Cambois Connection – Marine Scheme

Environmental Statement – Volume 3

Appendix 14.1: Marine Archaeology Technical Report

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Cambois Connection Marine Scheme

Marine Archaeological Technical Report

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Summary

Wessex Archaeology was commissioned by Xodus Group Ltd to prepare a marine archaeological baseline technical report for the marine component of the Cambois Connection (hereafter referred to as the Project). The Marine Scheme of the Project extends from the Berwick Bank Wind Farm (BBWF) array area through Scottish offshore waters (12 – 200 nautical miles (nm), through English offshore waters (12 – 200 nm) and inshore waters (Mean High Water Springs (MHWS) – 12 nm), and making landfall at Cambois, Northumberland.

Within Scottish waters, part of the Marine Scheme overlaps the BBWF array area. A Marine Archaeology Technical Report (BBWFL, 2022) was submitted to support the Section 36 consent application for BBWF, which assessed geophysical survey datasets collected between 2019 and 2020, along with a desktop review of existing studies and primary sources of data. For brevity the information within the Marine Archaeology Technical Report (Berwick Bank Wind Farm Limited (BBWFL), 2022) for BBWF is not repeated here within this document.

Reference to a Marine Archaeology study area within this report comprises the Marine Scheme in English waters and the part of the Marine Scheme in Scottish waters which does not overlap with the BBWF array area. It should be noted that the Marine Archaeology study area referred to in the associated Environmental Impact Assessment (EIA) chapter includes the Marine Scheme as a whole.

This document comprises a desk-based assessment of documentary sources and technical assessment of marine geophysical datasets to describe the marine archaeological baseline in the Marine Archaeology study area. The aim of the document is to assess the known and potential marine archaeological resource within the Marine Scheme, up to the MHWS. This informs the environmental impact assessment for marine archaeology and cultural heritage within the Marine Scheme Environmental Statement (ES) as well as the information contained with the BBWF Marine Archaeology Technical Report (BBWFL, 2022).

Within the Marine Archaeology study area, the following features have been identified:

- Four palaeogeographic features in English waters;
- Fifty records of wrecks, obstructions and associated debris of archaeological interest, of which;
    - 34 are located in the Scottish waters, and
    - 16 are located in the English waters.
- No known aircraft crash sites; and,
- One intertidal heritage assets at the Landfall.

There are a further 93 features recorded in the gazetteer of seabed features in English waters reflecting wider potential for further unknown maritime, aircraft and seabed prehistory sites and artefacts to be located within the Marine Scheme.

Acknowledgements

This project was commissioned by Xodus Group Limited on behalf of Berwick Bank Wind Farm Limited (BBWFL), a wholly owned subsidiary of SSE Renewables.

Data was provided by the United Kingdom Hydrographic Office (UKHO), the National Record of the Historic Environment (NRHE), Canmore and the Northumberland County Council (HER). Wessex Archaeology is grateful to the staff of all the above organisations for their assistance during the project.

Cambois Connection Marine Scheme

Marine Archaeology Technical Report

1 INTRODUCTION

1.1 Project background

1.1.1 Wessex Archaeology was commissioned by Xodus Group Ltd to prepare a marine archaeology technical report for the Marine Scheme of the Cambois Connection (hereafter referred to as the Project). The Marine Scheme extends from the Berwick Bank Wind Farm (BBWF) array area through Scottish offshore waters, (12 – 200 nautical miles (nm)), through English offshore waters (12 – 200 nm) and inshore waters (Mean High Water Springs (MHWS) – 12 nm), and making landfall at Cambois, Northumberland.

1.1.2 This report is prepared in support of the Environment Statement (ES) for the proposed Marine Scheme.

1.1.3 This report comprises a marine archaeological baseline study of the Marine Scheme, based on a review of records held by national and local inventories and secondary sources relating to the marine and intertidal historic environment of the region. An assessment of marine geophysical datasets has been undertaken for the Marine Scheme in English waters; and, the seascape character has also been assessed for the Marine Scheme, specifically in English inshore waters.

1.1.4 Prior to this assessment, other works have been undertaken in the vicinity of the Marine Scheme. A Marine Archaeology Technical Report (BBWFL, 2022) was submitted to support the Section 36 consent application for BBWF, which assessed geophysical survey datasets collected between 2019 and 2020, along with a desktop review of existing studies and primary sources of data. It is acknowledged that part of the Marine Scheme in Scottish waters overlaps with the BBWF array area, for brevity the information within the Marine Archaeology Technical Report (BBWFL, 2022) for BBWF is not repeated here.

1.2 The Marine Scheme

1.2.1 The Marine Scheme is comprised of the construction, operation and maintenance, and decommissioning of up to four subsea High Voltage Direct Current (HVDC) cables (Offshore Export Cables) from within the BBWF array area located in Scottish waters, to the proposed Landfall location along the Cambois coastline, Northumberland (Figure 14.1). The Offshore Export Cables will be installed within an installation corridor up to 180 km in length.

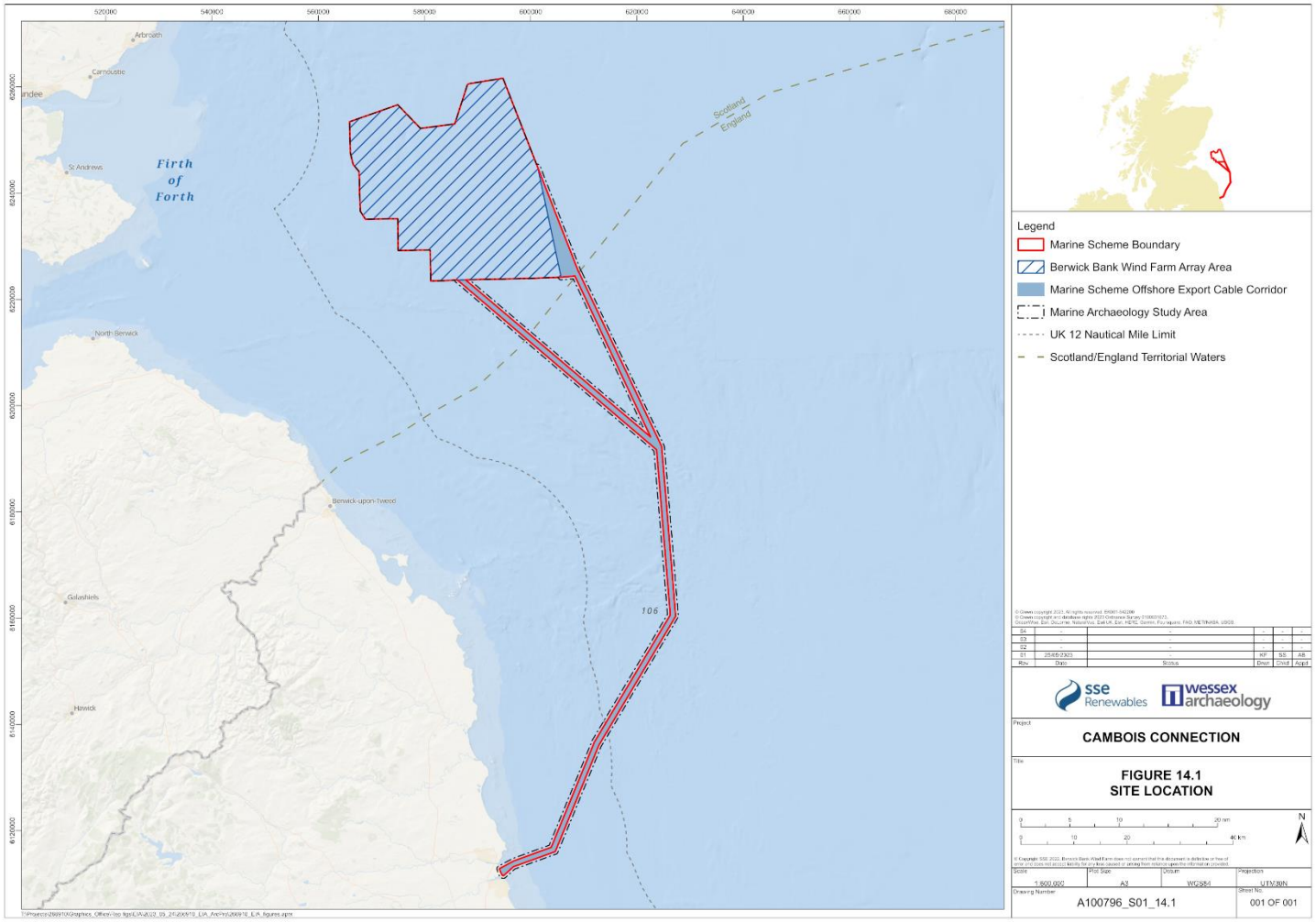

Figure 14.1 Site Location

1.3 Scope of document

1.3.1 The purpose of this assessment is to determine, as far as possible from existing information the nature, extent and significance of the known and potential marine archaeological resource within the boundary of the Marine Scheme.

1.4 Aims

1.4.1 The specific aim of this marine archaeological technical report is to summarise the known and potential archaeological baseline within the Marine Archaeology study area to subsequently inform the ES. The objectives of the assessment are as follows:

- to provide details of relevant legislation and best practice guidance, with these being clearly split for Scotland and England, as relevant;
- for the Marine Scheme, outline the known or previously located marine sites of archaeological potential and to comment on their apparent character; and identify, locate and characterise hitherto unrecorded marine sites of archaeological potential; and
- to summarise the Historic Seascape Character for the Marine Scheme in English waters.

