



13. Other Marine Users

13.1. Study Area Definition

This chapter of the Scoping Report describes the potential impacts arising from the construction, operation and maintenance, and decommissioning of the Eastern Green Link 4 (EGL 4) hereafter referred to as 'the Project' on other marine users. This chapter considers the following marine users:

- Offshore wind farms (OWF);
- Other power and telecommunication cables;
- Carbon Capture Storage (CCS) and natural gas storage sites;
- Disposal sites;
- Aggregate extraction sites;
- Chemical weapon and munitions disposal sites;
- Ministry of Defence (MoD) Practice Exercise Areas (PEXA);
- Oil and gas operations;
- Recreational activities (note that recreational boating is also covered in Chapter 11 Shipping and Navigation); and
- Angling – including chartered anglers (note that commercial fishing is also covered in Chapter 12 Commercial Fisheries).

The Scoping Boundary for the Project extends from MHWS in England to MHWS in Scotland. It is nominally 1 km wide, 500 m either side of the centreline, however, it widens in areas where there is still optionality in the design e.g., to allow for micro-routeing around potential seabed features. It is anticipated that the Marine Licence application boundary will ultimately be 500 m following refinement and rationalisation as the MEA and design process evolves.

There are two proposed Landfalls in England (Anderby Creek and Theddlethorpe) and two proposed Landfalls in Scotland (Kingham and one in Lower Largo/Lundin Links) being considered at this stage of the environmental assessment process. These options will be subject to further technical feasibility work and stakeholder consultation and will be refined to one preferred option for inclusion in the subsequent Marine Licence application for the Project.

The Study Area for this receptor includes the Scoping Boundary plus an additional 15 km buffer to either side. This is a precautionary maximum zone of influence that encompasses the potential impact pathways from underwater noise and increased suspended sediment concentrations. It will be reviewed and refined for the MEA based on maximum tidal excursions and if appropriate sediment dispersion modelling. The zone of influence will be determined by the conclusions of Chapter 6 – Marine Physical Processes, and this chapter should be read in conjunction with these findings.

Kilometre Points (KPs) are used throughout this Chapter to provide context as to where within the Study Area a feature lies. KP 0 is defined at the Anderby Creek Landfall. As there are still alternative Landfalls being considered, KPs have been created along the longest route from the proposed English Landfall at Anderby Creek, around the Holderness Offshore Marine Conservation Zone (MCZ) to the proposed Scottish Landfall at Kinghorn. The KPs for this route are referenced as KP0 – KP524.9. Alternative options, which branch off this longest route, are: routed from the proposed English Landfall at Theddlethorpe to the point where it converges with the longest route (referenced as T_KP0 to T_KP14); through Holderness Offshore MCZ, which is referenced as H_KP0 to H_KP39; and from the proposed Scottish landfall at Lower Largo to the point where it converges with the longest route (referenced as L_KP0 to L_KP16).

13.2. Data Sources

Data sourced for the baseline characterisation will be presented in accordance with relevant guidance for the topic. The datasets that will be used to inform the description of the baseline environment for the MEA are described in the following sub-sections.

13.2.1. Site-specific Survey Data

Extensive information is available regarding other marine users of the North Sea. Following a detailed review to inform the scope of the data and assessment, as presented, no site-specific surveys are planned for this topic.

13.2.2. Publicly Available Data

A desk-based review of publicly available data sources (literature and GIS mapping files) will be used to describe the baseline environment. Table 13 1 lists the key data sources which would be used in the assessment.



Table 13-1: Key publicly available data sources for other marine users

Data Source	Description	Coverage	
		English Study Area	Scottish Study Area
The Crown Estate (TCE)	OWF lease agreement areas, Marine Aggregate sites, Carbon Capture and Storage sites, Natural Gas Storage sites (The Crown Estate, 2023).	✓	
Crown Estate Scotland (CES)	OWF lease agreement areas, wave and tidal agreements, aquaculture sites, marine aggregate sites (Crown Estate Scotland, 2023).		✓
Marine Management Organisation (MMO)	Data sources for licensed aggregate and disposal sites and OWFs.	✓	
Marine Directorate - Licensing Operations Team (MD-LOT)	Data sources for licensed aggregate and disposal sites and OWFs.		✓
KIS-ORCA	KIS-ORCA data is available free of charge to skippers and includes Northern European cables and UK renewable energy structures (KIS-ORCA, 2022).	✓	✓
North Sea Transition Authority (NSTA), Department for Energy Security and Net Zero (DESNZ), Offshore Petroleum Regulator for Environment and Decommissioning	Hosts data on current and historical oil and gas infrastructure (Oil & Gas Interactive, 2023).	✓	✓
EMODnet (2023)	EMODnet is a consortium of organisations assembling European marine data, data products and metadata from diverse sources in a uniform way.	✓	✓
European Subsea Cable Association (ESCA)	Information for developers on offshore renewable and submarine cable infrastructure. (ESCA, 2023).	✓	✓
Royal Yachting Association (RYA)	UK Coastal Atlas of Recreational Boating (RYA, 2019).	✓	✓

13.2.3. Additional Studies

No additional studies are proposed to be undertaken for this topic.

13.3. Consultation

Consultation will be undertaken with other marine users to supplement the desk-top review and studies. The following bodies will be consulted, as a minimum, to ensure that the most up-to-date information is collated:

Table 13-2: List of stakeholders to be consulted

England	Scotland
MMO	MD-LOT
Environment Agency	Scottish Environment Protection Agency (SEPA)
TCE	CES
MoD	MoD
OPRED	OPRED
NSTA	NSTA



England	Scotland
Offshore Energies UK (OEUK)	OEUK
British Marine Aggregate Producers Association (BMAPA)	BMAPA
Royal Yachting Association (RYA)	RYA Scotland
Offshore Wind Farm owners	Offshore Wind Farm owners
Third-party asset owners (e.g., pipelines, power and telecommunication cables) which the Marine Scheme crosses.	Third-party asset owners (e.g., pipelines, power and telecommunication cables) which the Marine Scheme crosses.
Natural England	NatureScot

13.4. Baseline Characterisation

13.4.1. Introduction

This section has been split into the following sub-sections.

- English baseline characterisation
- Scottish baseline characterisation

The baseline characterisation sections include information on: OWFs, power and telecommunication cables, CCS and natural gas storage sites, dredge and spoil disposal sites, aggregate extraction sites, chemical weapon and munitions disposal sites, PEXAs, oil and gas operations and recreational activities.

13.4.2. English Baseline KP 0 – KP 418.7

13.4.2.1. Offshore Wind Farms

There are six operational or planned OWFs in proximity of the Project within the English Study Area as shown in Figure 13-2 (Drawing C01494-EGL4-INFR-005). Table 13-3 shows the distance from the proposed submarine cable corridor to these OWFs.

Table 13-3: Distance from Scoping Boundary to existing or planned OWFs within the English Study Area

OWF name	Operator	Status	Distance from the Scoping Boundary	Project could cross OWF export cables
Humber Gateway Offshore Wind Farm	Humber Wind Limited, operator RWE Renewables and Greencoat UK Wind Plc	Fully operational 2015	14.7 km	No
Triton Knoll Offshore Wind Farm	Triton Knoll Offshore Wind Farm Ltd, owner J-POWER/Electric Power Development Co.LTD, Kansai Electric Power Co., Inc	Fully operational 2022	7.5 km	Yes (See below)
Outer Dowsing Offshore Wind Farm	TotalEnergies SE, Corio Generation, Ontario Teachers' Pension Plan	Application is expected to be submitted to the Planning Inspectorate Q4 2023	13 km	Yes (see below)
Lincs Offshore Wind farm	Ørsted A/S, Equitix Ltd, Octopus Energy Generation & Corio Generation	Fully operational 2010	6.4 km	No
Inner Dowsing Offshore Windfarm	BlackRock Investment Management (UK) Limited & Equitix Ltd	Fully operational 2009	8.3 km	No
Lynn Offshore Wind Farm	BlackRock Investment Management (UK) Limited & Equitix Ltd	Fully operational 2009	14.8 km	No



13.4.2.2. Power and Telecommunications Cables

Within the English Study Area there are two operational interconnectors, three planned interconnectors, three planned reinforcement power cable projects, seven active telecommunication cables, fourteen operational export cables from four different OWFs and eighteen potential export cables from planned OWF projects. All of these cables are listed in Table 13-4. These cables are illustrated in Figure 13-2 (Drawing C01494-EGL4-INFR-005).

Table 13-4: Distance from Scoping Boundary to existing or planned power or telecommunication cables within English Study Area

Cable Name and Developer	Type	Project information	Distance from the Scoping Boundary
Viking Link – Energinet DK and National Grid	Interconnector	Operational	Crosses
North Sea Link	Interconnector	Operational	Crosses
Scotland England Green Link 1 [National Grid and Scottish Power Energy Networks]	Reinforcement power cable	Application submitted to Marine Management Organisation (MMO) 2022 Marine Scotland Licence granted July 2023 Construction between 2023 and 2027. MS Application Ref:00009880	Potentially crosses
Scotland England Green Link 2 [National Grid and Scottish and Southern Electricity Networks]	Reinforcement power cable	Application submitted to MMO 2022. Marine Scotland Licence granted July 2023. Construction due to start Autumn 2024 to 2029. MS Application Ref: 00009943	Potentially crosses
Nu-Link / SENECA [Nu-Link Consortium – Frontier Power]	Interconnector	Connection agreement at Mablethorpe Substation. Connection between UK and Netherlands (Offshore Energy, 2023). OFGEM licence granted 2023	Potentially crosses
Aminth [Copenhagen Infrastructure Partners]	Interconnector	Landfall at Mablethorpe. Connection between UK and Denmark. The project is expected to reach a final investment decision in 2026 and the start of operations between 2030 and 2032 (Offshore Energy, 2023a). OFGEM licence granted 2023	Potentially crosses
Continental Link Multi-Purpose Interconnector [National Grid Ventures]	Interconnector	Pre-Application Application is expected to be submitted Q2 2025 Connection between UK and Norway.	Potentially crosses
Eastern Green Link 3 [NGET and Scottish Power Transmission]	Reinforcement power cable	Pre-Application Application is expected to be submitted 2025. Connection between Scotland and England. Construction to be completed by 2031.	Potentially crosses
Lynn and Inner Dowsing Offshore Wind Farm export cables [GLID Wind Farms]	Six export cables	Fully operational	10 km
Lincs Offshore Wind Farm export cable [Ørsted]	One export cable	Fully operational	10 km
Triton Knoll [Equitix and TEPCO Power Grid]	Two export cables	Fully operational	Crosses



Cable Name and Developer	Type	Project information	Distance from the Scoping Boundary
Hornsea Project 1 & 2 Offshore Wind Farm Export cables [OFTO - Diamond Transmission Partners Hornsea One Ltd, OFTO for Hornsea Project 2 is still at ITT stage]	Five export cables	Fully operational	Crosses
Hornsea Project 4 Offshore Wind Farm cables [Ørsted]	Export cables (assumed x3)	Development Consent Order application approved in July 2023	Crosses
Dogger Bank A Offshore Wind Farm Export cables [SSE]	Export cables (assumed x2)	Under construction	Crosses
Dogger Bank B [SSE Renewables, Equinor and Vårgrønn]	Export cables (assumed x2)	Under Construction	Crosses
Dogger Bank C [SSE Renewables, Equinor and Vårgrønn]	Export cables (assumed x3)	Development Consent Order Granted in 2015	Crosses
Sofia [RWE]	Export cables (assumed x2)	Development Consent Order Granted in 2015	Crosses
Outer Dowsing Offshore Windfarm [Green Investment Group and TotalEnergies]	Export cables (assumed x2)	Application Application is expected to be submitted in Q1 2024	Potentially crosses
Dogger Bank South West [RWE]	Export cables (assumed x2)	Pre – Application Application is expected to be submitted in Q2 2024	Potentially crosses
Dogger Bank South East [RWE]	Export cables (assumed x2)	Pre – Application Application is expected to be submitted in Q2 2024	Potentially crosses
Havhingsten [Aquacomms]	Telecom	Active	Crosses
PANGEA NORTH [ASN]	Telecom	Active	Crosses
TATA NORTH EUROPE [EU Networks]	Telecom	Active	Crosses
UK-DENMARK 4 [BT]	Telecom	Active	Crosses
UK-GERMANY 6 [BT]	Telecom	Active	Crosses
NO UK [Altibox]	Telecom	Active	Crosses
CANTAT 3 [Faroese Telecom]	Telecom	Active	Crosses
Breagh Fibre Optic Cable	Fibre	Active	Crosses



13.4.2.3. Disposal Sites

There are thirteen dredge and spoil disposal sites in proximity of the Project within the English Study Area as shown in Figure 13-2 (Drawing C01494b-EGL4-INFR-005). Table 13-5 shows the distance from the Scoping Boundary to these sites.

Table 13-5: Distance from Scoping Boundary to disposal sites within the English Study Area

Disposal Site Name	Status	Distance from the Scoping Boundary
Hornsea 2A, HU209	Closed	Crosses
Hornsea 1, HU205	Open	2 km
Spurn Head, HU100	Closed	Crosses
Triton Knoll, HU204	Closed	7.4 km
West of Inner Dowsing Bank, HU200	Not for waste disposal	2.9 km
Sheringham Shoal Drillings, HU123	Closed	6.6 km
North West Zone Area 107, HU149	Closed	13.8 km
Wash Bank, HU114	Closed	8.6 km
Pickerhill Field, HU116	Closed	Crosses
Adjacent to South Basin Gas, HU115	Closed	Crosses
New Sand Hole, HU070	Closed	11.5 km
Babbage, HU203	Closed	14.8 km
Tyne Burial Site, TY193	Closed	9.5 km

13.4.2.3. Aggregate Extraction Sites

There are eight aggregate extraction sites in proximity of the Scoping Boundary within the English Study Area as shown in Figure 13-2 (Drawing C01494-EGL4-INFR-005). Table 13-6 shows the distance from the Scoping Boundary to these sites.

Table 13-6: Distance from Scoping Boundary to aggregate extraction sites within the English Study Area

Site Name and ID	Site owner	Status	Distance from the Scoping Boundary
Area 197	Tarmac Marine Ltd.	Active	0.8 km
Area 493	Tarmac Marine Ltd.	Active	Crosses
Area 400	Hanson Aggregates Marine Ltd.	Active	0.8 km
Areas 106/1, 106/2, 106/3	Hanson Aggregates Marine Ltd.	Active	3.5 km
Areas 481/1	Van Oord Ltd.	Active	14.5 km
Areas 514/1, 514/2, 514/3, 514/4	CEMEX UK Marine Ltd.	Active	0.5 km
Area 480	Hanson Aggregates Marine Ltd.	Not active	11.5 km
Area 1805	Hanson Aggregates Marine Ltd.	Exploration	3 km

13.4.2.4. Chemical Weapons and Munitions disposal sites

There are no chemical weapon or munition disposal sites that lie within the Scoping Boundary. However, UXO munitions are frequently found in the North Sea.

13.4.2.5. MoD Practice and Exercise Area (PEXA)

There are 16 MoD PEXA within the English Study Area (NATS, 2023). It is not possible for the proposed submarine cable corridor to avoid all of these. Table 13-7 lists all these sites.



Table 13-7: MoD PEXA within the English Study Area

Name	Category	Information
D613D	AIAA - Areas of Intense Aerial Activity	Authority: HQ Air; Minimum Flight Level: 10000 feet; Maximum Flight Level: 66000 feet
D307: DONNA NOOK	surface danger area, firing danger area	Authority: DIO SD TRG; Maximum Altitude: 20000 0; Activity: F,B
D323F	AIAA - Areas of Intense Aerial Activity	Authority: HQ Air; Minimum Flight Level: 25000 feet; Maximum Flight Level: 66000 feet
D323C	AIAA - Areas of Intense Aerial Activity	Authority: HQ Air; Minimum Flight Level: 5000 feet; Maximum Flight Level: 66000 feet
D323D	AIAA - Areas of Intense Aerial Activity	Authority: HQ Air; Minimum Flight Level: 5000 feet; Maximum Flight Level: 66000 feet
X5309: ROWLSTON	firing danger area, small arms firing range, surface danger area	Authority: ARMY DEPT; Activity: F
D323B	AIAA - Areas of Intense Aerial Activity	Authority: HQ Air; Minimum Flight Level: 5000 feet; Maximum Flight Level: 66000 feet
D323E	AIAA - Areas of Intense Aerial Activity	Authority: HQ Air; Minimum Flight Level: 25000 feet; Maximum Flight Level: 66000 feet
D323A	AIAA - Areas of Intense Aerial Activity	Authority: HQ Air; Minimum Flight Level: 5000 feet; Maximum Flight Level: 66000 feet
D323G	AIAA - Areas of Intense Aerial Activity	Authority: HQ Air; Minimum Flight Level: 25000 feet; Maximum Flight Level: 66000 feet
D412: STAXTON	surface danger area, firing danger area	Authority: HQ Air; Maximum Altitude: 10000 0; Activity: AAF
D513B: DRURIDGE BAY	surface danger area, firing danger area	Authority: HQ Air; Maximum Altitude: 23000 0; Activity: F
D513: DRURIDGE BAY	surface danger area, firing danger area	Authority: HQ Air; Maximum Altitude: 10000 0; Activity: F
D513A: DRURIDGE BAY	surface danger area, firing danger area	Authority: HQ Air; Maximum Altitude: 23000 0; Activity: F
D513B	firing danger area	Firing Practice Area

13.4.2.6. Oil & Gas operations

There are fifteen active pipelines which cross the proposed submarine cable corridor within the English Study Area and ten which are not in use or abandoned. These pipelines are listed in Table 13-8 and illustrated in Figure 13-2 (Drawing C01494-EGL4-INFR-005).

