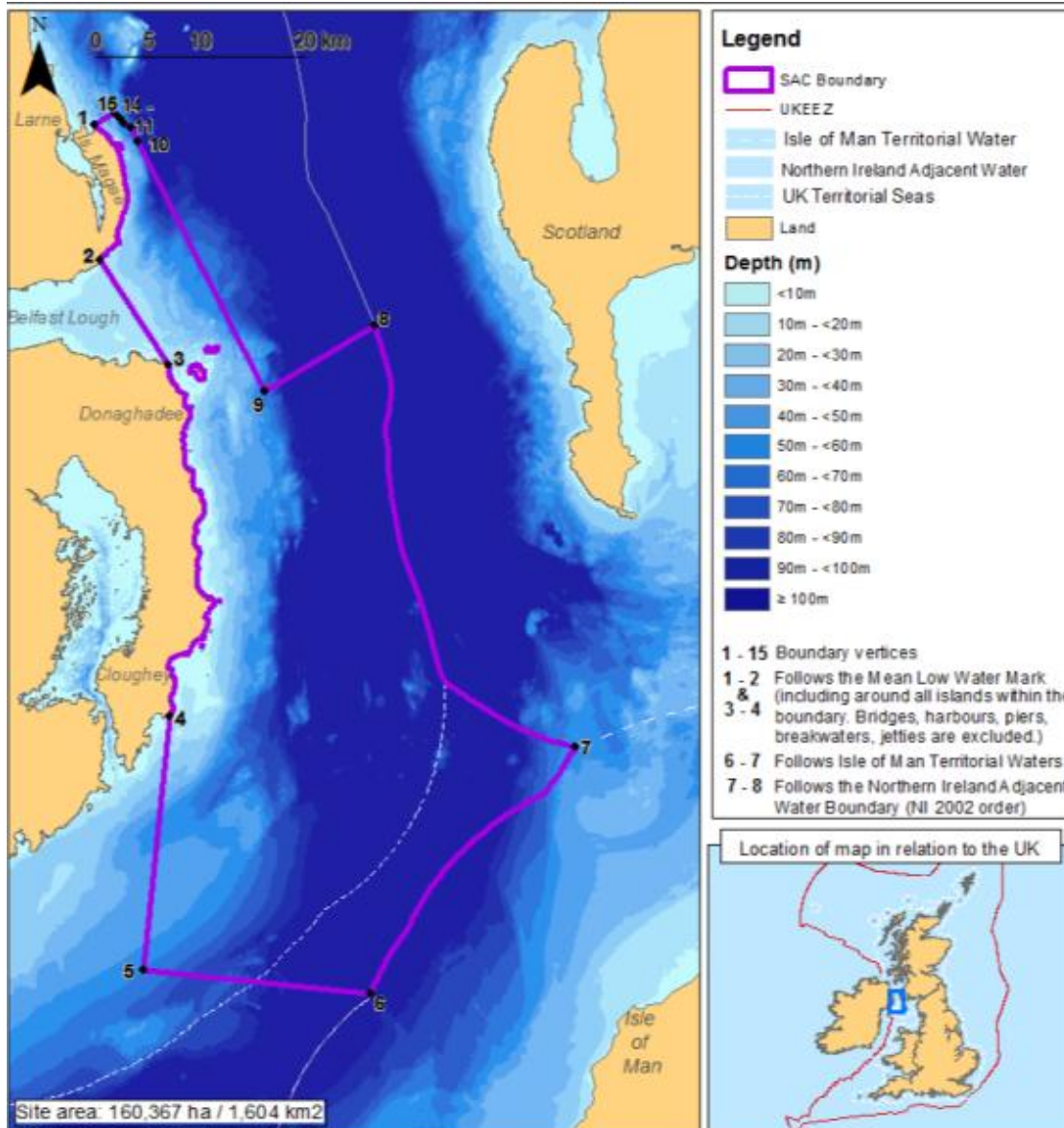
SACs

Further detail on SAC sites whereby there is direct overlap with the marine route corridors is provided here.

North Channel SAC

The North Channel SAC covers an area of approximately 1,604 km² located in the eastern coast of Northern Ireland (Figure A1.1). The site lies both within territorial Northern Irish waters and UK offshore waters⁸; 85% of the total site area falls within Northern Irish waters (JNCC and DAERA, 2019)⁸.

⁸ Joint Nature Conservation Committee (JNCC) and Department of Agriculture, Environment and Rural Affairs (DAERA) (2019), 'Harbour Porpoise (*Phocoena phocoena*) Special Area of Conservation: North Channel, Conservation Objectives and Advice on Operations, March 2019'.



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ID	Latitude	Longitude	ID	Latitude	Longitude	ID	Latitude	Longitude
1	54° 51' 34.7" N	5° 45' 46.6" W	6	54° 11' 30.7" N	5° 5' 8.3" W	11	54° 51' 50.6" N	5° 42' 33.9" W
2	54° 44' 55.9" N	5° 42' 33.0" W	7	54° 25' 59.8" N	4° 52' 7.7" W	12	54° 52' 1.0" N	5° 43' 14.3" W
3	54° 40' 30.7" N	5° 34' 37.0" W	8	54° 44' 48.0" N	5° 17' 30.8" W	13	54° 52' 11.2" N	5° 43' 35.8" W
4	54° 23' 6.4" N	5° 27' 40.7" W	9	54° 40' 16.0" N	5° 25' 43.8" W	14	54° 52' 19.8" N	5° 43' 59.1" W
5	54° 10' 8.4" N	5° 25' 0.3" W	10	54° 51' 14.4" N	5° 41' 45.0" W	15	54° 52' 25.8" N	5° 44' 21.3" W

Figure A1.1: North Channel SAC boundary map

Source: JNCC and DAERA (2019)⁸

The site was designated in 2019 due to its importance for harbour porpoise in winter months, based off analysis undertaken by Heinänen and Skov (2015)⁹. It is estimated that the site supports approximately 1.2% of the UK Celtic and Irish Seas (CIS) Management Unit (MU). The boundary

⁹ Heinänen, S. and Skov, H. (2015), 'The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area', JNCC Report No.544 JNCC, Peterborough.

of the SAC was defined based on areas of predicted high density for the species (Figure A1.2, JNCC and DAERA, 2019)⁸.

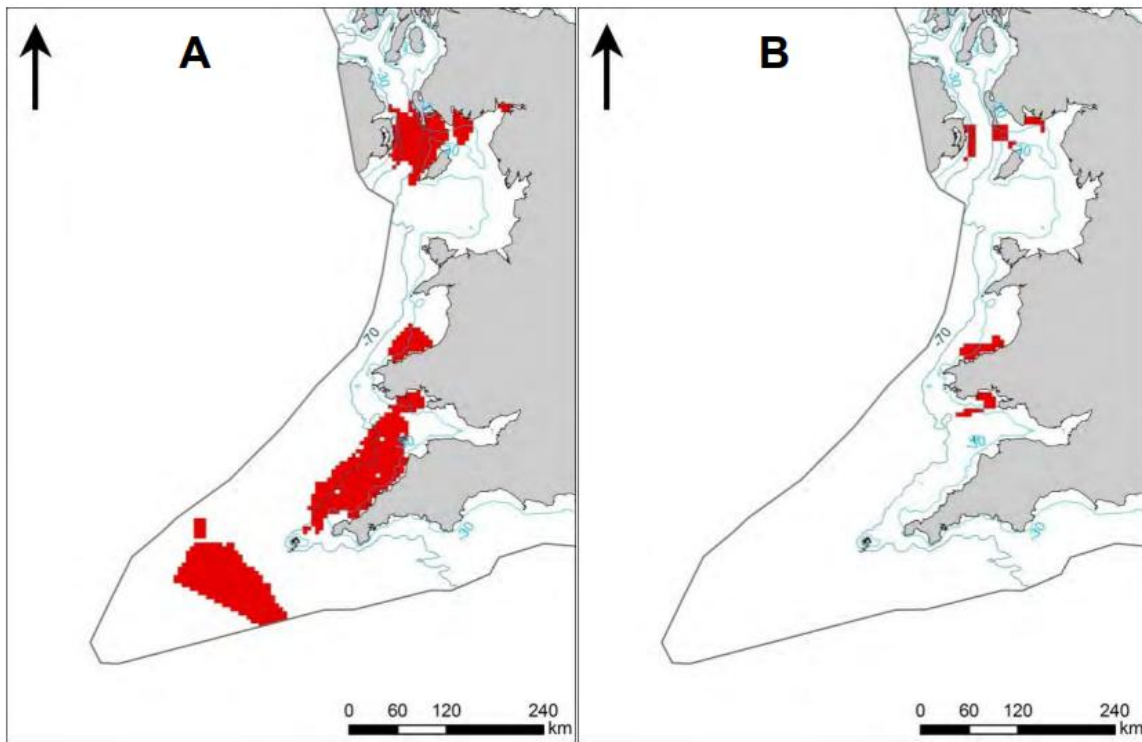


Figure A1.2: High density areas identified for harbour porpoise during winter months in relation to the North Channel SAC

Notes: Red areas mark persistent high density areas with survey effort from three or more years.

Source: Heinänen and Skov (2015)⁹

Habitats within the SAC constitute areas of coarse or sandy sediments interspersed with rock and mud patches. Depths reach up to 150 m, specifically at the eastern boundary of the site; the average depth ranges between 10 to 40 m (JNCC and DAERA, 2019)⁸.

The Conservation Objectives for the site are outlined below.

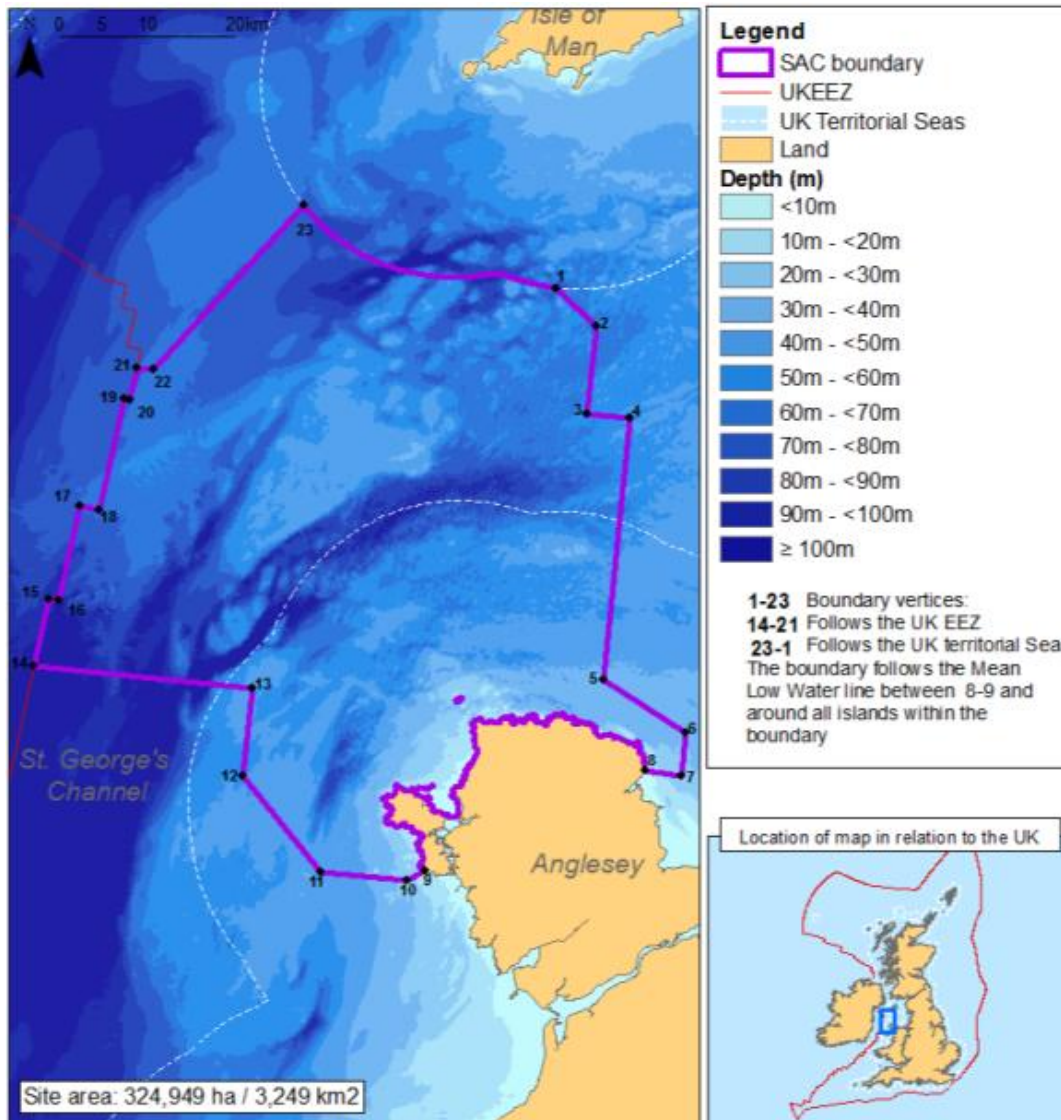
Table A1.3: Conservation Objectives for the qualifying features of the North Channel SAC

Qualifying feature	Conservation Objective
Harbour porpoise	<p>To avoid deterioration of the habitats of the harbour porpoise or significant disturbance to the harbour porpoise, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to maintaining Favourable Conservation Status (FCS) for the UK harbour porpoise.</p> <p>To ensure for harbour porpoise, subject to natural change, that the following attributes are maintained or restored in the long term:</p> <ul style="list-style-type: none"> • harbour porpoise is a viable component of the site • there is no significant disturbance of the species • the condition of supporting habitats and processes, and the availability of prey is maintained.

North Anglesey Marine/Gogledd Môn Forol SAC

The North Anglesey Marine/Gogledd Môn Forol SAC extends north and west off the coast of Anglesey and is located both within Welsh territorial waters and UK offshore waters (Figure A1.3). The site covers an area of approximately 3,235 km² extending to 100 m below sea level, although the majority of the site is within 50 m of shallower water. The SAC is designated also for harbour porpoise (JNCC et al., 2019)¹⁰.

¹⁰ Joint Nature Conservation Committee (JNCC), Natural Resources Wales (NRW) and Department of Agriculture, Environment and Rural Affairs (DAERA) (2019), 'Harbour Porpoise (*Phocoena phocoena*) Special Area of Conservation: North Anglesey Marine/Gogledd Môn Forol, Conservation Objectives and Advice on Operations'.



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ID	Latitude	Longitude	ID	Latitude	Longitude	ID	Latitude	Longitude	ID	Latitude	Longitude
1	53° 51' 13.5" N	4° 35' 25.8" W	7	53° 23' 31.3" N	4° 12' 22.2" W	13	53° 23' 20.3" N	4° 57' 33.8" W	19	53° 38' 60" N	5° 17' 0" W
2	53° 49' 25.9" N	4° 30' 32.1" W	8	53° 23' 27.2" N	4° 16' 4.9" W	14	53° 21' 47.7" N	5° 20' 0.0" W	20	53° 38' 60" N	5° 16' 20.4" W
3	53° 44' 5.1" N	4° 29' 34.5" W	9	53° 14' 36.2" N	4° 36' 12.8" W	15	53° 25' 60" N	5° 20' 0" W	21	53° 40' 59.383" N	5° 16' 20.401" W
4	53° 44' 22.0" N	4° 25' 4.0" W	10	53° 13' 49.5" N	4° 37' 45.7" W	16	53° 25' 60" N	5° 19' 0" W	22	53° 41' 6.545" N	5° 14' 35.945" W
5	53° 28' 19.3" N	4° 22' 14.9" W	11	53° 13' 14.7" N	4° 46' 40.1" W	17	53° 32' 0" N	5° 19' 0" W	23	53° 52' 54.106" N	5° 2' 58.412" W
6	53° 26' 11.8" N	4° 12' 49.5" W	12	53° 17' 59.8" N	4° 56' 34.0" W	18	53° 32' 0" N	5° 17' 0" W			

Figure A1.3: North Anglesey Marine/Gogledd Môn Forol SAC site boundary

Source: JNCC et al. (2019)¹⁰

The site was designated as a result of being an important area for the species during summer months (Figure A1.4; Heinänen and Skov, 2015)⁹.

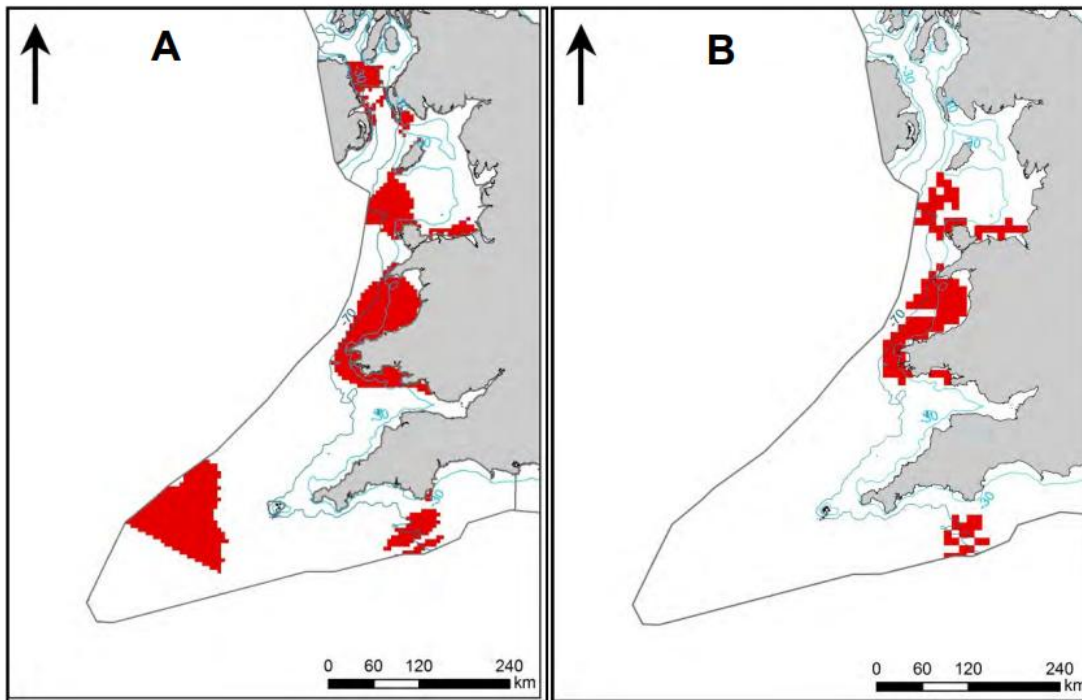


Figure A1.4: High-density areas identified for harbour porpoise during summer months in relation to the North Anglesey Marine/Gogledd Môn Forol SAC

Notes: Red areas mark persistent-high density areas with survey effort from three or more years.

Source: Heinänen and Skov (2015)⁹

Habitats within the SAC comprise of a mix of habitats, including rock, coarse and sandy sediments and mud (JNCC et al., 2019)¹⁰.

The Conservation Objectives for the site are outlined below.

Table A1.4: Conservation Objectives for the qualifying features of the North Anglesey Marine/Gogledd Môn Forol SAC

Qualifying feature	Conservation Objective
Harbour porpoise	<p>To avoid deterioration of the habitats of the harbour porpoise or significant disturbance to the harbour porpoise, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to maintaining FCS for the UK harbour porpoise.</p> <p>To ensure for harbour porpoise, subject to natural change, that the following attributes are maintained or restored in the long term:</p> <ul style="list-style-type: none"> • harbour porpoise is a viable component of the site • there is no significant disturbance of the species • the condition of supporting habitats and processes, and the availability of prey is maintained.

SPAs

Further detail on SPA sites whereby there is direct overlap with the marine route corridors is provided here.