1.5 Copyright

1.5.1 This report may contain material that is non-Wessex Archaeology copyright (e.g. Ordnance Survey, British Geological Survey (BGS), Crown Copyright), or the intellectual property of third parties, which Wessex Archaeology are able to provide for limited reproduction under the terms of our own copyright licence, but for which copyright itself is non-transferable by Wessex Archaeology. Users remain bound by the conditions of the Copyright, Designs and Patents Act 1988 with regards to multiple copying and electronic dissemination of the report.

2 LEGISLATION AND GUIDANCE

2.1 Introduction

2.1.1 The Marine Scheme falls within different national jurisdictions (Scotland and England), each covered by separate legislation and guidance, and is under the responsibility of different curators and heritage agencies. Details on relevant Legislation and Guidance and how they are considered for the Marine Scheme are presented in Chapter 14: Marine Archaeology and Cultural Heritage. More comprehensive details are provided in **Annex 2**. For further detail, Volume 2, Chapter 2: Policy and Legislative Context provides an overview of the legislation and policy relevant to the Marine Scheme.

2.2 Scotland

2.2.1 Historic Environment Scotland (HES) is responsible for the archaeological resource within Scotland's inshore waters (up to 12 nm). The Marine Directorate Licensing Operations Team (MD-LOT) is responsible for licencing, regulating and planning marine activities within Scotland's inshore and offshore waters.

2.2.2 The following relevant legislation applies within MD-LOT's inshore licensing area:

- Marine (Scotland) Act 2010;

- Protection of Wrecks Act 1973 (PWA 1973): Section Two;
- Ancient Monuments and Archaeological Areas Act 1979 (AMAA 1979) (as amended);
- Protection of Military Remains Act 1986 (PMRA 1986); and
- Merchant Shipping Act 1995 (MSA 1995).

2.2.3 The Marine (Scotland) Act 2010 is the primary legislation relevant to marine development within Scottish inshore waters. The Marine (Scotland) Act 2010 provides a framework to achieve sustainable development in Scottish inshore waters, implementing marine planning, licensing, conservation and enforcement. It is the responsibility of the Scottish Ministers and public authorities to act to protect and enhance the marine biodiversity and the preservation of marine historic assets of national importance.

2.2.4 Marine historic assets may also be designated under the Marine (Scotland) Act 2010 (Section 73) and the AMAA 1979 (Part II). Military wrecks and aircraft remains may be protected under the PMRA 1986. Ownership of any wreck remains is determined in accordance with the MSA 1995. The MSA 1995 requires that all wreck material that is recovered to be reported to the Receiver of Wreck, including material recovered from beyond the 12 nm limit but brought within it.

2.2.5 Within the Scottish offshore waters the following legislation applies:

- Marine and Coastal Access Act (MCAA) 2009; and
- PMRA 1986.

2.3 England

2.3.1 Historic England (HE) is responsible for the archaeological resource within England's inshore waters, up to the 12 nm limit. The Marine Management Organisation (MMO) is responsible for licencing, regulating and planning marine activities in English inshore waters and beyond to ensure they are carried out in a sustainable way.

2.3.2 Within English inshore waters the following relevant legislation applies:

- MCAA 2009;
- PWA 1973: Sections One and Two;
- AMAA Act 1979 (as amended);
- PMRA 1986; and
- MSA 1995.

2.3.3 The MCAA 2009 is the primary legislation relevant to marine development within English inshore waters.

2.3.4 Marine historic assets may also be designated under the PWA 1973 and the AMAA Act 1979. Military wrecks and aircraft remains may be protected under the PMRA 1986. Ownership of any wreck remains is determined in accordance with the MSA 1995. The MSA

1995 requires that all wreck material that is recovered to be reported to the Receiver of Wreck, including material recovered from beyond the 12 nm limit but brought within it.

2.3.5 Within English offshore waters the following legislation applies:

- MCAA 2009; and
- PMRA 1986.

2.4 Marine cultural heritage guidance

2.4.1 There is no specific guidance for offshore and subsea cable projects. Therefore, the assessment has been completed in line with current best practice following national, regional and industry specific standards and guidance, as relevant to cable projects within the context of offshore renewables:

- Identifying and Protecting Palaeolithic Remains: Archaeological Guidance for Planning Authorities and Developers (English Heritage (now Historic England), 1998);
- Managing Lithic Scatters: Archaeological Guidance for planning authorities and developers (English Heritage (now Historic England), 2000);
- Military Aircraft Crash Sites - Archaeological Guidance on their Significance and Future Management (English Heritage (now Historic England), 2002);
- Code of Practice for Seabed Development (Joint Nautical Archaeology Policy Committee (JNAPC), 2006);
- COWRIE Historic Environment Guidance for the Offshore Renewable Energy Sector (Wessex Archaeology, 2007);
- Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (English Heritage (now Historic England), 2008);
- Our Seas - A shared resource: High level marine objectives (Defra, 2009);
- Ships and Boats: Prehistory to Present - Designation Selection Guide (English Heritage (now Historic England), 2012);
- Protocol for Archaeological Discoveries: Offshore Renewables Projects ('ORPAD') (The Crown Estate 2014);
- Standard and guidance for archaeological advice by historic environment services (CIfA, 2014a, updated 2020);
- Code of Conduct (CIfA, 2014b, revised 2022);
- Standard and guidance for historic environment desk-based assessment (CIfA, 2014c, updated 2020);
- Managing Significance in Decision-Taking in the Historic Environment (English Heritage (now Historic England), 2015a);

- Management of Research Projects in the Historic Environment: the MoRPHE Project Managers' Guide (English Heritage (now Historic England), 2015b);
- Geoarchaeology: Using Earth Sciences to Understand the Archaeological Record (English Heritage (now Historic England), 2015c);
- Preserving Archaeological Remains: Decision-Taking for Sites under Development (English Heritage (now Historic England), 2016);
- Regulations for Professional Conduct (CIfA, 2019, revised 2021);
- Deposit Modelling and Archaeology. Guidance for Mapping Buried Deposits, Historic England, Swindon (Historic England, 2020); and
- Commercial Renewable Energy Development and the Historic Environment (Historic England, 2021).

3 METHODOLOGY

3.1 Marine Archaeology study area

3.1.1 The Marine Archaeology study area for the marine cultural heritage assessment has been defined on the basis of the area over which potential direct and indirect effects of the Marine Scheme are predicted to occur on marine heritage receptors during construction, operation and maintenance, and decommissioning.

3.1.2 Th study area comprises the extents of the Marine Scheme in English waters and the part of the Marine Scheme in Scottish waters which does not overlap with the BBWF array area, plus a 500 m buffer.

3.1.3 For brevity the information within the Marine Archaeology Technical Report (BBWFL, 2022) for BBWF is not repeated here within this document. Therefore, reference to a Marine Archaeology study area within this report includes the Marine Scheme in English waters and the part of the Marine Scheme in Scottish waters which does not overlap with the BBWF array area.[1]

3.1.4 A wider 500 m buffer of the Marine Scheme Offshore Export Cable Corridor has been applied to allow for a greater understanding of the wider archaeological baseline environment, especially regarding spatial uncertainty inherent in documentary sources, with the dual purpose of enabling any archaeological trends within the region to be recognised and to allow any marine heritage assets identified to be represented in a broader archaeological context.

3.2 Walkover survey methodology

3.2.1 In order to provide site specific and up to date information on which to base this technical report, an intertidal walkover survey was conducted at the proposed landfall location on 16th of May 2023.

[1] It should be noted that the Marine Archaeology study area referred to in the associated Environmental Statement (ES) chapter includes the Marine Scheme as a whole. (Figure 14.1).

3.2.2 This was undertaken by two archaeologists during a spring tide and on the outgoing tide.

3.2.3 The walkover survey consisted of a visual inspection, on foot, of the study area. It involved identifying and positioning, along with a scaled photographic record, known and unreported archaeological features with surface expression.

3.2.4 Any identified archaeological features had their position recorded using a Differential Global Positioning System (DGPS) and scale photographs captured.

3.2.5 The walkover survey methodology has been agreed with Historic England during pre-submission consultation meetings. Please see Volume 2, Chapter 4: Stakeholder Consultation and Engagement, and Chapter 14: Marine Archaeology and Cultural Heritage of the Marine Scheme ES.

3.3 Archaeological desk-based assessment

Key themes

3.3.1 The methodology follows the best practice professional guidance outlined by the Chartered Institute for Archaeologists' (CIfA) Standard and guidance for historic environment desk-based assessment (2014c, updated 2020).

3.3.2 The marine themes relevant to marine archaeological baseline as assessed in this report are:

- Seabed prehistory (for example, palaeochannels and other features that contain prehistoric sediment, and derived Palaeolithic artefacts e.g. handaxes);
- Seabed features, including maritime sites (such as shipwrecks and associated material including cargo, obstructions and fishermen's fasteners) and aviation sites (aircraft crash sites and associated debris);
- Intertidal heritage assets; and
- Historic seascape character.