Table 13-8: Oil and Gas pipeline crossings within the English Study Area

Name	Type	Status
AMETHYST A2D TO EASINGTON	Gas	Not in use
AMETHYST C1D TO AMETHYST A1D	Gas	Not in use
BREAGH 20INCH GAS PIPELINE - PART 1	Gas	Active
BREAGH 3INCHMEG PIPELINE - PART 1	Chemical	Active
CLEETON CP TO DIMLINGTON	Gas	Active
CLEETON TO MINERVA UMBILICAL	Hydraulic	Active
EKOFISK 2/4J TO TEESSIDE	Oil	Active
EVEREST TO TEESSIDE 36IN GAS EXPORT	Gas	Active
HELVELLYN PIPELINE	Gas	Active
LANGELED PIPELINE	Gas	Active



Name	Type	Status
LOGGS PP TO THEDDLETHORPE GAS LINE	Gas	Not in use
LOGGS PP TO THEDDLETHORPE MEOH LINE	Chemical	Not in use
PICKERALL A TO THEDDLETHORPE	Chemical	Not in use
MINERVA TO CLEETON PIGGY	Chemical	Active
MINERVA TO CLEETON GAS EXPORT	Gas	Active
MERCURY TO NEPTUNE	Gas	Active
NEPTUNE TO MERCURY UMBILICAL	Condensate	Active
NORDPIPE OLIJELEDNING	Oil	Active
ROSE CONTROL UMBILICAL	Chemical	Abandoned
ROSE PIPELINE	Gas	Abandoned
THEDDLETHORPE TO MURDOCH MD	Gas	Not in use
THEDDLETHORPE TO MURDOCH MD MEOH LINE	Methanol	Not in use
VIKING AR TO THEDDLETHORPE MEOH LINE	Chemical	Not in use
WEST SOLE TO EASINGTON 16IN GAS LINE	Gas	Active
WEST SOLE TO EASINGTON 24IN GAS LINE	Gas	Active

Source: NSTA (2023)

As well as the pipelines that are in the North Sea, there are a number of licensed oil and gas blocks which the proposed submarine cable corridor will pass through. Below is a list of these license blocks for the English Study Area.

- 47/5
- 42/27
- 41/5
- 41/10
- 35/28
- 47/9
- 47/4
- 47/10
- 35/23
- 41/4
- 35/29
- 47/3
- 42/17
- 42/28
- 42/22



13.4.2.7. CCS and Natural Gas storage

There are two CCS projects at the planning stage which are within the English Study Area. These projects are called Viking CCS project which is led by Harbour Energy, and Endurance which is a partnership of BP, Eni, National Grid, Shell and Total. The proposed Endurance site is 14 km away from the Scoping Boundary.

There are plans from the UK Government for many more to be implemented within the North Sea region. Figure 13-1, from The Crown Estate illustrates the potential CCS within the UK.

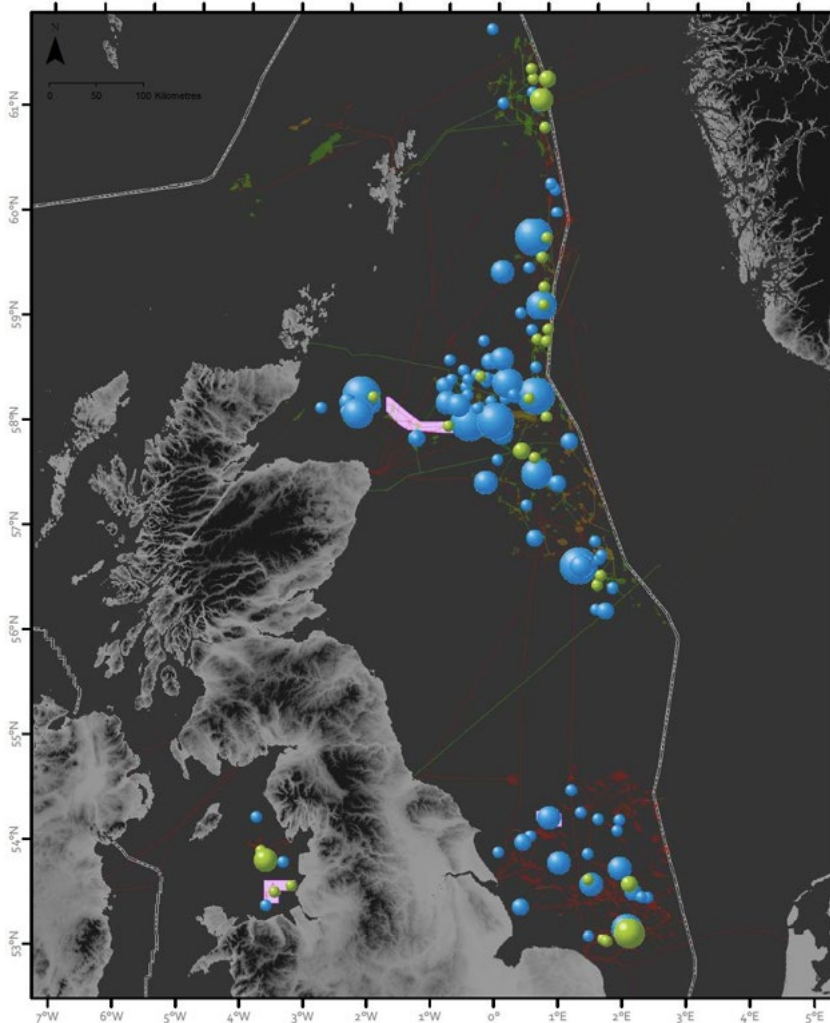


Figure 13-1: Map of Potential UK Offshore CO2 Storage Sites (The Crown Estate, 2021)

13.4.2.8. Recreational activities

Bathing waters

There are seven designated 'bathing waters' close to the proposed landfalls in the English Study Area which are listed in Table 13-9, all of which were classified as having excellent bathing water status in 2022/23. Consultation with the Environment Agency identified that the entire coastline within the Scoping Boundary between Theddlethorpe and Anderby Creek is considered a bathing water. Appropriate consideration will be given in the MEA to these sites.

Table 13-9: Bathing waters within the English Study Area

Bathing Water Name	Area	Year of Designation	Status (2022/2023)	Distance from the Scoping Boundary
Mablethorpe Town	Lincolnshire	1988	Excellent	Within
Sutton-on-Sea	Lincolnshire	1988	Excellent	Within
Moggs Eye	Lincolnshire	1988	Excellent	Within



Bathing Water Name	Area	Year of Designation	Status (2022/2023)	Distance from the Scoping Boundary
Anderby	Lincolnshire	1988	Excellent	0.8 km
Chapel St Leonard's	Lincolnshire	1988	Excellent	4.9 km
Ingoldmells South	Lincolnshire	1988	Excellent	8.5 km
Skegness	Lincolnshire	1990	Excellent	14 km

Source: Gov.UK, 2023

SCUBA Diving

There is evidence that suggests recreational diving takes place along the east and northeast coast of England, mainly associated with wrecks, but also for marine environmental research (Seasearch,2023).

Sailing and Cruising

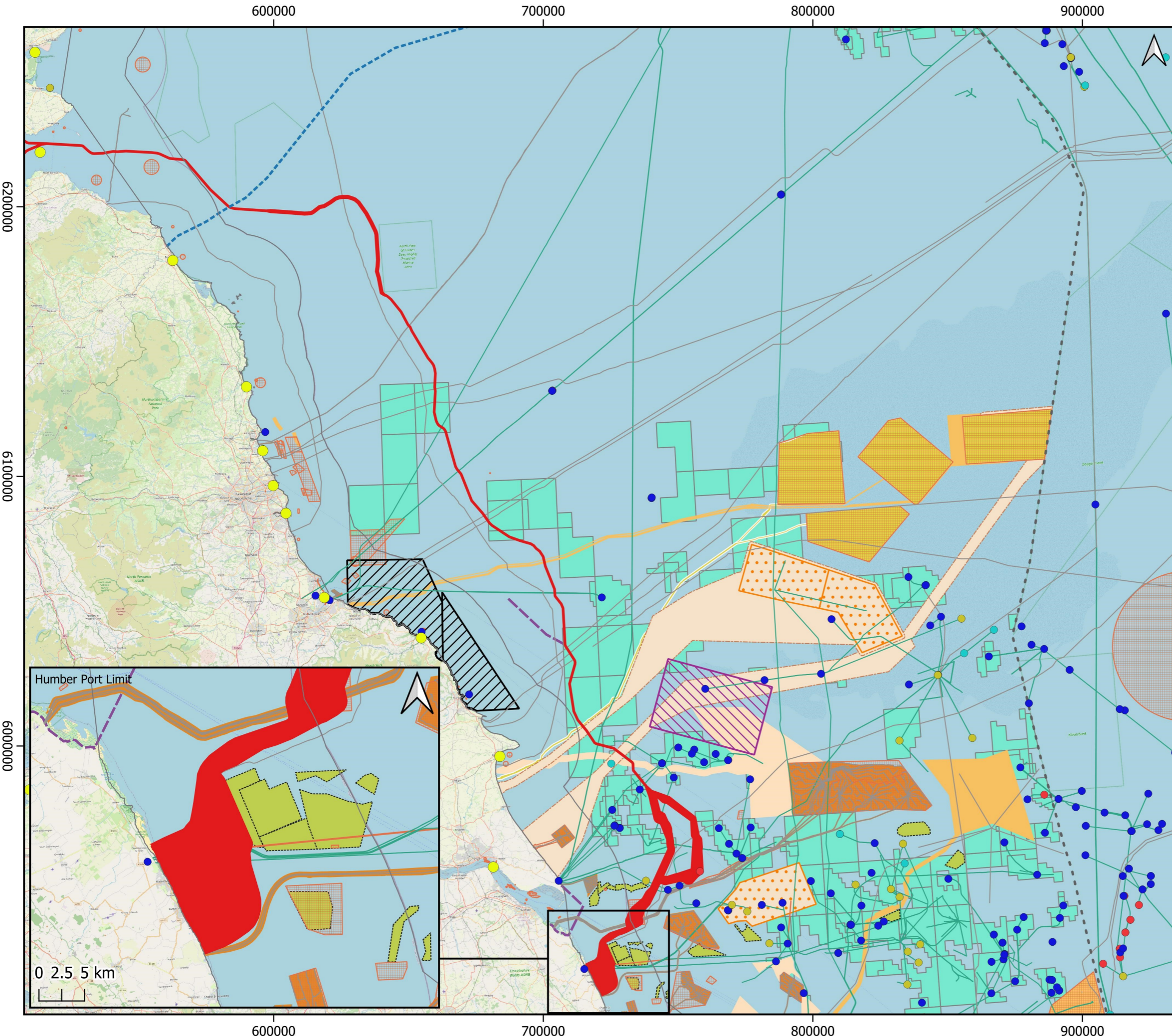
The east and northeast coast of England is a popular area to sail with many RYA sailing clubs along this coastline. The RYA Coastal Atlas (RYA, 2019) identifies the study area as of low to medium use for recreational sailing.

Water sports

The east and northeast coast of England have seasonal recreational water sports utilising its coastal waters including surfing, paddleboarding, canoeing, kite surfing, sailboarding, foiling and water skiing.

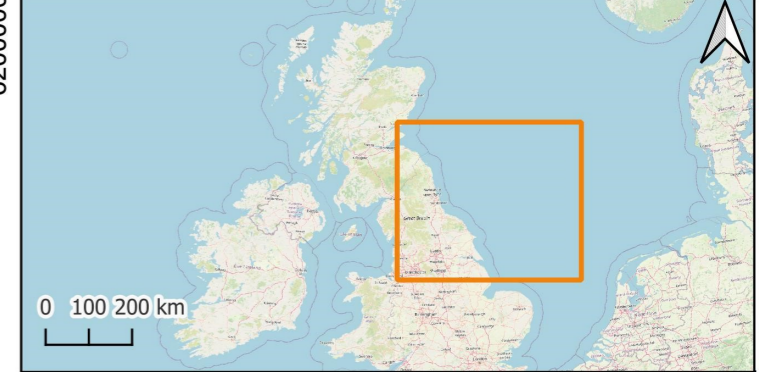
Angling

There are a number of chartered fishing vessels along the east and northeast coast which run fishing trips during the winter months aiming to catch cod, ling, skate and whiting and in the spring, summer and autumn targeting cod, ling, mackerel and pollock.



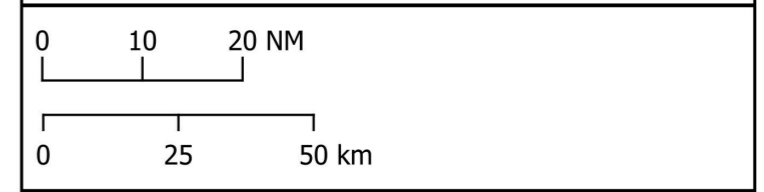
Other Marine Users Within The English Study Area

C01494b-EGL4-INFR-005-B



- Exclusive Economic Zone Limit (EEZ)
- 12NM Limit
- Scottish Adjacent Waters
- █ EGL 4 Scoping Boundary
- UK Port Limit
- Dredging
- Oil & Gas Offshore Installation
 - Closed down
 - Decommissioned
 - Operational
 - Removed
 - Under construction
- Cable
- Pipeline
- ▨ Carbon Capture And Storage Site Agreement
- ▨ Mining Site Agreement
- ▨ Disposal Site
- ▨ Aggregate Site Agreement
- ▨ NSTA Licensed Block
- Offshore Wind

█ Active/In Operation	█ In Planning
█ Under Construction	█ Pre-planning Application
█ Consented	█ Round 4 Preferred Project



Date	08/12/2023
Coordinate System	ETRS89 / UTM Zone 30N
Projection	Universal Transverse Mercator (UTM)
Unit	Meters
Scale at A3	1:1,400,000
Created	JC/EP
Reviewed	SP
Authorised	AF

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13.4.3. Scottish Baseline KP 418.7 – KP 524.9

13.4.3.1. Offshore Wind Farms

There are six operational or planned OWFs in proximity of the Project within the Scottish Study Area as shown in Figure 13-3 (Drawing: C01494-EGL4-INFR-006). Table 13-10 shows the distance from the Scoping Boundary to these OWFs. Though some of the windfarms listed are more than 15 km away from the Project we have noted them as there is a possibility that their export cables will intersect with the EGL 4 cable route.

Table 13-10: Distance from the Scoping Boundary to existing or planned OWFs within the Scottish Study Area

OWF name	Operator	Status	Distance from the Scoping Boundary
Near Na Gaoithe Offshore Wind farm	Near na Gaoithe Offshore Wind Limited, Owner EDF Energy Renewables, ESB	Expected to be fully operational 2023.	8.9 km
Forthwind Methil Demonstration	Forthwind Limited	Consented – Marine license obtained in 2023	3.4 km
Marr Bank Offshore Windfarm	SSE Renewables	Consent application submitted. Expected to be fully operational by 2025	10.1 km
Berwick Bank Offshore Windfarm	SSE Renewables	Consent application submitted. Expected to be fully operational by 2025	15 km
Inch Cape Wind Farm	Inch Cape Offshore Limited. JV of SDIC Power Holdings Co. & ESB	Expected to be fully operational 2026/27.	32.4 km
Seagreen Windfarm also known as Zone 2, Firth of Forth Alpha-Bravo; Seagreen Alpha; Seagreen Bravo, Seagreen Phase 1A	SeaGreen Wind Energy Limited, Owner SSE Plc) & TotalEnergies	Fully operational (from Oct 2023).	44.2 km

13.4.3.2. Power and Telecommunications Cables

Within the Scottish Study Area there is one planned reinforcement power cable project and three planned and two active export cables. All of these cables are listed in Table 13-11. These cables are illustrated in Figure 13-3 (Drawing: C01494-EGL4-INFR-006).

Several of the proposed Scotwind OWF export cables may cross or lie in proximity to the proposed submarine cable corridor, but this project data is not currently available.

Table 13-11: Distance from Scoping Boundary to existing or planned power or telecommunication cables within Scottish Study Area

Cable Name and Developer	Type	Project information	Distance from the Scoping Boundary
Scotland England Green Link 1 [National Grid and Scottish and Scottish Power Energy Networks (SPEN)]	Reinforcement power cable	Marine Scotland Licence granted May 2023. Construction due to start Autumn 2024 to 2028. MS Application Ref: 00009880	Potentially crosses
Near Na Gaoithe [OFTO - Near na Gaoithe Offshore Wind Limited, Owner EDF Energy Renewables, ESB]	Two export cables	Active	Crosses
Inch Cape [OFTO - Inch Cape Offshore Limited. JV of SDIC Power Holdings Co. & ESB]	Export cable	Consented	Crosses



Cable Name and Developer	Type	Project information	Distance from the Scoping Boundary
SeaGreen Phase 1A [OFTO - SSE Renewables and TotalEnergies]	Export cable	Consented	Crosses
Berwick Bank [OFTO – SSE Renewables]	Export cable	Application	Potentially crosses

13.4.3.3. Disposal Sites

There are seventeen disposal sites in proximity of the Project with the Scottish Study Area as shown in Figure 13-3 (Drawing: C01494-EGL4-INFR-006) (NMPI, 2023). Table 13-12 shows the distance from the Scoping Boundary to these sites.

Table 13-12: Distance from Scoping Boundary to disposal sites within the Scottish Study Area

Disposal Site Name	Status	Distance from the Scoping Boundary
Methil, FO048	Open	1.8 km
Blae Rock B, FO037	Closed	1.8 km
Blae Rock A, FO036	Disused	1.9 km
St. Abbs Head	Closed	1.9 km
Kirkcaldy, FO047	Closed	2.1 km
Firth of Forth, FO040	Closed	3.6 km
Narrow Deep B, FO038	Open	3.9 km
Narrow Deep S.E. of Inchkeith, FO039	Closed	4.2 km
Anstruther, FO101	Open	5.3 km
Leith, FO046	Closed	5.5 km
Pittenweem, FO051	Closed	5.5 km
Oxcars Main, FO041	Open	6.9 km
Dunbar, FO060	Closed	7.4 km
Oxcars ext A, FO042	Open	8.8 km
Oxcars ext B, FO043	Open	9.5 km
Port Seton Site, FO045	Closed	10 km
Hound Point, FO052	Closed	14 km

13.4.3.4. Aggregate Extraction Sites

There are no identified aggregate sites within the Scottish Study Area.

13.4.3.5. Chemical Weapons and Munitions disposal sites

There are no chemical weapon or munition disposal sites that lie within the Scoping Boundary. However, UXO munitions are frequently found in the North Sea. Within the Firth of Forth there is an area identified as 'Foul Ground' on Admiralty charts, within Kirkcaldy Bay. Consultation with the MoD has identified that the site overlaps with Exercise Area X5611 and potentially contains old sodium phosphide filled mines. There are four small explosive dumping grounds found in the Study Area, however, the cable route alignments have avoided these.

13.4.3.6. MoD Practice and Exercise Area (PEXA)

There are 11 MoD PEXAs within the Scottish Study Area (NMPI, 2023a). It is not possible for the proposed submarine cable corridor to avoid all of these. Exercise Area X5611 (Kirkcaldy Bay) has been identified by the MoD as of particular concern and should be avoided. The route alignment avoids this area but is in close proximity to it. Table 13-13 lists these sites.