Irish Sea Front SPA

The Irish Sea Front SPA is located within the Irish Sea, approximately 35 km south-west of the Isle of Man and 36 km to the north-west of Anglesey. The site lies entirely within UK offshore waters and covers 180 km² (Figure A1.5). The SPA was noted for its importance as a foraging site for Manx shearwater (Figure A1.6), with estimated population numbers of approximately 12,039 individuals¹¹, constituting the third largest marine aggregation of the species to be identified in UK waters (Mitchell et al., 2004¹²; JNCC, 2016¹³).

¹¹ The population figure is based on spatial interpolation and taken directly from the modelled output. While a precise figure is quoted, it should only be considered an indication of the scale of the population size rather than an absolute measurement.

¹² Mitchell, P. I., Newton, S. F., Ratcliffe, N. and Dunn, T. E. (2004), *Seabird populations of Britain and Ireland. Results of the Seabird 2000 census (1998 - 2002)* (Christopher Helm, London).

¹³ Joint Nature Conservation Committee (JNCC) (2016), 'Draft Departmental Brief, Irish Sea Front Potential SPA, February 2016'.

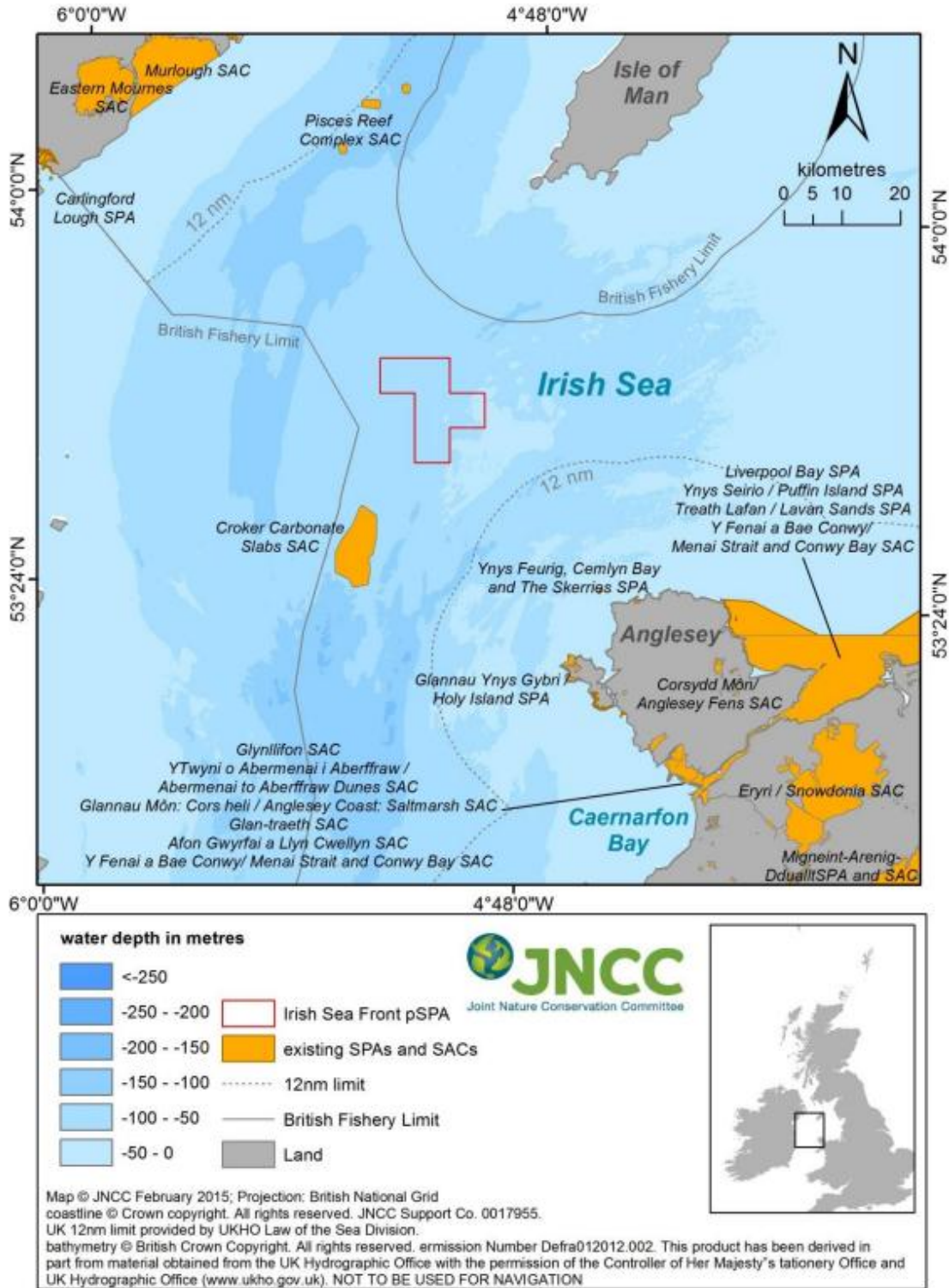


Figure A1.5: Irish Sea Front SPA site boundary

Source: JNCC (2016)¹³

Manx shearwater presence at the SPA is summarised in Table A1.5.

Table A1.5: Seasonality table for Manx shearwater presence at the Irish Sea Front SPA

Feature	Month												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Manx shearwater													
Key							Highest densities of individuals						
							Presence but in lower densities						

Source: JNCC (2023)¹⁴

¹⁴ Joint Nature Conservation Committee (JNCC) (2023), 'Irish Sea Front Special Protection Area UK site: UK9020328, Conservation Objectives and Advice on Operations.

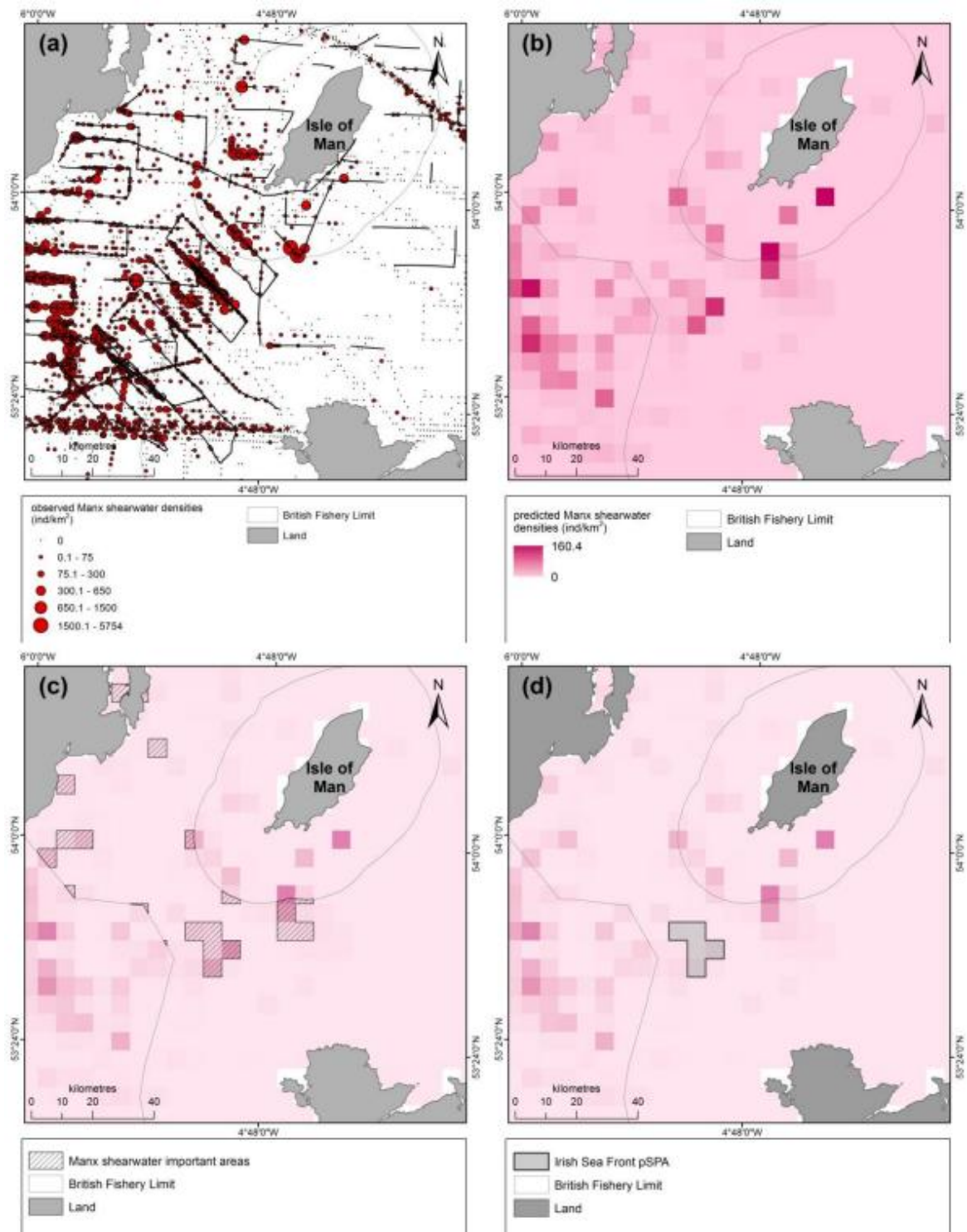


Figure A1.6: Analytical steps used to identify important areas for Manx shearwater in the Irish Sea

Notes: (a) raw European Seabirds at Sea observations on Manx shearwaters during the breeding season; (b) predicted densities of Manx shearwaters; (c) important areas for Manx shearwaters within the British fishery limits; and (d) boundary of the Irish Sea Front potential SPA, the only important area holding >1% of the biogeographic population on a near-regular basis in the region and which is located within UK offshore waters.

Source: JNCC (2016)¹³

The Conservation Objectives for the site are outlined below.

Table A1.6: Conservation Objectives for the qualifying features of the Irish Sea Front SPA

Qualifying feature	Conservation Objective
Manx shearwater	<p>To avoid significant deterioration of the habitats used by the qualifying species, or significant disturbance to the qualifying species, subject to natural change, thus ensuring that the integrity of the site is maintained in the long term and makes an appropriate contribution to achieving the aims of the Conservation of Habitats and Species Regulations 2017.</p> <p>This contribution would be achieved through delivering the following objectives for the site's qualifying feature:</p> <ul style="list-style-type: none"> • avoid significant disturbance of the qualifying feature within the site, so that the ability of the species to use the site is maintained in the long-term • maintain the habitats, processes and food resources of the qualifying feature in favourable condition • ensure connectivity between the site and its supporting habitats and Manx shearwater breeding colonies is maintained.

Anglesey Terns/Morwenoliaid Ynys Môn SPA

The Anglesey Terns/Morwenoliaid Ynys Môn SPA extends the majority of the east, north and west coast of Anglesey out to between 10 and 20 km offshore. The site, previously the Ynys Feurig, Cemlyn Bay and The Skerries SPA, was extended to include the marine areas utilised by tern species during the breeding season and not just the breeding sites (NRW, 2015¹⁵, Figure A1.7).

Table A1.7 summarises the qualifying features of the Anglesey Terns/Morwenoliaid Ynys Môn SPA.

Table A1.7: Summary of qualifying ornithological interest in Anglesey Terns/Morwenoliaid Ynys Môn SPA

Qualifying feature	Count	% of relevant population (%)
Common tern	189	1.5
Arctic tern	1,290	2.9
Roseate tern	3	5
Sandwich tern	460	3.3

Source: NRW (2015)¹⁵

The breeding season for terns associated with the SPA is summarised in Table A1.8.

¹⁵ Natural Resources Wales (NRW) (2015), 'Proposal to extend and reclassify Ynys Feurig, Cemlyn Bay and The Skerries Special Protection Area and rename it as ANGLESEY TERNS/MORWENOLIAID YNYS MÔN SPECIAL PROTECTION AREA Advice to the Welsh Government'.

Table A1.8: Seasonality table for tern presence at the Anglesey Terns/Morwenoliaid Ynys Môn SPA

Qualifying feature	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Common tern					■	■	■	■	■			
Arctic tern					■	■	■	■				
Roseate tern						■	■	■				
Sandwich tern					■	■	■	■	■			

Notes: This table illustrates the approximate breeding season for the noted tern species based on best available guidance at the time. These are indicated periods only and there may be variations, i.e., breeding periods may commence earlier in Wales. Green indicates the breeding season.

Source: NatureScot (2020)¹⁶

¹⁶ NatureScot (2020), 'Seasonal Periods for Birds in the Scottish Marine Environment', Short Guidance Note, Version 2. October 2020'.

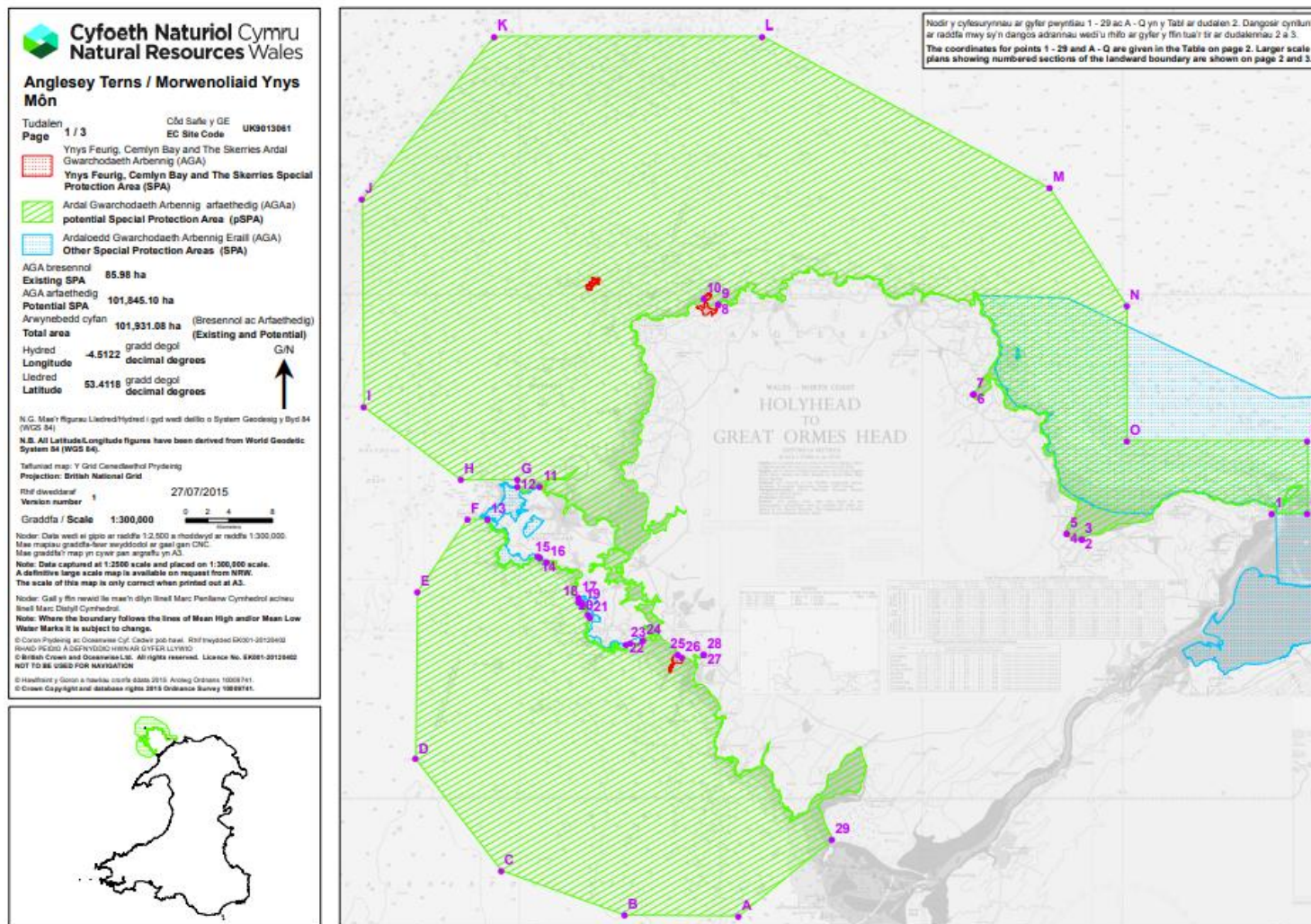


Figure A1.7: Anglesey Terns/Morwenoliaid Ynys Môn SPA site boundary in relation to previous Ynys Feurig, Cemlyn Bay and The Skerries SPA

Source: NRW (2015)¹⁵

The Conservation Objectives for the site are outlined below.

Table A1.9: Conservation Objectives for the qualifying features of the Anglesey Terns/Morwenoliaid Ynys Môn SPA

Qualifying feature	Conservation Objective
Arctic tern	<p>The breeding population of Arctic tern should be stable or increasing. The site was designated for 1,290 pairs across the SPA.</p> <p>The range and distribution of terns within the SPA and beyond is not constrained or hindered.</p> <p>The extent of supporting habitats used by terns is stable or increasing.</p> <p>Supporting habitats are of sufficient quality to support the requirements of terns</p> <p>There are appropriate and sufficient food sources for terns within access of the SPA.</p> <p>The number of chicks successfully fledged in the SPA and beyond is sufficient to help sustain the population.</p> <p>Actions or events likely to impinge on the sustainability of the population are under control.</p> <p>There should be no mammalian land predators present in the SPA, and control measures should be in place to ensure that accidental introduction does not take place.</p>
Common tern	<p>The breeding population of common tern should be stable or increasing. The site was designated for 189 pairs across the SPA.</p> <p>The range and distribution of terns within the SPA and beyond is not constrained or hindered.</p> <p>The extent of supporting habitats used by terns is stable or increasing.</p> <p>Supporting habitats are of sufficient quality to support the requirements of terns</p> <p>There are appropriate and sufficient food sources for terns within access of the SPA.</p> <p>The number of chicks successfully fledged in the SPA and beyond is sufficient to help sustain the population.</p> <p>Actions or events likely to impinge on the sustainability of the population are under control.</p> <p>There should be no mammalian land predators present in the SPA, and control measures should be in place to ensure that accidental introduction does not take place.</p>
Roseate tern	<p>The breeding population of roseate tern should be stable or increasing. The site was designated for three pairs across the SPA.</p> <p>The range and distribution of terns within the SPA and beyond is not constrained or hindered.</p> <p>The extent of supporting habitats used by terns is stable or increasing.</p> <p>Supporting habitats are of sufficient quality to support the requirements of terns.</p> <p>There are appropriate and sufficient food sources for terns within access of the SPA.</p>

Qualifying feature	Conservation Objective
	<p>The number of chicks successfully fledged in the SPA and beyond is sufficient to help sustain the population.</p> <p>Actions or events likely to impinge on the sustainability of the population are under control.</p> <p>There should be no mammalian land predators present in the SPA, and control measures should be in place to ensure that accidental introduction does not take place.</p>
Sandwich tern	<p>The breeding population of sandwich tern should be stable or increasing. The site was designated for 460 pairs across the SPA.</p> <p>The range and distribution of terns within the SPA and beyond is not constrained or hindered.</p> <p>The extent of supporting habitats used by terns is stable or increasing.</p> <p>Supporting habitats are of sufficient quality to support the requirements of terns.</p> <p>There are appropriate and sufficient food sources for terns within access of the SPA.</p> <p>The number of chicks successfully fledged in the SPA and beyond is sufficient to help sustain the population.</p> <p>Actions or events likely to impinge on the sustainability of the population are under control.</p> <p>There should be no mammalian land predators present in the SPA, and control measures should be in place to ensure that accidental introduction does not take place.</p>

MPAs

Further detail on MPA sites whereby there is direct overlap with the marine route corridors is provided here.

Clyde Sea Sill MPA

The Clyde Sea Sill MPA covers an area of 712 km² and stretches from Mull of Kintyre to Corsewall Point on the Rhins of Galloway. Within the MPA, a sill is located where the North Channel becomes the Firth of Clyde. This sill causes cooler, saline waters of the North Channel to mix with warmer, less saline waters of the Clyde, forming a front (NatureScot, 2025)¹⁷.