Data sources

3.3.3 Baseline conditions have been established by undertaking a desktop review of published information and through consultation with relevant organisations. The data sources used to inform the baseline description and assessment include:

- Geophysical survey datasets and reports (XOCEAN 2022).
- United Kingdom Hydrographic Office (UKHO) data for charted wrecks and obstructions;
- National Record of the Historic Environment (NRHE) maintained by HE, comprising data for terrestrial and marine archaeological sites, find spots and archaeological events;
- National Heritage List for England maintained by HE, comprising data of designated heritage assets including sites protected under the PMRA 1986 and the PWA 1973;

- Historic Environment Records (HER) maintained by HES (Canmore), comprising a database of recorded terrestrial and marine archaeological sites, find spots and archaeological events;
- Northumberland County Council HER, comprising a database of all recorded terrestrial and marine archaeological sites, find spots and archaeological events within the county and offshore;
- Historic Seascape Characterisation (HSC) using the consolidated HSC national database (LUC, 2017);
- North East Rapid Coastal Zone Assessment (NERCZ) carried out by Archaeological Research Services Ltd for English Heritage;
- Relevant mapping including Admiralty Charts, British Geological Survey (BGS), Ordnance Survey and historic maps; and
- Relevant documentary sources and grey literature held by Wessex Archaeology, and those available through the Archaeology Data Service and other websites (presented in the 'References'), including the Marine Archaeology Technical Report for BBWF (BBWFL, 2022).

Data structure

3.3.4 This chapter is supported by a Geographic Information System (GIS) using ArcGIS 10.8.1, incorporating the positional information of the various data sources listed above, allowing the data to be spatially analysed. The data were subsequently compiled into gazetteers of the maritime and aviation resources within the Marine Archaeology study area (defined in Section 3.1).

3.3.5 Within this assessment, the gazetteer has been compiled and presented in Universal Transverse Mercator (UTM) Zone 30 North projected from a World Geodetic System (WGS) 1984 datum.

3.3.6 Information relating to the marine heritage assets that did not include location or positional information were also used to inform the marine archaeological baseline assessment where relevant (e.g. **Annex 4**).

Chronology

3.3.7 Archaeological material is generally studied within a framework of ‘periods’ or ‘ages’ that reflect the activities and cultural changes taking place over time. All dates are referred to as BCE (Before Common Era), BP (Before Present) or AD (Anno Domini) within the text. BCE refers to calibrated radiocarbon chronology that can be considered equivalent to calendar years. BP dates are used for periods of time older than circa 10,000 years ago.

3.3.8 A list of the main archaeological periods of the British Isles referred to in the text, along with their broadly defined dates, are presented in **Annex 1**, which reflects the archaeological record documented from coastal and marine contexts.

Seabed prehistory

3.3.9 The baseline summary for seabed prehistory was based on a review of geological mapping of seabed sediments, solid geology and bathymetry from published BGS sources. This

assessment was further supported by the examination of models of past sea level, palaeo-shorelines and submerged prehistoric landscapes from published sources.

Seabed features: maritime and aviation sites

3.3.10 The sources of data for maritime and aviation archaeology listed above have been collated and summarised in order to develop a baseline of marine archaeology for the Marine Archaeology study area, and the potential for encountering unknown shipwreck and aircraft crash sites (Sections 5.6 and 5.7). Sources of data relevant to maritime and aviation archaeology are the UKHO, NRHE, Canmore and local HERs.

3.3.11 The data obtained were reviewed and those located within the Marine Archaeology study area were extracted and compiled to form a gazetteer as part of the known maritime and aviation baseline. These records were each given a unique identifier (**Annex 3**).

3.3.12 For the purpose of this assessment, records with duplicate positions between datasets were amalgamated and their co-ordinates are taken from the UKHO dataset as the raw data therein is based on hydrographic survey data presented in WGS 1984 datum. These co-ordinates were projected from WGS84 into UTM30N eastings and northings using the Quest Geodetic Calculator version. Furthermore, the NRHE and HER datasets are primary terrestrial datasets expressed in British National Grid (BNG) and are considered to be less accurate offshore.

3.3.13 Data relating to Recorded Losses were also extracted from the NRHE, HER and UKHO data sources. Recorded Losses are records for ships or aircraft that are known to have wrecked or crashed offshore, but for which the exact locations are not known. Recorded Losses are often grouped by area into Named Locations by the NRHE, and the positional data of these records is unreliable and serves only to provide an indication of the types of vessels that passed through the area and the wrecking incidents that are known to have occurred in the general region. Whilst the remains of these vessels and aircraft are expected to exist somewhere on the seafloor, their location is unknown. As such, they signify the potential maritime and aviation resource.

3.3.14 Details regarding maritime Recorded Losses, whose Named Location happens to be located within the Marine Scheme, are presented in a gazetteer format (**Annex 4**). These records have retained their original identification assigned by the UKHO, NRHE, Canmore or HER for ease of cross referencing. Where records are duplicated between datasets all corresponding identification numbers have been included but are referred to in the text by the NRHE Monument ID if one exists. The gazetteer does not include positional data due to the inaccuracies therein.

3.3.15 The baseline assessment of maritime and aviation archaeology was further supplemented by a review of relevant primary and secondary source material to provide an indication on the nature of maritime and aviation activity across the region. As well as summarising the known archaeological resource, the baseline assessment underlines the potential for encountering unknown shipwreck and aircraft crash sites within the Marine Archaeology study area (English Heritage 2002; Wessex Archaeology 2008).

Intertidal archaeology

3.3.16 Since the assessment of the onshore archaeological elements of the Marine Scheme will cover to MLWS, there is overlap between the onshore assessment and marine assessments within the intertidal area between MLWS and MHWS. Details regarding intertidal heritage assets are presented in **Annex 5**.

3.3.17 Data from the NRHE, Canmore and HER are provided in two spatial formats, points and polygons. All points and polygons below the MHWS mark that intersect the Marine Archaeology study area have been included within the assessment, however, it should be noted that co-ordinates given for the polygon records is the centroid generated using ArcGIS 10.8.1, which may lie outside the Marine Archaeology study area.

Historic seascape characterisation

3.3.18 In accordance with the European Landscape Convention, 'landscape' can be defined as 'an area, as perceived by people, whose character is the result of the action and interaction of natural and /or human factors' (Council of Europe, 2000). The term 'seascape' can be defined as a subset of 'landscape,' and has 'an area of sea, coastline and land, as perceived by people, whose character results from the actions and interactions of land and sea, by natural and / or human factors' (ibid.).

3.3.19 Seascape assessment reflects the holistic approach to landscape assessment as defined in the European Landscape Convention, extending it to the sea. Seascape Character Areas include coastal land, intertidal and marine environments up to the inshore limit (12 nm). Historic Seascape Characterisation is the identification and interpretation of the historic dimension of the present day coastal and marine environment (Natural England 2012, 33). This is done by mapping and describing the historic cultural influences which define present seascape perceptions across all of England's marine areas and costal land.

3.3.20 The baseline summary for character of the historic seascape for the section of the Marine Archaeology study area within English inshore waters was assessed using the results of the consolidated HSC national database (LUC, 2017), with a focus on the North East Coast. The HSC include ArcGIS shapefiles of the character areas and reports including a regional and national assessment of the historic seascape character types.

3.3.21 No equivalent HSC resource is available for the section of the Marine Archaeology study area within Scottish waters.

3.4 Geophysical data – technical specifications

3.4.1 Geophysical and bathymetric data were acquired by XOCEAN between July and September 2022. The data were acquired using proprietary inhouse unmanned surface vessels (USVs) which are named below.

3.4.2 The survey line spacing varied across the survey area. Most of the data sets were acquired at a line spacing of 75 m, aligned with and centred on the proposed cable route. Data block L16 (up to approximately 4 km from landfall) were acquired at a line spacing of 50 m, and the very nearshore data (up to approximately 1 km from landfall) were acquired aligned with the shoreline with a line spacing between 5 m to 35 m. The SBP data had cross lines along the length of the Marine Scheme at spacing of 2 km, but this was not present in the bathymetry trackplots provided. Further details on the equipment used is in Table 1.

Table 1 Summary of survey equipment

Survey Company	Survey Vessel	Data type	Equipment	Data format
XOCEAN	*XO-06 – MMSI 232025477* *XO-09 – MMSI 232027632* *XO-15 – MMSI 232035682* *XO-18 – MMSI 232039415* *XO-19 – MMSI 232039416*	SBP	Innomar SES2000 Standard	*.sgy*
		MBES	Norbit Winghead i67 Norbit Winghead i77 Norbit Dual Winghead i67	*.xyz*
		Backscatter	Norbit Winghead i67	*.tif*

	XO-20 – MMSI 232042736		Norbit Winghead i77 Norbit Dual Winghead i67	
		Positioning	Applanix Wavemaster II POS MV 320 BeamworX NavAQ	N/A

3.5 Geophysical data – processing

3.5.1 A number of datasets were assessed over the English Waters of the Marine Scheme, each dataset was processed separately using the following software (Table 2).

Table 2 Software used for geophysical assessment

Dataset	Processing Software	Interpretation and rationalisation
SBP	CodaOctopus Survey Engine v8.2	ArcMap v10.8
MBES	QPS Fledermaus v8.5.1	
Backscatter	ArcMap v10.8	

3.5.2 The SBP and MBES data were used as the primary data sets for the palaeographic assessment and the MBES and Backscatter data sets were used for the seabed features assessment.

3.5.3 The SBP data were processed using CodaOctopus Survey Engine Seismic+ software. This software allows the data to be visualised with user selected filters and gain settings in order to optimise the appearance of the data for interpretation. The software then allows an interpretation to be applied to the data by identifying and selecting sedimentary boundaries and shallow geological features that might be of archaeological interest.

3.5.4 The SBP data were interpreted with a two-way travel time (TWTT) along the z-axis. In order to convert from TWTT to depth, the velocity of the seismic waves was estimated to be 1,600 ms^{-1}. This is a standard estimate for shallow, unconsolidated sediments.

3.5.5 The SBP data can also be used to identify small reflectors, which may indicate buried material such as a wreck site covered by sediment. The position and dimensions of any such objects are noted in a gazetteer, and an image acquired of each anomaly for future reference. It should be noted that anomalies of this type are rare, as the sensors must pass directly over such an object in order to detect an anomaly.