Table 13-13: MoD PEXAs within the Scottish Study Area

Name	Category	Information
X5642: FORTH MIDDLE	Submarine exercise area, practice and exercise area (surface fleet)	Activity: Sub
X5641: FORTH OUTER	Submarine exercise area, practice and exercise area (surface fleet)	Activity: Sub
R516 (Torness)	Restricted Areas	Flight permitted for the purpose of landing at or taking off from the helicopter landing area at Torness. PPR.
R603 (Dungeness)	Restricted Areas	Flight permitted for the purpose of landing at or taking off from the helicopter landing area in Dungeness. PPR. Flight permitted by an aircraft which has taken off from or intends to land at London Ashford (Lydd) Airport remaining at least 1.5NM from the installation (505449N 0005717E).
Edinburgh	Avoidance Area	In the Avoidance Areas, military low flying does not normally take place unless the flights are in connection with an airfield located within such an area. Military low flying does not normally take place within Class A and Class C airspace.
X5614: MAY ISLAND	Practice and exercise area (surface fleet), submarine exercise area	Authority: NAVY DEPT; Activity: ASW, Sub
X5637: FIRTH OF FORTH (SOUTHERN)	Practice and exercise area (surface fleet)	Authority: NAVY DEPT; Activity: MCM
X5615: FORTH DEEP	Practice and exercise area (surface fleet)	Authority: NAVY DEPT; Activity: MCM
X5613S: ABERLADY	Submarine exercise area, practice and exercise area (surface fleet)	Activity: Sub
X5613N: KIRKCALDY	Submarine exercise area, practice and exercise area (surface fleet)	Activity: Sub
X5612: ABERLADY BAY	Practice and exercise area (surface fleet)	Authority: NAVY DEPT; Activity: MCM
X5625: ANSTRUTHER	Practice and exercise area (surface fleet)	Authority: NAVY DEPT; Activity: MCM
X5611: KIRKCALDY BAY	Practice and exercise area (surface fleet)	Authority: NAVY DEPT; Activity: MD, MCM
X5638: FIRTH OF FORTH (NORTHERN)	Practice and exercise area (surface fleet)	Authority: NAVY DEPT; Activity: MCM

13.4.3.7. Oil & Gas operations

There is one gas pipeline spanning the width of the Firth of Forth with an exclusion zone surrounding it to prevent anchoring (Navionics, 2023). This pipeline is passed over by the Scottish Scoping Boundary. The proposed submarine cable corridor does not pass through any license blocks within the Scottish Study Area.

13.4.3.8. CCS and Natural Gas storage

There are plans from the UK Government for CCS projects to be implemented within the North Sea region, however currently there are no CCS projects within the Scottish Study Area. Figure 13- 1, which is from The Crown Estate, illustrates the potential CCS within the UK.

13.4.3.9. Recreational activities

Bathing waters

There are twenty-six designated 'bathing waters' close to the proposed Scottish landfalls. These are listed in Table 13-14 and have a range of bathing water classifications, from poor to excellent in 2022/23.



Table 13-14: Bathing waters within the Scottish Study Area

Bathing Water Name	Area	Year of Designation	Status (2022/2023)	Distance from the Scoping Boundary
Lower Largo	Fife	2023	Poor	Crosses
Crail (Roome Bay)	Fife	1999	Excellent	11.6 km
Aberdour (Silversands)	Fife	1990	Excellent	8 km
Kinghorn (Pettycur)	Fife	1990	Excellent	1.7 km
Elie (Harbour) and Earlsferry	Fife	2007	Excellent	2.9 km
Elie (Ruby Bay)	Fife	1999	Excellent	2.7 km
Kinghorn (Harbour Beach)	Fife	2012	Poor	0.4 km
Kirkcaldy (Seafield)	Fife	2012	Excellent	2.1 km
Leven	Fife	2012	Sufficient	0.3 km
Burmtisland	Fife	1999	Good	3.4 km
Aberdour Harbour (Black Sands)	Fife	2012	Good	8.9 km
Anstruther (Billow Ness)	Fife	2012	Excellent	6.5 km
Dunbar (Belhaven)	East Lothian	1990	Good	13.5 km
Dunbar (East)	East Lothian	1999	Good	13 km
Gullane	East Lothian	1990	Excellent	7.4 km
Longniddry	East Lothian	2006	Good	11.1 km
North Berwick (Milsey Bay)	East Lothian	1990	Sufficient	10.1 km
North Berwick (West)	East Lothian	1999	Excellent	10 km
Fisherrow Sands	East Lothian	2023	Good	12.4 km
Portobello (Central)	Edinburgh	1999	Good	11.2 km
Portobello (West)	Edinburgh	1999	Sufficient	10.4 km
Seton Sands	East Lothian	1999	Good	11.5 km
Whitesands	East Lothian	1999	Excellent	14.2 km
Yellow Craig	East Lothian	1990	Sufficient	8.4 km
Broad Sands	East Lothian	2012	Good	9.1 km
Seacliff	East Lothian	2012	Excellent	11.6 km

Source: SEPA (2023)

Diving

There is evidence demonstrated by the number of scuba-diving centres, of some recreational diving within the Scottish Study Area, but this is at a lower level than within the English Study Area.

Sailing and Cruising

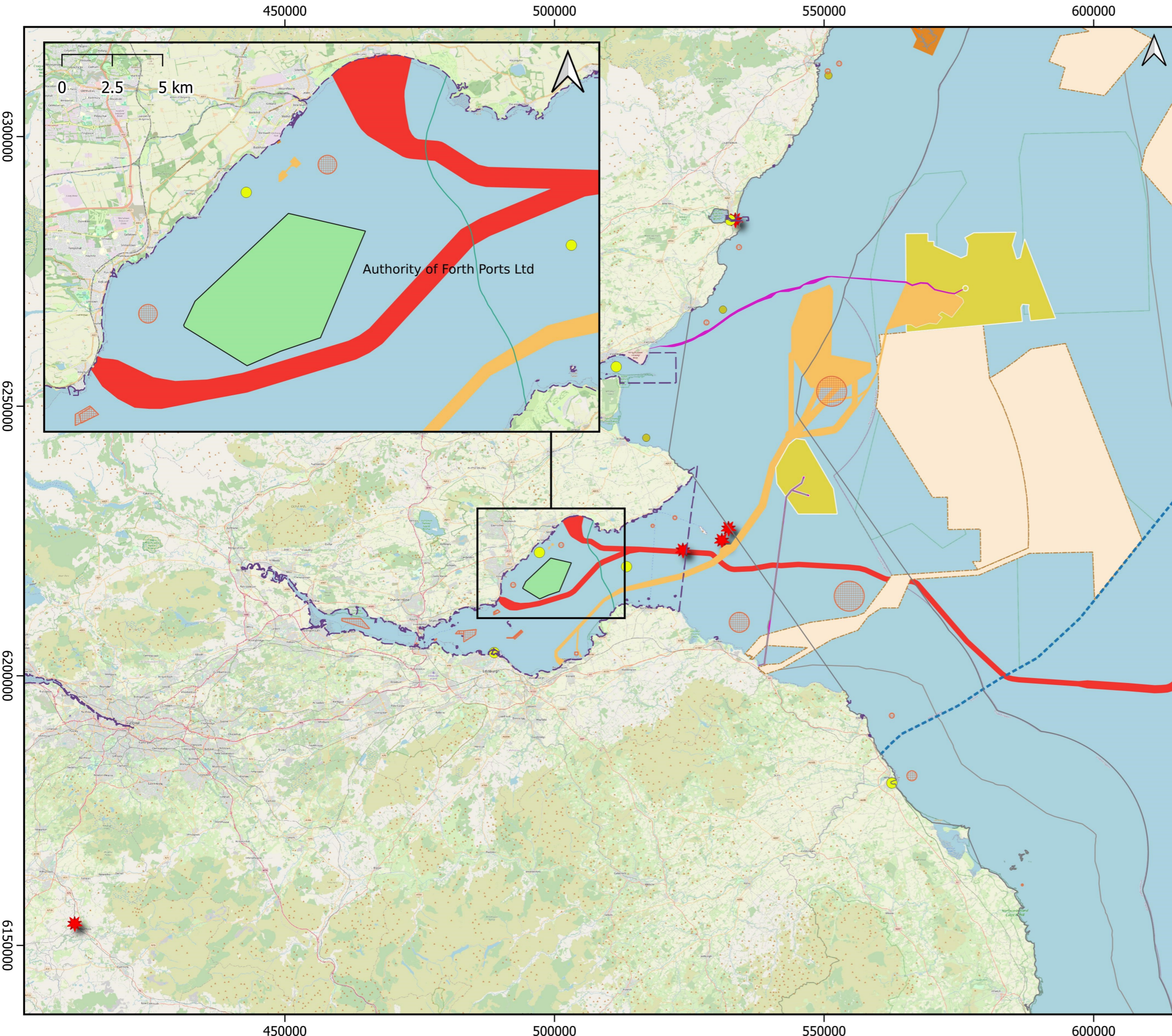
The east coast of Scotland is also a popular area for sailing. There are seven RYA sailing clubs within the proximity of the Scottish Study Area. Three near the proposed Lower Largo/Lundin Links landfalls and four near the proposed Kinghorn landfall. The RYA Coastal Atlas (RYA, 2019) identifies the area as of low to medium use for recreational sailing.

Water sports

The east coast of Scotland as with England has seasonal recreational water sports along its coastline including surfing, paddleboarding, canoeing, wind surfing, canyoning and coastal rowing.

Angling

There are chartered fishing vessels on the east coast of Scotland which run fishing trips all year round. Landed fish can include cod, ling, coley, pollack, scorpion fish, cuckoo wrasse, ballan wrasse and mackerel when in season.

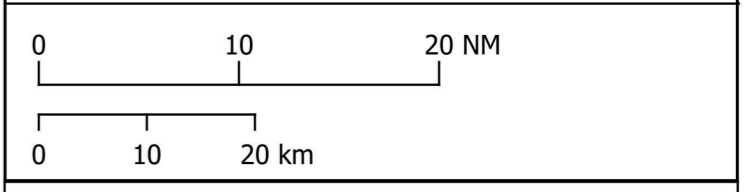


Other Marine Users Within the Scottish Study Area

C01494b-EGL4-INFR-006-B



- 12NM Limit
- Scottish Adjacent Waters
- EGL 4 Scoping Boundary
- UK Port Limit
- Dredging
- Dumped Munitions
- Offshore Oil and Gas Installation**
- Closed down
- Pipeline
- Cable
- Disposal Site
- Foul Area
- Offshore Wind**
- Operational
- Under construction
- Consented
- In Planning
- Pre Planning
- OFTO (Offshore Transmission Owner, Including Wind)



Date	18/12/2023
Coordinate System	ETRS89 / UTM Zone 30N
Projection	Universal Transverse Mercator (UTM)
Unit	Meters
Scale at A3	1:700,000
Created	JC/EP
Reviewed	SP
Authorised	AF/JDM

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13.5. Proposed Assessment Methodology

The other marine users MEA will follow the assessment approach set out in Chapter 4 of this Scoping Report, using the project-wide assessment matrix. The assessment of potential effects will be established using the standard Source-Pathway-Receptor approach. The MEA chapter will be prepared in accordance with the following guidance:

- ESCA Guideline No.6: The Proximity of Offshore Renewable Energy Installations & Submarine Cable Infrastructure in UK waters (ESCA, 2016)
- ICPC recommendations (ICPC, 2023)

Crossing/proximity agreements will be established for all cables which the Project crosses or is located within 250 m of.

The baseline will be established through desk-based review of literature and GIS mapping files and consultation with relevant stakeholders. Where possible quantitative analysis will be provided e.g., an estimate of the amount of area that is no longer available for other projects, including where positioning of the Project may restrict future development or use. If quantitative analysis is not possible, qualitative assessment will be undertaken based on consultation with relevant stakeholders and review of publicly available literature.

The potential for displacement, as a result of cumulative impacts, will be considered carefully and an appropriate assessment approach agreed with key stakeholders once the number of other projects to be assessed is defined. Further detail on the approach to the assessment of cumulative effects is provided in Chapter 4.

Where significant effects are identified, mitigation measures will be proposed, and residual effects presented.

13.6. Scope of Assessment

A range of potential impacts on other marine users have been identified which may occur during the construction, operation and maintenance, and decommissioning phases of the Project. Table 13-15 describes the potential impacts identified and provides justification as to whether they will be scoped in or out of the MEA. A precautionary approach has been taken and where there is no strong evidence base, or the significance is uncertain at this stage the impact has been scoped 'in' to the MEA. Where there is a clear evidence base that the effect from the impact will not be significant, either alone or in combination with other plans and projects, the impact has been scoped 'out' of the MEA.

It is recognised that the other marine users will be transiting between their licensed areas and ports. However, potential impacts on vessel movements will be assessed in Chapter 11 - Shipping and Navigation.



Table 13-15: Scoping assessment of impacts on other marine users

Potential Impacts	Project Activities	Sensitive Receptors	Scoping Justification		
			Construction	Operation (including repair and maintenance)	Decommissioning
Interaction with other seabed infrastructure	Boulder clearance, PLGR, pre-sweeping of sand waves. Cable burial and trenching. Anchoring / jack-up legs.	Cables and pipelines	OUT - Pre-works surveys will be undertaken to locate all existing infrastructure including subsea cables and pipelines. Following analysis of this information appropriate plans will be put in place to avoid or to cross existing subsea cables or pipelines with the use of external cable protection. Individual crossing agreements will be set up with cable and pipeline owners following guidance from the International Cable Protection Committee (ICPC) and European Subsea Cable Association.	IN - If the cable is installed correctly the likelihood of it requiring maintenance and repair is significantly reduced. However, there remains the potential that localised repair works, or remedial external cable protection may be required which potentially could affect any new or existing infrastructure. If this occurs discussions will take place with the cable owners ahead of works taking place.	OUT- At the point of decommissioning studies will be undertaken to decide how or if the cable will be removed from the seabed and how that will affect any other seabed infrastructure.
Occupancy of seabed – Below seabed	Presence of cables	Oil and Gas, aggregates, power and telecom cables, Offshore wind farms and CCS.	n/a	IN - The presence of the cables in the seabed may disrupt the placement of future infrastructure/offshore activities	n/a
Occupancy of seabed – on seabed	External cable protection	Oil and Gas, aggregates, power and telecom cables, Offshore wind farms and CCS.	n/a	IN - The presence of external cable protection may disrupt the placement of future infrastructure/offshore activities.	n/a



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14. Marine Archaeology

This chapter of the Scoping Report describes the potential impacts arising from the construction, operation (including maintenance and repair) and decommissioning of the Eastern Green Link 4 (EGL 4) hereafter referred to as 'the Project' on offshore archaeology and cultural heritage receptors.

Offshore archaeological and cultural heritage receptors located within the Study Area for the topic will be considered against the following categories:

- Submerged prehistory: including palaeolandscapes (a past (usually prehistoric landscape), palaeolandscape forms, palaeoenvironmental (of or relative to a past (usually prehistoric) environment) remains and prehistoric artefacts and sites;
- Maritime and intertidal archaeology: broadly comprising vessel remains, wreckage/debris, cargo, and sites/structures within the offshore area (up to mean high water springs (MHWS)); and
- Aviation archaeology: comprising all military and civilian aircraft crash sites and related wreckage.

14.1. Study Area Definition

The Scoping Boundary for the Project extends from MHWS in England to MHWS in Scotland. It is nominally 1 km wide which reflects the area surveyed by a marine cable reconnaissance survey, however this may be wider in places to accommodate any potential optionality such as routeing around a seabed feature or habitat, or to allow for the footprint of installation vessels. The Project will begin on the Lincolnshire coast, at either Anderby Creek or Theddlethorpe and route to Lower Largo/Lundin Links or Kirkcaldy Bay in Scotland.

There are two proposed Landfalls in England (Anderby Creek and Theddlethorpe) and two proposed Landfalls in Scotland (one in Kinghorn and one in Lower Largo/Lundin Links) being considered at this stage of the environmental assessment process. These options will be subject to further technical feasibility work and stakeholder consultation and will be refined to one preferred option for inclusion in the subsequent Marine Licence application for the Project.

The Study Area for offshore archaeology comprises a 2 km zone measured from the Scoping Boundary Figure 14-1 (Drawing: C01494-EGL4-ARCH-001-A). The onshore section of the Study Area extends for 200 m, measured from MHWS. This Study Area is considered suitable for characterising the offshore archaeological resource of the Project, as it will examine assets potentially susceptible to direct and/or indirect impacts. Should further information demonstrate a potential for impacts to offshore heritage assets beyond this Study Area, this may be amended in agreement with the Applicant and key stakeholders.

14.2. Data Sources

14.2.1. Site-specific Survey Data

Primary data will be obtained from geophysical and geotechnical surveys covering the Project (scope of works described in Chapter 6). This will be collected and assessed following best practice professional guidance for marine archaeology including, but not limited to:

- Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for Renewable Energy Sector (Gribble & Leather 2011); and
- Marine Geophysics Data Acquisition, Processing, and Interpretation Guidance Notes (English Heritage and Bates, R., Dix, J. K., Plets, R. 2013) (document currently under review by MSDS Marine).

14.2.2. Publicly Available Data

14.2.2.1. Baseline Summary for the Scoping Report

The baseline summary for offshore archaeology was informed by a range of publicly available data sources.

The submerged prehistory baseline was informed by sea level modelling studies and projects mapping onshore and offshore palaeolandscape features (sources referenced in text below). The outputs of these studies included GIS shapefile data, which were reviewed for the baseline assessment.

The baseline of known archaeological and cultural heritage receptors within the Study Area refers to data obtained from the following sources:

- United Kingdom Hydrographic Office (UKHO) data: comprising records relating to charted wrecks and other seabed obstructions that are considered navigational hazards;



- Historic England (HE) National Record of the Historic Environment (NRHE) data: World Heritage Sites, Protected Wrecks, Scheduled Monuments, Listed Buildings, Registered Battlefields, Registered Parks and Gardens and Conservation Area records for England;
- Historic Environment Scotland (HES) data: World Heritage Sites, Historic Marine Protected Areas, Scheduled Monuments, Listed Buildings, Inventory of Historic Battlefields, Gardens and Designed Landscapes, Conservation Areas and Properties in Care records for Scotland;
- Canmore data: archaeological and historic environment records for onshore and offshore heritage assets in Scotland; and
- Local Historic Environment Record (HER) data: archaeological and historic environment records for onshore and offshore heritage assets in Lincolnshire. Data for Fife in Scotland is supplied through Canmore.