The seabed sediments constitute coarse and mixed sediments off Kintyre, while sandy mud habitats are located on the Galloway side. Within the MPA, the marine environment is highly dynamic, supporting a range of species. Toward the north-west of the MPA, a breeding black guillemot colony is located, using the Sanda Island, Sheep Island and Glunimore Island as feeding areas (NatureScot, 2025). The site reference population of guillemot is 440 (1998–2003). The latest count of individuals concluded 220 individuals (2021); a 50% decline compared to its citation year (NatureScot, 2025)¹⁷.

A feature map of the MPA is illustrated in Figure A1.8.

¹⁷ NatureScot (2025), 'Conservation and Management Advice, Clyde Sea Sill MPA, April 2025'.

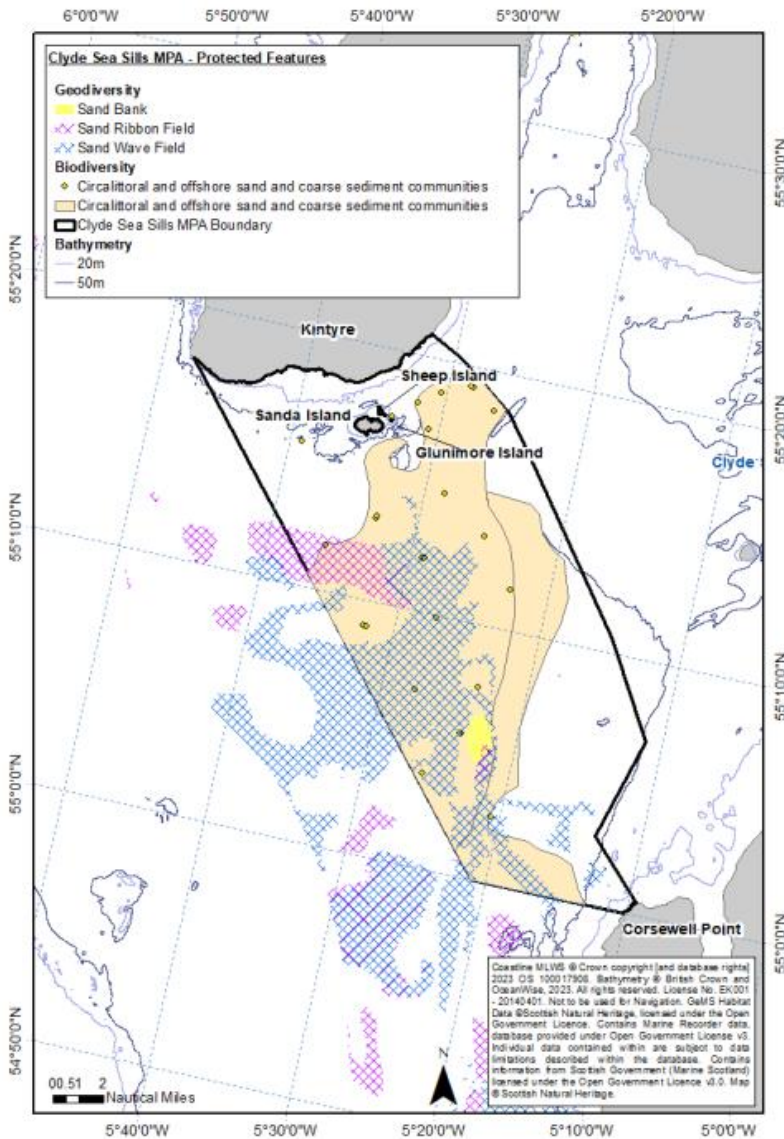


Figure A1.8: Protected feature map of the Clyde Sea Sill MPA

Source: NatureScot (2025)¹⁷

Potential seasonality for black guillemot at the Clyde Sea Sill MPA is presented in Table A1.10.

Table A1.10: Seasonality table for black guillemot presence at the Clyde Sea Sill MPA

Species	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	
Black guillemot												
Key		Breeding site attendance (not close association with site)										
		Breeding season (strong association with site)										
		Flightless moult period										

Notes: These are indicated periods only and there may be variations.

Source: NatureScot (2020)¹⁶

The Conservation Objectives for the site are outlined below.

Table A1.11: Conservation Objectives for the qualifying features of the Clyde Sea Sill MPA

Qualifying feature	Conservation Objective
Black guillemot	<p>The Conservation Objectives of the Clyde Sea Sill MPA are that the protected features:</p> <ul style="list-style-type: none"> so far as already in favourable condition, remain in such condition so far as not already in favourable condition, be brought into such condition, and remain in such condition.
Circalittoral and offshore sand and coarse sediment communities	
Fronts	
Marine geomorphology of the Scottish shelf seabed	

MCZs

Further detail on MCZ sites whereby there is direct overlap with the marine route corridors is provided here.

Queenie Corner MCZ

The Queenie Corner MCZ, located in the western Irish Sea covers an area of 146 km² and reaches depths of up to 50 m.

The site protects subtidal mud and benthic communities, in tandem supporting a wider range of species (Norway lobster, shrimps, crabs, bivalves etc.). The fine mud habitats are characterised by the burrows and mounds formed by burrowing organisms (DEFRA, 2019)¹⁸.

A feature map of the MCZ is illustrated in Figure A1.9.

¹⁸ Department for Environment, Food and Rural Affairs (DEFRA) (2019a), 'Queenie Corner Marine Conservation Zone'. 31 May 2019.

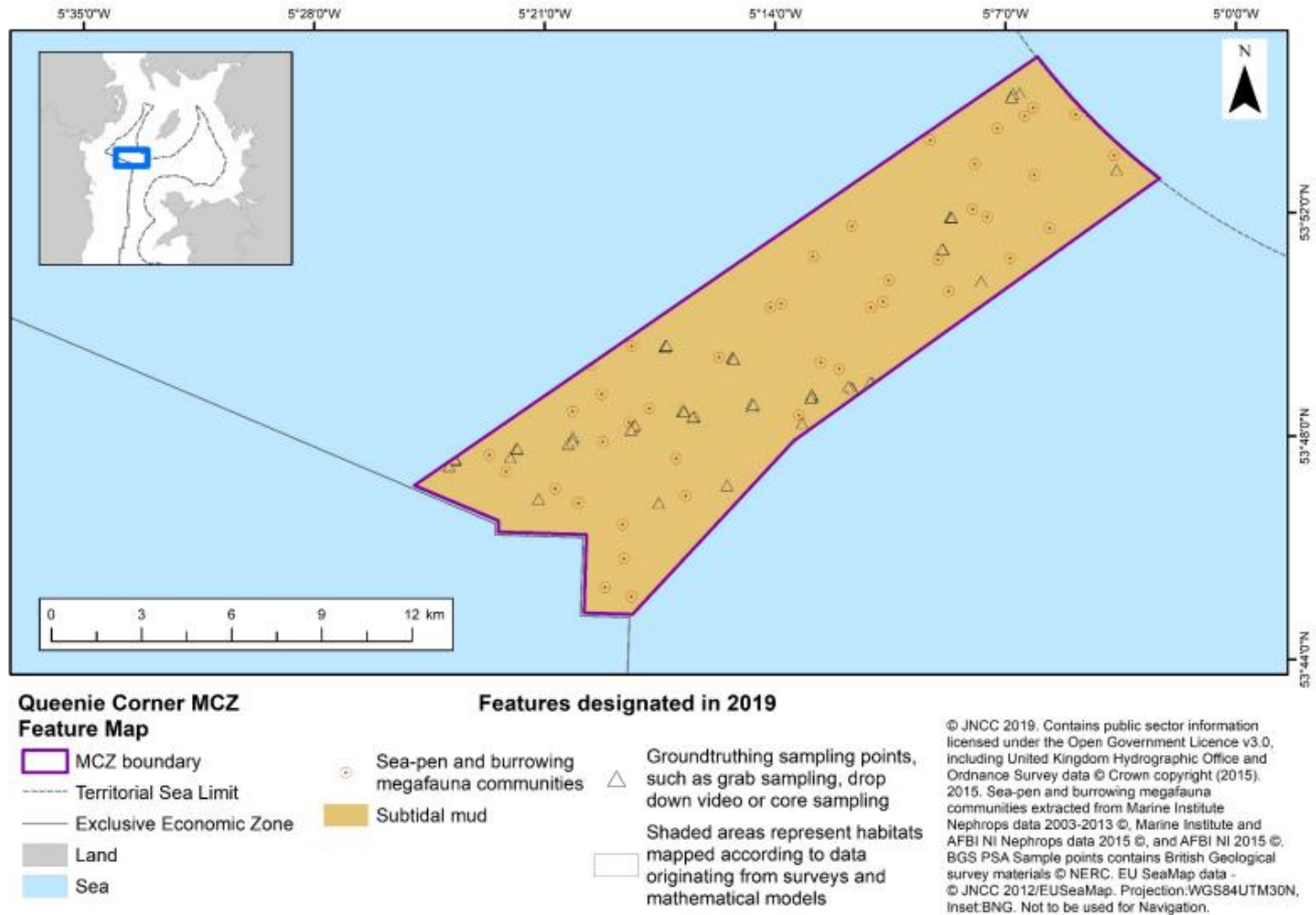


Figure A1.9: Protected feature map of the Queenie Corner MCZ¹⁹

¹⁹ Department for Environment, Food and Rural Affairs (DEFRA) (2019c), 'Queenie Corner MCZ, Feature Map, May 2019'.

The Conservation Objectives for the site are outlined below.

Table A1.12: Conservation Objectives for the qualifying features of the Queenie Corner MCZ

Qualifying feature	Conservation Objective
Subtidal mud	Recover to favourable condition.
Seapen and burrowing megafauna communities	

SSSIs

Further detail on SSSI sites whereby there is direct overlap with the marine route corridors is provided here.

Dinas Dinlle SSSI

Dinas Dinlle SSSI (Figure A1.10) comprises a 900-m-long stretch of coastal cliffs, designated for the nationally important sequence of sediments deposited during the last Ice Age which it provides. The one designated feature is specifically:

- Pleistocene/Quaternary landform assemblage and associated subsurface stratigraphical profile.

The deposits within the SSSI are a complex series of Irish Sea and Welsh tills associated with sands and gravels that have been extensively folded and faulted. There are further two drift mounds within the SSSI that are also important features as to how sediments may have accumulated (NRW, n.d.)²⁰.



Figure A1.10: Dinas Dinlle

²⁰ Natural Resources Wales (NRW) (n.d.), 'Dinas Dinlle Site of Special Scientific Interest'.

The Conservation Objectives for the site are outlined below.

Table A1.13: Conservation Objectives for the qualifying features of the Dinas Dinlle SSSI

Qualifying feature	Conservation Objective
Pleistocene/Quaternary landform assemblage and associated subsurface stratigraphical profile	Maintaining the current level and continuity of sediment exposure along the cliffs

AONBs

Further detail on AONB sites whereby there is direct overlap with the marine route corridors is provided here.

Llŷn AONB and Heritage Coast

The Llŷn AONB (Figure A1.11) is designated due to its exceptional landscape whose distinctive character and natural beauty are precious enough to be safeguarded in the national interest. The purpose of its designation is to conserve and enhance the natural beauty of the designated area

Designated in 1957, the AONB covers an area of up to 15,500 hectares. The site further encompasses 22 SSSIs, and a 55-mile section of the AONB is designated as a Heritage Coast. Specifically, the following aspects are deemed special qualities of the AONB:

- landscape and coast
- tranquillity and a clean environment
- wealth of wildlife
- historic environment
- Welsh language
- people and close knit communities
- local produce and rural businesses
- rights of way and access.



Figure A1.11: Llŷn AONB boundary

Source: Llŷn Area of Outstanding Natural Beauty Ardal o Harddwch Naturiol Eithriadol (2025)²¹

²¹Llŷn Area of Outstanding Natural Beauty Ardal o Harddwch Naturiol Eithriadol (2025), 'Home'. Available online: <https://www.ahne-llyn-aonb.org/Home> (accessed July 2025)

Annex I habitats

The marine route corridors largely avoid Annex I habitat types, although there is some intersection at the Welsh landfall that cannot be avoided. It is anticipated that trenchless installation methods at landfall can be used to avoid the reef. These habitats are detailed below.

It is appreciated that while Annex I habitats are largely avoided by the marine route corridors, indirect impacts associated with sediment resuspension and smothering may still impact such habitats located near the project.

1170 Reef

Annex I reef habitats have been identified to intersect with the marine route corridor options that are not associated with any SAC designation. Such reef habitats constitutes both bedrock, stony and biogenic reef.

The marine route corridors which intersect Annex I reef habitats are as follows:

- AC6-WAL-CAE-1
- AC6-WAL-CAE-2
- AC6-WAL-CAE-3
- AC6-WAL-CAE-4
- AC5-SCO-BAL-2
- AC6-SCO-BAL.

Annex I reef habitats tend to be submarine or are exposed at low tide. They are formed of rocky substrates and/or biogenic concretions that arise from the seafloor in the sublittoral zone; however, they may extend into the littoral area.

Reef habitats support a range of benthic communities that tend to form in strict zonation patterns based on a range of factors (depth, tidal exposure, etc.). Species composition tends to include a range of algae, invertebrate and vertebrate species, alongside concretions, encrustations and corallogenic concretions. Two types of reef are recognised; one whereby animal and plan communities develop on rock/stable boulders/cobles, or those whereby a structure is created by a species itself (i.e., biogenic reef) (EUNIS, 2025)²².

Reef habitats that have been identified to intersect with the marine route corridors are noted as the following.

Table A1.14: Potential reef habitats identified in relation to the marine route corridors

EUNIS biotope and marine habitat classification	Habitat description	Comments	Route intersection
Possible subtidal reef	NA	Very poor confidence data Rough ground close to shore, but	AC6-WAL-CAE-1 AC6-WAL-CAE-2 AC6-WAL-CAE-3

²² EUNIS (2025), 'Habitat Annex I Directive hierarchal view, Coastal and Halophytic Habitats, Open sea and tidal areas, Reefs'. Available online: <https://eunis.eea.europa.eu/habitats/10009> (accessed July 2025).

EUNIS biotope and marine habitat classification	Habitat description	Comments	Route intersection
		does not extend far offshore	
NA	Rock at surface Outcropping rock visible from bathymetry	Potential bedrock and/or stony reef	AC5-SCO-BAL-2 AC6-SCO-BAL
<i>Mytilus edulis</i> beds on littoral mixed substrata (LS.LBR.LMus.Myt.Mx and A2.7211)	Mid and lower shore mixed substrate comprised largely of cobbles and pebbles on fine sediments with aggregations of mussels (<i>Mytilus edulis</i>) colonising the sediment. Species may extend to also colonise the cobbles. Provide habitat for a range of infauna and epifauna when in high densities (e.g., <i>Fucus vesiculosus</i> , <i>Semibalanus balanoides</i> , <i>Carcinus maenas</i> <i>Lanice conchilega</i> , etc.). In habitats with boulders present, <i>Patella vulgata</i> and <i>Nucella lapillus</i> may occur, among other species.	Potential biogenic reef	AC6-WAL-CAE-1 AC6-WAL-CAE-2 AC6-WAL-CAE-3
<i>Fucus vesiculosus</i> on mid eulittoral mixed substrata (LR.LLR.F.Fves.X and A1.3132)	Occurring in sheltered and mid eulittoral zone, pebbles and cobbles lying on sediment are characterised by the presence of <i>Fucus vesiculosus</i> for this habitat type. <i>Semibalanus balanoides</i> and <i>Patella vulgata</i> may also be found on cobbles. <i>Littorina littorea</i> , among other species, commonly graze on seaweed biofilm and so may be present in high densities.	Potential bedrock and/or stony reef	AC6-WAL-CAE-1 AC6-WAL-CAE-2 AC6-WAL-CAE-3 AC6-WAL-CAE-4
<i>Fucus serratus</i> on full salinity lower eulittoral mixed substrata (LR.LLR.F.Fserr.X and A1.3152)	Dense strands of <i>Fucus serratus</i> occurring in the sheltered lower eulittoral. Crab (<i>Carcinus maenas</i>) and winkle (<i>Littorina littorea</i>) species and <i>Mytilus edulis</i> are often interspersed throughout cobbles and pebbles. Encrusting species such as <i>Semibalanus</i>	Potential bedrock and/or stony reef	AC6-WAL-CAE-1 AC6-WAL-CAE-3

EUNIS biotope and marine habitat classification	Habitat description	Comments	Route intersection
	<p><i>balanoides</i>, <i>Patella vulgata</i> and the red algae <i>Lithothamnion</i> spp. may be found on mussel species and larger cobbles. Other algae species can also occur in patches.</p>		
<p><i>Semibalanus balanoides</i> and <i>Littorina</i> spp. on exposed to moderately exposed eulittoral boulders and cobbles (LR.HLR.MusB.Sem.LitX and A1.1133)</p>	<p>Large patches of boulders/cobbles/pebbles interspersed throughout the eulittoral zone on exposed to moderately exposed shorelines, colonised by <i>Semibalanus balanoides</i> and, on larger rocks, <i>Patella vulgata</i>. Winkle and whelk species also occur in high densities (<i>Littorina</i> spp. and <i>Nucella lapillus</i>). Species such as <i>Mytilus edulis</i> <i>Carcinus maenas</i> and gammarid amphipods may occur in low abundances between cobbles and pebbles. Other algae such as <i>Chondrus crispus</i>, <i>Mastocarpus stellatus</i> and <i>Fucus vesiculosus</i> may also be present in low densities.</p>	<p>Potential bedrock and/or stony reef</p>	<p>AC6-WAL-CAE-1 AC6-WAL-CAE-2 AC6-WAL-CAE-3</p>
<p><i>Laminaria saccharina</i>, <i>Chorda filum</i> and dense red seaweeds on shallow unstable infralittoral boulders and cobbles (IR.HIR.KSed.LsacChoR and A3.123)</p>	<p>This habitat constitutes seasonally disturbed unstable boulders and cobbles in very shallow water. It is commonly dominated by the noted algal species. Encrusting coralline algae and brown crusting species are also common; sediment tolerant seaweeds are most abundant. Fauna is typically sparse, the most conspicuous species being <i>Asterias rubens</i>, <i>Pagurus bernhardus</i> and <i>Necora puber</i>.</p>	<p>High confidence bedrock and/or stony reef</p>	<p>AC6-WAL-CAE-1 AC6-WAL-CAE-4</p>
<p><i>Porphyra purpurea</i> or <i>Enteromorpha</i> spp. on sand-scoured mid or lower eulittoral rock</p>	<p>This habitat is characterised by exposed or moderately exposed mid-shore bedrock and</p>	<p>Potential bedrock and/or stony reef</p>	<p>AC6-WAL-CAE-1 AC6-WAL-CAE-2 AC6-WAL-CAE-3</p>