3.5.6 For the SBP assessment, the centre line and 25% of the cross lines were initially assessed. Where features of interest were identified, additional lines were then interpreted to map the extents of these features more accurately.

3.5.7 The MBES data were analysed to identify any unusual seabed structures that could be shipwrecks or other anthropogenic debris. The offshore data (L05-L15) were gridded at 1 m and the inshore data were gridded at 0.5 m. These data were analysed using QPS Fledermaus software, which enables a 3-D visualisation of the acquired data and geo-picking of seabed anomalies. The MBES data were also used in the palaeogeographic assessment.

3.5.8 The Backscatter geotiffs were interpreted for any objects of possible anthropogenic origin. The images were first loaded into ESRI ArcMap, and then individual features of possible archaeological potential were tagged and their positions and dimensions recorded.

3.5.9 The form, size and/or extent of an anomaly is a guide to its potential to be an anthropogenic feature and therefore of archaeological interest. A single small but distinct anomaly may be part of a much more extensive feature that is largely buried. Similarly, a scatter of minor anomalies may be unrelated individual features, define the edges of a buried but intact feature, or may be all that remains as a result of past impacts from, for example, dredging or fishing. Assessment is made of such groups of anomalies during data interpretation to determine which of these alternatives is the most likely.

3.6 Geophysical data – data quality

3.6.1 Once processed, the geophysical data sets were individually assessed for quality and their suitability for archaeological purposes, and rated using the following criteria (Table 3).

Table 3 Criteria for assigning data quality rating

Data quality	Description
Good	Data which are clear and unaffected or only slightly affected by weather conditions, sea state, background noise or data artefacts. Seabed datasets are suitable for the interpretation of upstanding and partially buried wrecks, debris fields, and small individual anomalies. The structure of wrecks is clear, allowing assessments on wreck condition to be made. Subtle reflectors are clear within SBP data. These data provide the highest probability that anomalies of archaeological potential will be identified.
Average	Data which are moderately affected by weather conditions, sea state and noise. Seabed datasets are suitable for the identification of upstanding and partially buried wrecks, the larger elements of debris fields and dispersed sites, and larger individual anomalies. Dispersed and/or partially buried wrecks may be difficult to identify. Interpretation of continuous reflectors in SBP data is problematic. These data are not considered to be detrimentally affected to a significant degree.
Below Average	Data which are affected by weather conditions, sea state and noise to a significant degree. Seabed datasets are suitable for the identification of relatively intact, upstanding wrecks and large individual anomalies. Dispersed and/or partially buried wrecks, or small isolated anomalies may not be clearly resolved. Small palaeogeographic features, or internal structure may not be resolved in SBP data.
Variable	This category contains datasets where the individual lines range in quality. Confidence of interpretation is subsequently likely to vary within the Marine Archaeology study area.

3.6.2 The quality of the SBP data has been rated as ‘Average’ using the above criteria. The data are affected by weather noise and shallow sea state in the inshore areas to some degree, meaning the subtle change between shallower reflectors is not always clear. Penetration varies across the lines between 6 m to 10 m, meaning the full extents of deeper features may not be visible on some lines.

3.6.3 The MBES data were rated as ‘Below Average’ using the above criteria. The data have been affected by pitch and roll to a significant degree with the nadir clearly visible, causing multiple data artefacts in the data, which may be mistaken for, or obscure the interpretation of, ‘real’ features present on the seabed. The resolution of 1 m across most of the site allows for archaeological assessment of objects and debris over 1 m in size. The resolution of 0.5 m in the nearshore (L16) section allows for archaeological assessment of objects and debris over 0.5 m in size.

3.6.4 The Backscatter data were rated as ‘Below Average’ using the above criteria. The data have been affected by pitch and roll to a significant degree with the nadir clearly visible, causing multiple data artefacts in the data, which may be mistaken for, or obscure the interpretation of, ‘real’ features present on the seabed. The resolution of 1 m across most of the site allows for archaeological assessment of objects and debris over 1 m in size. The

resolution of 0.5 m in the nearshore (L16) section allows for archaeological assessment of objects and debris over 0.5 m in size.

3.7 Geophysical data – anomaly grouping and discrimination

3.7.1 The previous section describes the initial interpretation of all available geophysical datasets which were conducted independently of one another. This inevitably leads to the possibility of any one object being the cause of multiple anomalies in different datasets and apparently overstating the number of archaeological features in the exploration area.

3.7.2 To address this fact the anomalies were grouped together; allowing one ID number to be assigned to a single object for which there may be, for example, a UKHO record, a MBES anomaly, and a Backscatter anomaly.

3.7.3 Once all the geophysical anomalies and desk-based information have been grouped, a discrimination flag is added to the record in order to discriminate against those which are not thought to be of an archaeological concern. For anomalies located on the seabed, these flags are ascribed as follows (Table 4).

Table 4 Criteria discriminating relevance of identified features

Overview classification	Discrimination	Criteria	Data type
Archaeological	P1	Feature of probable archaeological interest, either because of its palaeogeography or likelihood for producing palaeoenvironmental material	SBP, MBES
Archaeological	P2	Feature of possible archaeological interest	SBP, MBES
Archaeological	A1	Anthropogenic origin of archaeological interest	MBES, Backscatter
Archaeological	A2_h	Anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature	MBES, Backscatter
Archaeological	A2_l	Anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature	MBES, Backscatter
Archaeological	A3	Historic record of possible archaeological interest with no corresponding geophysical anomaly	MBES, Backscatter
Non-archaeological	U1	Not of anthropogenic origin	MBES, Backscatter
Non-archaeological	U2	Known non-archaeological feature / Feature of non-archaeological interest	MBES, Backscatter
Non-archaeological	U3	Recorded loss	MBES, Backscatter
Non-impact	O1	Outside horizontal footprint of Marine Archaeology study area	MBES, Backscatter, SBP
Non-impact	O2	Outside vertical footprint of proposed impact	SBP

Overview classification	Discrimination	Criteria	Data type
Non-impact	O3	Area subsequently cleared after data acquired, anomaly/object recovered	MBES, Backscatter, SBP

3.7.4 The grouping and discrimination of information at this stage is based on all available information and is not definitive. It allows for all features of potential archaeological interest to be highlighted, while retaining all the information produced during the course of the geophysical interpretation and desk-based assessment for further evaluation should more information become available.

3.8 Assumptions and limitations

Archaeological data

3.8.1 Data used to compile this chapter comprises elements of secondary information derived from a variety of sources, only some of which have been directly examined for the purposes of this appraisal. The assumption is made that the secondary data, as well as that derived from other secondary sources, are reasonably accurate.

3.8.2 The records held by the UKHO, NRHE, Canmore, HER and the other sources used in this appraisal are not a record of all surviving cultural heritage assets, rather a record of the discovery of a wide range of archaeological and historical components of the marine historic environment. The information held within these is not complete and does not preclude the subsequent discovery of further elements of the historic environment that are, at present, unknown. In particular, this relates to buried archaeological features.

3.8.3 A limitation of the data used for this assessment is the absence of acquired sidescan sonar data which would provide more accurate height information. As such, all dimensions provided in the results section, especially the height readings, should be considered a minimum. Sidescan sonar data also provides more detailed representation of features which allows for easier interpretation and discernment as to whether features are likely to be natural or anthropogenic in origin.

3.8.4 The presence of ferrous material, more likely to be anthropogenic in origin, cannot be determined in the absence of magnetometer data. This means that there is potential for any potential ferrous debris to be buried or have little surface expression across the Marine Scheme.

3.8.5 Any anomalies interpreted to be non-archaeological, or that are located outside of the defined area of assessment (either previously recorded in known databases (e.g. UKHO) or identified during this geophysical assessment), are deemed beyond the scope of the current assessment and are subsequently not included in this report, unless specifically referred to.

4 SEABED PREHISTORY BASELINE

4.1 Geological baseline and archaeological potential

4.1.1 The following is an overview of the bedrock geological context and archaeologically relevant Quaternary history of the wider region from the Pleistocene to the Holocene marine transgression. This is based on a range of secondary sources, including academic papers, monographs, geological information (e.g. BGS mapping), and previous work undertaken by Wessex Archaeology within the area and the wider region (Bicket and Tizzard, 2015). This

serves as a baseline for the palaeogeographic assessment, and aids in producing a stratigraphy for the Marine Archaeology study area, assigning archaeological potential to identified units, and informing future sampling strategies.

4.1.2 The Marine Archaeology study area extends from the BBWF array area in Scottish waters to the north-east coast of England. As a long, linear study area, the background geology varies from the landfall in England to Scottish offshore waters.

4.1.3 Close to the coast and in the inshore waters, Carboniferous bedrock is present, but in general the geology across the Marine Scheme can be summarised as bedrock of Triassic age or younger (BGS 1984; 1988).

4.1.4 Increasing deposits of overlying Quaternary sediments appear in the Inshore waters and are generally present in the Offshore waters. These are predominantly Pleistocene deposits of the Marr Bank Formation, Wee Bankie Formation and St Abbs Formation and small pockets of the Forth Formation (BGS 1984; 1988).

4.2 Submerged prehistory potential

4.2.1 These Quaternary sediments record the glacial cycles experienced by the UK during the Pleistocene, and are a combination of glacial, peri-glacial, terrestrial, and marine deposits. During periods of relative sea level lowstand, parts of the Marine Archaeology study area (particularly near landfall) are likely to have been exposed as dry land. This landscape would likely have been attractive to human communities when climatic conditions allowed. As such, any surviving terrestrial sediments from these periods are potentially of archaeological interest. This archaeological and palaeolandscapes potential is clearly highlighted locally in Northumberland by early prehistoric structures and wider archaeological and geoarchaeological records at Howick and Low Hauxley (Bicket et al., 2017).