All spatial data utilised in forming the offshore archaeological baseline was converted to and presented in Universal Transverse Mercator (UTM) Zone 30 North projected from a European Terrestrial Reference System (ETRS) 1989 datum.

14.2.2.2. Sources for the Future Desk-Based Assessment

The desk-based assessment (DBA), as part of the MEAp, would include further, detailed examination of the data sources used for the baseline summary. In addition, a range of relevant published academic articles, books and grey literature reports would be reviewed to inform the baseline. Where applicable and accessible, reports relating to the archaeology of nearby offshore developments would also be reviewed during the DBA.

As referenced in Section 14.2.1 above, further primary data would be obtained from geophysical and geotechnical surveys covering the Project. The data would be subject to archaeological review to provide a full assessment of known and potential offshore heritage receptors. An intertidal walkover survey would be undertaken at the landfall options in Scotland and England to ground truth previously recorded heritage receptors and to identify any new receptors that may be of relevance to the assessment. The results would be incorporated into a DBA, which would be undertaken using data from the United Kingdom Hydrographic Office (UKHO), national and local authority sources, and other relevant data sources.

The character and potential of submerged prehistoric landscapes and remains would be based on a review of geological mapping of seabed sediments, solid geology, and bathymetry from published British Geological Survey (BGS) sources. This would be enhanced by the geoarchaeological review of geotechnical and geophysical datasets gathered for the Project.

Regarding the assessment of intertidal heritage receptors, whilst some assessment has been provided within this Scoping Report, it is intended that a range of national and local HER datasets and further relevant data (such as Rapid Coastal Zone Assessment Surveys) would be used to inform the MEA in this area. An intertidal walkover survey will also help to identify and characterise any heritage assets within this area.

14.3. Consultation

Consultation will be undertaken with relevant stakeholders, ensuring that key considerations are included in the DBA and any issues can be resolved at an early stage. Stakeholder feedback may also supplement the DBA, providing information that may not be obtainable through the aforementioned data sources. The following bodies will be consulted, at a minimum:

Table 14-1: List of stakeholders to be consulted.

England	Scotland
Marine Management Organisation (MMO)	Marine Directorate Licensing Operations Team (MD-LOT)
Historic England	Historic Environment Scotland
Lincolnshire County Council	Fife Council

Further details and responses from stakeholder consultation will be included in the Marine Archaeology chapter of the MEAp.

14.4. Baseline Characterisation

14.4.1. Introduction

The baseline summary for submerged prehistory is based on a preliminary review of geological mapping of seabed sediments and solid geology from published British Geological Survey (BGS) sources, enhanced by the high-level and localised results of regional and national archaeological and geoarchaeological studies.



The baseline of known archaeological and cultural heritage receptors within the Study Area was formed through preliminary review of data obtained from the UKHO and historic environment data archives.

This section has been split into the following sub-sections to provide an overview of the known offshore archaeological resource:

- Overview;
- English baseline characterisation; and
- Scottish baseline characterisation.

14.4.2. Overview

14.4.2.1. Submerged prehistory

The North Sea contains prehistoric submarine archaeological remains which date back to almost one million years ago, encompassing the known chronology of hominid activity in the British Isles. The earliest dated remains of hominid activity in Britain, dating to c. 900,000 Before Present (BP), were recovered from the intertidal Site 3 at Happisburgh, Norfolk, c. 100 km southeast from the proposed English Landfalls. Investigation of this site and others in the vicinity place them in a Middle Pleistocene palaeolandscape characterised by grassland, conifer forest, braided river systems and megafauna (Pathways to Ancient Britain, 2023). A range of regional studies, both geologically and archaeologically focussed, have been undertaken over the past 60 years to develop understanding of the palaeogeography and how humans may have interacted with the palaeolandscapes of the North Sea (Historic England, 2023).

These studies have shown that the coastline along the southeast of Scotland and northeast of England has the potential for the presence of as-yet undiscovered in situ prehistoric sites, artefacts, and deposits of palaeoenvironmental interest, located within the inundated nearshore and offshore palaeogeography. Palaeolandscape features such as lake deposits, tunnel valleys, palaeochannels, submerged peat and submerged forests have the potential to contain palaeoenvironmental and archaeological remains. A detailed review of geological units identified within the Project (by site-specific geophysical and geotechnical surveys) and their inherent archaeological and palaeoenvironmental potential would be undertaken to inform the DBA for the MEA.

14.4.2.2. Maritime and intertidal archaeology

Maritime archaeological sites comprise two broad categories: the remains of vessels that have been lost by stranding, foundering, collision, enemy action and other causes, and those sites that consist of vessel-related material. Vessel-related material can include (but is not limited to): equipment lost overboard or deliberately jettisoned, such as fishing gear, ammunition, and anchors; or the only surviving remains of a vessel, such as its cargo or a ballast mound. Shipwrecks on the seabed provide an insight on the types of vessels used in the past, the nature of shipping activity in the wider area and the changing usage of the marine environment through different periods. Such remains are considered more likely to survive in sediments which promote the preservation of wreck sites (e.g., finer grained sediments that are not subject to high levels of mobility).

The Study Area includes numerous records relating to archaeological and heritage assets in England and Scotland. Designated heritage assets comprise:

- England:
 - a) Six Listed Buildings;
- Scotland:
 - a) One 'historic' wreck;
 - b) Two Scheduled Monuments;
 - c) Three hundred and two (302) Listed Buildings; and
 - d) Two Conservation Areas.

Non-designated assets comprise:

- England:
 - a) One hundred and seven (107) wreck records (UKHO; Figure 14-2, Drawing: C01494-EGL4-ARCH-002-A); and
 - b) Sixty-eight (68) archaeological sites (Lincolnshire HER);
- Scotland:
 - a) Sixty-six (66) wreck records (UKHO; Figure 14-2 and Figure 14-4 Drawings: C01494-EGL4-ARCH-002-A and C01494-EGL4-ARCH-004-A); and
 - b) Two hundred and fifty-five (255) maritime archaeological sites and 400 onshore heritage records (Canmore; Figure 14-5 and 14-6, Drawings: C01494-EGL4-ARCH-005-A and C01494-EGL4-ARCH-006-A).

In several cases, records from various data sources may correlate with others for the same site or findspot. Any such instances will be highlighted by the DBA and the resultant total sum of heritage and wreck records would be less than indicated above.



14.4.2.3. Aviation archaeology

Offshore aviation archaeology receptors comprise the remains, or associated remains, of military and civilian aircraft that have been lost at sea. Evidence is divided into three primary time periods, based on major technological advances in aircraft design:

- Pre-1939;
- 1939-1945; and
- Post-1945.

Several records indicate the possible location of aircraft remains within the Study Area:

- England:
 - a) One UKHO record; and
 - b) Five NRHE records.
- Scotland:
 - a) Forty-two (42) Canmore records.

Maritime aircraft crash sites can retain a significant amount of material and, although these can be difficult to identify and remains may be dispersed and/or buried, there is a possibility that aircraft material may be present within the Study Area. Any aircraft remains would be automatically protected under the Protection of Military Remains Act 1986.

14.4.3. English Baseline Characterisation KP 0 to KP 418.7

14.4.3.1. Submerged prehistory

The BRITICE project (Clark et al., 2017) mapped a series of sub-glacial tunnel valleys crossing near to the 12 NM limit of English waters. The North Sea Palaeolandscapes Project (University of Birmingham, 2011) utilised geophysical data to reconstruct the Mesolithic palaeolandscape of part of the Southern North Sea, from c. 12 NM from the Lincolnshire/Norfolk coast to Doggerbank. The results placed a southern part of the Study Area in a palaeolandscape characterised by a large valley to the northeast, the slopes of which were crossed by numerous watercourses. Earlier palaeolandscape features were also identified, including a sub-glacial tunnel valley crossing the Study Area. EMODnet data (2023) holds records for submerged peat at Mablethorpe and submerged forests at Trusthorpe, Sutton-on-Sea and Anderby, all within English waters of the Study Area.

Prehistoric coastline modelling by Brooks et al. (2011) suggests the Study Area up to c. 12 NM in English waters remained sub-aerially exposed until c. 8,000 BP.

Five Lincolnshire HER records relate to prehistoric findspots in the English intertidal zone of the Study Area. These range in date from the Palaeolithic to Iron Age.

14.4.3.2. Maritime and intertidal archaeology (up to 12 NM)

There are currently six records within the Study Area that are subject to statutory protection as Listed Buildings. All are situated within the onshore zone of the Study Area in Lincolnshire. No records within the Study Area relate to remains or sites designated as Protected Wrecks, Scheduled Monuments (England) or under the Protection of Military Remains Act 1986.

There are 18 wreck sites recorded by the UKHO within the Study Area within 12 NM (Table 14 2). Two are situated off the East Yorkshire coast at Flamborough Head Figure 14-2, (Drawing: C01494-EGL4-ARCH-002-A), with the remaining 16 lying off the Lincolnshire coast Figure 14-3 (Drawing: C01494-EGL4-ARCH-003-A). Seven (7) of these are listed as 'dead', with two of these also recorded as 'foul ground'. A further two wrecks are recorded as 'lifted', i.e. recovered, though there is the possibility of debris and other discarded material remaining.

The Lincolnshire HER illustrates 68 archaeological sites within the onshore and intertidal zones of the Study Area Figure 14-3 (Drawing: C01494-EGL4-ARCH-003-A). These records include wrecks, find spots, structural remains and landscape features. No Lincolnshire HER records correlate with UKHO records.

14.4.3.3. Maritime archaeology (beyond 12 NM)

There are currently no records within the Study Area (beyond 12 NM) that are subject to statutory protection as Scheduled Monuments, Protected Wrecks, Historic Marine Protected Areas or under the Protection of Military Remains Act 1986.

Eighty-nine (89) wreck sites are recorded by the UKHO within English waters of the Study Area beyond 12 NM Figure 14-2 (Drawing: C01494-EGL4-ARCH-002-A; Table 14 2). Thirty-eight (38) are marked as dead with one wreck recorded as lifted. Fifteen (15) areas of 'foul ground' are also included in the list of 'dead' wrecks, with four areas marked as 'foul ground' with no further detail.

No NRHE or HER records lay within English waters beyond 12 NM, however, Canmore provides 12 maritime records here.



14.4.3.4. Aviation archaeology

One UKHO record relates to an aircraft crash site in English waters, situated within the Study Area beyond 12 NM (Table 14 2; UKHO record 9088). UKHO 9088 relates to a United States Air Force F15, ditched at a broad location in 1990, which has not been identified during subsequent surveys. It is recorded as a 'dead' location by the UKHO.

There are five further recorded losses located within the Study Area i.e., aircraft whose loss location has been arbitrarily set, or is only known approximately. There is also the potential for the discovery of previously unknown aircraft-related debris to exist on the seafloor within the Study Area, with a higher potential for material dating to the Second World War.

Lincolnshire has been home to an extensive aviation industry from the early 20th century and was the home of Bomber Command during the Second World War. Numerous airbases situated throughout the county hosted flight training and combat missions to the European mainland.

Table 14-2: UKHO records in English waters.

UKHO ID	Name	Type	Description	Latitude	Longitude	Source
Up to 12 NM						
85316	-	-	Dangerous wreck	53 16.022 N	0 23.589 E	UKHO
91943	Lincolnshire Time and Tide Bell	-	-	53 22.011 N	0 14.992 E	UKHO
8667	FRYKEN	Steam ship	Dangerous wreck	53 27.651 N	0 26.136 E	UKHO
8997	-	-	Dead, non-dangerous wreck	53 23.269 N	0 24.429 E	UKHO
6678	-	-	Dead, foul ground	54 13.13 N	0 12.526 E	UKHO
6681	-	-	Dead, foul ground	54 11.48 N	0 13.91 E	UKHO
9074	-	-	Dead, non-dangerous wreck, possible small vessel	53 23.036 N	0 20.229 E	UKHO
8637	STAR	Sailing vessel	Dead, non-dangerous wreck	53 20.12 N	0 22.696 E	UKHO
9181	-	-	Lifted	53 17.52 N	0 19.296 E	UKHO
9094	-	Pipes/Tubes/Diffusers	Dead	53 22.079 N	0 15.421 E	UKHO
81776	-	-	In area of pipelines, possibly disturbed seabed	53 22.408 N	0 18.783 E	UKHO
8640	-	-	Lifted, dangerous wreck	53 20.8 N	0 23.1 E	UKHO
8651	-	Fishing vessel	Wreck showing any portion of hull or superstructure	53 22.419 N	0 14.897 E	UKHO
94757	-	-	Dangerous wreck	53 16.319 N	0 19.833 E	UKHO
8664	LIZZIE CARTER	Sailing vessel	Dangerous wreck; dead	53 27.136 N	0 18.696 E	UKHO
8676	RAVONIA (part) (possibly)	Steam ship	Dangerous wreck; broken wreckage	53 29.347 N	0 24.507 E	UKHO
8661	HMS CORFIELD	Steam ship	Dangerous wreck; area of debris lying entirely within scour	53 26.94 N	0 18.899 E	UKHO
8678	RAVONIA (part)	Steam ship	Dangerous wreck	53 29.964 N	0 24.949 E	UKHO
Beyond 12 NM						
4491	CHOICE	Trawler	Non-dangerous wreck, intact and upright	55 56.306 N	1 38.026 W	UKHO
4492	-	-	Dead, non-dangerous wreck	55 54.499 N	1 6.602 W	UKHO
4497	-	-	Dead, non-dangerous wreck	55 56.498 N	1 21.767 W	UKHO
4560	-	-	Dead, non-dangerous wreck	55 0.723 N	0 21.688 W	UKHO
4629	RAMESES	Trawler	Dead, non-dangerous wreck	55 54.999 N	0 50.104 W	UKHO
4633	-	Fisherman's Fastener	Dead, foul ground	55 33.41 N	0 41.35 W	UKHO
4636	-	Fisherman's Fastener	Dead, foul ground	55 33.993 N	0 37.85 W	UKHO
4671	-	Fisherman's Fastener	Dead, foul ground	55 14.41 N	0 30.85 W	UKHO



UKHO ID	Name	Type	Description	Latitude	Longitude	Source
6205	-	-	Non-dangerous wreck, broken	54 48.808 N	0 7.69 W	UKHO
6384	-	-	Non-dangerous wreck, intact	54 56.524 N	0 19.239 W	UKHO
6464	CYNTHIA	Trawler	Dead, non-dangerous wreck	54 0.965 N	0 33.291 E	UKHO
6487	JOSEPH AND WILLIAM	Sailing vessel	Dead, non-dangerous wreck	54 6.914 N	0 25.792 E	UKHO
6528	-	Fisherman's Fastener	Dead; foul ground	54 42.209 N	0 4.992 E	UKHO
6230	-	Fisherman's Fastener	Dead; foul ground	54 44.259 N	0 4.892 E	UKHO
6557	-	-	Dead, non-dangerous wreck	54 20.412 N	0 13.426 E	UKHO
6597	KIELDRECHT (POSSIBLY)	Steam ship	Non-dangerous wreck	54 5.281 N	0 27.326 E	UKHO
6635	-	Possible boulder or debris	Foul ground	54 34.63 N	0 11.413 E	UKHO
6643	-	-	Dead, foul ground	54 8.914 N	0 16.426 E	UKHO
6655	-	-	Dead, foul ground	54 28.578 N	0 13.125 E	
6666	-	-	Non-dangerous wreck, intact, and probably on side	54 19.608 N	0 15.745 E	UKHO
6671	-	Stones/Masonry/Rubble	Foul ground, group of boulders	54 14.088 N	0 12.065 E	UKHO
6672	-	-	Dead, foul ground	54 13.813 N	0 13.26 E	UKHO
6673	-	-	Dead, foul ground	54 13.763 N	0 14.959 E	UKHO
6682	-	-	Dead, foul ground	54 11.363 N	0 14.71 E	UKHO
6683	-	-	Dead, foul ground	54 10.88 N	0 14.993 E	UKHO
6684	-	-	Dead, foul ground	54 9.347 N	0 16.126 E	UKHO
6688	-	-	Non-dangerous wreck, intact and upright	54 7.162 N	0 21.855 E	UKHO
6715		Sailing vessel	Non-dangerous wreck	54 27.088 N	0 11.165 E	UKHO
6717	-	-	Pile of fishing nets and ropes	54 24.162 N	0 15.637 E	UKHO
8691	BEELSBY	Sailing vessel	Dead, dangerous wreck	53 31.019 N	0 31.394 E	UKHO
8726	SCHIELAND (POSSIBLY)	Steam ship	Dangerous wreck, upright with bow detached	53 32.761 N	0 37.162 E	UKHO
8730	STYLIANOS CHANDRIS	Steam ship	Dangerous wreck, broken in two main sections with scour	53 32.599 N	0 30.838 E	UKHO
8759	LANCASTER	Trawler	Dead, dangerous wreck	53 33.519 N	0 34.294 E	UKHO
8842	VIRGINIAN	Trawler	Dangerous wreck	53 40.855 N	0 48.648 E	UKHO
8852	ROYSTON	Steam ship	Dangerous wreck, broken midships	53 37.534 N	0 39.488 E	UKHO
8854	SCOTIA (POSSIBLY)	Trawler	Dangerous wreck	53 38.639 N	0 43.601 E	UKHO
8856	CECIL (POSSIBLY)	Sailing vessel	Dangerous wreck, almost buried wreck	53 38.216 N	0 39.55 E	UKHO
8858	SILVER QUEEN	Sailing vessel	Dead, dangerous wreck	53 38.851 N	0 51.723 E	UKHO
8860	CATFORD	Steam ship	Dangerous wreck, upright and very broken	53 38.948 N	0 41.154 E	UKHO
8868	NORFOLK (POSSIBLY)	Sailing vessel	Dangerous wreck, in two parts	53 40.329 N	0 51.895 E	UKHO
8874	-	Sailing vessel	Dangerous wreck	53 41.281 N	0 49.596 E	UKHO
8879	KEYNES	Steam ship	Dangerous wreck	53 42.107 N	0 44.821 E	UKHO
8887	ABY (POSSIBLY)	Fishing vessel	Dead, foul ground, debris	53 43.351 N	0 40.609 E	UKHO
8888	-	-	Dead	53 43.817 N	0 47.29 E	UKHO
8891	-	Steam ship	Dangerous wreck, intact and upright	53 44.168 N	0 50.341 E	UKHO
8903	LARCHWOOD (POSSIBLY)	Steam ship	Dangerous wreck, intact	53 41.718 N	0 54.539 E	UKHO