EUNIS biotope and marine habitat classification	Habitat description	Comments	Route intersection
(LR.FLR.Eph.EntPor and A1.452)	boulders adjacent to sandy habitats. Hence the community is typically dominated via green and red seaweeds over wrack species. In less scoured areas, barnacles (<i>Semibalanus balanoides</i> and <i>Elminius modestus</i>), limpets (<i>Patella vulgata</i>) and occasional winkles (<i>Littorina</i> spp.) may be present below such seaweeds.		AC6-WAL-CAE-4
Ephemeral green and red seaweeds on variable salinity and/or disturbed eulittoral mixed substrata (LR.FLR.Eph.EphX and A2.821)	Composition of eulittoral mixed sediments of pebbles and cobbles overlying sand/mud and characterised by dense blankets of red and green seaweeds. Common species are <i>Ulva intestinalis</i> , <i>Ulva lactuca</i> and <i>Porphyra</i> spp. A small number of fauna and infauna species may occur including, <i>Semibalanus balanoides</i> , <i>Austrominius modestus</i> , <i>Mytilus edulis</i> and <i>Carcinus maenas</i> .	Potential bedrock and/or stony reef	AC6-WAL-CAE-2 AC6-WAL-CAE-3
<i>Chthamalus</i> spp. on exposed upper eulittoral rock (LR.HLR.MusB.Cht and A1.112)	Occurring on very exposed to moderately exposed shorelines, upper and mid eulittoral bedrock and boulders may be characterised by dense barnacle (e.g., <i>Chthamalus montagui</i> , <i>Chthamalus stellatus</i> and <i>Semibalanus balanoides</i>) and limpet (e.g., <i>Patella vulgata</i>) communities. Mussel and winkles may also occur interspersed between boulders, alongside coralline algae and anemone species.	High confidence bedrock and/or stony reef	AC6-WAL-CAE-3
<i>Fucus spiralis</i> on full salinity exposed to moderately exposed upper eulittoral rock (LR.MLR.BF.FspiB and A1.212)	Band of <i>Fucus spiralis</i> overlying <i>Verrucaria maura</i> and <i>Verrucaria mucosa</i> . Characteristic of exposed to moderately exposed eulittoral bedrock. Under algal fronds a	High confidence bedrock and/or stony reef	AC6-WAL-CAE-3

EUNIS biotope and marine habitat classification	Habitat description	Comments	Route intersection
	community of <i>Patella vulgata</i> , <i>Littorina saxatilis</i> , <i>Littorina littorea</i> , <i>Mytilus edulis</i> and <i>Semibalanus balanoides</i> may be present.		
<i>Semibalanus balanoides</i> , <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral rock (LR.HLR.MusB.Sem.Sem and A1.1131)	Ranging from very exposed to sheltered coastlines of mid to upper eulittoral bedrock and large boulders. This habitat is commonly characterised by dense aggregations of <i>Semibalanus balanoides</i> and <i>Patella vulgata</i> . Seaweeds are not common in this habitat type.	High confidence bedrock and/or stony reef	AC6-WAL-CAE-3 AC6-WAL-CAE-4
<i>Fucus vesiculosus</i> on moderately exposed to sheltered mid eulittoral rock (LR.LLR.F.Fves and A1.313)	This habitat constitutes dense canopies of <i>Fucus vesiculosus</i> on moderately exposed/very sheltered shorelines of mid eulittoral bedrock and large boulders. There may also be sparse coverings of <i>Semibalanus balanoides</i> and <i>Patella vulgata</i> , with other species of winkles and mussels present.	High confidence bedrock and/or stony reef	AC6-WAL-CAE-3 AC6-WAL-CAE-4
<i>Fucus serratus</i> and red seaweeds on moderately exposed lower eulittoral rock (LR.MLR.BF.Fser.R and A1.2141)	<i>Fucus serratus</i> and turf-forming red seaweeds (e.g., <i>Osmundea pinnatifida</i> , <i>Mastocarpus stellatus</i> or <i>Corallina officinalis</i>) on moderately exposed lower eulittoral bedrock. The hydroid <i>Dynamena pumila</i> may occur on <i>Fucus serratus</i> fronds, while the sponge <i>Halichondria panicea</i> can be found on the bedrock beneath. A number of additional red and green seaweeds may also be present in the habitat, providing a key sheltered habitat for a number of species (e.g., <i>Patella vulgata</i> , <i>Semibalanus</i>	High confidence bedrock and/or stony reef	AC6-WAL-CAE-3 AC6-WAL-CAE-4

EUNIS biotope and marine habitat classification	Habitat description	Comments	Route intersection
	<i>balanoides</i> or <i>Nucella lapillus</i>)		
<i>Enteromorpha</i> spp. on freshwater-influenced and/or unstable upper eulittoral rock (LR.FLR.Eph.Ent and A1.451)	An upper shore hard substratum habitat that is largely unstable. This habitat type is commonly lacking in species diversity though dense mats of <i>Enteromorpha</i> spp. occurs. The occasional limpet (<i>Patella vulgata</i>), winkle (<i>Littorina</i> spp.) and barnacle (<i>Semibalanus balanoides</i>) may however occur.	Potential bedrock and/or stony reef	AC6-WAL-CAE-3 AC6-WAL-CAE-4
<i>Fucus serratus</i> and under-boulder fauna on exposed to moderately exposed lower eulittoral boulders (LR.MLR.BF.Fser.Bo and A1.2142)	This habitat type possesses a high species richness. Upper surfaces of boulders are colonised similar to other <i>Fucus serratus</i> biotopes (i.e., <i>Patella vulgata</i> , <i>Nucella lapillus</i> , <i>Actinia equina</i> <i>Semibalanus balanoides</i>). Shaded sides of boulders are typically colonised by red foliose seaweeds (e.g., <i>Mastocarpus stellatus</i>), while green seaweeds (e.g., <i>Ulva intestinalis</i>) may occur underneath the <i>Fucus serratus</i> canopy. Species assemblages under the boulders are dependent on sediment type. Muddy shores typically are limited in infauna species. Where more space between boulders is available, species diversity increases with more mobile species (e.g., <i>Porcellana platycheles</i> and <i>Carcinus maenas</i>). The richest examples of this biotope also contain a variety of brittlestars, ascidians and small hydroid.	High confidence bedrock and/or stony reef	AC6-WAL-CAE-3
<i>Semibalanus balanoides</i> , <i>Patella vulgata</i> and <i>Littorina</i> spp. on exposed to moderately exposed or vertical sheltered eulittoral	Found on very exposed to sheltered mid to upper eulittoral bedrock and large boulders. It is commonly characterised	High confidence bedrock and/or stony reef	AC6-WAL-CAE-4

EUNIS biotope and marine habitat classification	Habitat description	Comments	Route intersection
rock (LR.HLR.MusB.Sem.Sem and A1.1131)	by barnacles (i.e., <i>Semibalanus balanoides</i>) and limpets (i.e., <i>Patella vulgata</i>). Though relatively low density, species may be found within cracks and crevices (i.e., mussel, winkle and whelk species). A sparse algal community may also be found, with patches of red algae (e.g., <i>Osmundea pinnatifida</i>).		
<i>Fucus vesiculosus</i> and barnacle mosaics on moderately exposed mid eulittoral rock (LR.MLR.BF.FvesB and A1.213)	Exposed to moderately exposed bedrock and boulders are commonly associated with <i>Semibalanus balanoides</i> and the wrack <i>Fucus vesiculosus</i> . Other species are also present (i.e., limpet and whelk species) with some confined to crevices (e.g., anemone, <i>Actinia equina</i> , and mussel, <i>Mytilus edulis</i>). On the underside of the <i>Fucus vesiculosus</i> community, red seaweeds (e.g., <i>Corallina officinalis</i> , <i>Mastocarpus stellatus</i> and <i>Osmundea pinnatifida</i>) are present associated with winkle species (i.e., <i>Littorina</i> spp.).	High confidence bedrock and/or stony reef	AC6-WAL-CAE-4
Ephemeral green and red seaweeds on variable salinity and/or disturbed eulittoral mixed substrata (LR.FLR.Eph.EphX and A2.821)	This habitat constitutes eulittoral mixed substrata (pebbles and cobbles overlying sand and mud) that are subject to variations in salinity and/or siltation. It is commonly characterised by dense blankets of green and red seaweeds (e.g., <i>Ulva intestinalis</i> , <i>Ulva lactuca</i> and <i>Porphyra</i> spp.). A small number of species may be confined to large boulders (i.e., <i>Semibalanus balanoides</i> and <i>Austrominius modestus</i>), while crabs and <i>Littorina littorea</i> may	Potential bedrock and/or stony reef	AC6-WAL-CAE-4

EUNIS biotope and marine habitat classification	Habitat description	Comments	Route intersection
	be interspersed between such structures.		

Source: EUNIS (2012)²³; JNCC (2025a)²⁴

Associated designations

A number of further Annex I habitats are located near (within 10 km) of the marine route corridors. These are associated with designations as identified in Table A1.1.

Such Annex I habitats, of potential relevance to the project are outlined below with a brief description (Table A1.15)

Table A1.15: Summary of Annex I habitats within 10 km of the marine route corridor options

Annex I habitat	Summary ²⁵
Submarine structures made by leaking gases [1180]	<p>Submarine complex structure consisting of rocks, pavements and pillars up to 4 m high. Formation is consequent of an aggregation of sandstone by carbonate cement resulting from microbial oxidation of gas emissions. Such formations are interspersed with gas vents and form a highlight diverse ecosystem.</p> <p>In the UK, blocks and pavements are commonly referred to as 'pockmarks' when associated with gas seep depressions.</p>
Vegetated sea cliffs of the Atlantic and Baltic Coasts [1230]	<p>Steep slopes fringing hard and soft coral associated with past/present marine erosion. These habitats support a wide array of vegetation characterised by the level of exposure each habitat is subject to.</p> <p>Exposed areas are commonly dominated by salt-tolerant plants, while more sheltered communities are more closely associated with those found on similar substrates inland.</p>
Embryonic shifting dunes [2110]	<p>Vegetation associated with these habitats is largely dependent on the physical processes at the dune/beach interface. Such vegetation is the first type to colonise areas of incipient dune formations at the top of a beach. It may further be the precursor to the marine dune-building vegetation dominated by marram (<i>Ammophila arenaria</i>).</p> <p>In most cases, this habitat type is transient and is often replaced by marram-dominated vegetation as the dune habitat develops.</p> <p>Such habitats characteristically have low species diversity, e.g., sea rocket (<i>Cakile maritima</i>), lyme grass (<i>Leymus arenarius</i>) and sand couch (<i>Elytrigia juncea</i>).</p>

²³ EUNIS (2012), 'EUNIS habitat types hierarchal view 2012'. Available online: <https://eunis.eea.europa.eu/habitats-code-browser.jsp> (accessed July 2025).

²⁴ Joint Nature Conservation Committee (2025a), 'Marine Habitat Classification for Britain and Ireland'. Available online: <https://mhc.jncc.gov.uk/> (accessed July 2025).

²⁵ Joint Nature Conservation Committee (2025b), 'Habitats'. Available online: <https://sac.jncc.gov.uk/habitat/> (accessed July 2025).

Annex I habitat	Summary ²⁵
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) [2120]	This habitat is characteristic of unstable dunes with active sand movement. Here sand-binding marram (<i>Ammophila arenaria</i>) dominates and occurs on both accreting and eroding dunes.
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Such habitats largely occur on the largest dune systems, occurring inland of habitats characterised by marram (<i>Ammophila arenaria</i>). Instead, representing vegetation replaces marram as the dune system stabilises and organic content of sand increases. The most widespread herbaceous vegetation across the UK is Atlantic dune grassland, with dominant vegetation such as red fescue (<i>Festuca rubra</i>) and lady's bedstraw (<i>Galium verum</i>). In southern Scotland, orchid species may occur; in Wales, wild thyme (<i>Thymus polytrichus</i>) is more common.
Dunes with <i>Salix repens</i> ssp. <i>argentea</i> (<i>Salicion arenariae</i>) [2170]	Dunes or part of dunes whereby creeping willow (<i>Salix repens</i> ssp. <i>argentea</i>) is dominant. Found predominately in and around dune slacks or on drier ridges, it can mark the mature phase in the life cycle of calcareous dune slacks.
Humid dune slacks [2190]	Low-lying areas with seasonally flooding dune systems. These habitats are primarily on larger dune systems across the UK.
Sandbanks which are slightly covered by sea water all the time [1110]	Sandy sediments that are primarily covered by shallow seawater at depths of less than 20 m. Distinct banks may arise from horizontal and/or sloping planes of sediment. Sediment type determines species assemblages, alongside a variety of physical, chemical and hydrological factors but are typically colonised by works crustaceans, bivalves, molluscs and echinoderms. There are four main subtypes: <ul style="list-style-type: none"> • gravelly and clean sand • muddy sands • eelgrass • maerl beds. Maerl is present in coarser sediment types.
Mudflats and sandflats not covered by seawater at low tide [1140]	These are intertidal mudflats which become exposed at low tide, ranging from mobile coarse sand beaches (exposed coasts) to fine sediment mudflats (sheltered coasts). There are three main subtypes: <ul style="list-style-type: none"> • clean sands, with robust species including amphipod crustaceans • muddy sands, with a wide range of species including bivalve molluscs • muds.
Large shallow inlets and bays [1160]	Large indentations of the coastline in generally sheltered shallow environments. Habitats vary largely in species diversity, dependent on factors such as location, exposure and geology, notably between soft and hard sediment. Rock communities may be dominated by wrack species and beds of mussels. Exposed sediment shores lack species diversity, while sheltered shores may support communities of polychaetes and crustaceans. Finer sand communities are rather composed of bivalve communities and eelgrass beds.

Annex I habitat	Summary ²⁵
	<p>More sublittoral habitats may support forests of kelp (i.e., <i>Laminaria hyperborea</i>).</p> <p>Three main subtypes occur:</p> <ul style="list-style-type: none"> • embayment • fjardic sea loch • ria.
<p>Submerged or partially submerged sea caves [8330]</p>	<p>These cave habitats are only exposed at high tide. Communities associated with such habitats depend on the structure and extent of the cave system but are typically colonised by encrusting animal species and shade-tolerant seaweeds.</p> <p>Caves that are subject to a high degree of wave exposure are characterised by mussels, bivalves, cushion sponges and encrusting bryozoans. More sheltered environments support soft corals, sponges, bryozoans and sessile jellyfish larvae.</p>
<p>Atlantic decalcified fixed dunes (<i>Calluno-Ulicetea</i>) [2150]</p>	<p>Occurs commonly on mature, stable systems with initial low calcium carbonate content. Surface layers of the sediment rapidly lose calcium carbonate through leaching, hence becoming acidified. Common species associated with these dune systems includes dune heath (i.e., <i>Calluna vulgaris</i> and <i>Carex arenaria</i>).</p>
<p>Salicornia and other annuals colonising mud and sand [1310]</p>	<p>Habitats whereby pioneer saltmarsh vegetation colonises intertidal mud and sandflats, specifically found in sheltered environments. Such vegetation develops in lower reaches of saltmarshes where its frequently inundated by the tides.</p>
<p>Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1330]</p>	<p>These habitats develop where halophytic vegetation colonises soft intertidal sediments (sand and mud). Vegetation associated with this habitat type develops in the middle and upper reaches of saltmarshes, where tidal inundation begins to decrease in frequency and duration. Community types vary, with low species diversity in the lower reaches. Further into the habitat herb-dominated vegetation commences, alongside red fescue. Upper habitats have greater species variation, e.g., sea rush (<i>Juncus maritimus</i>) and slender spike-rush (<i>Eleocharis uniglumis</i>).</p> <p>The upper saltmarsh may transition into a number of habitats.</p>
<p>Estuaries [1130]</p>	<p>Estuaries are subtidal and intertidal habitats closely associated with surrounding terrestrial habitats. Communities vary according to predominant sediment type and salinity gradient. Where there is greater freshwater input, soft sediments are common with oligochaete worms and other invertebrates. In rockier habitats, fucoid seaweeds, barnacles and hydroids may occur. Where salinity increases closer to the open ocean, ragworms, bivalves and crustaceans dominate. There are four main sub-types:</p> <ul style="list-style-type: none"> • coastal plain estuaries • bar-built estuaries • complex estuaries • Ria estuaries.

Priority marine features and UK Biodiversity Action Plan habitats

As discussed in Section 7.2.4, the main UK Biodiversity Action Plan habitats of relevance to the project are horse mussel and maerl beds. Though these habitats do not directly intersect the marine route corridors, there is potential for impacts to arise due to their proximity. The closest horse mussel beds are located approximately 5.5 km away from marine route corridor AC6-WAL-CAE-4, while the closest maerl is located approximately 11.7 km away from AC6-SCO-OFF-2B.

Table A1.16 summarises the relevant UK Biodiversity Action Plan habitats in relation to the project.

Table A1.16: UK Biodiversity Action Plan summary

UK Biodiversity Action Plan habitats	Description
Horse mussel beds	<p>Found at depths of 5 to 70 m in fully saline, often moderately tide-swept areas. Though the species is widespread, true beds forming the biotope are much more limited in their distribution.</p> <p>Can occur as relatively small, dense beds of epifaunal mussels carpeting steep rocky surfaces or alternatively and more frequently, recessed at least partly into mixed/muddy sediments.</p> <p>Horse mussel are a long-lived species (25 years and above) and, as a result, recruitment of the species is slow and sporadic.</p> <p>Biotope composition is variable depending on a number of environmental factors. Though beds are commonly associated with species, such as sponges, ascidians, soft corals, anemones, hydroids, bryozoans, tubeworms, brittlestars, urchins, starfish, barnacles and crabs.</p>
Maerl beds	<p>Maerl, a collective term for several species of calcified red seaweed, grows unattached to nodules on the seabed. It can form extensive beds, typically in areas with a degree of tidal influence (narrows, sea lochs, sounds, etc.). Beds are characteristically found in water depths above 20 m, extending up to the low tide level.</p> <p>The main maerl bed-forming species in UK waters comprise the following:</p> <ul style="list-style-type: none"> • <i>Phymatolithon calcareum</i> • <i>Lithothamnion glaciale</i> (more northern extent) • <i>Lithothamnion corallioides</i> (south-western extent, no Scottish records to date).

Source: BRIG (2011)²⁶

Sensitive fish habitats

Spawning and nursery grounds

The marine route corridors overlap a number of potential spawning and/or nursery grounds for several fish species. Table A1.17 summarises the species with potential to be impacted by project activities, alongside the relevant intensity of the grounds, where available.

²⁶ BRIG (2011), 'UK Biodiversity Action Plan: Priority Habitat Descriptions'. JNCC Peterborough.

Table A1.17: Spawning and nursery grounds that intersect marine route corridors

Species	Nursery grounds		Spawning grounds	
	High intensity	Low intensity	High intensity	Low intensity
Spurdog (<i>Squalus acanthias</i>)	Y	-	-	-
Tope shark (<i>Galeorhinus galeus</i>)	-	Y	-	-
Common skate (<i>Dipturus batis</i>)	-	Y	-	-
Thornback ray (<i>Raja clavata</i>)	-	Y	-	-
Spotted ray (<i>Raja montagui</i>)	-	Y	-	-
Atlantic herring	Y	-	-	-
Atlantic cod (<i>Gadus morhua</i>)	Y	Y	Y	Y
Whiting	Y	Y	-	Y
Common ling (<i>Molva molva</i>)	-	-	-	Y
European hake	-	Y	-	Y
Anglerfish (<i>Lophius piscatorius</i>)	-	Y	-	-
Horse mackerel	-	-	-	Y
Sandeel	-	Y	-	Y
Mackerel (<i>Scomber scombrus</i>)	-	Y	-	Y
European plaice (<i>Pleuronectes platessa</i>)	-	Y	-	Y
Sole (<i>Solea solea</i>)	-	Y	-	Y
Sprat	-	-	Y	Y
Norway lobster	Y	-	Y	Y

Source: Coull et al. (1998)²⁷; Ellis et al. (2012)²⁸

Notes: Y = indicates overlap of spawning and/or nursery grounds with the marine route corridors.

Spawning season

Table A1.18 presents the spawning season of the species noted as having spawning and/or nursery grounds that may be impacted by project activities.

²⁷ Coull, K. A., Johnstone, R. and Rogers, S. I. (1998), 'Fisheries Sensitivity Maps in British Waters', UKOOA Ltd.

²⁸ Ellis, J., Milligan, S. P., Readdy, L., Taylor, N. and Brown, M. J. (2012), 'Spawning and nursery grounds of selected fish species in UK waters', Cefas.