4.2.2 The Holocene marine transgression resulted in the deposition of sands, gravels and muds, which represent the modern marine sediment, but can also incorporate reworked sediment from the underlying Pleistocene deposits. Post the Holocene marine transgression, the archaeological potential of the North Sea, including the Marine Scheme, shifts to the maritime history of the UK.

4.3 Early Prehistory context

4.3.1 The discovery of actual human artefacts, such as hand axes and worked bone, is a rarer occurrence, but artefacts have been recovered. Reported finds from offshore activity have, to date, produced a range of early prehistoric lithic artefacts indicating early prehistoric activity in submerged palaeolandscapes from Lower, Middle, and Upper Palaeolithic periods (Tizzard, *et al.*, 2014) with notable collections of more recent Mesolithic artefacts from submerged palaeolandscape contexts (Bicket and Tizzard, 2015).

4.3.2 Preserved palaeolandscape features and their potentially associated finds are rarer further north within the North Sea, due to repeated reworking of the landscape in this area by ice sheets. However, such features do still survive in shallower water, such as nearshore/intertidal sites and on bathymetric highs such as Dogger Bank, and along the mainland coasts of northern England and Scotland (Bicket and Tizzard, 2015).

4.3.3 South of the Marine Archaeology study area part of a Lower Palaeolithic (Achulean) hand axe was discovered at South Gare, near Redcar (Rowe, 2007), which represents the first and only Lower Palaeolithic artefact discovered in this area. However, it should be noted that it may not be in its primary context and may have been eroded from offshore deposits

within the North Sea Basin or redeposited through 19th century dredging and ballast (Wessex Archaeology, 2021). The most northerly palaeolithic record in the English Heritage archives is related to a 'quartzite implement', which was recovered in 1927 from a gravel bed in Limehouse Gill, County Durham (Wessex Archaeology, 2015).

4.3.4 It is clear from numerous research and development-led investigations that postglacial marine transgression has not destroyed Pleistocene and Holocene palaeogeography by default (Wessex Archaeology, 2013a). Areas of preserved palaeogeographic features do remain, and detailed reconstructions of palaeoenvironments and palaeogeography can be achieved for large parts of the North Sea basin (Tappin, et al., 2011, Limpenny, et al., 2011, Dix & Sturt, 2011).

4.3.5 It is noted in Wessex Archaeology (2015) that the coastal strip moving north to Northumberland is a key palaeogeographical zone which not only links the onshore and offshore archaeological records, but also represents an area of merging routes through the southern North Sea basin into northern England and Scotland, during both the Later Upper Palaeolithic and the Mesolithic. It is also thought that larger valleys such as the Tweed may have served as routeways in and out of the North Sea Basin (Wessex Archaeology, 2015).

4.3.6 The Mesolithic period began in the early Holocene. Around 10,000 BP, sea levels were still more than 60 m below current levels, and during this period, an extremely large area of the central and southern North Sea and English Channel was dry land, suitable for human occupation.

4.3.7 A number of Mesolithic sites are known from the modern Northumbria coast, including Howick, Low Hauxley, and flint scatters at Newbiggin-By-Sea and Lynemouth (Wessex Archaeology, 2020). In addition, 'submerged forests' have also previously been identified close to the Marine Archaeology study area at South Beach, Blyth, during an unusually low tide in 2014 (Wessex Archaeology, 2020), and at Low Hauxley, which has been linked to contemporary Mesolithic activity (Wessex Archaeology, 2015). Submerged peats have also been identified south of the Marine Archaeology study area in Hartlepool where organic peats and megafaunal remains, including a Southern Mammoth vertebra, were discovered suggesting that, although securely provenanced Upper Palaeolithic archaeology has yet to be discovered, the environmental conditions suggest there is the potential for the preservation of late glacial human activity within this area (Wessex Archaeology, 2021).

4.3.8 Considerable attention has been paid to Mesolithic Doggerland in the last decade (Gaffney, et al., 2007, Tappin, et al., 2011). Increasingly, a maritime perspective has developed for understanding the early prehistoric archaeological record, where coasts, estuaries and wetlands are key landscape elements (Ransley, et al., 2013). Other key Mesolithic sites are located along the north-east coast such as East Barns, Cramond, as well as Echline, Firth of Forth, where one of the oldest Mesolithic structures in the British Isles has been discovered (Wessex Archaeology, 2015). Mesolithic lithic scatterings and flint flakes have also been identified on Holy Island and the Farne Islands (Wessex Archaeology, 2015).

4.3.9 Investigations have shown that during the early Holocene, the coast in Northumberland was at least 1 km east of Howick around 8,000 years ago (Wessex Archaeology, 2015; Bicket et al., 2017). Between 7,000 and 5,000 BP, much of the land was inundated by eustatically driven sea level change (Bicket & Tizzard, 2015), and by 6,000 BP sea level was only approximately 7 m below the present level (Cameron, et al., 1992). Around this time, Britain became an island again (Coles, 1998), although, due to its more northern location, the Marine Archaeology study area will have been mostly inundated before this time; potentially around 8,000 BP, with the exception of the most nearshore areas (Shennan, et al., 2018).

Following this mid-Holocene marine transgression, the archaeological potential of the North Sea, including the Marine Archaeology study area, shifts to the maritime history of the British Isles.

4.4 Palaeogeographic assessment results

4.4.1 The identified geology within the Marine Scheme has been divided into 8 Units, as described below (Table 5):

Table 5 Shallow stratigraphy of the Marine Scheme

Unit	Unit Name	Geophysical Characteristics (1)	Sediment Type (2)	Archaeological Potential
6b	Holocene Seabed Sediments (post-transgression) (MIS 1)	Generally observed as a thin veneer across the Marine Scheme but thickens out into sandwaves in areas.	Variable, generally clayey silty sand with gravel	Considered of low potential in itself, but possibly contains re-worked artefacts and can cover wreck sites and other cultural heritage in areas with sufficient thickness.
6a	Holocene Sediments (pre-transgression) (MIS 2 to 1)	Shallow infilled cut and fills with fill characterised by sub-parallel internal reflectors, and possibly occasionally with unstructured fill.	Fluvial, estuarine and terrestrial deposits, generally extremely low to medium strength silty sandy clay.	Potential to contain in situ and derived archaeological material, and palaeoenvironmental material.
5b	Forth Formation, St. Andrews Bay member (Late Devensian/Early Holocene) (MIS 3 to 1)	Acoustically transparent/unstructured unit with occasional point contacts. Not definitely seen in the SBP data	Interbedded sand and clay, fluviomarine and estuarine	Potential to contain derived archaeological and palaeoenvironmental material, and to protect underlying surfaces.
5a	Forth Formation, Largo Bay member (Late Devensian) (MIS 3 to 2)	Distinct unit characterised by parallel internal reflectors	Silty sandy muds, marine/glaciomarine deposits.	Basal contact may cover old land surfaces, but fill unlikely to contain artefacts.
4	St Abbs Formation (Late Devensian) (MIS 3 to 2)	Acoustically unstructured with occasional weak layering.	Glacimarine sediments- muds and clays with small pebbles	Unlikely to contain archaeological material.
3	Wee Bankie Formation (Devensian) (MIS 3)	Acoustically chaotic/unstructured unit	Glacial lodgement till	Unlikely to contain archaeological material.
2	Marr Bank Formation (MIS 3)	Characteristic truncating basal reflector with variable acoustic signature. Not definitively seen in the SBP data	Fine sands with pebbles with some muddy sediments	Unlikely to contain archaeological material.

Unit	Unit Name	Geophysical Characteristics (1)	Sediment Type (2)	Archaeological Potential
1	Pre-Quaternary bedrock (Carboniferous Westphalian – Upper Cretaceous)	Not always seen in the SBP data but tentatively identified in the nearshore as parallel dipping reflectors	Various depending on age	Pre-Earliest occupation of the UK

(1) Based on geophysical data and BGS 1984; BGS 1988

(2) Based on Gatliff *et al.* (1994)

4.5 Palaeogeographic features within Offshore English Waters

4.5.1 No palaeogeographic features of archaeological interest were identified in the MBES data, but a number of palaeogeographic features of possible archaeological potential have been identified within the SBP data for the English Offshore Waters. These features are discussed below, individually described in gazetteer format in Annex 3, and their distribution is illustrated in Figure 14.2.

4.5.2 Two features (**75001** and **75002**) have been discriminated as P2 - Feature of possible archaeological interest. These are both considered to be simple cut and fill features, cutting into interpreted glacial till likely of the Wee Bankie Formation (Unit 3). The fill is generally unstructured although some sub-horizontal reflectors are visible, and is likely to correspond to Unit 6a. Both may be internal reflectors of the till but have the potential to be remnants of a fluvial feature.

4.5.3 One feature, **75000**, has been discriminated as U1 – Not of anthropogenic origin. This feature has been classified as a sand dune, and is identified as two, possibly three mounds of acoustically unstructured fill overlying interpreted till. The feature is overlain by an acoustically chaotic unit interpreted to be sands of the Holocene seabed sediments of Unit 6b. The dune is located just below the seabed which is at a general depth of approximately 65 m below sea level and is located approximately 50 km north-east of the English coastline. It is therefore likely to be subaqueous in formation, rather than a former land surface, but has been retained within the gazetteer as a precaution and is illustrated in Figure 14.2a,b. Other possible evidence of similar features have been identified in the vicinity; however, these are less distinct and harder to trace in the data and therefore have not been mapped or included in the report at this time.