UKHO ID	Name	Type	Description	Latitude	Longitude	Source
8913	AJAX	Trawler	Dead, non-dangerous wreck	53 46.017 N	0 51.89 E	UKHO
8915	PILSUDSKI	Liner	Dangerous wreck	53 46.265 N	0 45.554 E	UKHO
8918	REBONO (PROBABLY)	Trawler	Dangerous wreck, well defined and intact	53 47.834 N	0 54.774 E	UKHO
8940	LISMORE	Trawler	Dead, non-dangerous wreck	53 52.316 N	0 42.74 E	UKHO
8953	ROCHESTER (POSSIBLY)	Trawler	Non-dangerous wreck	53 53.283 N	0 42.207 E	UKHO
8964	LISMORE	Trawler	Non-dangerous wreck	53 54.499 N	0 37.124 E	UKHO
8966	TWO BROTHERS	Trawler	Non-dangerous wreck	53 55.416 N	0 37.924 E	UKHO
8968	DEVONIAN	Trawler	Dead, non-dangerous wreck	53 56.216 N	0 46.49 E	UKHO
8994	LANCASTER (POSSIBLY)	Trawler	Dangerous wreck, upright and intact	53 32.172 N	0 32.295 E	UKHO
8995	-	-	Dead, non-dangerous wreck	53 30.485 N	0 31.461 E	UKHO
9030	-	Trawler	Dangerous wreck, steel hulled single boiler vessel	53 39.064 N	0 40.369 E	UKHO
9040	-	Steam ship	Dangerous wreck, intact lying over to starboard	53 41.968 N	0 54.639 E	UKHO
9041	-	Trawler	Dangerous wreck	53 41.934 N	0 54.923 E	UKHO
9043	-	-	Foul ground, area of debris and wreck fragments	53 43.201 N	0 51.074 E	UKHO
9044	VEREINGTE (POSSIBLY)	Steam ship	Dangerous wreck, bow, and boiler intact, stern broken up	53 45.917 N	0 43.441 E	UKHO
9045	RADO (POSSIBLY)	Trawler	Dangerous wreck	53 41.45 N	0 39.575 E	UKHO
9058	-	-	Dangerous wreck, only part of hull, filled with large stones	53 51.233 N	0 39.891 E	UKHO
9067	-	-	Dead, foul ground, small linear contact, possible debris	53 37.235 N	0 45.575 E	UKHO
9088	-	Aircraft	Dead, foul ground	53 41.018 N	0 48.89 E	UKHO
9091	STRATON (POSSIBLY)	Trawler	Dead, non-dangerous wreck	53 38.302 N	0 43.359 E	UKHO
9105	-	-	Non-dangerous wreck	53 53.883 N	0 42.424 E	UKHO
9135	-	-	Non-dangerous wreck	53 45.634 N	0 45.59 E	UKHO
9145	SCOTIA (POSSIBLY)	-	-	53 37.599 N	0 47.341 E	UKHO
9159	-	-	Dead, possible boulder	53 34.01 N	0 36.485 E	UKHO
9160	-	-	Dead, possible pile of boulders	53 33.985 N	0 36.993 E	UKHO
67143	MILO	Sailing vessel	Dead, non-dangerous wreck	53 34.418 N	0 31.043 E	UKHO
67148	-	-	Dangerous wreck	53 34.003 N	0 29.895 E	UKHO
67163	SCHIELAND	Steam ship	Lifted	53 32.185 N	0 33.726 E	UKHO
67164	SECRET	Sailing vessel	Dead, non-dangerous wreck	53 34.418 N	0 31.043 E	UKHO
67187	-	-	Dead, non-dangerous wreck	53 43.017 N	0 46.89 E	UKHO
71773	-	-	Non-dangerous wreck, hight degraded	55 11.1 N	0 28.273 W	UKHO
71775	-	-	Non-dangerous wreck, hight degraded	55 10.869 N	0 28.431 W	UKHO
72000	-	-	Non-dangerous wreck, intact and upright	55 25.137 N	0 30.596 W	UKHO
73287	-	-	Dead, non-dangerous wreck, intact and upright possibly	55 41.253 N	0 47.842 W	UKHO
73566	HOLMAR I	Motor vessel	Non-dangerous wreck	54 18.512 N	0 13.393 E	UKHO



UKHO ID	Name	Type	Description	Latitude	Longitude	Source
78151	-	-	Non-dangerous wreck, upright with broken bow, and possibly buried	54 7.152 N	0 22.165 E	UKHO
81021	-	-	250 kg gearbox (<i>sic.</i>)	53 50.732 N	0 48.383 E	UKHO
86593	-	-		53 39.655 N	0 54.364 E	UKHO
87269	-	-	Dangerous wreck	53 38.897 N	0 43.92 E	UKHO
93000	-	-	Dangerous wreck, suspected remains of partially buried and degraded vessel	53 40.889 N	0 40.925 E	UKHO
93002	-	-	Dangerous wreck	53 39.277 N	0 51.165 E	UKHO
93006	-	-	Dangerous wreck	53 38.108 N	0 54.979 E	UKHO
99507	-	-	Foul ground	55 55.661 N	1 39.002 W	UKHO

14.4.4. Scottish Baseline Characterisation KP 418.7 to KP 524.9

14.4.4.1. Submerged prehistory

The BRITICE project (Clark et al., 2017) mapped a series of east-west aligned crag and tail features terminating around the proposed Landfall at Kinghorn and several meltwater channels and drumlin features around the Landfall at Lower Largo/Lundin Links. A series of larger meltwater channels are mapped crossing the Study Area close to the Scottish Adjacent Waters boundary (EMODnet (n.d.)).

Prehistoric coastline modelling by Brooks et al. (2011) suggests the northern half of the Study Area was submerged prior to 18,000 BP.

No heritage records indicate offshore prehistoric sites or finds in Scottish waters, and few relate to onshore remains in the Study Area.

14.4.4.2. Maritime and intertidal archaeology (up to 12 NM)

There is one 'historic' wreck within the Scottish 12 NM limit designated under the Protection of Wrecks Act 1986 (HMS Pathfinder) and recorded by UKHO. No records within the Study Area relate to remains or sites designated as Historic Marine Protected Areas.

There are two records within the Study Area that are subject to statutory protection as Scheduled Monuments. Both are situated within the onshore zone in Fife. In addition, 302 Listed Buildings and two Conservation Areas lay within the same part of the Study Area.

There are 62 wreck sites recorded by the UKHO within the Study Area within 12 NM Figure 14-4 (Drawing: C01494-EGL4-ARCH-004-A; Table 14 3). Seven of these are recorded as 'foul ground', of which five are also indicated to be 'Dead'. A further 26 are recorded as 'Dead', indicating that they have not been detected by repeated surveys. Two wrecks are recorded as 'lifted' indicating no, or little, remains on the seabed. One wreck is recorded as 'historic' (see above).

The Canmore records (including Fife HER data) illustrate 255 maritime archaeology sites within the Study Area (offshore) and 400 archaeological or heritage sites onshore Figure 14-5 and 14-6 (Drawings: C01494-EGL4-ARCH-005-A and C01494-EGL4-ARCH-006-A). Several Canmore records correspond to identified UKHO records.

14.4.4.3. Maritime archaeology (beyond 12 NM)

There are currently no records within the Study Area beyond 12 NM that are subject to statutory protection as Scheduled Monuments, Protected Wrecks, Historic Marine Protected Areas or under the Protection of Military Remains Act 1986.

Four (4) wreck sites are recorded by the UKHO within Scottish waters of the Study Area beyond 12 NM Figure 14-4 (Drawing: C01494-EGL4-ARCH-004-A; Table 14 3). Two (2) of these are recorded as 'Dead', indicating that they have not been detected by repeated surveys. The remaining two are in the same location and both relate to UKHO record 99368, most likely representing a duplicate record rather than two physical sites relating to the same wreck.

Canmore records six maritime records within the Study Area (Scottish waters beyond 12 NM). Two of the three UKHO records in this area correlate with Canmore records.

14.4.4.4. Aviation archaeology

There are 42 recorded aircraft crash sites located within the Study Area for Scotland, recorded within the Canmore records. In some cases, no surviving examples of the lost aircraft exist. There is also the potential for the discovery of further previously unknown aircraft-related debris to exist on the seafloor within the study area, with a higher potential for material dating to the Second World War. As these are recorded losses the positional data is unreliable and serve only to provide an indication of the types of aircraft that flew



over this coastline. In many cases the location is only a set of general coordinates, a general distance and bearing from a landmark, or the location of the crew's dinghy, or recovered remains as reported via the RNLi, air sea rescue reports, or other secondary sources.

Fife has been home to at least 24 airfields operated by both the Royal Air Force and Royal Navy's Fleet Air Arm with some dating back to World War One. These included both training and active airfields with corresponding levels of losses through accidents or battle damage, both overland and on missions to and from the European mainland.

Table 14-3: UKHO records for Scottish waters.

UKHO ID	Name	Type	Description	Latitude	Longitude	Source
Up to 12 NM						
2826	GOOD DESIGN	Patrol boat	Dangerous wreck, lifted	56 2.929 N	3 6.42 W	UKHO
2828	HMS BOY ANDREW (POSSIBLY)	Drifter	Non-dangerous wreck	56 3.623 N	3 1.789 W	UKHO
2829	LY 120	Barge	Dead	56 3.696 N	3 10.786 W	UKHO
2831	SALVESTRIA	Tanker	Dangerous wreck, mostly flattened plates	56 4.046 N	3 4.87 W	UKHO
2904	CRADOCK	Trawler	Dead, non-dangerous wreck	56 4.997 N	2 0.095 W	UKHO
2905	G4	Barge	Non-dangerous wreck, lifted	56 5.012 N	2 55.138 W	UKHO
2906	-	-	Non-dangerous wreck, inverted, intact, bow level with seabed	56 5.246 N	2 55.305 W	UKHO
2908	LCA 845	Landing craft	Foul ground	56 5.446 N	2 53.288 W	UKHO
2910	-	-	Non-dangerous wreck, intact, upright	56 6.203 N	2 25.382 W	UKHO
2912	BOYNE CASTLE	Steam ship	Dead, non-dangerous wreck	56 6.496 N	2 4.095 W	UKHO
2914	-	-	Dead	56 6.795 N	2 52.188 W	UKHO
2916	-	Submarine	Dead, non-dangerous wreck	56 6.996 N	2 20.093 W	UKHO
2920	HMS PATHFINDER	Light cruiser	Non-dangerous wreck, historic wreck, upright, other areas of debris close by	56 7.094 N	2 10.049 W	UKHO
2921	STJERNVIK	Steam ship	Non-dangerous wreck, intact, upright, '3 island' type with 4 hatches	56 7.512 N	2 49.181 W	UKHO
2923	-	Fisherman's Fastener	Dead, foul ground	56 7.996 N	2 28.192 W	UKHO
2924	MARE VIVIMUS	Drifter	Dead, foul ground, wooden hull	56 7.995 N	2 51.089 W	UKHO
2925	-	-	Dead, non-dangerous wreck	56 8.246 N	2 32.758 W	UKHO
2926	STELLA	Steam ship	Non-dangerous wreck, well defined	56 8.304 N	2 44.823 W	UKHO
2927	ROLFSBORG	Steam ship	Non-dangerous wreck, intact, listing to port, netted	56 8.254 N	2 52.014 W	UKHO
2928	-	Fisherman's Fastener	Dead, foul ground	56 8.346 N	2 29.092 W	UKHO
2929	-	-	Dead	56 8.496 N	2 18.093 W	UKHO
2930	-	Steam ship	Non-dangerous wreck, intact, upright, no superstructure, bows to west	56 8.379 N	2 48.822 W	UKHO
2932	-	-	Dead, non-dangerous wreck	56 8.829 N	2 37.041 W	UKHO
2933	HMS COLUMBA (PROBABLY)	Trawler	Non-dangerous wreck, intact, upright	56 9.52 N	2 33.599 W	UKHO
2934	AVONDALE PARK (POSSIBLY)	Steam ship	Non-dangerous wreck, intact, mainly upright	56 9.279 N	2 30.215 W	UKHO
2935	-	-	Dangerous wreck	56 9.312 N	2 53.755 W	UKHO



UKHO ID	Name	Type	Description	Latitude	Longitude	Source
Up to 12 NM						
2936	PHAEACIAN	Steam ship	Dangerous wreck, broken wreck, probably in three parts	56 9.278 N	2 51.647 W	UKHO
2938	-	-	-	56 9.645 N	2 53.405 W	UKHO
2939	SNELAND 1	Steam ship	Non-dangerous wreck, partially broken	56 9.692 N	2 30.858 W	UKHO
2941	-	-	-	56 9.712 N	2 53.322 W	UKHO
2942	-	-	Dead, dangerous wreck	56 9.745 N	2 50.839 W	UKHO
2946	ARIZONA	Motor vessel	Dangerous wreck, well broken up	56 10.228 N	2 52.472 W	UKHO
2950	-	-	Dead	56 10.578 N	2 51.489 W	UKHO
2953	KAREN	Schooner	Dangerous wreck	56 11.061 N	2 58.838 W	UKHO
3079	-	-	Non-dangerous wreck	56 8.662 N	2 28.542 W	UKHO
3080	-	-	Non-dangerous wreck	56 8.212 N	2 23.876 W	UKHO
3081	-	-	Dead, non-dangerous wreck	56 8.196 N	2 19.326 W	UKHO
3082	-	-	Dead, non-dangerous wreck	56 8.179 N	2 23.209 W	UKHO
3083	-	-	Dead, non-dangerous wreck	56 8.079 N	2 27.575 W	UKHO
3084	-	-	Dead, non-dangerous wreck	56 7.946 N	2 15.877 W	UKHO
3085	-	-	Dead, non-dangerous wreck	56 7.879 N	2 35.024 W	UKHO
3086	-	-	Dead, non-dangerous wreck	56 7.729 N	2 36.157 W	UKHO
3087	-	-	Dead, non-dangerous wreck	56 7.512 N	2 24.759 W	UKHO
3088	-	-	Dead, non-dangerous wreck	56 7.513 N	2 16.477 W	UKHO
3089	-	-	Non-dangerous wreck	56 7.296 N	2 29.108 W	UKHO
3091	-	-	Dead, non-dangerous wreck	56 6.746 N	2 18.243 W	UKHO
3092	-	-	Dead, non-dangerous wreck	56 6.713 N	2 24.142 W	UKHO
3094	-	-	Dead, non-dangerous wreck	56 6.413 N	2 21.793 W	UKHO
3112	DENMORE	Steam ship	Non-dangerous wreck, intact, on its side, partly buried, bows to south	56 8.587 N	2 38.407 W	UKHO
3117	PTARMIGAN	Fishing vessel	Non-dangerous wreck, intact	56 8.478 N	2 28.238 W	UKHO
3122	-	Drifter	Non-dangerous wreck, bows missing, stern collapsed	56 9.278 N	2 52.938 W	UKHO
3129	HMS EMBLEY	Trawler	Non-dangerous wreck, possibly upright, intact	56 10.206 N	2 33.179 W	UKHO
3132	-	-	Non-dangerous wreck, partially broken wreck	56 10.107 N	2 33.852 W	UKHO
3134	-	-	Foul Ground, area of minor debris	56 9.054 N	2 46.056 W	UKHO
3136	-	-	Non-dangerous wreck, area of wreckage or cargo	56 4.533 N	2 57.333 W	UKHO
3145	SCOT	Steam ship	Dead, dangerous wreck	55 59.997 N	1 49.597 W	UKHO
60208	OCEAN HARVEST	Fishing vessel	Dangerous wreck, glass reinforced plastic (GRP) hull	56 5.8 N	2 52.972 W	UKHO
65438	-	-	Dead	56 8.362 N	2 48.939 W	UKHO
65439	-	Fisherman's Fastener	Dead, foul ground	56 7.596 N	2 28.392 W	UKHO
65440	-	Fisherman's Fastener	Dead, foul ground	56 7.396 N	2 29.192 W	UKHO



UKHO ID	Name	Type	Description	Latitude	Longitude	Source
Up to 12 NM						
78493	-	-	Cut piles & guideposts	56 11.232 N	2 59.704 W	UKHO
80013	VULCAN	Steam ship	Dead, distributed remains of wreck	56 5.26 N	3 9.185 W	UKHO
Beyond 12 NM						
3144	-	-	Dead, non-dangerous wreck	55 59.997 N	1 46.097 W	UKHO
4500	-	-	Dead, non-dangerous wreck	55 57.498 N	1 41.098 W	UKHO
99368	-	-	-	55 59.962 N	1 43.844 W	UKHO
99368	-	-	Non-dangerous wreck, possible remains of degraded vessel	55 59.962 N	1 43.844 W	UKHO

14.5. Proposed Assessment Methodology

For this Scoping Report, the baseline of known offshore archaeology and cultural heritage receptors within the Study Area refers to data obtained from the data sources listed above. The data collection has been completed in line with the Chartered Institute for Archaeologists' (CIfA) *Standard and guidance for historic environment desk-based assessment* (CIfA, 2020). This information will feed into a full DBA undertaken as part of the MEA.

In addition to the receptors examined for the baseline characterisation of this Scoping Report, the MEA will examine the Historic Seascape Characterisation (HSC) of the Study Area. Any impacts to the HSC will be identified within the DBA.

The MEAp will be prepared following relevant legislation, policy, and guidance for offshore archaeology, including, but not limited to, the following:

- Legislation:
 - a) The World Heritage Convention (1972);
 - b) Protection of Wrecks Act (1973);
 - c) Ancient Monuments and Archaeological Areas Act (1979);
 - d) United Nations Convention on the Law of the Sea (1982);
 - e) Protection of Military Remains Act (1986);
 - f) Merchant Shipping Act (1995);
 - g) International Council of Monuments and Sites Charter on the Protection and Management of Underwater Cultural Heritage (1996) (the Sofia Charter);
 - h) Planning (Listed buildings and Conservation Areas) (Scotland) Act (1997);
 - i) UNESCO Convention on the Protection of Underwater Cultural Heritage (2001);
 - j) European Convention on the Protection of Archaeological Heritage (revised) (1992) (the Valletta Convention) – ratified by the UK Government in 2000 and came into force in 2001;
 - k) Environmental Assessment (Scotland) Act (2005);
 - l) European Landscape Convention (2000) – adopted in the UK in 2007;
 - m) Marine and Coastal Access Act (2009);
 - n) Marine (Scotland) Act (2010); and
 - o) Historic Environment Scotland (HES) Act (2014).