Table A1.18: Spawning season of the species as noted above

Species	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	
Spurdog												
Tope shark												
Common skate												
Thornback ray												
Spotted ray												
Atlantic herring (Clyde)												
Atlantic herring (Mourne)												
Atlantic cod												
Whiting												
Common ling												
European hake												
Anglerfish												
Horse mackerel												
Sandeel												
Mackerel (Western)												
European plaice												
Sole												
Sprat												
Norway lobster												
Key								Spawning				
								Peak spawning				

Source: Coull et al. (1998)²⁷; Ellis et al. (2012)²⁸

Group 0 aggregations

Figure A1.12 depicts Group 0 fish species³ aggregations for those species whereby a higher probability of presence overlaps with the marine route corridor options (Aires et al., 2014)²⁹. This suggests a greater likelihood of overlap with spawning and/or nursery grounds for the noted

²⁹ Aires, C., González-Irusta, J. M. and Watret, R. (2014), 'Updating Fisheries Sensitivity Maps in British Waters'. Scottish Marine and Freshwater Science Report, Vol 5 No 10'.



species as outlined in Section 7.2.5. Areas are concentrated to the North Channel and north-west Irish Sea.

As outlined in Section 7.2.5, there are limitations to this dataset as with other fish sensitivity data. Therefore, the identified sources should all be used in conjunction to develop an understanding of fish spawning and nursery habitats in relation to the marine route corridors.

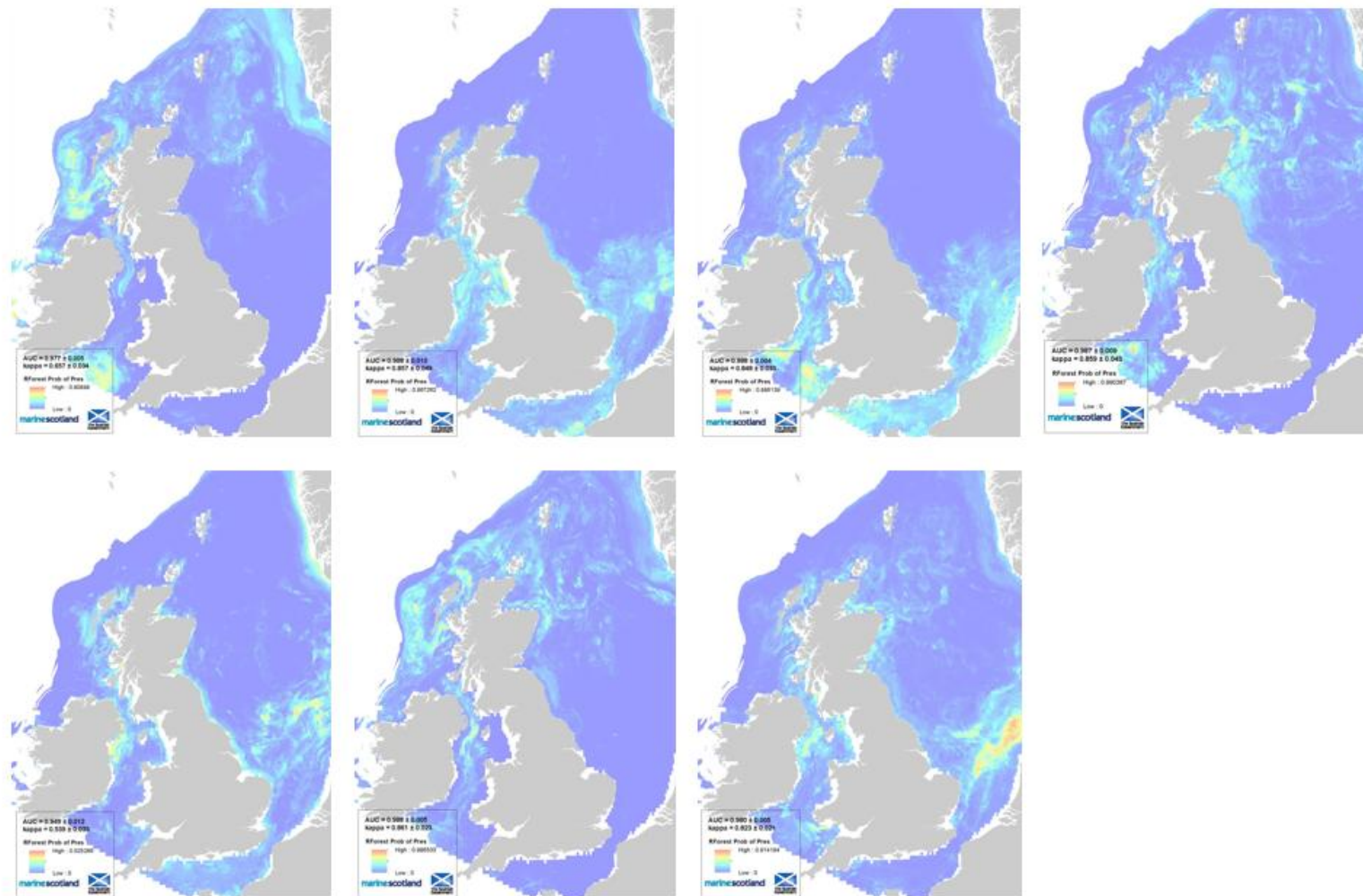


Figure A1.12: Species Group 0 aggregations whereby a higher probability of presence overlaps with the marine route corridors when compared with other species

Top row, left to right: European hake, sprat, horse mackerel and haddock. Bottom row, left to right: Atlantic herring, Norway pout and whiting. Source: Aires et al. (2014)²⁹

Species of conservation interest

Marine mammals

Marine mammals may overlap with the marine route corridors at any given time. These include cetaceans (whales, dolphins and porpoises), pinnipeds and otters. The most common is expected to be harbour porpoise, associated with the North Channel SAC and North Anglesey Marine/Gogledd Môn Forol SAC, which directly intersect the marine route corridors (see Appendix 1 Biological environment, Designated and protected site descriptions, SACs). Bottlenose dolphin are also relatively common in the Irish Sea (Figure A1.13).

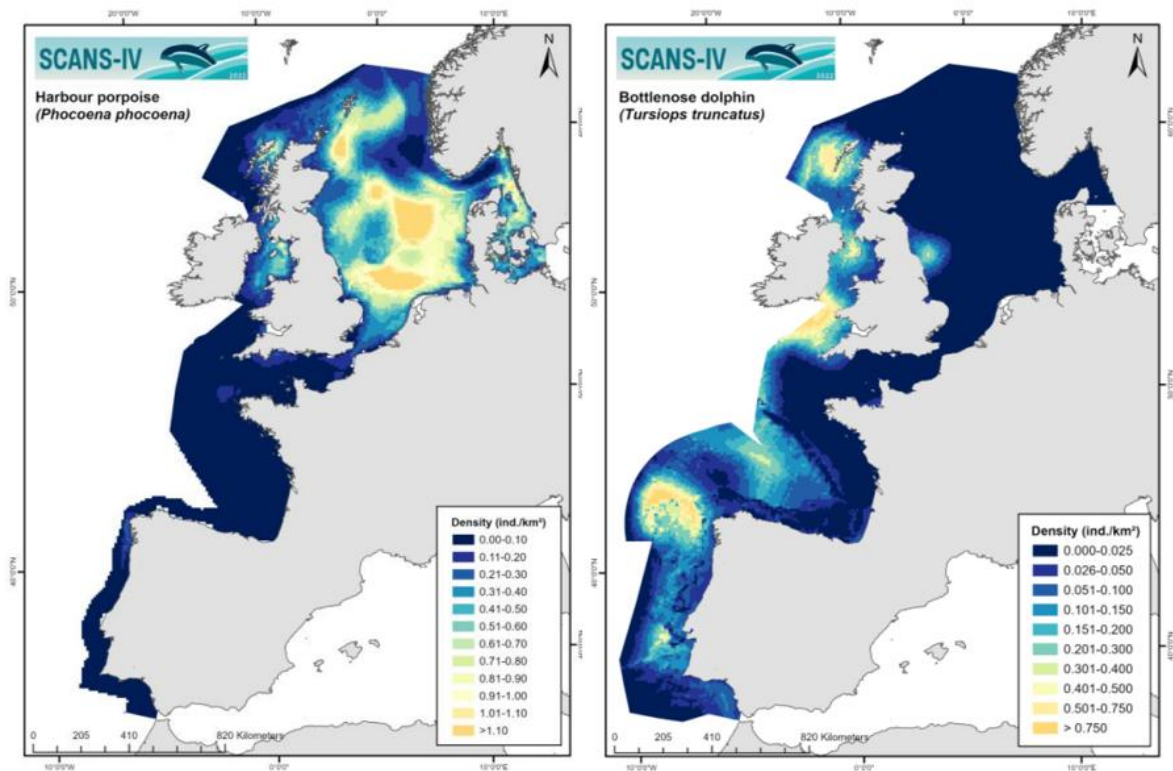


Figure A1.13: Predicted surfaces of estimated density for harbour porpoise (left) and bottlenose dolphin (right)

Source: Gilles et al. (2025)³⁰

Species such as, common dolphin, minke whale and Risso's dolphin are noted as being more occasional visitors.

The marine route corridors overlap with the SCANS-IV CS-F and CS-D Blocks. The most recent abundance and density estimates for these blocks are presented in Table A1.19 for the most common species (Gilles et al., 2023)³¹.

³⁰ Gilles, A., Authier, M., Pigeault, R., Ramirez-Martinez, N. C., Benoit, V., Carlström, J., Eira, C., Geelhoed, S. C. V., Laran, S., Sequeira, M., Sveegaard, S., Taylor, N. L., Saavedra, C., Vazquez-Bonales, J. A. and Hammond, P. S. (2025), 'Spatial models of cetacean density in European Atlantic waters based on SCANS-IV summer 2022 survey data', final report published 14 May.

³¹ Gilles, A., Authier, M., Ramirez-Martinez, N. C., Araújo, H., Blanchard, A., Carlström, J., Eira, C., Dorémus, G., FernándezMaldonado, C., Geelhoed, S. C. V., Kyhn, L., Laran, S., Nachtsheim, D., Panigada, S., Pigeault, R.,

Table A1.19: Abundance and density estimates for SCANS-IV blocks of relevance to the project

Species	Abundance (95% CI)	Density (CV)
Block CS-D		
Harbour porpoise	9,773 (4,764–18,125)	0.2802 (0.316)
Bottlenose dolphin	8,199 (3,595–15,158)	0.2352 (0.353)
Common dolphin	949 (32–2,990)	0.0272 (0.814)
Unidentified common or striped dolphin (<i>Stenella coeruleoalba</i>)	31,108 (14,524–54,382)	0.3471 (0.311)
Beaked whale	73 (20–267)	0.0021 (0.702)
Minke whale	477 (85–1,425)	0.0137 (0.632)
Block CS-F		
Harbour porpoise	3,064 (688–5,906)	0.2010 (0.425)
Bottlenose dolphin	647 (13–2,198)	0.0425 (0.777)
Common dolphin	829 (14–3,244)	0.0544 (1.028)
Minke whale	209 (2–954)	0.0137 (1.091)

Source: Gilles et al. (2023)³¹

Notes: CI = confidence interval, CV = coefficient of variation

In addition to SCANS, the Inter-Agency Marine Mammal Working Group (IAMMWG) defined MU for the most common cetacean species in UK waters. These MU areas are commonly implemented in the screening of designated sites as part of the Habitats Regulations assessment (HRA) process. Specifically, the marine route corridors overlaps with the following MUs (IAMMWG, 2023)³²:

- harbour porpoise:
 - CIS
 - West Scotland (WS)
- bottlenose dolphin:
 - Irish Sea (IS)
 - Coastal West Scotland and Hebrides (CWSH)
- common dolphin, white-beaked dolphin, Risso’s dolphin and minke whale:
 - Celtic and Greater North Seas (CGNS).

Table A1.20 summarised the abundance estimates for the above noted MUs per species.

Sequeira, M., Sveegaard, S., Taylor, N. L., Owen, K., Saavedra, C., Vázquez-Bonales, J. A., Unger, B. and Hammond, P. S. (2023), ‘Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys’, final report published 29 September.

³² Inter-Agency Marine Mammal Working Group (IAMMWG) (2023), ‘Review of Management Unit Boundaries for Cetaceans in UK Waters (2023)’, JNCC Report 734, March 2023, Revised May 2023, ISSN 0963 8091.

Table A1.20: Summary of abundance estimates for MUs of relevance to the marine route corridors

Species	Abundance (CV)	95% CI
Harbour porpoise	62,517 (0.13) (CIS MU) 28,936 (0.16) (WS MU)	48,324–80,877 21,140–39,608
Bottlenose dolphin	293 (0.54) (IS MU) 45 (CWSH MU)*	108–793 33–66
Common dolphin	102,656 (0.29)	58,932–178,822
White-beaked dolphin	43,951 (0.22)	28,439–67,924
White-sided dolphin	18,128 (0.61)	6,049–54,323
Risso's dolphin	12,262 (0.46)	5,227–28,764
Minke whale	20,118 (0.18)	14,061–28,786

Notes: *abundance estimate available for UK portion of the MU only.

CI = confidence interval, CV = coefficient of variation.

Source: IAMMWG (2023)³²

Seal species

Grey and harbour seal (*Phoca vitulina*) are commonly associated with designated sites. Notably, grey seal is a qualifying feature of the Maidens SAC, located approximately 3 km from the marine route corridors. This site supports approximately 50 individuals, and is used both during the pupping and breeding season (DAERA, 2017a)³³. The closest SAC designated for harbour seal is the Strangford Lough SAC, approximately 12 km away from the marine route corridor options; this site is designated for supporting approximately 210 individuals (DAERA, 2017b)³⁴.

While the marine route corridors do not directly intersect any seal haul-out sites, the general area is known to be widely used for such species, specifically grey seal. As a result consideration may be needed in relation to the timing associated with project construction in order to avoid sensitive periods for the species (i.e., moulting and breeding season).

The timing of the breeding season for grey seal varies across the UK, getting progressively later in breeding colonies distributed clockwise around the coast (JNCC, 2005). In Wales the pupping season typically occurs from August to December, with peaks seen in September and October. In 2004, approximately 96 pups were estimated to be counted in North Wales (Stringell et al., 2014³⁵; Robinson et al., 2023³⁶). In Scotland, the breeding season is noted as September to December (NatureScot, 2025)³⁷.

³³ Department of Agriculture, Environment and Rural Affairs (DAERA) (2017a), 'The Maidens SAC, UK0030384, Conservation Objectives'.

³⁴ Department of Agriculture, Environment and Rural Affairs (DAERA) (2017b), 'Strangford Lough SAC, UK0016618, Conservation Objectives'.

³⁵ Stringell, T. B., Miller, C. P., Sanderson, W. G., Westcott, S. M. and McMath, M. J. (2014), 'When aerial surveys will not do: grey seal pup production in cryptic habitats of Wales', *Journal of the Marine Biological Association of the United Kingdom*, 94/6: 1155–1159.

³⁶ Robinson G. J., Clarke L. J., Banga R., Griffin R. A., Porter J., Morris C. W., Lindenbaum C. P. and Stringell, T. B. (2023), 'Grey Seal (*Halichoerus grypus*) Pup Production and Distribution in North Wales during 2017', NRW Evidence Report No. 293. 66pp. Natural Resources Wales, Bangor.

³⁷ NatureScot (2025), 'Seals'. Available online: <https://www.nature.scot/plants-animals-and-fungi/mammals/marine-mammals/seals> (accessed July 2025).

Potential considerations

Marine mammals are known to be specifically sensitive to underwater noise. For where there is direct intersection of the marine route corridors with sites designated for the protection of harbour porpoise, it should be demonstrated that there are no adverse impacts to the species during the relevant season. This assessment will be contained within the HRA for project construction, alongside the general impact assessment. Marine mammals may further be impacted by the physical presence of vessels associated with construction and changes in prey availability.

Bird species

Both seabird and wading bird species are documented as being sensitive to anthropogenic disturbance, i.e., vessel presence and above-water noise disturbance. Diving seabird species, i.e., gannets, auks and scoters, have the potential to also be impacted via underwater noise. The level of disturbance will be depending on foraging characteristics of the species, including time spent underwater. Waterfowl species do not fully immerse themselves in the water when they are feeding (wading, dabbling, etc.) and as such are not expected to be impacted by underwater noise as a result. Species sensitivity to underwater noise has only been documented in few species, including the lesser scaup (*Aythya affinis*) and the cormorant; species thresholds were not significantly different from that of odontocetes and pinnipeds at low frequencies. For those species that are sensitive, behavioural disturbance may be illustrated in the form of evasion (Anderson et al., 2020)³⁸. As a result, consideration may have to be given to seasonality, in order to avoid sensitive time periods for vulnerable species (i.e., breeding season).

Fish species

The Afon Gwyrfaï a Llyn Cwellyn SAC, located within 10 km of the Project, is the only site designated for Atlantic salmon close to the marine route corridors. The closest site designated for lamprey species is located approximately 47 km away from the marine route corridors; this is the River Dee and Bala Lake/Afon Dyfrdwy a Llyn Tegid SAC, designated for both river and sea lamprey, alongside Atlantic salmon.

Atlantic salmon are anadromous individuals who commonly spawn in shallow excavations called redds found in clean rivers. Individuals migrate downstream as 'smolts' after one to six years; after one to three years in the sea, individuals return back to their river (known as homing), leading to the formation of genetically distinct stocks across the UK (JNCC, 2025a)³⁹. Freshwater pearl mussel (*Margaritifera margaritifera*) has a symbiotic relationship with Atlantic salmon. The early life cycle is spent attached to the gills of young salmon; individuals are therefore reliant on them for population sustainability and juvenile recruitment. As a result, they are commonly qualifying features of sites also designated for Atlantic salmon features. The closest in relation to the marine route corridor options is the River Eden/Afon Eden – Cors Goch Trawsfynydd SAC. However, this site is located over 30 km from the marine route corridor options (JNCC, 2025b)⁴⁰.

Rivers that support river lamprey are characterised as being predominately clear water with gravel, silt or sand habitats, supporting spawning behaviour. Sites that support the species tend to be

³⁸ Anderson Hansen, K., Hernandez, A., Mooney, T. A., Rasmussen, M. H., Sørensen, K. and Wahlberg, M. (2020), 'The common murre (*Uria aalge*), an auk seabird, reacts to underwater sound', *The Journal of the Acoustical Society of America*, 147/6: 4069–4074.

³⁹ Joint Nature Conservation Committee (JNCC) (2025a), 'Species, 1106 Atlantic salmon *Salmo salar*'. Available online: <https://sac.jncc.gov.uk/species/S1106/> (accessed July 2025).

⁴⁰ Joint Nature Conservation Committee (JNCC) (2025b), 'Species, 1029 Freshwater pearl mussel *Margaritifera margaritifera*'. Available online: <https://sac.jncc.gov.uk/species/S1029/> (accessed July 2025).

extensive river systems with numerous tributaries that support a range of habitats utilised by river lamprey. The sea lamprey is the largest lamprey species in UK waters and occurs widely in river systems and estuaries. As for river lamprey, spawning habitats include clean gravel areas with marginal silt/sand content to support borrowing juveniles. In comparison to river lamprey, sea lamprey appear to be more constrained to lower river reaches due to their poor capacity to ascend obstacles for migration (JNCC, 2025c⁴¹; 2026d⁴²).

Basking shark and other conservation interest species

As noted within Section 7.2.6.4, Manx waters hold the highest densities of basking shark in comparison to other jurisdictions of relevance to the project. Basking shark in Manx water are typically observed between May and August, with June and July being the peak months for sightings (Howe, 2018a)⁴³. Although the marine route corridors may occur up to approximately 40 km within Manx waters, the routes do not overlap the high-density area along the coastline. As such, it is considered appropriate to assume a density of 0.1 whale shark per square kilometre within the Manx portion of the marine route corridors.

Table A1.21 notes estimated basking shark density for all jurisdictions that the marine route corridors intersect.