4.6 Palaeogeographic features within Inshore English Waters

4.6.1 No palaeogeographic features of archaeological interest were identified in the MBES data, but one palaeogeographic feature of possible archaeological potential has been identified within the SBP data for the Inshore English Waters. This feature is discussed below, described in gazetteer format in Annex 3, and its extent is illustrated in Figure 14.2.

4.6.2 Features **75003** has been discriminated as P2 - Feature of possible archaeological interest. This is classified as a shallow, simple cut and fill feature, cutting into a deposit interpreted to be the St Abbs Formation (Unit 4). The basal reflector is fairly distinct, though the fill is shallow and difficult to distinguish. This feature may be an internal reflector of Unit 4 but does have the potential to be remnants of a fluvial feature.

4.6.3 Some acoustic blanking was seen in the data towards the very inshore. However, these were not definitively interpreted as areas of shallow gas and may have been small gravel deposits, and so these have not been mapped or included in the report at this time.

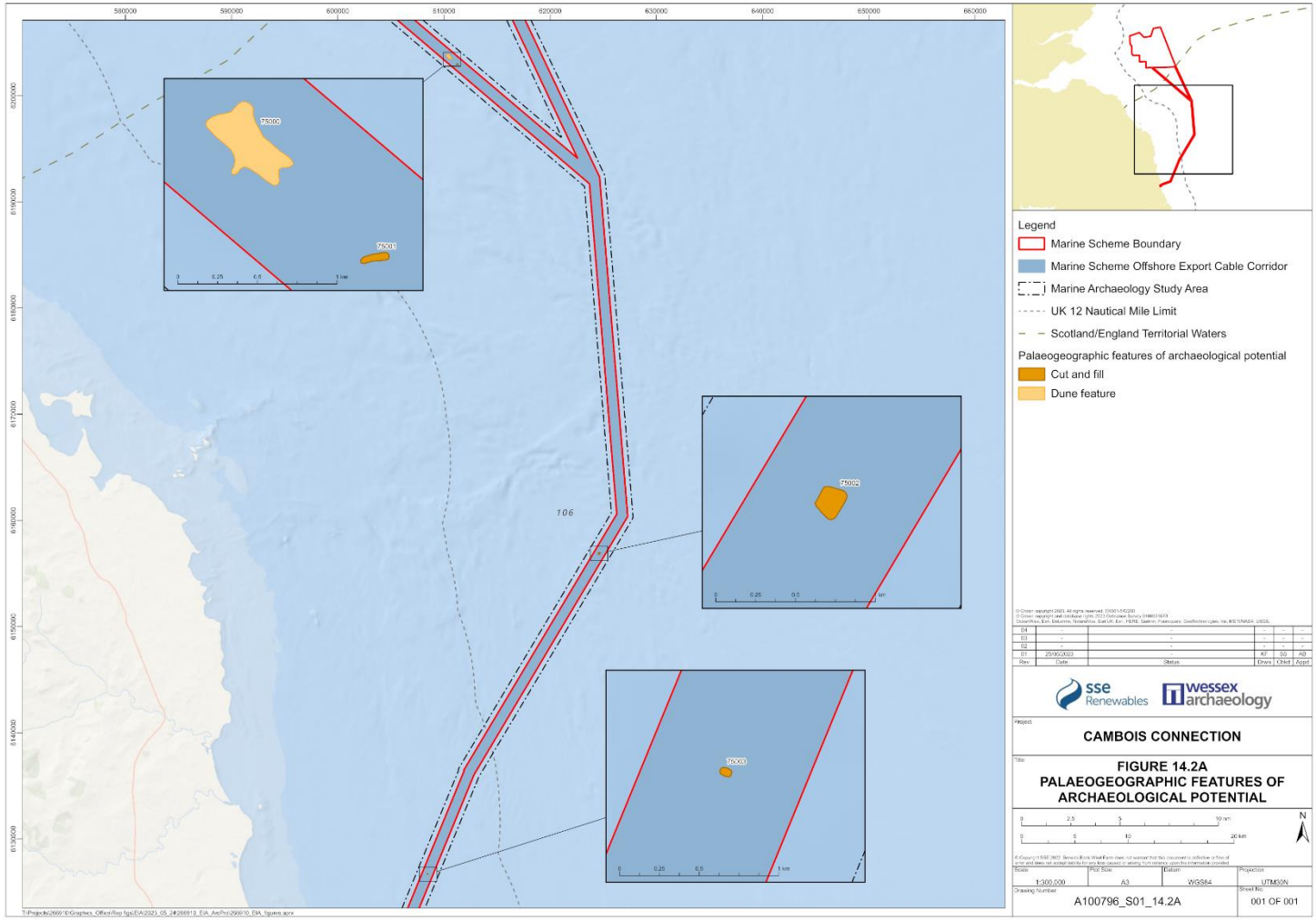

Figure 14.2a Palaeographic Features of Archaeological Potential

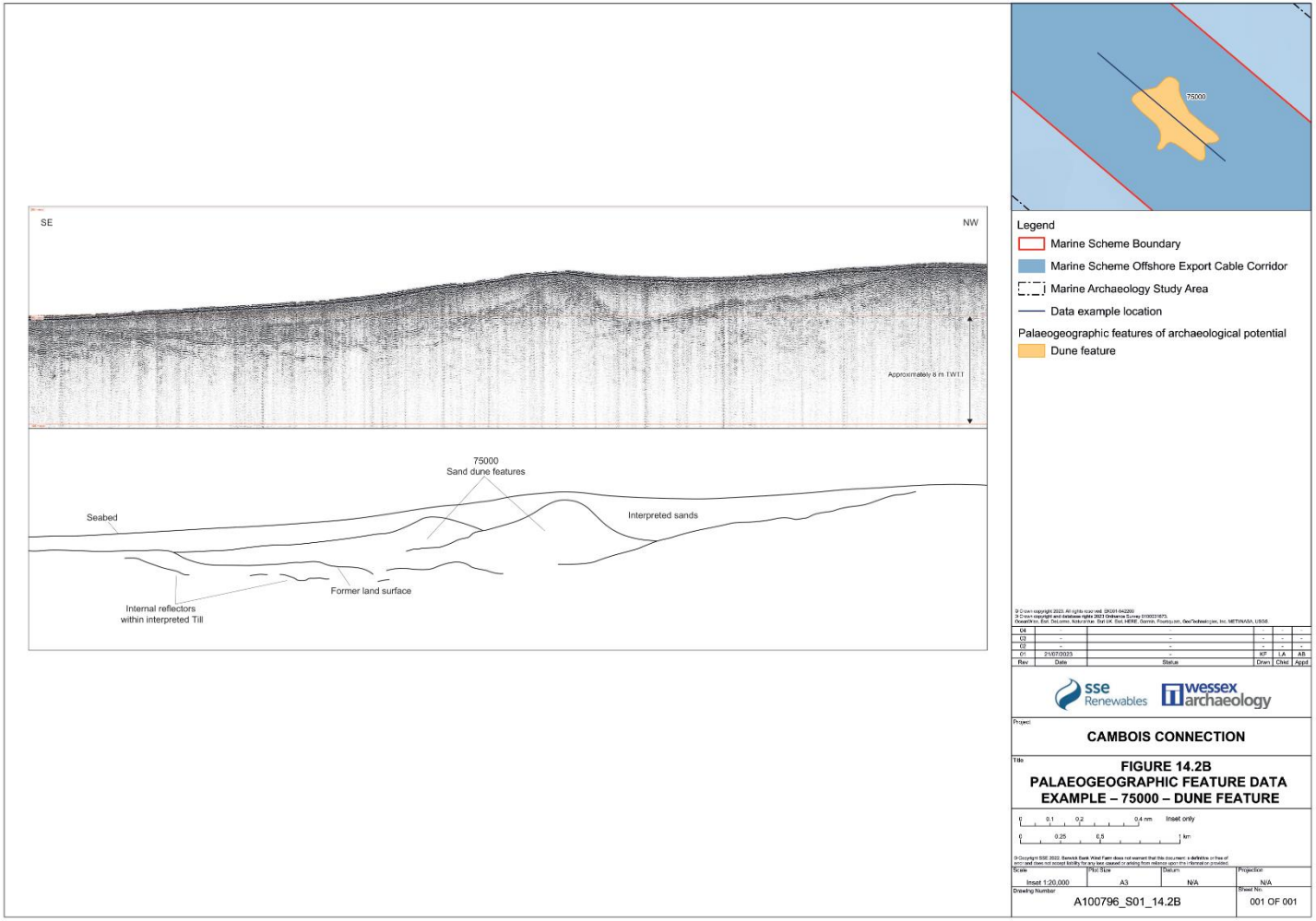

Figure 14.2b Palaeographic Feature Data Example – 75000 – Dune Feature

5 MARITIME AND AVIATION ARCHAEOLOGY BASELINE

5.1 Introduction

5.1.1 The following assessment of the maritime resource is based on records of known shipwrecks, aircraft crash sites and obstructions and in English waters this is enhanced by archaeological assessment of marine geophysical datasets. The sites are listed in **Annex 3** (Figure 14.3a-k).