- Policy, Plans, and Supporting Documents:
 - a) Marine Policy Statement (2011);
 - b) Planning Advice Note 2/2011: Planning and Archaeology (2011) (Scotland);
 - c) East Inshore and East Offshore Marine Plans (2014) (England);
 - d) Scottish Planning Policy (SPP) (2014);
 - e) Our Place in Time - The Historic Environment Strategy for Scotland (2014 - currently under review);
 - f) Scottish National Marine Plan (2015 – NMP2 in consultation);
 - g) Historic Environment Policy for Scotland (HEPS 2019);
 - h) Historic Environment Scotland Circular (2019); and
 - i) North East Inshore and Northeast Offshore Marine Plan (2021) (England).



- Key Guidance:
 - a) Environmental Impact Assessment Handbook: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland (HES and NatureScot 2018);
 - b) Standard and Guidance for Historic Environment Desk-Based Assessment (ClFA 2020);
 - c) Designation Policy and Selection Guidance (DPSG 2019);
 - d) Historic Environment Circulars;
 - e) Historic Environment Scotland's Managing Change in the Historic Environment series;
 - f) Key Agencies Group National and Major Developments: An Agency Joint Statement on Pre-application Engagement;
 - g) Scottish Government Planning Advice Notes, in particular 2/2011: Planning and Archaeology; Planning Advice Note 1/2013: Environmental Impact Assessment (amended 2017); Planning Circular 1/2017: Environmental Impact Assessment Regulations (Scottish Government 2017); and
 - h) Guidance on Heritage Impact Assessments for Cultural World Heritage Properties (ICOMOS 2011).
 - i) Code of Practice for Seabed Development (Joint Nautical Archaeology Policy Committee, 2008);
 - j) COWRIE Historic Environment Guidance for the Offshore Renewable Energy Sector; (Wessex Archaeology, 2007);
 - k) Marine Geophysics Data Acquisition, Processing, and Interpretation: Guidance Note (EH, 2013, note MSDS Marine are currently in the process of updating this guidance on behalf of Historic England);
 - l) Offshore Geotechnical Investigations and Historic Environment Analysis: Guidance for the Renewable Energy Sector (Gribble and Leather, 2011);
 - m) Archaeological Written Schemes of Investigation for Offshore Wind Farm Projects (The Crown Estate 2021); and
 - n) Protocol for Archaeological Discoveries: Offshore Renewables Projects (The Crown Estate 2014).

To define the scope of the environmental receptors, liaison between key stakeholders and Archaeological Curators may be required. Key consultees are listed in Table 14-1.

14.5.1. Assessment criteria and assignment of significance

Following the identification of marine archaeological receptors within the Study Area, the MEA will attribute a significance of effect to each receptor, in correlation to the project-related activity which results in a direct or indirect impact. The significance of effect will be determined by identifying the sensitivity and magnitude of change for each receptor. These terms and the proposed assessment methodology to be applied are described within this Section.

Both sensitivity and magnitude of change are influenced by the value, or significance, of a receptor as a heritage asset, which will be defined prior to the assessment of impact significance.

14.5.1.1. Value

The UK Marine Policy Statement (HM Government, 2011) describes a heritage asset (including archaeological receptors) as holding a degree of significance (value) meriting consideration, where significance relates to the heritage interest of an asset and the value they hold for present and future generations.

Both designated and non-designated heritage assets can hold heritage value. Value considers whether the receptor is rare, has protected status or has importance at a local, regional, national, or international level. Designated assets, such as Protected Wreck Sites (England) or Historic Marine Protected Areas (Scotland), have been assigned the highest level of value. The value of non-designated heritage assets can be determined through professional interpretation of the values or characteristics of the asset. These factors vary in their wording slightly between England and Scotland and are listed below.

England

Historic England's *Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment* (HE, 2008) defines the significance of a heritage asset as "the diverse cultural and natural heritage values that people associate with it, or which prompt them to respond to it". HE recommends the use of the following valuation criteria to determine heritage significance:

- Evidential value: the potential of an asset to yield evidence about past human activity;
- Historical value: the ways in which past people, events and aspects of life can be connected through an asset to the present, tending to be illustrative or associative;
- Aesthetic value: the ways in which people draw sensory and intellectual stimulation from an asset; and
- Communal value: the meanings of an asset for the people who relate to it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical (particularly associative) and aesthetic values but tend to have additional and specific aspects.



Scotland

Historic Environment Scotland use similar principles for the attribution of value, alongside a slightly different set of valuation criteria (HES, 2019):

- Intrinsic characteristics: how the physical remains of an asset contribute to our knowledge of the past;
- Contextual characteristics: how an asset relates to its surroundings and/or to our existing knowledge of the past; and
- Associative characteristics: how an asset relates to people, practices, events and/or historic and social movements.

Within the MEAp, identified assets will be assigned value alongside the relevant regional guidance documents and terminology (i.e. HE guidance for assets in England and HES guidance for those in Scotland). Although the terminology may vary, the similarity of the valuation criteria will result in equivalent attributed levels of significance.

The value of known archaeological assets will also be assessed on a five-point scale, using professional judgement informed by criteria provided in Table 14-4.

Table 14-4: Criteria to assess the heritage value of receptors.

Value	Definition
High	Internationally or nationally important. Within a marine or intertidal context, high value heritage assets can include: <ul style="list-style-type: none"> ▪ World Heritages Sites and assets of acknowledged international importance or that can greatly contribute to international research objectives; ▪ Sites designated under national legislation, i.e., Scheduled Monuments, Protected Wreck Sites, Historic Marine Protected Areas, etc. ▪ Buildings designated under the Planning (Listed Buildings and Conservation Areas) Act 1990 (England) or Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997. Additionally, any remains which are not currently designated but have equivalent significance to a designated asset are considered to be of high value.
Medium	Within a marine or intertidal context, medium value assets include: <ul style="list-style-type: none"> ▪ Heritage assets that are not designated and that do not meet the criteria for designation, but display notable values or characteristics; and ▪ Heritage assets, groups of assets or landscapes that contribute to regional research objectives.
Low	Within a marine or intertidal context, low value assets include: <ul style="list-style-type: none"> ▪ Heritage assets displaying limited values or characteristics; and ▪ Heritage assets, or groups of assets, that contribute to a limited degree to regional research objectives.
Negligible	Within a marine or intertidal context, negligible value assets include: <ul style="list-style-type: none"> ▪ Heritage assets with very little or no surviving archaeological interest and little or no heritage value or characteristics; and ▪ Heritage assets or groups of assets that cannot appreciably contribute to regional research objectives.
Uncertain	Assets for which the importance of the resource has not been or cannot be ascertained.

While designation (e.g., as a Scheduled Monument, Listed Building, etc.) indicates that a receptor has been identified as being of high value, non-designated archaeological assets are not necessarily of lesser value. Non-designated receptors that can be demonstrated to be of equivalent value to designated sites would be of equivalent significance, as included within Table 14 4.

The nature of the marine archaeological resource is such that there is a high level of uncertainty concerning remains on the seabed. Often data regarding the nature and extent of assets are limited or out of date and the precautionary principle will be applied to all aspects of archaeological impact assessment in the MEA.

14.5.1.2. Sensitivity

The sensitivity of a receptor is a function of its capacity to accommodate change and reflects its ability to recover if it is affected. Sensitivity is determined by consideration of the value, adaptability, tolerance, and recoverability of a receptor. These criteria are determined through professional judgement and relevant experience and are described further below:

- Value: a measure of the receptor’s heritage significance (criteria and specific assessment methodology detailed above);
- Adaptability: the ability of a receptor to adapt to or avoid an external factor;
- Tolerance: the susceptibility (ability to be affected or unaffected) of a receptor to an external factor; and



- Recoverability: the ability of a receptor to return to a state close to that which existed before the activity or event caused change within a specific period of time.

The guidelines presented in Table 14 5 will be adopted in the MEA to define the sensitivity of a receptor.

Table 14-5: Sensitivity levels for receptors.

Sensitivity	Description
High	Receptor has very limited capacity to avoid, adapt to, accommodate, or recover from the anticipated impact.
Medium	Receptor has limited capacity to avoid, adapt to, accommodate, or recover from the anticipated impact.
Low	Receptor has some tolerance to avoid, adapt to, accommodate, or recover from the anticipated impact.
Negligible	Receptor is generally tolerant to and can accommodate or recover from the anticipated impact.

The National Planning Policy Framework (NPPF, 2023) states that heritage assets should be recognised as “an irreplaceable resource” and to “conserve them in a manner appropriate to their significance”.

Heritage receptors cannot typically adapt, tolerate, or recover from direct impacts resulting in material damage or loss caused by development. Consequently, the sensitivity of each receptor is predominantly quantified only by their value. Where receptors can adapt to, tolerate, or recover from indirect impacts, these factors will be incorporated into an assessment of their sensitivity as part of the MEA.

In some instances, the value of a receptor is recognised by means of designation and the ‘value’ element recognises and gives weight in the assessment to that designation. However, irrespective of the recognised value, all receptors will exhibit a greater or lesser degree of sensitivity to the potential changes brought about by the Project. The assessment of sensitivity is a matter of judgement applied using professional expertise, based on the receptors and impacts identified within the Study Area.

14.5.1.3. Magnitude of change

The magnitude of change is defined by the level of alteration to a receptor resulting from project-related impacts, as measured from that receptor’s baseline state and condition, alongside environmental factors, and natural variability. The assessment of magnitude will consider both positive and negative changes to a receptor.

The criteria to be used in assessment are set out in Table 14 6. Definitions have been established with reference to key documentation, including the Marine Policy Statement (HM Government, 2011) and Scottish National Marine Plan (Marine Scotland, 2015).

Table 14-6: Magnitude of change definitions.

Magnitude of change	Definition	
	Positive change (beneficial)	Negative change (adverse)
High	<ul style="list-style-type: none"> Large scale improvement of asset or attribute quality; and/or extensive restoration or enhancement. 	<ul style="list-style-type: none"> Substantial loss or harm to the heritage asset and/or integrity of the heritage asset or severe damage to key characteristics, features or elements, such that the heritage asset is lost, or its significance is totally altered; and/or Permanent/irreplaceable change which is certain to occur.
Medium	<ul style="list-style-type: none"> Improvement to, or addition of, key characteristics, features, or elements of the resource; and or/ Improvement to attribute quality. 	<ul style="list-style-type: none"> Loss of, or alteration to, key characteristics, features, or elements; and/or Measurable change in significance, attributes, quality or vulnerability, such that the heritage asset and its significance is altered.
Low	<ul style="list-style-type: none"> Minor improvement to, or addition of, one or a small number of characteristics, features, or elements; and/or Very minor improvement to attribute quality. 	<ul style="list-style-type: none"> Minor loss of, or small alterations to, one or a small number of characteristics, features, or elements; and/or Noticeable change in attributes, quality, or vulnerability.
Negligible	No change or unquantifiable change to the receptor and its significance.	



14.5.1.4. Significance of impact

The significance of an impact on a heritage receptor, whether a direct or indirect impact, is determined by correlating the sensitivity of the archaeological receptor (Table 14 5) and the magnitude of the change (Table 14 6). The impact will be presented as of major, moderate, minor, or negligible significance and can be positive (beneficial) or negative (adverse). The matrix in Table 14 7 provides a guide to the assessment but is not a substitute for professional judgement and interpretation, particularly where the sensitivity or effect magnitude levels are not clear or are borderline between categories.

Table 14-7: Significance of impact matrix

		Magnitude of change			
		High	Medium	Low	Negligible
Value / sensitivity of receptor	High	Major	Major	Moderate	Minor
	Medium	Major	Moderate	Minor	Minor
	Low	Moderate	Minor	Minor	Negligible
	Negligible	Minor	Minor	Negligible	Negligible

Table 14 8 provides further rationalisation of the implications and definition of each level of impact significance set out in Table 14 7, in relation to historic assets.

Table 14-8: Significance of impact definitions

Significance of impact	Definition	
	Beneficial	Adverse
Major	Development will deliver a highly positive contribution and/or better reveal the value of a heritage asset of recognised national or international value, such that an application should be treated very favourably.	Substantial harm or total loss of the value of a designated heritage asset (or asset worthy of designation), such that development should not be consented unless substantial public benefit is delivered by the development.
Moderate	Development will deliver a positive contribution and/or better reveal the value of a designated heritage asset (or asset worthy of designation), such that an application should be treated favourably.	Less than substantial harm or total loss of the value of a designated heritage asset or an asset of designable quality, such that the harm should be weighed against the public benefit delivered by the development to determine consent. Harm to a non-designated heritage asset of a greater degree than that perceived of as minor adverse, which should be considered in determining an application.
Minor	Development will deliver a positive contribution and/or better reveal the value of a non-designated heritage asset.	Less than substantial harm to the value of a designated heritage asset, of a lesser degree than that perceived as moderate adverse, but which should still be weighed against the public benefit delivered by the development to determine consent. Harm to a non-designated heritage asset that can be adequately compensated through the implementation of a programme of industry standard mitigation measures.
Negligible	No discernible change to the receptor and its significance.	

14.5.2. Mitigation

Impacts to both known and potential marine archaeological receptors will be addressed through the application of embedded mitigation. In line with current policy and guidance, mitigation aims first to avoid adverse impacts on historic assets, minimise impacts where they cannot be avoided or mitigate impacts where they cannot be minimised.



Known receptors (identified through the assessment) would be avoided through the application of Archaeological Exclusion Zones (AEZs), Temporary Archaeological Exclusion Zones (TAEZs) and subsequent micro-siting of infrastructure on the seabed, as necessary.

Unavoidable impacts to potential receptors would be addressed through a series of agreed mitigation measures to manage discoveries once identified. These measures would be set out in a project-specific Written Scheme of Investigation (WSI), as part of the MEAp, which would clarify the methodologies to address unavoidable impacts associated with the worst-case scenario (Project Design Envelope), in accordance with the Model Clauses for Archaeological Written Schemes of Investigation: Offshore Renewables Projects (The Crown Estate, 2021).

14.6. Scope of Assessment

This section describes the potential impacts on offshore archaeological receptors which might potentially occur from the pre-construction, construction, operation, and maintenance and decommissioning of the Project. This assessment considers the methods described within Chapter 3 – Project Description. A summary of project phases and the source of potential impacts is summarised in Table 14 9, below.

The potential for and assessment of cumulative effects to marine archaeology receptors arising will be included within the MEA, as outlined in Chapter 4 of this Scoping Report



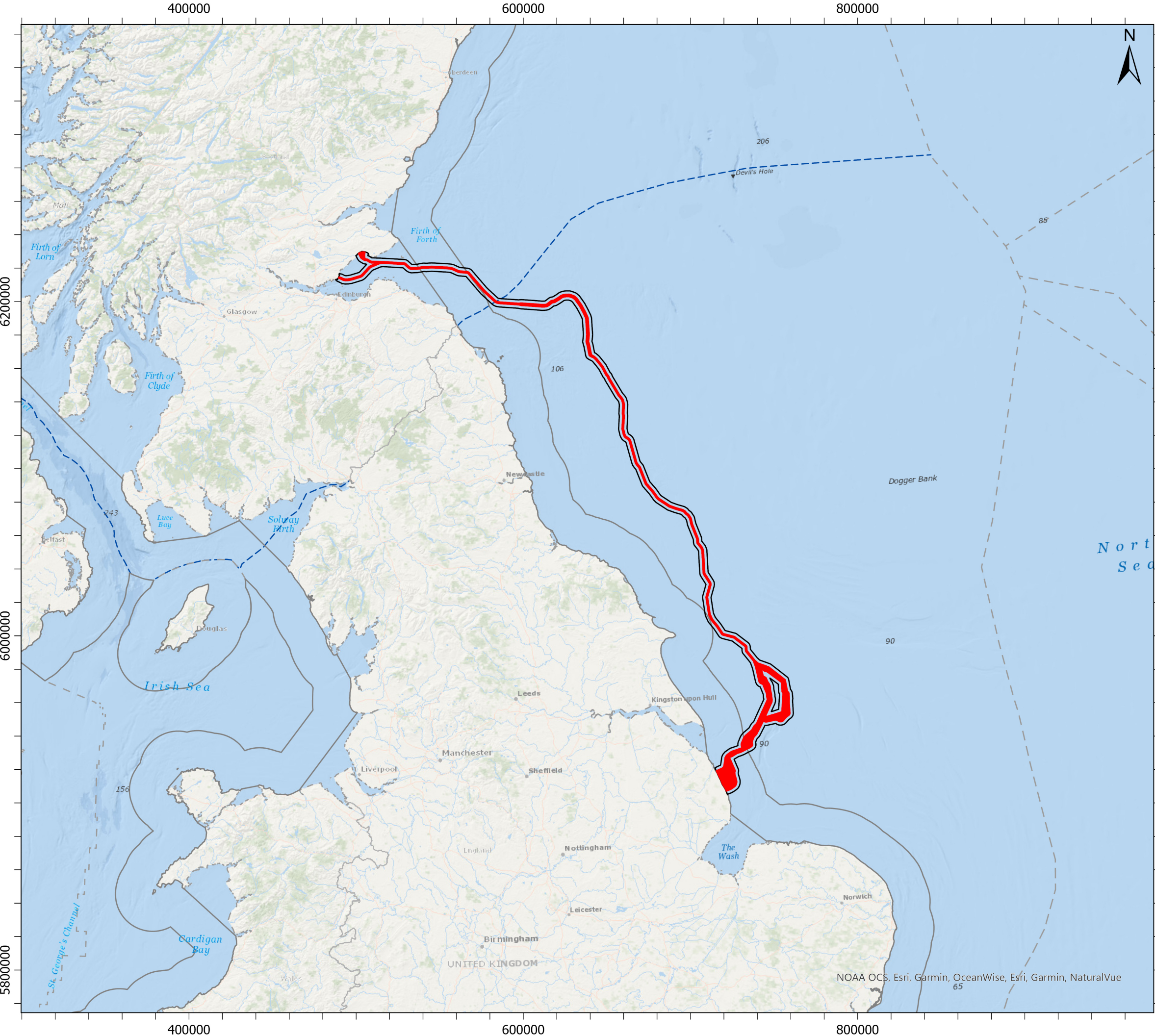
Table 14-9: Scoping assessment of impacts on Marine Archaeology.