Table A1.21: Estimated basking shark density by jurisdiction

Jurisdiction of relevance to the project	Basking shark density (n per km ²)
Scotland	0.00–0.10
Northern Ireland	0.00–0.01
Isle of Man	>0.10
Wales	0.00–0.01

There is limited abundance and density estimates available for marine turtles due to their vagrant nature to UK waters. However, it is appreciated that recent years have seen an increase in their numbers.

Such species may be vulnerable to project construction activities via disturbance from vessel presence and associated collision risk.

⁴¹ Joint Nature Conservation Committee (JNCC) (2025c), 'Species, 1099 River lamprey *Lampetra fluviatilis*'. Available online: <https://sac.jncc.gov.uk/species/S1099/> (accessed July 2025).

⁴² Joint Nature Conservation Committee (JNCC) (2025d), 'Species, 1095 Sea lamprey *Petromyzon marinus*'. Available online: <https://sac.jncc.gov.uk/species/S1095/> (accessed July 2025).

⁴³ Howe, V. L. (2018a), 'Basking Sharks'. Manx Marine Environmental Assessment, 1.1 Edition – partial update, Isle of Man Government.

APPENDIX 2 PHYSICAL ENVIRONMENT

Bathymetry

Seabed bathymetry can be challenging to cable installation. The most significant risks occur during the construction phase. However, a cable that is insufficiently buried or protected can face challenges from external threats, spans, vibration and fatigue across its lifespan.

Bathymetric levels described in this report are taken from OceanWise Marine Themes Digital Elevation Model (DEM), which provides bathymetry at a resolution of 30 m (Evolv Energies, 2025a). Localised features will not be evident at this resolution, and therefore detailed geophysical surveys are required to fully assess the cable route and provide information for route engineering.

Bathymetric depths across the AC5 marine route corridors reach a maximum of approximately 68.3 m. The routes become shallower towards the shore with no significant variation in bathymetric depth between the Monkton, Barassie, and Girvan landfall locations. A seabed depression is crossed on the approach to Ballantrae, where water depths range from 34.5 m to 47 m across 300 m.

The AC6 marine route corridor options are characterised by varying water depths, which are shallower towards the Scottish and Welsh landfall areas and deeper through the North Channel and Central Irish Sea. The maximum bathymetric depth is approximately 153 m along the AC6-NC-S-1B section.

Beaufort's Dyke is a bathymetric feature present within the AC6 routeing considerations. Beaufort's Dyke is a large, north–south orientated trench, approximately 50 km long and 2.5 km wide, and is situated within the North Channel. Water depths within this feature exceed 300 m, and the dyke is characterised by steep seabed slopes and thin or absent sediment on the trench sides. This area has been used, historically, as a munitions dump (see Section 7.5.3.3), and side scan sonar data indicates that there are large quantities of dumped munitions, munitions-related materials and unidentified man-made debris located outside the chartered boundary (Marine Laboratory, 1996). Routes through the North Channel have therefore been developed to the east and west of Beaufort's Dyke to avoid this engineering constraint. There is a larger variation in bathymetric levels to the east of this feature (AC5-IS-N-3) when compared to the central route (AC6-IS-N-2), as illustrated in Figure A2.1 below. The potential for steep localised slopes poses a risk to burial depths and an increased likelihood of external cable protection, such as rock or mattress placement. Rock placement can wash away in strong hydrodynamic environments, and a regular monitoring and maintenance campaign is recommended.

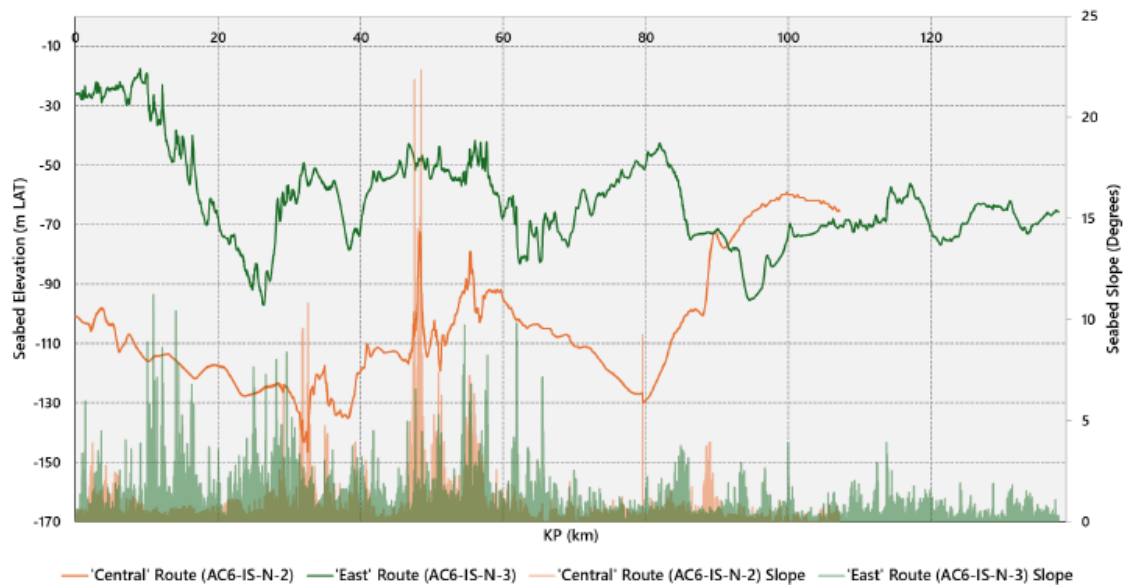


Figure A2.1: Bathymetric profile and slope across central and eastern routes

Source: Evolv Energies (2025a)

The marine route corridor sections within the central and northern parts of the Irish Sea (AC6-IS-N-2, AC6-IS-N-3 and AC6-IS-C-2) have been identified as having the highest variability of water depth over short distances where they cross ridges, valleys and mobile bedforms.

Sand wave zones have been identified within the Central Irish Sea and Southern Irish Sea. The field within the Central Irish Sea contains sand waves that are orientated north-west to south-east and have heights of 8 m and wavelengths of 400 m. Cable section AC6-IS-C-2 is routed approximately parallel with sand wave orientation. The sand waves within the Southern Irish Sea field are also orientated north-west to south-east and are located near the Welsh landfall area. Sand waves reach heights of up to 10 m and have wavelengths of ~800 m. The proposed marine route corridor section for AC6-IS-S-2A also runs parallel to this area.

There is potential for the sand waves to be mobile, with migration patterns changing over time, which could increase the risk to larger areas of the cable route. The combination of geophysical survey works and route engineering may be able to identify potential issues with bedforms. However, seabed modelling and in-situ current measurements should be considered to fully evaluate this risk.

Seabed slope

Seabed slopes can cause engineering issues for cable installation due to the operating limits of the burial tool and can contribute to cable instability. Steep slopes should be mitigated by routeing and micro-routeing or crossed at 90° where this is unavoidable. Seabed preparation, such as sediment dredging, can be used to reduce slope angles in certain circumstances. External protection, such as rock berm, mattress and articulated pipe, can also be used to protect surface laid cables from external aggressors and to maintain cable integrity.

Seabed slopes across the WL2 marine route corridors were generally noted to be less than 5° (Evolv Energies, 2025a), although localised areas of 12° or greater were also noted. Localised slopes are most significant within the North Channel, in and around Beaufort's Dyke, where sediment cover is anticipated to be thin or absent and seabed slopes are associated with areas of

exposed rock and till. Localised variations in bathymetry and slope are considered more significant in the eastern cable route when assessed against the central route, as detailed in the bathymetric section above.

In general, slope limitations on the following burial tools are as follows (Evolv Energies, 2025a):

- plough: Maximum angles for ploughs are approximately 12° for down slope angles, 14° up slope and 6–10° for side slopes. The length of the slope and soil type should also be considered. It is preferable to bury up slope rather than down slope to prevent plough ride out.
- post-lay burial (PLB) with remotely operated vehicles (ROV): PLB with seabed contact also has similar restrictions to plough operations. Free-swimming ROV equipment can be used (to the limits of the equipment) if slope angles exceed these gradients, although the cable should be surface laid if PLB is considered unfeasible.
- PLB with free-swimming ROV: This technique is recommended over non-trenchable slopes where a threat remains to the cable if it is not buried, and there is sufficient sediment cover. However, it may not be viable to bury long lengths of cable with this method. Modern water jetting free-swimming ROVs can generally bury on slopes with gradients of 15° and side slopes of 8°.

Mobile bedforms

Mobile bedforms can either increase or decrease surface sediments over a buried cable, causing overheating of the cable or leaving the cable more susceptible to damage from external threats such as fishing and anchor strikes.

Evolv has assessed the publicly available bathymetric data identified sand wave zones within the Central Irish Sea and Southern Irish Sea (Evolv Energies, 2025a). The field within the Central Irish Sea contains sand waves that are orientated north-west to south-east and have heights of 8 m and wavelengths of 400 m. Marine route corridor section AC6-IS-C-2 is routed approximately parallel with sand wave orientation. The sand waves within the Southern Irish Sea field are also orientated north-west to south-east and are located near the Welsh landfall area. Sand waves reach heights of up to 10 m and have wavelengths of ~800 m. The proposed marine route corridor section for AC6-IS-S-2A also runs parallel to this area (Figure 7.6).

Information obtained from cable burial risk assessment (CBRA) data used on the Western Link 1 project also identified sand waves in the northern part of the North Channel. Sand waves were typically 5–6 m in this area, although one sand wave was recorded to be 16 m high (Evolv Energies, 2025a). There is potential for the sand waves to be mobile and for migration patterns to change over time, which could increase the risk to larger areas of the cable route. The combination of geophysical survey works, and route engineering may be able to identify potential issues with bedforms. However, seabed modelling and in-situ current measurements should be considered to fully evaluate this risk.

Seabed pre-sweeping can reduce the heights of the sand waves and the most mobile areas of seabed. However, sand waves in the marine study area are high, and it is considered that removal of such quantities of sand would be uneconomic and/or impractical. Therefore, further engineering should be considered as part of the route design.

The following engineering assessments may be considered in these circumstances (Evolv Energies, 2025b).

Stage 1 seabed mobility review

A Stage 1 seabed mobility review should be undertaken from the results of the geophysical survey data to understand the size and wavelength of these bedforms and the risk to the cable from these potentially mobile sediments. Large bedforms present a larger risk to the cable due to the potential for exposure or over-burial over the life of the asset.

It is important to understand the migration of bedforms to ensure the cable is protected across its lifetime. The CBRA will specify a depth of lowering, which will mitigate the threat from external influences, to either the measured seabed level or a reference stable seabed level (i.e., base of mobile sediments).

Stage 2 seabed morphology analysis

A more-detailed Stage 2 seabed morphology analysis may be required if the risk posed from bedforms is not mitigated through burial with typical trenching equipment. This assessment will be used to assess potential migration rates across the life of the project with information obtained from the geophysical survey, publicly available sources, metocean data and details of the morphodynamical regime. Several bathymetric surveys may be required to adequately assess seabed mobility.

The spatial extent of bedforms such as megaripples and sand waves will be assessed along with tidal influences, wave-generating regimes and other environmental influences that control the seabed and changes in bedforms. These factors will allow an assessment of the mechanisms for seabed change and will calculate bedform characteristics such as height, wavelength asymmetry and migration. The output of this assessment will inform burial depths and will identify and make recommendations on any preparation works required for the seabed. The assessment may feed into the Stage 3 assessment if required.

Stage 3 sand wave impact and mitigation assessment

The Stage 3 sand wave impact and mitigation assessment is used to assess the impact of bedform migration on the cable and considers the cable route and the bathymetry of the seabed at the time of installation with the cable at the recommended design depth. The assessment then predicts future bathymetry levels using data developed in Stage 2, considering the highest and lowest bed levels and best-estimate bathymetry over the asset's design life. The Stage 3 assessment concludes with a detailed understanding of bedform migration and changes in burial levels along the cable route for a variety of burial scenarios and an understanding of potential span development and cable integrity issues. An impact and migration plan may also be developed to address and issues identified.

Seabed sediments

Seabed sediments across the marine study area were obtained from the British Geological Society (BGS) and noted to comprise sediments ranging from muds to sandy gravels. Sediments across the AC5 marine route corridors generally comprise mud, muddy sands, sands, slightly gravelly sands, sandy gravel, and gravel sands and silts. Hard substrate was noted mostly around the coastline, including the landings at Girvan and Ballantrae. A review of this publicly available data indicates that cable routeing should be able to avoid this at these landings, although this should be verified during the geophysical survey.

Sediments across the AC6 marine route corridors include sandy mud, muddy sand, slightly gravelly sandy mud, slightly gravelly mud, sand, slightly gravelly muddy sand, slightly gravelly sand,

gravelly muddy sand, muddy gravelly sand, gravelly sand and sandy gravel. As indicated in Section 7.3, these sediments can be characterised into four separate regional areas (Evolv Energies 2025a):

- the Firth of Clyde area, which primarily comprises very soft, occasionally sandy, clays with the exception of the landfall where inshore sediments are likely to comprise sands and area of outcropping/subcropping glacial till and bedrock
- the North Channel, which is largely characterised by a veneer of mobile sands and gravels overlaying glacial till or bedrock. There are also extensive boulder fields in this area
- the Western Irish Sea, which is dominated by very soft clays with occasional outcrops of rock
- the Southern Irish Sea, to the south-west and the south of the Isle of Man, which is characterised by a veneer of very loose and loose mobile sands and gravels overlying glacial tills, dense to very fine glacial sands and occasionally soft to firm glacio-lacustrine clays. An expanse of sand with isolated sand waves lies to the south-west of the Isle of Man. Paleoglacial features and extensive boulder fields are also noted across this area.

Areas of diamicton were noted across the marine study area and areas of hard substrate were also noted around the Scottish coastline, in the North Channel and to the south-west, west and north-west of Anglesey. Isolated areas of boulders and cobbles were also noted across the marine survey area. Preliminary routeing undertaken by Evolv Energies has avoided routeing across all of these, except a small area of AC6-IS-N-2 where areas of hard substrate cannot be avoided. The results of the geophysical survey should identify these and the thickness of the overlying sediment to assess whether it is possible to micro-route around these or whether external protection should be considered.

Rock outcrops are noted in parts of the marine study area and some cable sections, the North Channel in particular, traverse pockets of these. These have also been avoided as far as possible in the preliminary routeing undertaken by Evolv Energies, although the cable route may cross areas of rock in deeper water (>100 m). These areas lie in an area where anchor or fishing strikes may still be possible. Therefore, a CBRA and Employer's Burial Assessment Study is recommended to ascertain what additional protection is required and the feasibility of burial equipment (Evolv Energies 2025a).

Geology

Bedrock lithologies across the AC5 marine route corridors comprise Palaeozoic sedimentary rocks in the north with Mesozoic and metamorphic rocks to the south. Areas of igneous intrusions were noted in the sedimentary rocks around Troon.

Bedrock across the AC6 marine route corridors comprise mostly Mesozoic interbedded rocks in the northern section and across the North Channel. Metamorphic rocks are anticipated around the Scottish and Irish coastline in these areas also. Palaeozoic sedimentary and metamorphic rocks dominate southern portion of the AC6 marine route corridors.

Sediment thickness overlying this rock is anticipated to be between 5 and 50 m thick across the AC5 marine route corridors. Therefore, bedrock is not considered an issue across most of the cable route.

Sediment thickness is also considered sufficient across most of the AC6 marine route corridors. However, thicknesses <5 m were noted across parts of AC6-IS-N-3, AC6-IS-N-1B, AC6-IS-S-1A,



AC6-IS-S-1B, AC6-IS-N-1, AC6-IS-N-2, AC6-IS-S-1 and AC6-IS-S-1-ALT. This reduction in sediment implies a reduced potential for cable burial in these areas, which may increase the likelihood of additional protection.

APPENDIX 3 HISTORIC ENVIRONMENT

Wrecks and obstructions

Table A3.1 presents wrecks and obstructions that have been identified within the marine route corridors.

Table A3.1: Wrecks and obstructions of relevance to the marine route corridors

Wreck and obstruction ID	Type	Marine route corridor intersection
94610	Diffuser	AC6-SCO-GIR
3682	Non dangerous wreck	AC6-NC-N-1B
5199	Non dangerous wreck	AC6-NC-N-3B
5823	Non dangerous wreck	AC6-NC-N-3B
5106	Non dangerous wreck	AC6-IS-N-1
5263	Non dangerous wreck	AC6-IS-N-2
5073	Non dangerous wreck	AC6-IS-N-1
5069	Non dangerous wreck	AC6-IS-N-2
5054	Unknown	AC6-IS-N-2
7102	Foul ground	AC6-IS-C-1A
7072	Unknown	AC6-IS-C-1B
7465	Dangerous wreck	AC6-WAL-CAE-2
7127	Non dangerous wreck	AC6-IS-C-4A
5352	Non dangerous wreck	AC6-IS-N-3
5336	Non dangerous wreck	AC6-IS-N-3
5320	Foul ground	AC6-IS-N-3
5023	Non dangerous wreck	AC6-IS-N-3
7127	Non dangerous wreck	AC6-IS-C-4A

APPENDIX 4 SOCIO-ECONOMIC ENVIRONMENT

Bathing waters

Table A4.1 presents the recognised (regionally and locally) bathing waters within the study area and close to landfall sites.

Table A4.1: Bathing waters close to landfall sites

Bathing water name	Area	Designation year	Bathing condition status – Aug 2025	Closest landfall site	Distance from bathing water
Prestwick (ID: UKS7616046) ⁴⁴	Between Ayr and Troon on the Ayrshire coast	1987	Excellent condition	AC5-SCO-MON	0
Morfa Dinlle/Dinas Dinlle	South of Caernarfon	1988	Excellent condition	AC6-WAL-CAE-1	1331

Infrastructure

Cables

Various telecommunications and power cables cross the marine route corridor alignments. Table A4.2 lists all cable crossings as identified by Evolv Energies.

Table A4.2: Cable crossings

Cable	Type	Status	Marine route corridor intersection
Scotland to Northern Ireland 3	Telecommunication	Active	AC5-SCO-BAL-2 AC6-NC-N-1A AC6-NC-N-2A-2 AC6-IS-N-1 AC6-IS-N-2 AC6-IS-N-3
Lanis 2	Telecommunication	Active	AC6-IS-N-1 AC6-IS-N-2 AC6-IS-N-3
Lanis 3	Telecommunication	Active	AC5-SCO-BAR AC6-NC-N-1A AC6-NC-N-2B AC6-NC-N-3A AC6-NC-S-1C

⁴⁴ SEPA (2025), 'Prestwick bathing water profile'. SEPA.