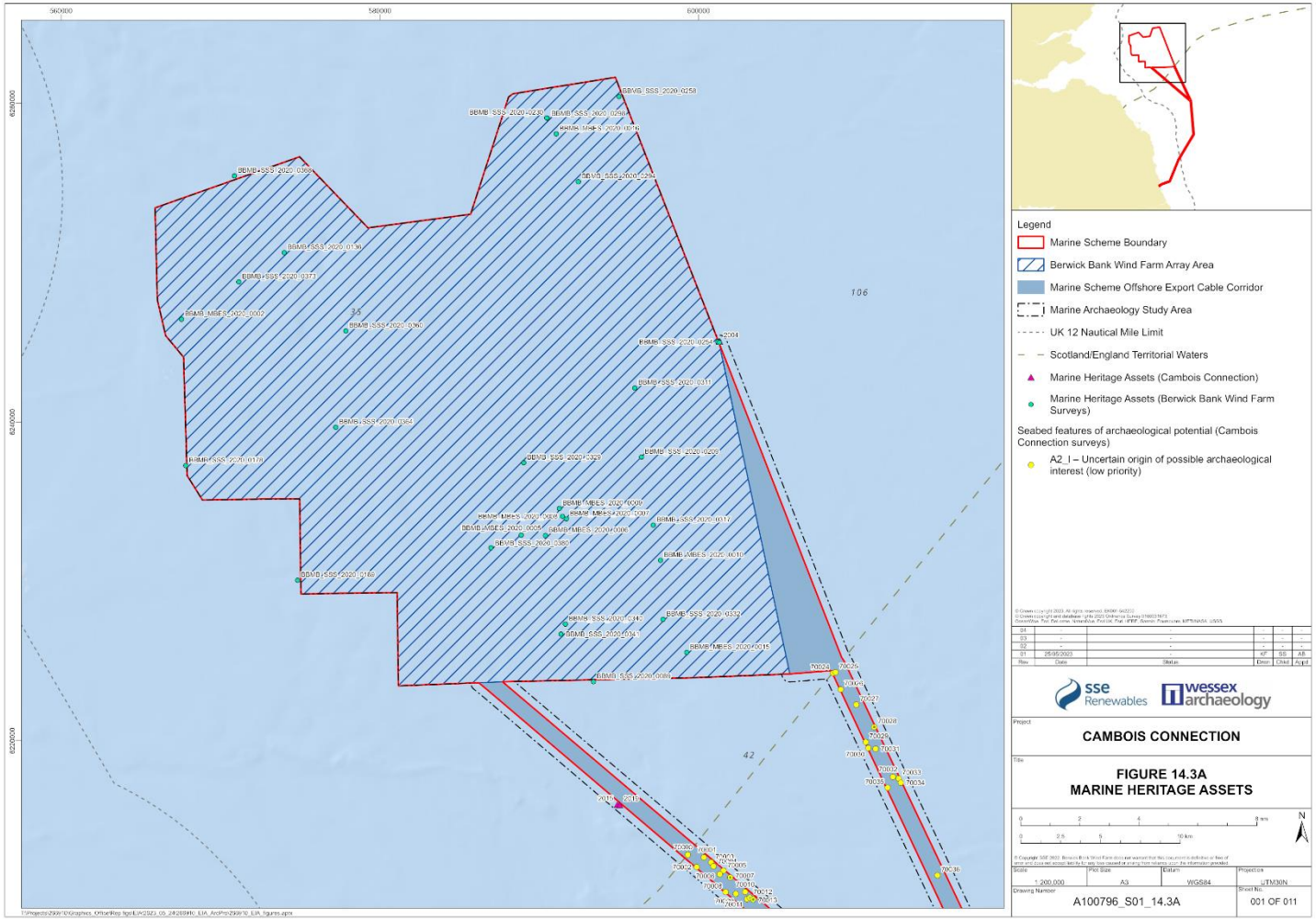

Figure 14.3a Marine Heritage Assets

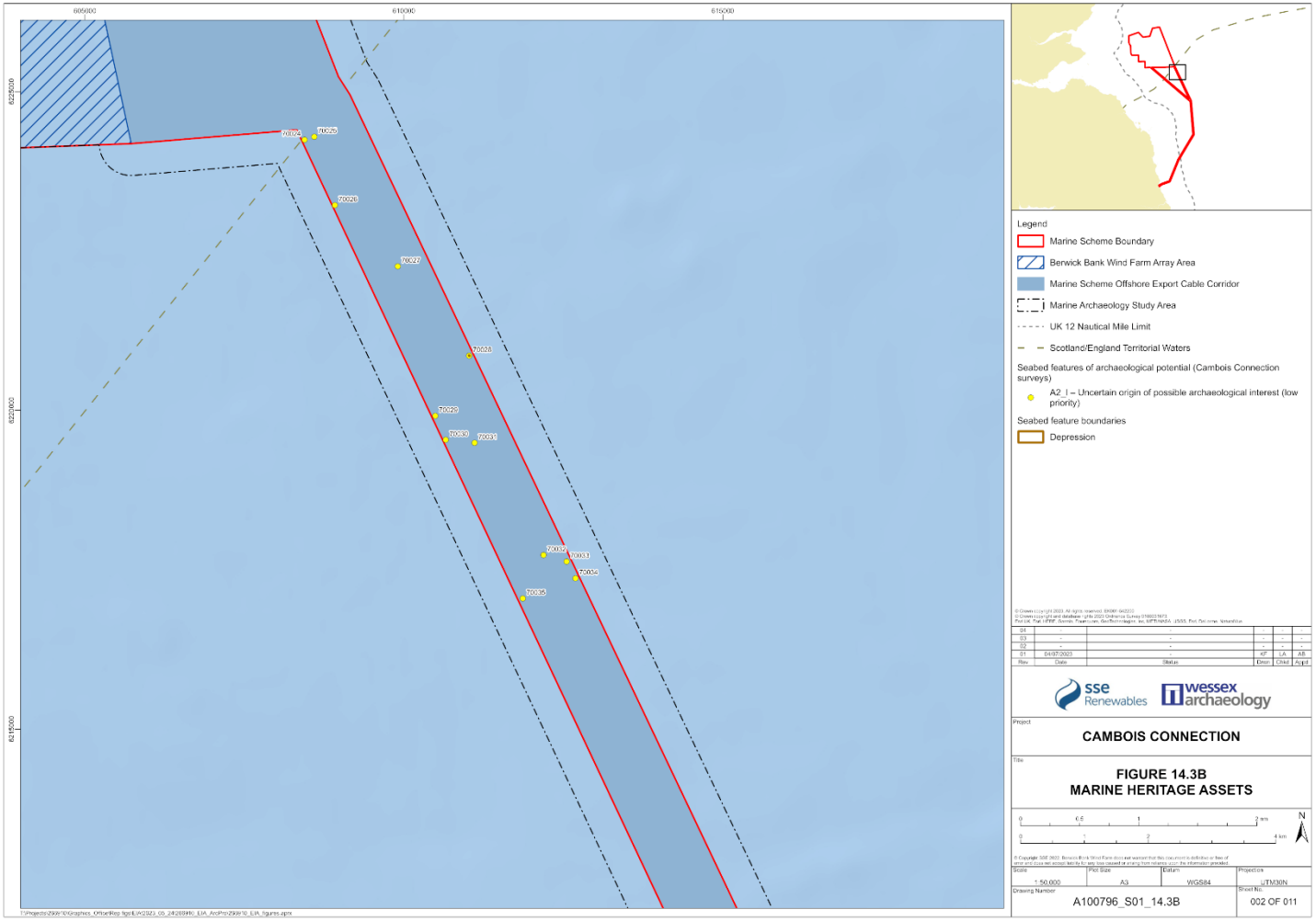

Figure 14.3b Marine Heritage Assets

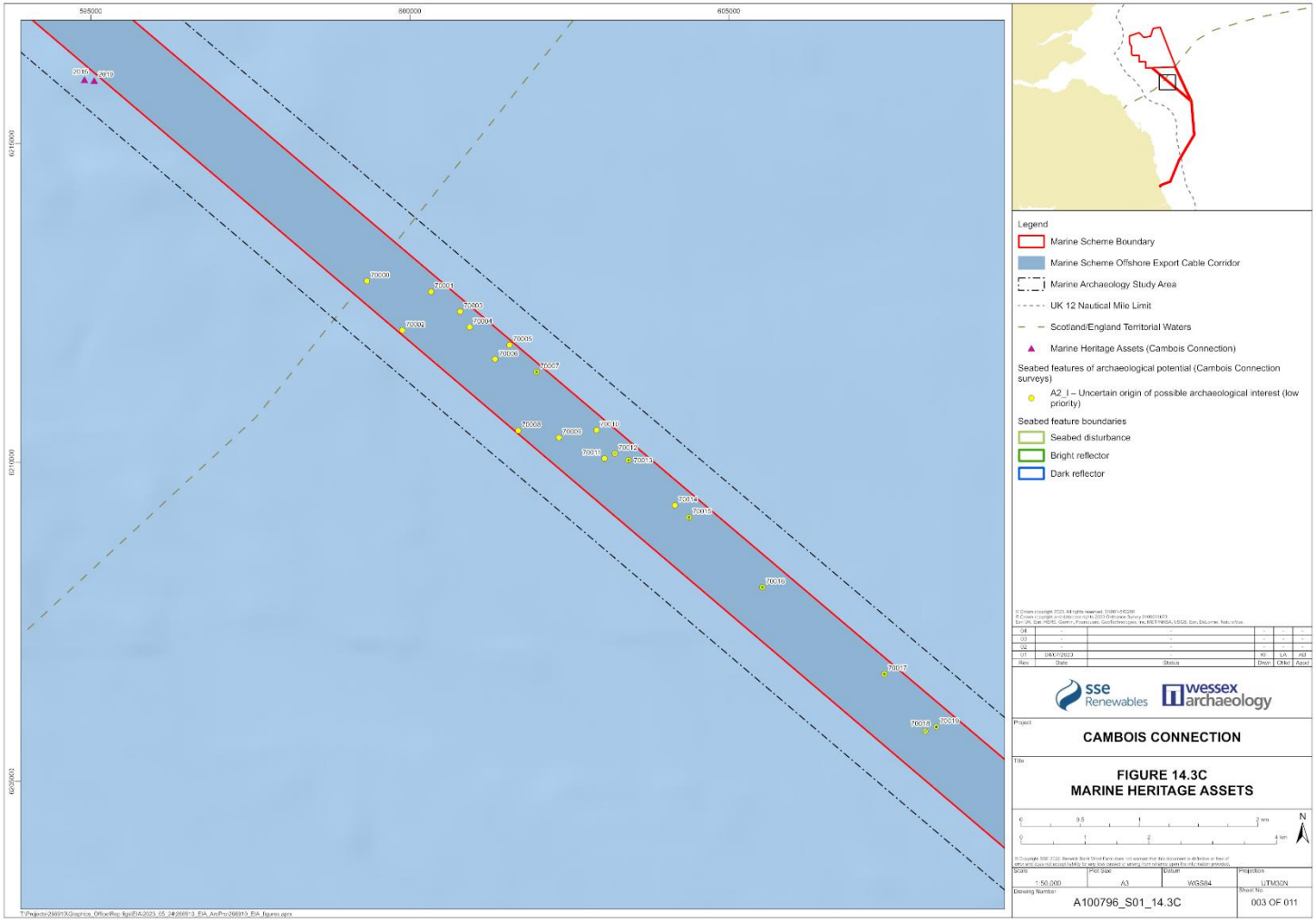