Potential Impact	Project Activities	Sensitive Receptors	Scoping Justification		
			Construction	O&M	Decommissioning
Direct impacts to marine archaeology assets, resulting in damage and/or loss	Seabed preparation (e.g., boulder clearance, PLGR, pre-sweeping of sand waves, UXO identification and clearance, etc.); Cable burial and trenching; Placement of external cable protection; HDD drive path and entry/exit pits; Anchoring/jack-up foundations; Cable/cable protection repair/replacement; Removal of infrastructure.	Sub-seabed and seabed heritage receptors, including known and potential submerged prehistoric remains and known and potential maritime and aviation assets.	IN: Any disturbance of the seabed during preparation and construction activities could directly impact marine archaeology receptors. These effects are likely to be localised, but should they occur, they could lead to adverse and irreversible damage to known or previously undiscovered heritage assets. Where asset locations are already known, embedded mitigation measures will be adopted to avoid and preserve assets, including the application of AEZs and micro-siting.	IN: Localised repair/replacement works to cables or remedial external cable protection may be required. Although assets may have been identified prior to or during pre-construction and construction, further assets may remain undetected. Where O&M activities extend beyond the footprint of previous works, undetected assets may experience impacts.	IN: The significance of the effect during decommissioning is likely to be similar or of lower magnitude than during the construction phase. However, where decommissioning activities extend beyond the footprint of previous activities, hitherto undetected assets have the potential to experience impacts.
Indirect impacts to marine archaeology assets, resulting in damage, loss, relocation and/or destabilisation	Material deposition; Sediment removal; Scour around installations, anchors.	Sub-seabed and seabed heritage receptors, including known and potential submerged prehistoric remains and known and potential maritime and aviation assets.	IN: Seabed preparation and construction activities have the potential to destabilise or compress assets, through sediment removal and deposition. Altered hydrodynamic processes may occur around infrastructure and vessel anchors, potentially resulting in the removal of deposits of palaeoenvironmental interest and destabilising nearby assets (which may lead to subsequent harm). The MEA will be informed by an assessment on marine physical processes to determine the likely extent, duration and frequency and resultant significance of impact on marine archaeological receptors.	IN: Indirect impacts similar to the construction phase may be experienced by receptors. Unlike direct impacts, the significance of indirect impacts would not likely be lesser in consideration of the footprint of activities.	IN: Indirect impacts similar to the construction phase may be experienced by receptors. Unlike direct impacts, the significance of indirect impacts would not likely be lesser in consideration of the footprint of activities.



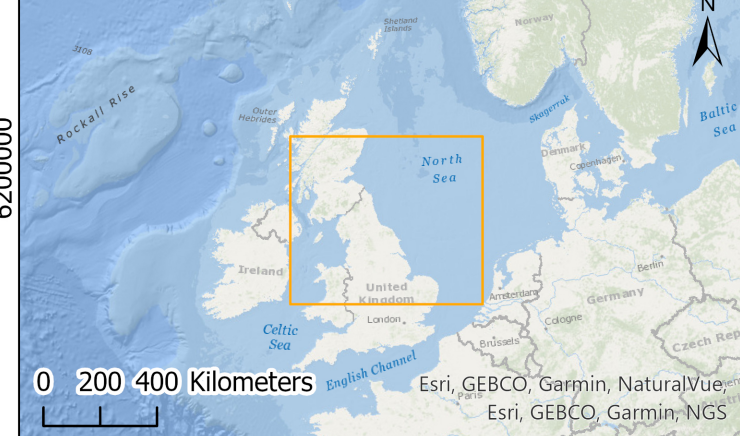
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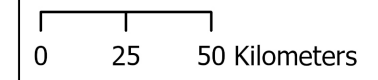
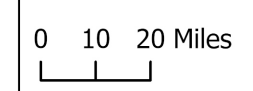


Marine Archaeology Study Area

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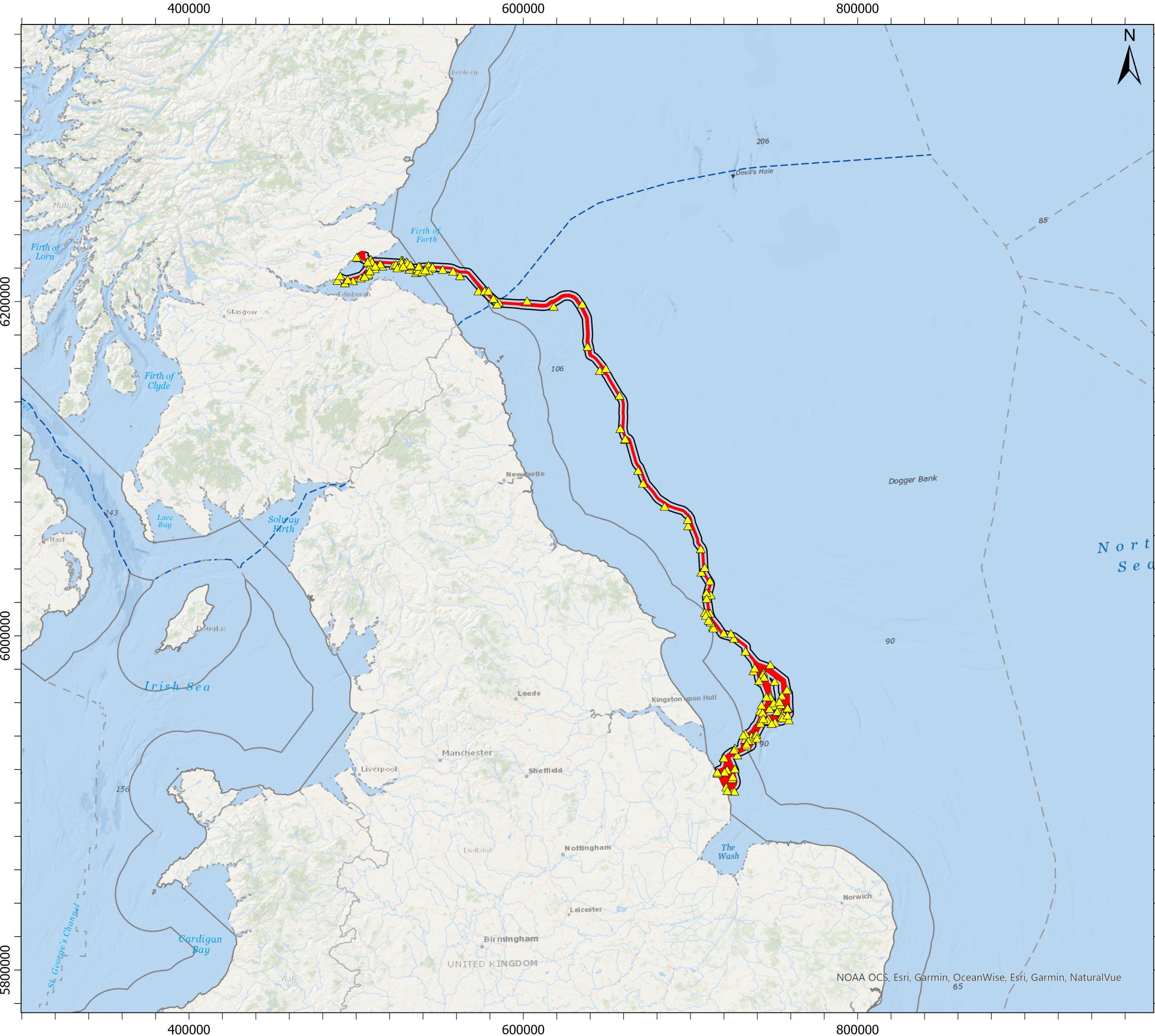


- EGL 4 Scoping Boundary
- Study Area
- 12 NM Limit
- Exclusive Economic Zone Limit (EEZ)
- Scottish Adjacent Waters



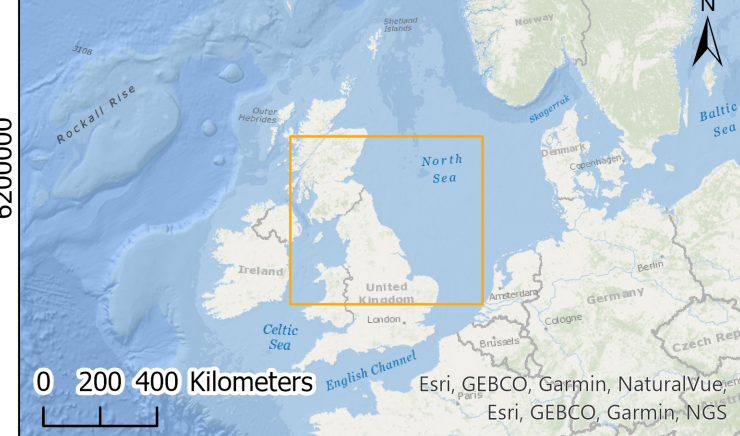
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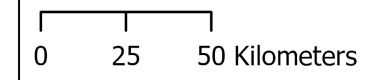
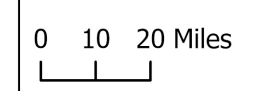


UKHO Records in Study Area

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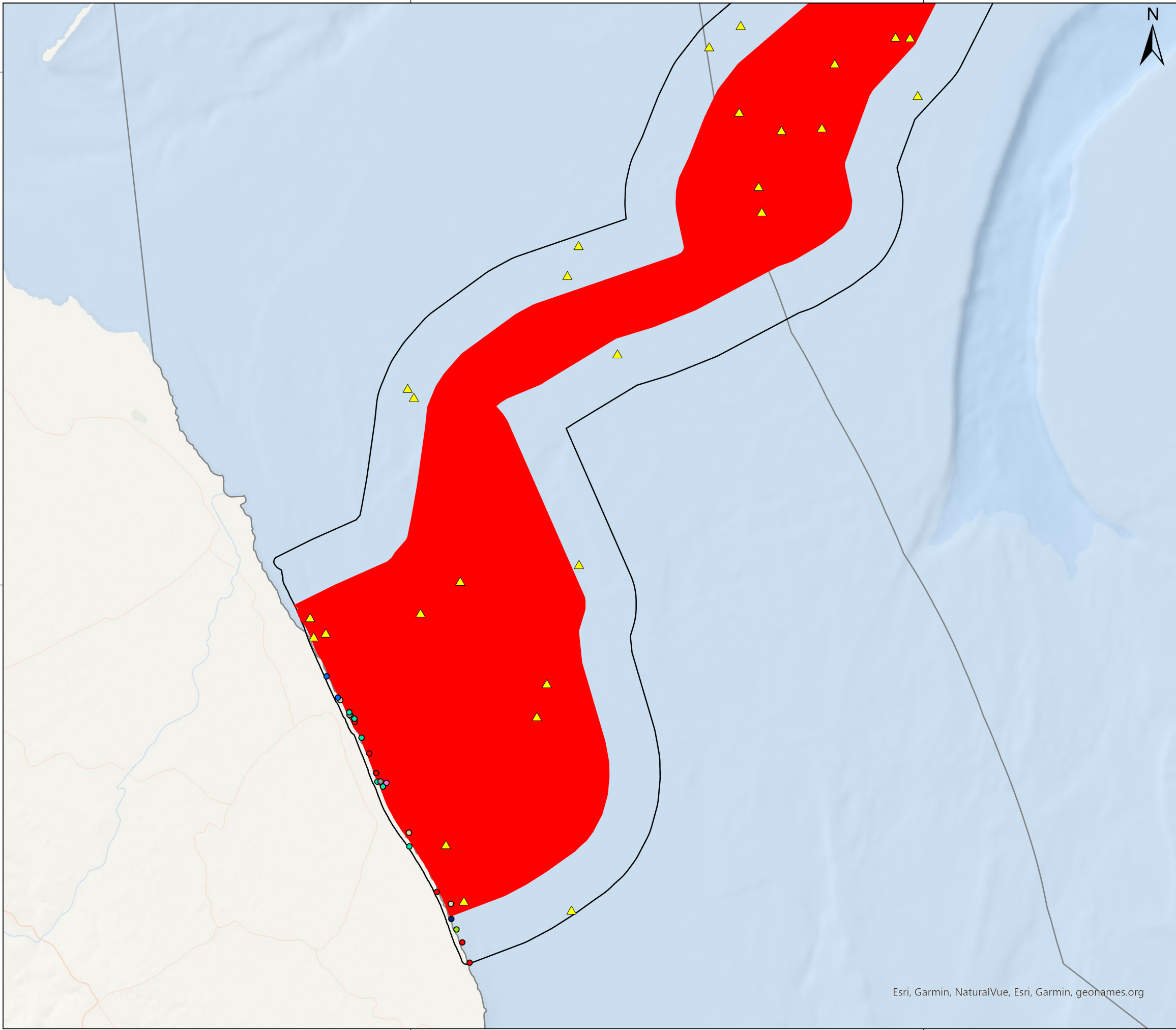


- EGL 4 Scoping Boundary
- Study Area
- UKHO record
- 12 NM Limit
- Exclusive Economic Zone Limit (EEZ)
- Scottish Adjacent Waters



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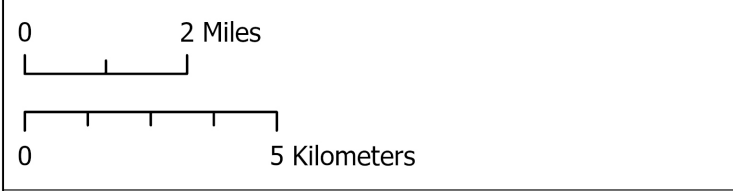
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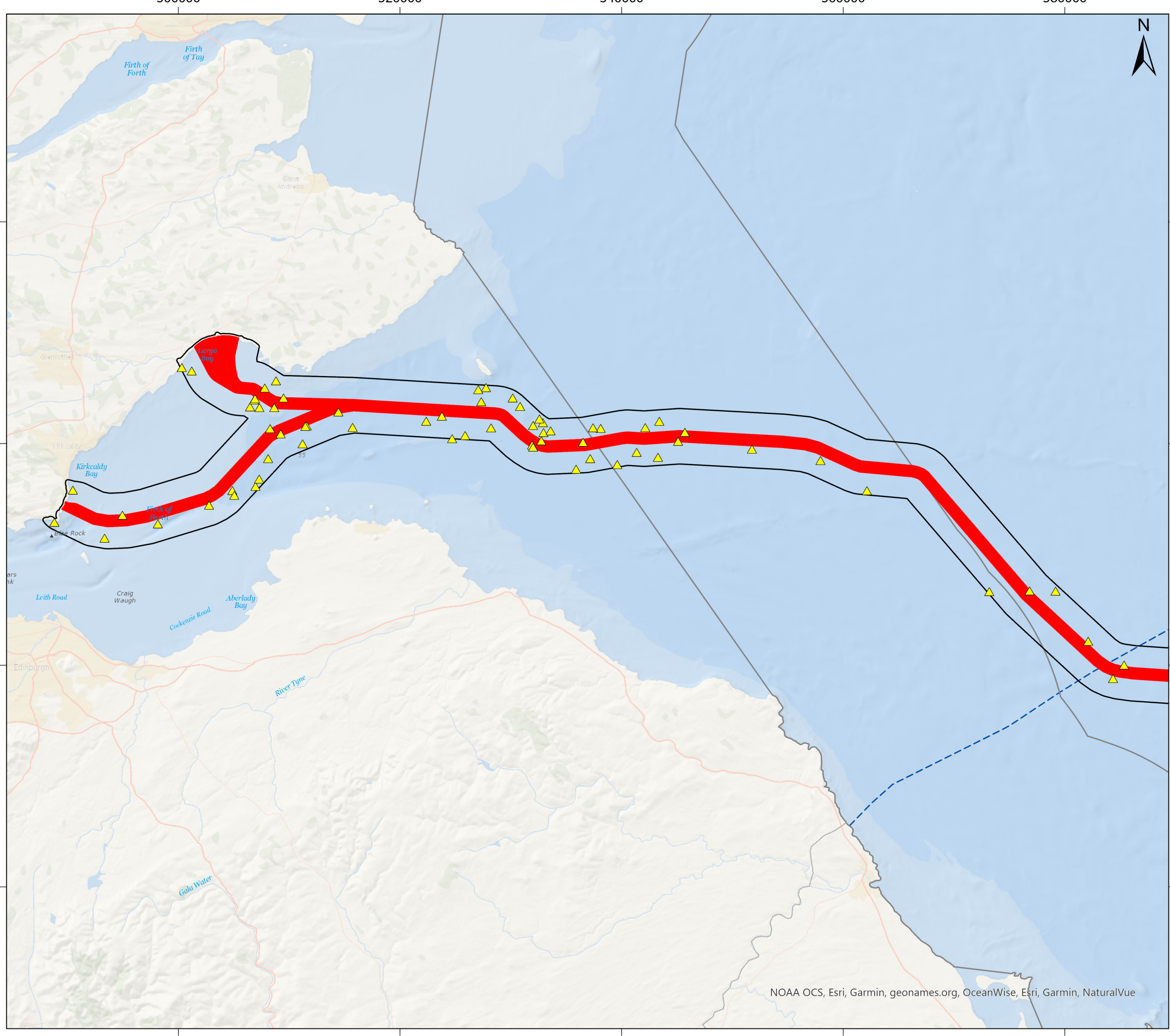
UKHO and HER records in English waters (to 12 NM)
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- EGL 4 Scoping Boundary
- Study Area
- UKHO record
- Lincs HER point
- Period
- Palaeolithic
- Neolithic
- Iron Age
- Roman
- Early medieval
- Medieval
- Post-medieval
- Modern
- Undated
- 12 NM Limit



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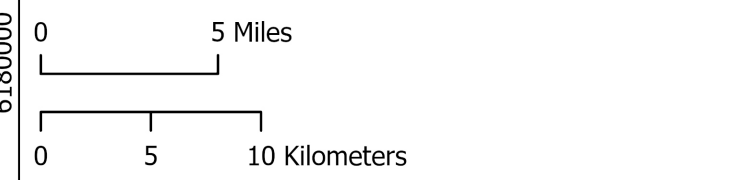