Cable	Type	Status	Marine route corridor intersection
			AC6-NC-S-2
Moyle Interconnector North	Power line	Active	AC6-NC-N-2C AC6-NC-N-4 AC6-NC-S-1C AC6-NC-S-2
Moyle Interconnector South	Power line	Active	AC6-NC-N-2C AC6-NC-N-4 AC6-NC-S-1C AC6-NC-S-2
Hibernia Atlantic Seg A	Telecommunication	Active	AC6-NC-S-2
Western Link Ardnell to Wirral 1	Power line	Active	AC6-NC-S-1A AC6-NC-S-1B AC6-NC-S-2 AC6-IS-N-3
Sirius North	Telecommunication	Active	AC6-NC-S-1C
Manx-Northern Ireland	Telecommunication	Active	AC6-IS-N-1 AC6-IS-N-2 AC6-IS-N-3
Havhingsten Seg 1.1	Telecommunication	Active	AC6-IS-C-2 AC6-IS-C-3
Hibernia Atlantic Seg C	Telecommunication	Active	AC6-IS-C-3
East West Interconnector Cable	Power line	Active	AC6-IS-C-2 AC6-IS-C-5
Rockabill	Telecommunication	Active	AC6-IS-C-2 AC6-IS-C-3
Sirius South	Telecommunication	Active	AC6-IS-C-2 AC6-IS-C-5
Emerald Bridge	Telecommunication	Active	AC6-IS-S-1
Celtixconnect	Telecommunication	Active	AC6-IS-S-1
ESAT 2	Telecommunication	Active	AC6-IS-C-2 AC6-IS-C-3
Scotland to Northern Ireland 2	Telecommunication	Decommissioned	AC5-SCO-BAL-2 AC6-NC-N-2A-2 AC6-NC-N-3B AC6-NC-S-1C AC6-NC-S-2
Scotland to Northern Ireland 1	Telecommunication	Decommissioned	AC6-IS-N-1 AC6-IS-N-2 AC6-IS-N-3

Source: KIS-ORCA (2025)

Table A4.3: Asset owner stakeholder engagement

Asset name	Owner
Lanis 3 telecommunication cable	Vodafone
Scotland to Northern Ireland 2 telecommunication cable	BT
Scotland to Northern Ireland 3 telecommunication cable	BT
Moyle Interconnector North power cable	Moyle Interconnector Ltd
Hibernia Atlantic Seg A telecommunication cable	Hibernia Atlantic
Scotland to Northern Ireland Pipeline (SNIP)	Mutual Energy Limited
Moyle Interconnector South power cable	Moyle Interconnector Ltd
Western Link Ardneill to Wirral 1 power cable	National Grid and Scottish Power
Scotland to Northern Ireland 1 telecommunication cable	BT
Lanis 2 telecommunication cable	Vodafone
Manx-Northern Ireland telecommunication cable	BT
Interconnector 2 Scotland to Ireland IC2	Gas Networks Ireland
Interconnector 1 Scotland to Ireland IC1	Gas Networks Ireland
Havhingsten Seg 1.1 telecommunication cable	Aqua Comms
Hibernia Atlantic Seg C telecommunication cable	Hibernia Atlantic
ESAT 2 telecommunication cable	BT
Rockabill cable system	EU Networks
East West Interconnector power cable	EirGrid Interconnector Ltd
Sirus South telecommunication cable	Virgin Media
Celtixconnect telecommunication cable	Aqua Comms
Emerald Bridge telecommunication cable	ESB.ie
LirIC	Transmission Investment

Oil and gas

There is significant oil and gas infrastructure off the west coast of Scotland and the north-west of Wales/England. Table A4.4 lists all pipeline crossings as identified by Evolv Energies.

Table A4.4: Oil and gas pipeline crossings

Asset name	Type	Status	Marine route corridor intersection
Scotland To N Ireland Pipeline (SNIP) (PL982)	Gas	Active	AC6-NC-S-2 AC6-NC-S-1C
Interconnector 1 Scotland to Ireland IC1 (PL938)	Gas	Active	AC6-IS-N-3 AC6-IS-N-2 AC6-IS-N-1

Asset name	Type	Status	Marine route corridor intersection
Interconnector 2 Scotland to Ireland IC2 (PL1890)	Gas	Active	AC6-IS-N-3 AC6-IS-N-2 AC6-IS-N-1

Offshore wind farms and renewables

Table A4.5 shows the distances between the marine route corridor alignments and existing and planned offshore wind farms within the study area. It should be noted that many of the projects still in a planning stage have not decided on export cable routes, so there will be potential interactions with this. Where crossings of export cable routes are known, these are listed in Table A4.2 above.

Table A4.5: Existing and planned offshore wind farms within marine study area and their distances to the marine route corridors

Asset name	Developer	Status	Project background	Distance to marine route alignments (km)	Closest marine route corridor
Offshore wind farm projects					
Burbo Bank (also known as Crosby Flats)	Ørsted (formerly DONG Energy)	Operational	One of the UK's earliest offshore wind farms, commissioned in 2007, located in Liverpool Bay, ~7 km offshore	87.92	AC6-WAL-CAE-1
North Hoyle	RWE Renewables (formerly npower renewables)	Operational	The UK's first major offshore wind farm, commissioned in 2003, located ~7.5 km off the North Wales coast near Prestatyn	68.44	AC6-WAL-CAE-1
Rhyl Flats	RWE Renewables	Operational	Commissioned in 2009, located ~8 km offshore near Rhyl and Llandudno, designed to complement North Hoyle	55.03	AC6-WAL-CAE-1
Gwynt y Môr	RWE Renewables (60%), Stadtwerke München, Siemens	Operational	One of the largest offshore wind farms in Europe, operational since 2015, located ~13 km off the North Wales coast	60.08	AC6-WAL-CAE-1
Burbo Bank Extension	Ørsted, KIRKBI A/S, PKA	Operational	Operational since 2017, an extension to the original Burbo Bank site, using the then-largest turbines (8 MW)	80.01	AC6-WAL-CAE-1
West of Duddon Sands	Ørsted & ScottishPower Renewables	Operational	Located around 14 km south-west of Walney Island, the 389 MW wind farm became operational in 2014. Consists of 108 Siemens turbines	90.80	AC6-IS-N-3
Walney 1	Ørsted (formerly DONG Energy), SSE	Operational	Commissioned in 2011, Walney 1 is located west of Barrow-in-Furness and includes 51 turbines with a capacity of 183.6 MW.	89.70	AC6-IS-N-3

Asset name	Developer	Status	Project background	Distance to marine route alignments (km)	Closest marine route corridor
Walney 2	Ørsted & SSE	Operational	Walney 2 followed shortly after Walney 1, also commissioned in 2011, with a similar design and layout. It consists of another 51 turbines, bringing the total Walney capacity at the time to 367 MW.	81.68	AC6-IS-N-3
Walney Extension	Ørsted	Operational	Completed in 2018, this 659 MW project extended the Walney site. It uses a mix of Siemens and MHI Vestas turbines. Located south-west of the original Walney 1 and 2 wind farms, 19 km west of Walney Island	64.75	AC6-IS-N-3
Ormonde	Vattenfall	Operational	Located approximately 10 km off the coast of Barrow-in-Furness. Ormonde became operational in 2012. The 150 MW wind farm consists of 30 REpower turbines.	94.32	AC6-IS-N-3
Barrow	Ørsted (formerly DONG Energy)	Operational	Situated around 7 km south-west of Walney Island, Barrow Offshore Wind Farm was commissioned in 2006 with a capacity of 90 MW.	105.57	AC6-IS-N-3
Awel y Môr (Gwynt y Môr extension)	RWE Renewables	Consent authorised (pre-Final Investment Decision)	Extension to the operational Gwynt y Môr wind farm. Development Consent Order granted in 2023. The project is currently preparing for its Final Investment Decision (FID). The wind farm is expected to have a capacity of up to 576 MW.	N/A – no confirmed development area identified at the time of writing	-

Asset name	Developer	Status	Project background	Distance to marine route alignments (km)	Closest marine route corridor
Mona (Project Elizabeth/ Yellow South)	Mona Offshore Wind Ltd (joint venture between BP and EnBW)	Development consent granted	The Secretary of State granted development consent on 4 July 2025. Located approximately 28 miles off the north coast of Wales. It will generate up to 1.5 GW of electricity. It will share infrastructure with the Morgan Offshore project.	N/A – no confirmed development area identified at the time of writing	-
Moor Vannin (Isle of Man)	Ørsted (provisional developer under agreement with Isle of Man Government)	Early-stage/ Agreement for Lease	Proposed offshore wind farm within Isle of Man territorial waters. The project is part of the Isle of Man's renewable energy strategy. Capacity, design and consenting are in early stages and subject to future assessment and stakeholder consultation.	N/A – no confirmed development area identified at the time of writing	-
Morgan Offshore	Joint venture between BP and Energie Baden-Württemberg AG (EnBW)	Awaiting decision from Secretary of State	The Examination concluded on 10 March 2025. Awaiting the Examining Authority's report and final decision from the Secretary of State. The project will have a similar capacity to Mona and may share grid connections.	N/A – no confirmed development area identified at the time of writing	-
Morecambe Offshore	Morecambe Offshore Windfarm Ltd (joint venture between Zero-E/COBRA and Flotation Energy)	Examination concluded; Development Consent Order decision expected Q4 2025	A decision on the Development Consent Order is expected in Q4 2025. Located off the Lancashire coast and estimated to deliver up to 480 MW	N/A – no confirmed development area identified at the time of writing	-
North Channel Wind 1	SBM Offshore & NMK Renewables	Prospective	Floating offshore wind farm concept	N/A – no confirmed development area identified at the time of writing	-

Asset name	Developer	Status	Project background	Distance to marine route alignments (km)	Closest marine route corridor
North Channel Wind 2	SBM Offshore & NMK Renewables	Conceptual	Offshore wind farm at early planning stage	N/A – no confirmed development area identified at the time of writing	-
Draig Y Môr	RWE	Dormant	Offshore wind farm currently dormant	N/A – no confirmed development area identified at the time of writing	-
Tidal stream projects					
Morlais (also known as West Anglesey Demonstration Zone)	Menter Môn	Planned/consent obtained	Tidal stream project, consent granted 2021; construction expected to start in 2025 (starting onshore)	N/A – no confirmed development area identified at the time of writing	-
Holyhead Deep	Minesto AB	Testing/semi-operational (not attached to grid)	0.5 MW tidal stream project; plans to expand to 80 MW installed capacity. In September 2021, Minesto announced plans to develop the Holyhead Deep tidal array, proposing to install a 1.2 MW by the end of 2022. However, by March 2022, focus moved towards projects in the Faroe Islands.	6.5	AC6-IS-S-1

Restricted areas

Dredging, spoil and dumping grounds

Table A4.6 shows the dredging, spoil and dumping grounds that intersect or are close to the marine route corridor alignments.

Table A4.6: Disposal sites within proximity of marine route corridors

Site name and ID	Status	Cable route	Distance to closest cable route (km)	Length of cable intersecting site (km)
Beaufort's Dyke (IS280)	Disused/Closed	AC6-IS-N-1 AC6-IS-N-2 AC6-IS-N-3	0	0
Belfast Dredgings C (IS591)	Active	AC6-IS-N-1	302.9	0
Ayr Bay (MA050)	Active	AC5-SCO-MON	1148.0	0

PEXA and military areas

There are numerous military exercise (PEXA) areas within the study area; these are listed below in Table A4.7.

Table A4.7: Military areas within the marine study area

Name	Category	Information	Marine route corridor which intercepts with PEXA/military area
X5511: Irvine	Military practice area	Submarine exercise area	AC5-SCO-BAR
X5512: Ayr	Military practice area	Submarine exercise area	AC5-SCO-BAR
X5521: Turnberry	Military practice area	Submarine exercise area	AC5-SCO-BAL-2
X5552: Corridor Bravo	Military practice area	Naval operations area	AC5-SCO-OFF-2B
X5522: Pladda	Military practice area	Submarine exercise area	AC5-SCO-OFF-2B
X5524: Ailsa	Military practice area	Submarine exercise area	AC6-NC-N-1A
X5525: Ballantrae	Military practice area	Submarine exercise area	AC6-NC-N-2C
D509: Campbeltown	Military practice area/ PEXA	Surface or firing danger area and submarine/military exercises	AC6-NC-N-1A
X5527: Maiden	Military practice area	Submarine exercise area	AC6-NC-S-2

Name	Category	Information	Marine route corridor which intercepts with PEXA/military area
X5408: Beaufort	Military practice area	Submarine exercise area	AC6-IS-N-3
X5406: Juniper Rock	Military practice area	Surface danger area; practice and exercise area	AC6-IS-N-3
X5407: Magee	Military practice area	Submarine exercise area	AC6-NC-S-2
X5402: Ardglass	Military practice area	Submarine exercise area	AC6-IS-N-1
X5403: Peel	Military practice area	Submarine exercise area	AC6-IS-N-1
D402A: Luce Bay (N)	Military practice area/ PEXA	Surface or firing danger area and military practice zone	AC6-NC-N-4
D201B: Aberporth	Military practice area/ PEXA	Surface or firing danger area and missile testing/trials (QinetiQ site)	AC6-IS-S-1

Shipping and navigation

Table A4.8 shows the distances between the marine route corridor alignment and the existing ferry routes within the marine study area. It should be noted that ferry routes are not physically positioned and can marginally vary due to daily weather conditions and other marine traffic.

Table A4.8: Existing ferry routes within the study area and their distances to the marine route corridors

Ferry route	Distance (approx. km)	Frequency/seasonality	Marine route corridor that intercepts ferry route
Liverpool–Dublin	250	Daily, year-round (multiple sailings/day)	AC6-IS-C-2 AC6-IS-C-5
Liverpool–Belfast	265	Daily, year-round	AC6-IS-N- AC6-IS-N-2 AC6-IS-N-3
Cairnryan–Larne	72	High frequency, year-round	AC6-NC-N-2C AC6-NC-N-4 AC6-NC-S-2 AC6-NC-S-1C
Cairnryan–Belfast	81	Daily, year-round	AC6-NC-S-2 AC6-IS-N-1 AC6-IS-N-3

Commercial fisheries

Activity

Brown & May Marine Ltd was commissioned to undertake a fishing activity report for WL2 (Brown and May, 2024). The report categorised fishing activity by vessel country of origin, specifically UK, Belgian, French and Irish vessels. All the data demonstrated is summarised below.

Intensity

Fishing activity within the proposed cable route corridor across the Irish Sea is variable, with higher concentrations of activity recorded in the central section of the route, particularly within International Council for the Exploration of the Sea (ICES) rectangles 37E4, 37E5 and 36E4. Landings data indicate these areas support significant Nephrops trawl fisheries and seasonal scallop dredging. In contrast, fishing activity in the northern (39E5, 39E4, 38E4, 38E5) and southern sections (35E4, 35E5) is comparatively lower in terms of overall volume.

Activity is more spatially dispersed in offshore rectangles, with higher vessel concentrations typically closer to shore, particularly around known fishing grounds such as the Pisces Reef Complex in 37E4 and scallop grounds in 37E5 and 36E5.

Larger vessel intensity:

- Demersal trawling by larger vessels is most intense in rectangles 37E4 and 37E5, reducing towards the southern and northern extents of the route.
- Scallop dredging peak in 37E5 and 36E5, although fishing activity contains strong seasonal patterns.
- Potting activity is concentrated in the southern part of the route (35E4, 35E5), although lower volumes occur in the north.

These patterns of fishing activity are supported by AIS vessel tracking data, which show consistent spatial distributions and fishing effort within the corresponding ICES rectangles.

Type

Fishing methods within the marine route corridor are diverse but dominated by demersal otter trawls targeting Nephrops, particularly in 37E4, 37E5 and 36E4. Seasonal scallop dredging is a key activity in 37E5 and 36E5. Pots and traps are widely used in the southernmost rectangles (35E4, 35E5) to target edible crab, lobster and whelks. Most Irish vessel landings originate from ICES rectangles on the western side of the marine study area, closer to Ireland, and involve a variety of fishing methods (demersal otter trawls, pelagic trawls, pots, beam trawls, seines, dredges, etc.) targeting a wide range of species. Additionally, scallop dredger landings from Irish vessels are recorded in rectangle 36E5, near the North Wales landfalls.

Pelagic trawling is also recorded, primarily linked to seasonal herring fisheries in rectangles 37E4 and 38E4, while lower-intensity drift netting and fixed netting occurs occasionally along the marine route corridor.

The ICES rectangles that intersect the marine route corridors are outlined in Table A4.9.

Table A4.9: Location and restrictions of ICES rectangles that intercept the marine route corridor

ICES rectangles in which the routes intercept	Location of ICES rectangle	Regulations on fishing activities which take place within rectangle
39E5	Eastern part of the Firth of Clyde	Fishing for any species of sea fish (except herring, mackerel and sprats) from a fishing boat with an overall length not greater than 21.34m is permitted. Other time restrictions exist. No other specific regulations or restrictions found
39E4	East of the Kintyre peninsula and north of specified coordinates in the Firth of Clyde	Seasonal fishing ban (Feb 14–Apr 30), Prohibits most fishing by British vessels in specified parts, but allows scallop dredging, creeling and Norway lobster trawling under conditions
38E4	Southern part of the Firth of Clyde	Prohibited to deploy any bottom set gillnet, entanglement net and trammel net at any position where the charted depth is greater than 200m. Daily time restrictions on scallop fishing are present. No other specific regulations or restrictions found
38E5	Adjacent to 38E4, also within the Firth of Clyde	Fishing for sea fish with a dredge, beam trawl, demersal seine net or demersal trawl is prohibited in the Luce Bay Protected Area. No specific regulations or restrictions found
37E4	Includes the Pisces Reef Complex; significant Nephrops and demersal-species fishery ⁴⁵	Irish Sea Cod Box: From 14 th February to 30 th April each year it is prohibited to use any demersal trawl, seine or similar towed net, any gillnet, entangling net or trammel net or any fishing gear incorporating hooks. Daily time restrictions on scallop fishing are present. No other specific regulations or restrictions found
37E5	Known area for king scallop fishing with historic seasonal landings	No specific regulations or restrictions found
36E4	Part of the Irish Sea West Functional Unit; important Nephrops fishery	No specific regulations or restrictions found
36E5	Supports king scallop fishing during seasonal landings ⁴⁶	No specific regulations or restrictions found

⁴⁵ Joint Nature Conservation Committee (2012), 'Pisces Reef Complex Special Area of Conservation: Final Impact Assessment', JNCC, Peterborough. Available online: <https://data.jncc.gov.uk/data/9fd4a46a-7d93-461a-87b1-10a0a0834ad7/PiscesReef-FinallImpactAssessment.pdf> (accessed August 2025).

⁴⁶ Isle of Man Scallop Management Board and Department of Environment, Food and Agriculture (2021), 'Joint Consultation on a Long-Term Management Plan for the King Scallop Fishery within the Isle of Man territorial sea', SMB and DEFA, Isle of Man. Available online: https://consult.gov.im/environment-food-and-agriculture/consult-on-the-isle-of-man-king-scallop-fishery/supporting_documents/Consultation%20Document%20Part%201%20and%20Part%202.pdf (accessed August 2025).

ICES rectangles in which the routes intercept	Location of ICES rectangle	Regulations on fishing activities which take place within rectangle
35E4	General fishing area in the Irish Sea	No specific regulations or restrictions found
35E5	Southern part of the Irish Sea	NWSFC Byelaw 3, 6, 7, 8, 10, 11, 12, 14, 30 and Scallop order 2010 exist here. No specific regulations or restrictions found

Fisheries engagement summary

Given the project spans multiple jurisdictions, it was essential to ensure all key fisheries stakeholders were identified and subsequently consulted. Specifically, key stakeholders that have been consulted to date with regard to this topic are outlined below.

In relation to the northern portion of the marine route corridor in Scottish waters, the Clyde Fishermen’s Association (CFA) and the Scottish Fishermen’s Federation (SFF), as well as unaffiliated creel fishers were consulted. Meetings with both organisations have taken place over the course of project development, facilitated by the wider project team and Blackhall and Powis. Through consultation with local fishing industry representatives (FIR) and fisheries liaison officers (FLO), it was possible to identify the Scottish creel fishers of relevance to the project. Several dozen fishers were identified throughout the region. It was concluded six creel fishers may be impacted from project-related activities.

With regard to Northern Ireland, the Anglo-North Irish Fish Producers Organisation (ANIFPO), through Director Brian Chambers, served as the FIR in Northern Ireland. It was determined static gear was not a stakeholder issue, due to sufficient water depth of the project in Irish waters.

Conversations with the Manx Fish Producers’ Organisation, as well as the Director of Harbours and DoI was undertaken in relation to fisheries engagement in the Isle of Man. Offshore FLOs have additionally been mobilised as part of the geophysical survey campaign for the project. In Manx waters, it was determined that mobile fishing gear is more prevalent over static gear methods.

In Wales, consultation with the Welsh Fishermen’s Association was undertaken, alongside the identification of unaffiliated fishers, specifically creel fishers; two were noted to be potentially impacted through project-related activities. To date, gear relocation and schedule shifts have been required with respect to the survey campaign for the project in relation to fisheries interaction.

Restricted fishing areas and relevant byelaws

Relevant authorities:

- Scotland – managed under the Inshore Fishing (Scotland) Act 1984, which permits regulation of fishing methods and restricted areas in inshore waters
- Isle of Man – governed by the Sea-Fisheries Act 1971 and associated byelaws, including the Manx Marine Nature Reserves Byelaws 2018, which enforce no-take, mobile gear restrictions and habitat protection in areas like Laxey Bay.

- Wales – falls under UK-wide frameworks established by the Marine and Coastal Access Act 2009 and enforcement by Welsh authorities (no specific regional byelaws identified in available sources).⁴⁷

Relevant marine plans

Welsh National Marine Plan

The relevant policies for cables in the Welsh National Marine Plan⁴⁸ are summarised in Table A4.10.

Table A4.10: Welsh National Marine Plan policies

Policy code	Policy text
CAB_01 (Supporting)	"Proposals that facilitate the growth of digital communications networks and/or the optimal distribution of electricity will be supported where they contribute to the objectives of this plan. Proposals should comply with the relevant general policies and sector safeguarding policies of this plan and any other relevant considerations."
CAB_02 (Safeguarding)	"Preference for burial of subsea cables where feasible. Where burial isn't possible, proposals must include appropriate protection measures. If neither burial nor protection is viable, a clear case for proceeding must be explained."
CAB_03 (Safeguarding)	"Support compatibility with future landfall and cable development opportunities, ensuring proposals avoid, minimise or mitigate significant adverse impacts on new or existing landfall sites."
CAB_04 (Safeguarding)	"Ensure compatibility with maintenance, decommissioning, and existing subsea cable operations, demonstrating how current functions and ongoing activities are safeguarded."
Policy SAF_01a	"Proposals must safeguard existing and future strategic infrastructure — including subsea cables — by allowing sufficient buffer and access to installed assets. This includes a standard buffer of approx. 250 m either side of the cable or greater (typically three times the water depth), consistent with Crown Estate and ESCA guidelines."
Policy SAF_02a	Addresses broader strategic resource areas. Although currently in draft guidance, SAF_02 may affect subsea cable routing and associated infrastructure zones. Should be monitored for updates.

Scotland's National Marine Plan

The relevant policies for cables in the Scotland's National Marine Plan⁴⁹ are summarised in Table A4.11.

⁴⁷ Welsh Government (2024), 'Fishing vessel licences: category A (11) conditions', Welsh Government, Cardiff. Available online: <https://www.gov.wales/sites/default/files/publications/2024-01/fishing-vessel-licences-category-a-11-conditions.pdf> (accessed August 2025).

⁴⁸ Welsh Government (2019), 'Welsh National Marine Plan'. Accessed August 2025.

⁴⁹ Scottish Government (2015), 'Scotland's National Marine Plan'. Accessed August 2025.

Table A4.11: Scotland's National Marine Plan policies

Policy code	Policy text
CABLES 1	Cable and network owners should engage decision-makers at an early planning stage to notify of intentions to lay, repair or replace cables before routes are selected. Proposals must show a joined-up approach to minimise impacts on marine historic and natural environments, assets, infrastructure and other users. Includes appropriate risk and environmental assessments and consideration of protection or mitigation measures.
CABLES 2	Decisions on submarine cable proposals should consider suitable routeing, impact minimisation methods, burial where there are safety or seabed stability risks and (where burial is not feasible) protection by approved measures like rock placement or armour. Post-lay monitoring, seabed reinstatement and remedial action guidance may be required.
CABLES 3	A risk-based approach should be applied to removal of redundant submarine cables. Where leaving cables in situ would minimise impacts on the marine environment or other users, that option should be considered.
CABLES 4	When selecting landfall sites for power or telecom cables, developers and decision-makers must consider General Policies (e.g., flooding and coastal protection) and align with Scottish Planning Policy and Local Development Plans. Regional marine plans should identify suitable landfall areas integrated with terrestrial marine spatial priorities.

Scotland National Marine Plan 2 - Strategic Environmental Assessment Scoping Report

The Scotland National Marine Plan 2 (SNMP2)⁵⁰ is the expected update to Scotland's existing marine planning framework, intended to guide sustainable development and management of Scottish seas. It will build on the original National Marine Plan (2015) by incorporating new policy priorities such as climate change targets, biodiversity recovery and emerging marine industries. SNMP2 is currently in development, with a Strategic Environmental Assessment Scoping Report published to help outline the environmental considerations of the new plan.

At the time of writing, no specific policies or legislative actions relating to subsea cables have been published under SNMP2. As the project progresses, the SNMP2 will be monitored for the inclusion of relevant policies that may be released in future drafts or the final plan document.

Clyde Regional Marine Plan pre-consultation draft

The draft Clyde Regional Marine Plan⁵¹ was submitted to Marine Scotland for review in July 2020. The review process is still in progress. The submission of an updated Statement of Public Participation to Scottish Ministers was put on hold because of the Covid-19 pandemic response.

Therefore, at the time of writing, no confirmed policies or legislative actions relating to subsea cables have been published under the Clyde Regional Marine Plan. We will continue to monitor developments and update this document accordingly should relevant policies be released in future

⁵⁰ Scottish Government (2023), 'National Marine Plan 2: Strategic Environmental Assessment Scoping Report'. Accessed August 2025.

⁵¹ Clyde Marine Planning Partnership (n.d.), 'Clyde Regional Marine Plan'. Accessed August 2025.

drafts or the final plan document. The draft relevant policies for cables in the Clyde Regional Marine Plan are summarised in Table A4.12.

Table A4.12: Clyde Regional Marine Plan pre-consultation draft policies

Policy code	Policy text
ENCA 1	<p>“Development and activities relating to offshore wind and marine renewable energy development will be supported where:</p> <ul style="list-style-type: none"> • proposals for commercial scale developments are sited in Plan Option areas identified through the Sectoral Marine Plan process..., • due regard has been paid to relevant factors in Regional Locational Guidance, • connections to shore and National Grid infrastructure have been considered in line with the relevant Local Development Plan(s), • detailed restoration and maintenance proposals are included.”
ENCA 2	<p>“The decommissioning of oil and gas infrastructure will be supported in line with Policy SHIP 2. Proposals for oil and gas exploration and production are not anticipated in the Clyde Marine Region; however, any proposal will only be supported where in line with statutory marine and terrestrial planning policy, environmental regulations and industry best practice.”</p>
ENCA 3	<p>“The laying, replacement and maintenance of communication and power cables and any oil and gas pipelines is supported where:</p> <ul style="list-style-type: none"> • proposed land fall is in line with the relevant Local Development Plan(s), • existing routes and landing points are used where practicable, • a Fishing Mitigation Action Plan, considering all legitimate sea users, is completed.”

Draft Marine Plan for Northern Ireland

The Draft Marine Plan for Northern Ireland (2018)⁵² sets out the framework for sustainable management of the marine environment in Northern Ireland’s inshore and offshore waters. It includes a specific policy supporting subsea telecommunications cabling, emphasising the importance of avoiding, minimising or mitigating adverse environmental impacts and promoting burial of cables, where feasible. At the time of writing, this remains the sole dedicated subsea cable policy within the draft plan. We will continue to monitor any updates and incorporate relevant policies as they are published in the final Marine Plan. The relevant information for cables in Northern Ireland is summarised in Table A4.13.

Table A4.13: Draft Marine Plan for Northern Ireland associated cable documents

Document	Summary of the document text
Draft Marine Plan NI (final April 2018) ⁵³	<p>“There is a presumption in favour of subsea telecommunication proposals where it can be demonstrated: a) there will be no unacceptable adverse impact on marine activities, uses and/or the marine area and any potential adverse impact is, in order of preference, avoided, minimised and/or mitigated; b) consideration has been given to burial of cables as a</p>

⁵² Department of Agriculture, Environment and Rural Affairs (DAERA) (n.d.) *Marine Plan for Northern Ireland*. Accessed August 2025.

⁵³ Department of Agriculture, Environment and Rural Affairs (DAERA) (2018) *Marine Plan for Northern Ireland*.

Document	Summary of the document text
	preferred option; and, c) restoration measures have been agreed where necessary.”

Manx Marine Environmental Assessment (Isle of Man Marine Plan Marine Development Consenting Consultation)

The Manx Marine Environmental Assessment⁵⁴ provides a baseline overview of the Isle of Man’s marine environment, including ecological features, human uses and spatial data such as existing subsea infrastructure. It is intended as a supporting evidence base rather than a policy document and does not contain any specific marine policies or regulatory frameworks relating to subsea cable development.

The Isle of Man Marine Development Consenting Consultation^{55,56}, prepared under the Marine Infrastructure Management Act 2016, is due to outline the consenting process for marine infrastructure such as submarine cables and pipelines. While it will establish the legal framework for approvals, it will not include formal policy codes or detailed technical guidance. At the time of writing, no specific subsea cable policies have been published for the Isle of Man. These areas remain under development, and we will continue to review and update this summary as relevant policy documents emerge. The relevant information for cables in the Manx Marine Environmental Assessment are summarised in Table A4.14.

Table A4.14: Manx Marine Environmental Assessment (Isle of Man Marine Plan Marine Development Consenting Consultation) associated cable documents

Document	Summary of the document text
Manx Marine Environmental Assessment (<i>N/A Policy Codes</i>)	Provides environmental baseline data, including mapping of existing submarine cables and sensitive marine habitats. Does not contain formal policies or policy codes. Focus is descriptive and spatial, not regulatory.
Marine Development Consenting Consultation (under the Marine Infrastructure Management Act 2016) (<i>N/A Policy Codes</i>)	Will set out the consenting process for marine infrastructure (including submarine cables and pipelines). Will cover application requirements, environmental assessments and stakeholder engagement. Does not include specific subsea cable policies or technical guidance

Major projects

A review of projects in the marine study area has been undertaken. Projects in this section may have an impact on the cable landfall or offshore cable route. This section considers:

- cable landfall selection and de-selection and reasons behind these decisions on other projects
- stakeholder comments that may have an effect on the proposed landfalls or offshore routes within 12 nm
- seabed leases and how they interact

⁵⁴ Isle of Man Government (2018), ‘Manx Marine Environmental Assessment: Non-technical summary’.

⁵⁵ Department of Infrastructure, Isle of Man (n.d.), ‘Marine Infrastructure Regulations consultation’.

⁵⁶ Isle of Man Government (2024), Marine Infrastructure (Consenting Process) Regulations 2024.

- decisions made on projects by the Marine Management Organisation and any conditions that were placed on them which may be pertinent to the project.

It is recognised that since the development of the marine route corridor alignments prior to July 2025, major developments in the region have provided further details on their individual schemes, e.g., cable routes have been published or refined. The changes do not materially alter the conclusions of the assessment, although they would be used in future to refine the selected preferred marine route corridor alignment, e.g., to optimise infrastructure crossing locations. The sections below provide the most recent publicly available information as of August 2025. For detail on the proposed timelines for these projects, please see Table 7.2.

Holyhead Harbour extension

The planned Holyhead Harbour extension⁵⁷ will reconstruct and expand the port through significant land reclamation.

As part of the Holyhead Gateway scheme, endorsed under the North Wales Growth Deal⁵⁸, the extension project aims to reclaim approximately 11.7 ha of seabed within the harbour to accommodate two new major berths and increase operational space. A specialist deep-water berth will also be added to support growing ferry, freight and cruise ship activity.

The project has proceeded through formal consenting: a Harbour Revision Order application has been submitted and approved by the Welsh Government, and a Marine Works EIA consent (CML1931) has been granted by Natural Resources Wales, allowing construction, reclamation and dredging activities subject to environmental conditions.

Key elements include:

- land reclamation of ~11.7 ha for quay walls, dock space, and cruise/ferry berths
- construction of a specialist deep-water berth for cruise vessels and enhanced freight capacity
- dredging of approach channels to support larger vessels and improve navigability
- full EIA with marine, coastal, ecological, and noise assessments completed, with statutory licensing in place.

Barrow Port expansion

The planned expansion of Barrow Port seeks to enhance the harbour's operational capacity to support maritime industries, particularly offshore energy.

Planning consent has been secured for new berthing facilities as part of the development, which will serve as a critical hub for offshore wind farm maintenance and associated maritime logistics.

The proposal includes infrastructure upgrades to improve vessel access and operational efficiency, aligning with regional growth in renewable energy and maritime trade.

Key elements include:

- construction of new berths to support offshore wind sector servicing
- upgrades to port infrastructure to handle increased vessel traffic

⁵⁷ Associated British Ports (2024), 'ABP unveils ambitious masterplan for Port of Barrow'. Available online: <https://www.abports.co.uk/news-and-media/latest-news/2024/abp-unveils-ambitious-masterplan-for-port-of-barrow/> (accessed August 2025).

- enhanced logistical capabilities to support regional maritime industries.

Woodside Ferry Terminal upgrade (Merseyside)

The Woodside Ferry Terminal⁵⁹ is undergoing a major upgrade as part of wider improvements to ferry infrastructure across the Mersey.

Marine licensing has been granted, with works involving demolition of outdated structures and construction of new foundations and a modern ferry landing facility. The terminal, located on the Wirral, is historically significant and plays a key role in connecting communities across the river.

Key elements include:

- demolition of the existing terminal structure
- construction of a new, accessible ferry landing and passenger facilities
- infrastructure upgrades to meet modern safety and operational standards.

Mersey Estuary habitat restoration

Ongoing habitat restoration projects⁶⁰ within the Mersey Estuary aim to improve ecological health, enhance biodiversity and build natural resilience to flooding and erosion.

Various phases of wetland creation, saltmarsh enhancement and shoreline improvement are being delivered in partnership with conservation bodies and local authorities.

These initiatives contribute to the long-term health of estuarine ecosystems while supporting the region's climate resilience strategies.

Key elements include:

- creation and enhancement of intertidal habitats, including saltmarsh and mudflats
- reconnection of historic wetlands to tidal flow to restore natural processes
- implementation of nature-based solutions for flood risk management.

Northwest England and North Wales Shoreline Management Plan 2 and 3 (SMP2/SMP3)

The next iteration of the Shoreline Management Plans (SMPs)⁶¹ for Northwest England and North Wales is in development, building on findings from SMP1 and SMP2.

These strategic documents guide long-term coastal risk management, balancing flood and erosion protection with environmental and community priorities.

The upcoming SMP3 will undergo public consultation and integrate new data, climate projections and stakeholder input to update coastal management policy.

Key elements include:

- policy reviews for coastal defence approaches (Hold the Line, Managed Realignment, etc.)

⁵⁹ Mersey Ferries (2024), 'Woodside Ferry Terminal Upgrade'. Available online: <https://www.merseyferries.co.uk/blog/other/woodside-upgrade/> (accessed August 2025).

⁶⁰ Mersey Gateway Environmental Trust (n.d.), 'Projects'. Available online: <https://www.mget.org.uk/projects/> (accessed August 2025).

⁶¹ Environmental Agency (n.d.), 'Shoreline Management Plan (SMP22) – Main Document'. Available online: <https://environment.data.gov.uk/shoreline-planning/documents/SMP22/SMP%20Main%20Document%20FINALV2.pdf> (accessed August 2025).

- updated coastal erosion and flood risk assessments using latest modelling
- consultation with communities and regulators to shape adaptive coastal strategies.

Irish Sea Marine Protected Area monitoring

Ongoing government-led monitoring⁶² of Marine Protected Areas in the Irish Sea ensures that designated sites are effectively managed and conserved.

The programme assesses the health and status of marine habitats and species within Special Areas of Conservation, Special Protection Areas and Marine Conservation Zones. Data collected through surveys and remote monitoring informs future management actions and compliance with environmental objectives.

Key elements include:

- ecological surveys of seabed habitats, fish populations and protected species
- use of remote sensing, acoustic monitoring and scientific sampling
- annual reporting to track conservation status and progress.

⁶² GOV.UK Marine Science Blog (2025), 'Integrated marine monitoring to protect the Irish Sea', 13 May. Available online: <https://marinescience.blog.gov.uk/2025/05/13/integrated-marine-monitoring-to-protect-the-irish-sea/> (accessed August 2025).

APPENDIX 5 ELECTRICITY ACT 1989

SCHEDULE 9 PRESERVATION OF AMENITY AND FISHERIES⁶³.

Preservation of amenity: England and Wales

- 1 (1) In formulating any relevant proposals, a licence holder or a person authorised by exemption to generate, distribute, supply or participate in the transmission of electricity
- (a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and
 - (b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.
- (2) In considering any relevant proposals for which its consent is required under section 36 or 37 of this Act, the appropriate authority shall have regard to—
- (a) the desirability of the matters mentioned in paragraph (a) of sub-paragraph (1) above; and
 - (b) the extent to which the person by whom the proposals were formulated has complied with his duty under paragraph (b) of that sub-paragraph.
- (3) In this paragraph—
- “appropriate authority” has the meaning given by section 36(10)(b) or (c) of this Act;
 - “building” includes structure;
 - “relevant proposals” means any proposals—
- (a) for the construction or extension of a generating station of a capacity not less than 10 megawatts, or for the operation of such a station in a different manner;
 - (b) for the installation (whether above or below ground) of an electric line; or
 - (c) for the execution of any other works for or in connection with the transmission or supply of electricity.
- (4) The appropriate authority may by order provide that sub-paragraph (3) above shall have effect as if for the capacity mentioned in paragraph (a) there were substituted such other capacity as may be specified in the order.
- (5) This paragraph and paragraph 2 below extend to England and Wales only.
- 2 (1) A licence holder shall within twelve months from the grant of his licence prepare, and from time to time modify, a statement setting out the manner in which he

⁶³ <https://www.legislation.gov.uk/ukpga/1989/29/schedule/9>

proposes to perform his duty under paragraph 1(1) above, including in particular the consultation procedures which he intends to follow.

(2) Before preparing or modifying a statement under this paragraph, a licence holder shall consult the Countryside Agency, and—

(a) where the activities which he is authorised by his licence to carry on include activities in England, Natural England and the Historic Buildings and Monuments Commission for England; and

(b) where those activities include activities in Wales, the Natural Resources Body for Wales and the National Assembly for Wales.

(3) As soon as practicable after preparing or modifying a statement under this paragraph, the licence holder shall publish the statement as so prepared or so modified in such manner as he considers appropriate.

Preservation of amenity and fisheries: Scotland

3 (1) In formulating any relevant proposals, a licence holder or a person authorised by an exemption to generate, distribute, supply or participate in the transmission of electricity—

(a) shall have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and

(b) shall do what he reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.

(2) In considering any relevant proposals for which his consent is required under section 36 or 37 of this Act, the Secretary of State shall have regard to—

(a) the desirability of the matters mentioned in paragraph (a) of sub-paragraph (1) above; and

(b) the extent to which the person by whom the proposals were formulated has complied with his duty under paragraph (b) of that sub-paragraph.

(3) Without prejudice to sub-paragraphs (1) and (2) above, in exercising any relevant functions each of the following, namely, a licence holder, a person authorised by an exemption to generate or supply electricity and the Secretary of State shall avoid, so far as possible, causing injuries to fisheries or to the stock of fish in any waters.

(4) In this paragraph—

“building” includes structure;

“relevant proposals” has the same meaning as in paragraph 1 above and, for the purposes of this paragraph, any such order as is mentioned in sub-paragraph (4) of that paragraph may be made under this sub-paragraph;

“relevant functions” means any powers conferred and any duties imposed by or under this Act.

(5) This paragraph and paragraphs 4 and 5 below extend to Scotland only.

- 4 (1) A licence holder shall within twelve months from the grant of his licence prepare, and from time to time modify, a statement setting out the manner in which he proposes to perform his duty under paragraph 3(1) above, including in particular the consultation procedures which he intends to follow.
- (2) Before preparing or modifying a statement under this paragraph, a licence holder shall consult with Scottish Natural Heritage and with the National Park authority for any National Park which would be affected by the relevant proposals.
- (3) As soon as practicable after preparing or modifying a statement under this paragraph, the licence holder shall publish the statement so prepared or so modified in such a manner as he considers appropriate.