UKHO records in Scottish waters

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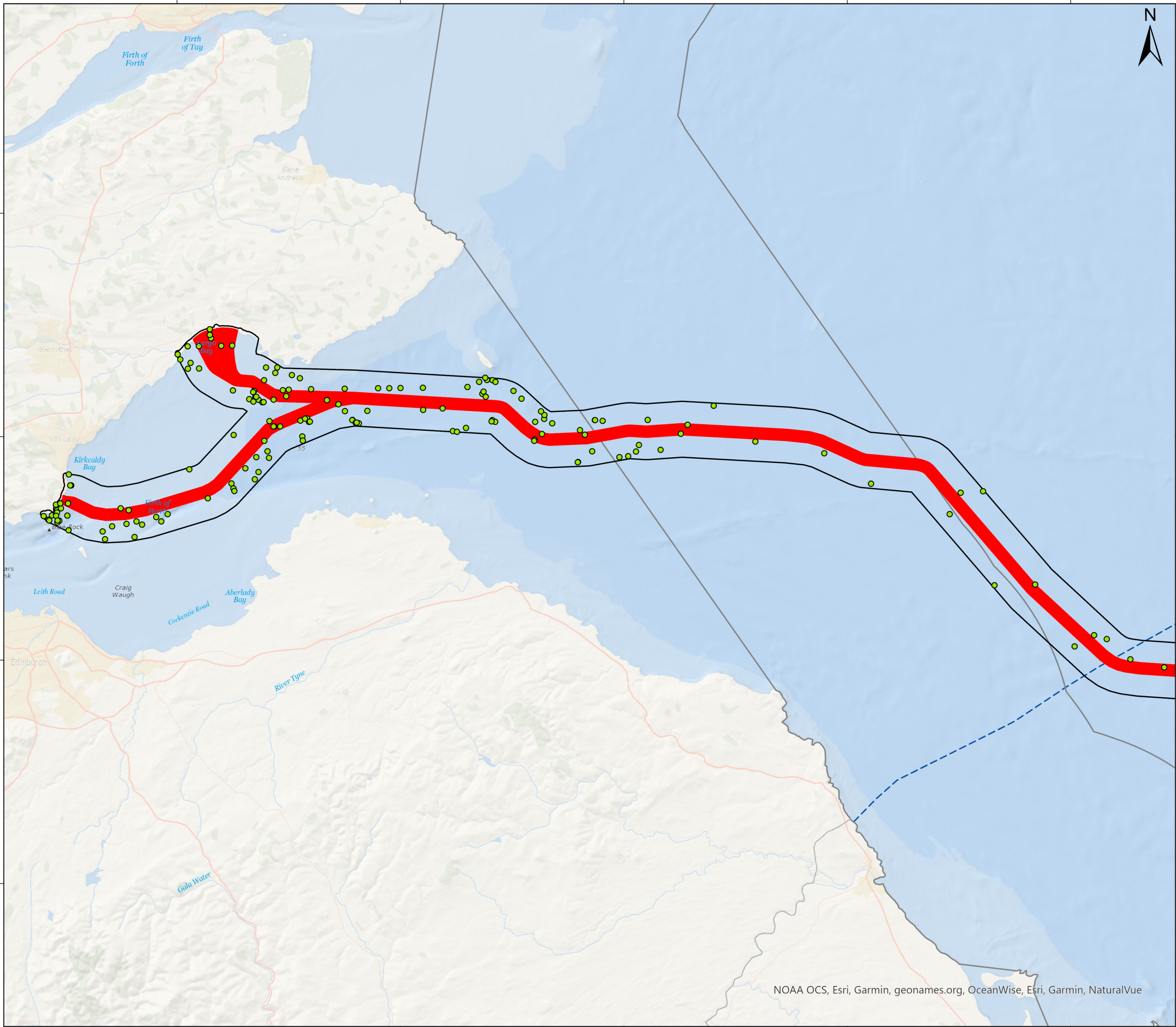


- █ EGL 4 Scoping Boundary
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- 12 NM Limit
- Scottish Adjacent Waters



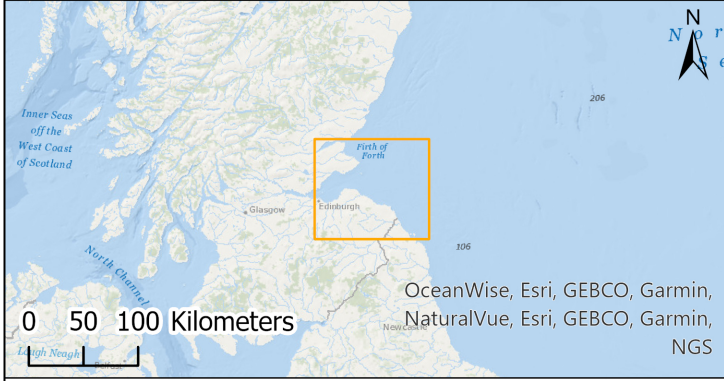
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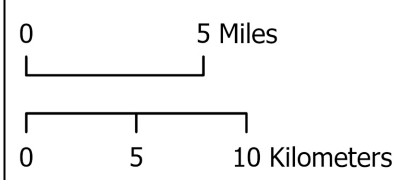


Canmore maritime records in Scottish waters

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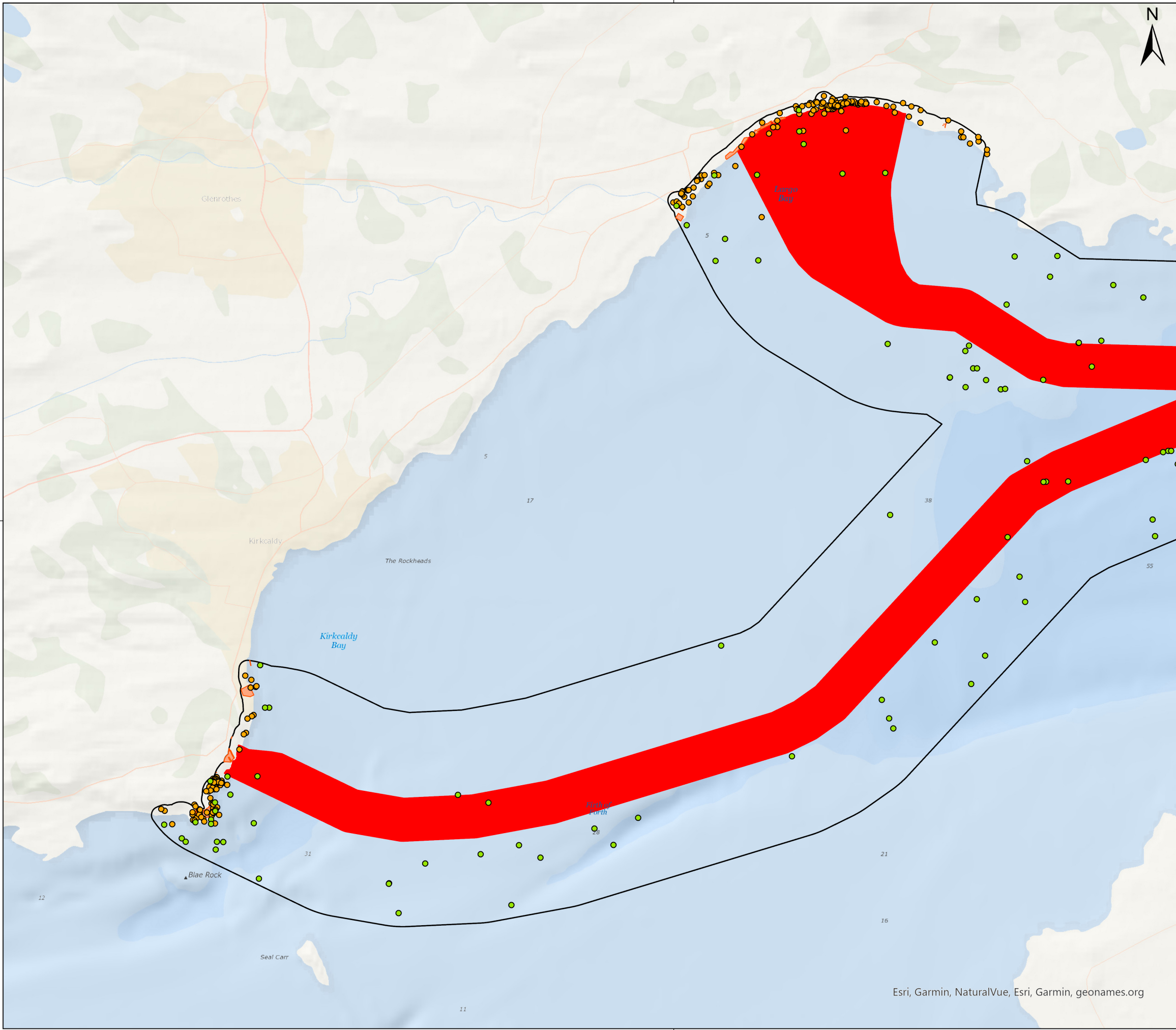


- █ EGL 4 Scoping Boundary
- Study Area
- Canmore maritime point
- 12 NM Limit
- Scottish Adjacent Waters



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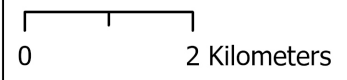
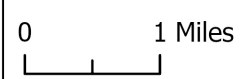


Canmore records at Scottish landfall

C01494b-EGL4-ARCH-006-A



- EGL 4 Scoping Boundary
- Study Area
- Canmore maritime point
- Canmore point
- Canmore area



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15. Scoping Conclusions

15.1. Summary of Scoping

Tables 15-1 and 15-2 provide a summary of the impacts of the Project that have been scoped 'in' to the MEA and those impacts it is proposed to scope 'out' of the assessment, for physical and biological receptors and socio-economic receptors respectively.

Table 15-1: Summary of the Impacts to be Included with the MEA – Physical and Biological Receptors

C – Construction, O&M – Operations and Maintenance, D - Decommissioning

Potential Impact	Physical Environment			Intertidal and Subtidal Benthic Ecology			Fish and Shellfish			Intertidal and Marine Ornithology			Marine Mammals and Marine Reptiles		
	C	O&M	D	C	O&M	D	C	O&M	D	C	O&M	D	C	O&M	D
Temporary habitat loss / seabed disturbance <i>(Abrasion / disturbance of the substrate on the surface of the seabed Penetration and/or disturbance of the substratum below the surface of the seabed, including abrasion)</i>	-	-		IN	OUT	OUT	IN	IN	IN	OUT	OUT	OUT	-	-	-
Permanent habitat loss <i>(Physical change (to another seabed type or sediment type) Water flow (tidal current) changes including sediment transport considerations)</i>	-	-	-	IN	IN	OUT	IN	IN	OUT	-	-	-	-	-	-
Temporary increase and deposition of suspended sediments <i>(Changes in suspended solids (water clarity) Smothering and siltation rate changes Hydrocarbon & PAH contamination)</i>	IN	OUT	OUT	IN	IN	IN	IN	OUT	IN	-	-	-	-	-	-
Underwater noise changes	-	-	-	OUT	OUT	OUT	IN	OUT	OUT	-	-	-	IN	OUT	OUT
Introduction or spread of Marine invasive non-native species (MINNS)	-	-	-	OUT	OUT	OUT	-	-	-	-	-	-	-	-	-
Changes in distribution of prey species	-	-	-	-	-	-	-	-	-	IN	IN	OUT	IN	IN	IN
Electromagnetic changes / Barrier to species movement	-	-	-	-	OUT	-	-	IN	-	-	-	-	-	OUT	-
Temperature increase	-	OUT	-	-	OUT	-	-	OUT	-	-	-	-	-	-	-
Visual / physical disturbance or displacement	-	-	-	-	-	-	-	-	-	IN	IN	IN	IN	IN	IN
Collision Risk	-	-	-	-	-	-	OUT	OUT	OUT	-	-	-	OUT	OUT	OUT
Accidental spills <i>(Hydrocarbon & PAH contamination)</i>	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
Disturbance of sub-tidal seabed morphology.	IN	OUT	OUT	-	-	-	-	-	-	-	-	-	-	-	-
Disturbance of intertidal morphology	IN	OUT	OUT	-	-	-	-	-	-	-	-	-	-	-	-
Modifications to tidal and wave regimes and associated impacts to morphological features	OUT	OUT	OUT	-	-	-	-	-	-	-	-	-	-	-	-



Potential Impact	Physical Environment			Intertidal and Subtidal Benthic Ecology			Fish and Shellfish			Intertidal and Marine Ornithology			Marine Mammals and Marine Reptiles		
	C	O&M	D	C	O&M	D	C	O&M	D	C	O&M	D	C	O&M	D
Release of contaminated sediments	OUT	OUT	OUT	-	-	-	-	-	-	-	-	-	-	-	-

Table 15-2: Summary of the Impacts to be Included with the MEA – Socio-Economic Receptors

C – Construction, O&M – Operations and Maintenance, D - Decommissioning

Potential Impact	Commercial Fisheries			Shipping & Navigation			Other Marine Users			Marine Archaeology		
	C	O&M	D	C	O&M	D	C	O&M	D	C	O&M	D
Temporary restricted access to fishing ground (including required static gear clearance)	IN	IN	IN	-	-	-	-	-	-	-	-	-
Temporary displacement of fishing activity into other areas	IN	IN	IN	-	-	-	-	-	-	-	-	-
Loss of grounds	-	IN	-	-	-	-	-	-	-	-	-	-
Changes in distribution of target species	IN	IN	IN	-	-	-	-	-	-	-	-	-
Temporary increase and deposition of suspended sediments <i>(Changes in suspended solids (water clarity) Smothering and siltation rate changes Hydrocarbon & PAH contamination)</i>	IN	OUT	OUT	-	-	-	-	-	-	-	-	-
Project activities causing disruption and displacement to other marine developments	-	-	-	-	-	-	IN	IN	IN	-	-	-
Interaction with other seabed infrastructure	-	-	-	-	-	-	IN	IN	IN	-	-	-
Occupancy of seabed – Below seabed	-	-	-	-	-	-	-	IN	-	-	-	-
Occupancy of seabed – on seabed	-	-	-	-	-	-	-	IN	-	-	-	-
Direct damage to marine archaeology heritage assets	-	-	-	-	-	-	-	-	-	IN	IN	IN
Indirect impacts to marine archaeology assets, resulting in damage, loss, relocation and/or destabilisation	-	-	-	-	-	-	-	-	-	IN	IN	IN
Vessel collisions	-	-	-	IN	IN	IN	-	-	-	-	-	-
Reduced visibility during Mobilising project vessels in extreme weather conditions	-	-	-	IN	IN	IN	-	-	-	-	-	-
Anchor strike/drag	-	-	-	IN	IN	IN	-	-	-	-	-	-
Fishing gear snagging	-	-	-	IN	IN	IN	-	-	-	-	-	-
Project vessels blocking navigational features	-	-	-	IN	IN	IN	-	-	-	-	-	-
Disturbance to existing shipping patterns	-	-	-	IN	IN	IN	-	-	-	-	-	-



Potential Impact	Commercial Fisheries			Shipping & Navigation			Other Marine Users			Marine Archaeology		
	C	O&M	D	C	O&M	D	C	O&M	D	C	O&M	D
Reduction in under-keel clearance	-	-	-	IN	IN	IN	-	-	-	-	-	-
Interference with marine navigation equipment	-	-	-	OUT	IN	OUT	-	-	-	-	-	-

15.2. Marine Environmental Appraisal Structure

The structure of the Marine Environmental Appraisal (MEAp), will describe the findings and conclusions of the marine environmental assessment (MEA) and will enable robust and consistent consideration of the significant of effects, including cumulative impacts. The technical chapters will be informed by the Non-Statutory Scoping Opinions that will be provided by the Marine Management Organisation (MMO) and Marine Directorate - Licensing Operations Team (MD-LOT) in response to this Scoping Report. Technical supporting information will be provided as appendices to the main MEAp. A non-technical summary will accompany the MEAp.

The MEAp will likely be structured as follows:

- Non-Technical Summary
- Introduction
- The Need for the Development and Project Alternatives
- Project Description
- Assessment Scope and Methodology
- Designated Sites
- Marine Physical Processes
- Intertidal and Subtidal Benthic Ecology
- Fish and Shellfish
- Intertidal and Offshore Ornithology
- Marine Mammals and Marine Reptiles
- Shipping & Navigation
- Commercial Fisheries
- Other Marine Users
- Marine Archaeology
- Cumulative Effects Assessment
- Schedule of Mitigation
- Conclusions
- Technical Appendices
 - Compliance with Marine Plan(s)
 - Water Framework Directive Screening
 - Shadow Habitats Regulations Assessment (Screening and if necessary, Report to Inform Appropriate Assessment)
 - Shadow Marine Conservation Zone Assessment (Screening and if necessary, Stage 1 Assessment)
 - Navigation Risk Assessment
 - Marine Archaeology Technical Assessment

Each technical topic chapter will likely be structured as follows:

- Study Area Definition
- Data Sources
- Consultation
- English Assessment
 - Description of the Existing and Likely Evolving Baseline
 - Relevant Embedded Mitigation
 - Significance Assessment



- Project Specific Mitigation
- Residual Effect
- Scottish Assessment
 - Description of the Existing and Likely Evolving Baseline
 - Relevant Embedded Mitigation
 - Significance Assessment
 - Project Specific Mitigation
 - Residual Effect

15.3. Next Steps and Scoping Questions

The Marine Management Organisation (MMO) and Marine Directorate - Licensing Operations Team (MD-LOT) (as the Regulatory Authorities) will request statutory stakeholders provide an opinion on the Marine Environmental Appraisal Non-Statutory Scoping Report. These consultation responses will be collated into one set of responses for England and one for Scotland, which will be returned to the Applicants. Concurrently, the Applicants will also seek opinions on the Marine Environmental Appraisal Non-Statutory Scoping Report from other non-statutory stakeholders to ensure a robust assessment process.

The following questions are designed to assist stakeholders in providing feedback to the Applicant on the Marine Environmental Appraisal Non-Statutory Scoping Report:

- Do you agree with the combined approach of including both the English and Scottish Study Areas within one Marine Environmental Appraisal?
- Do you agree that the data sources and assessment approach identified is sufficient to characterise the baseline for the non-statutory marine environmental assessment?
- Are there any other data sources, surveys or additional studies, which you think the Project Team should have regard to in the preparation of the marine environmental assessment?
- Is there any additional guidance and policy that the Project Team should have regard to in the preparation of the marine environmental assessment?
- Do you agree with the impact pathways identified, and are there any other impact pathways that you think the Project Team should consider in the preparation of the marine environmental assessment?
- Do you agree with how impact pathways have been scoped in and out?
- Do you agree that the design and preliminary mitigation measures described provide a suitable means for managing and mitigating the relevant potential impacts?
- Are there any relevant stakeholders that you think the Project Team have missed?
- Do you have any other comments?



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environmental
advisers