Figure 14.3c Marine Heritage Assets

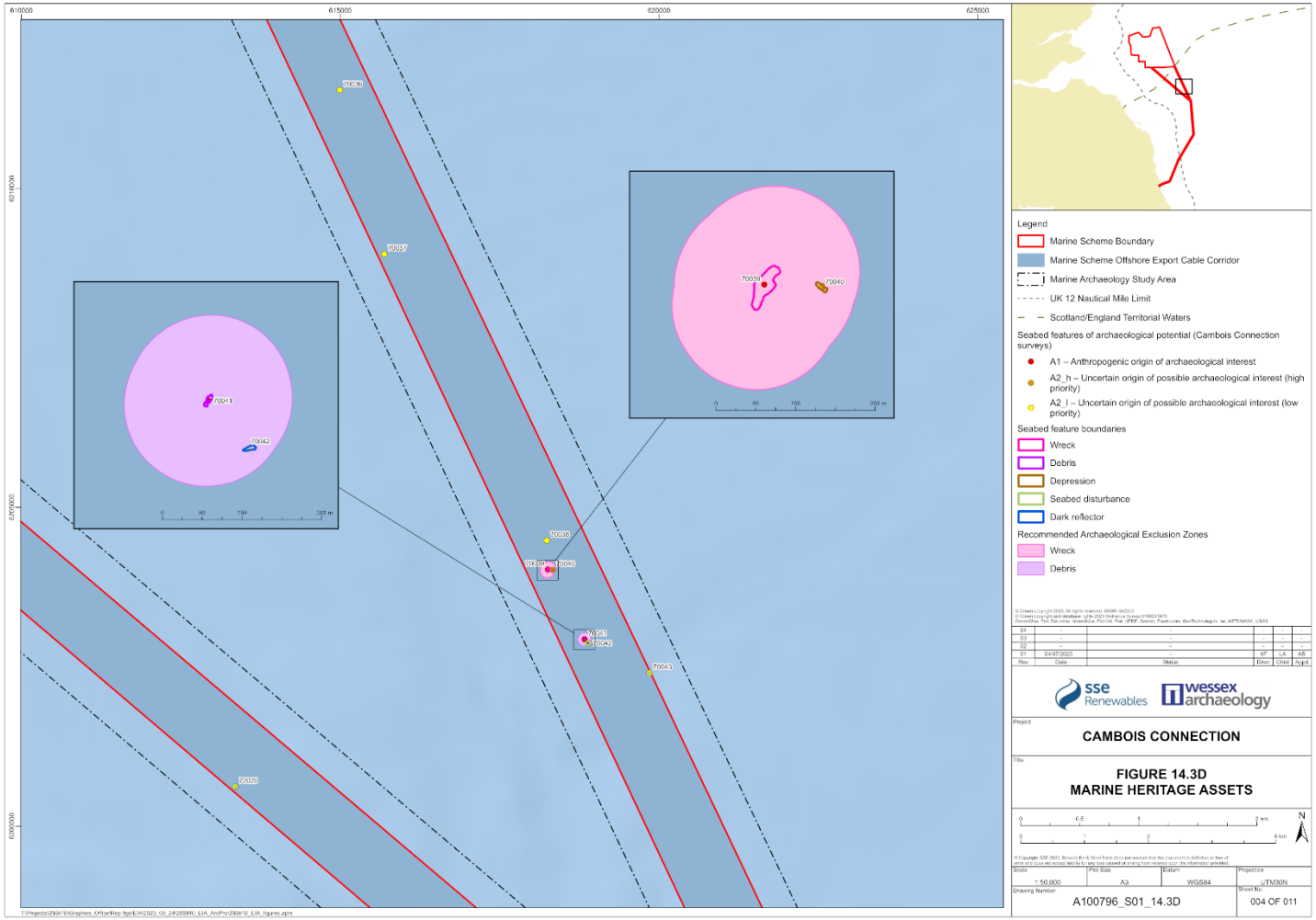

Figure 14.3d Marine Heritage Assets

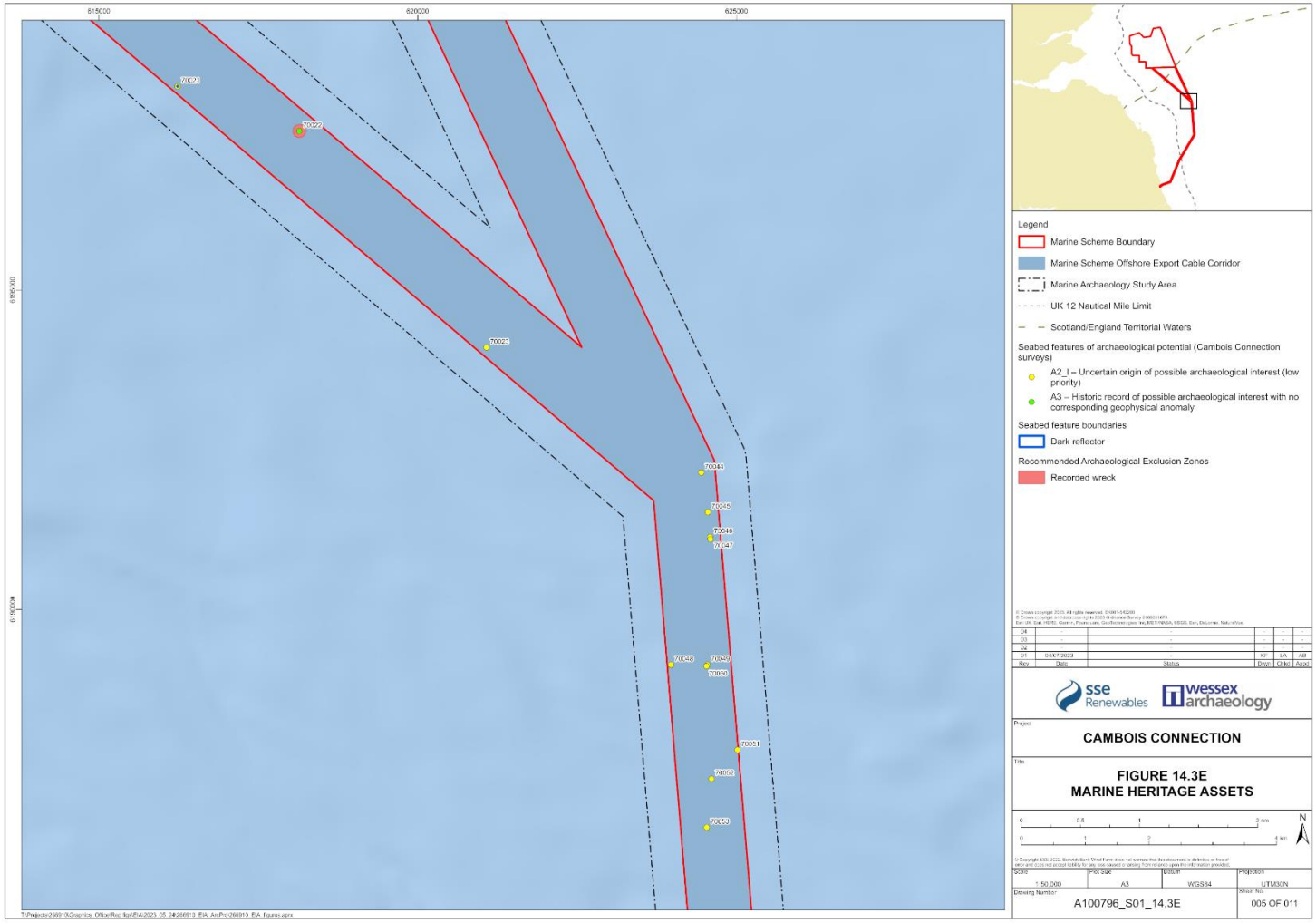

Figure 14.3e Marine Heritage Assets

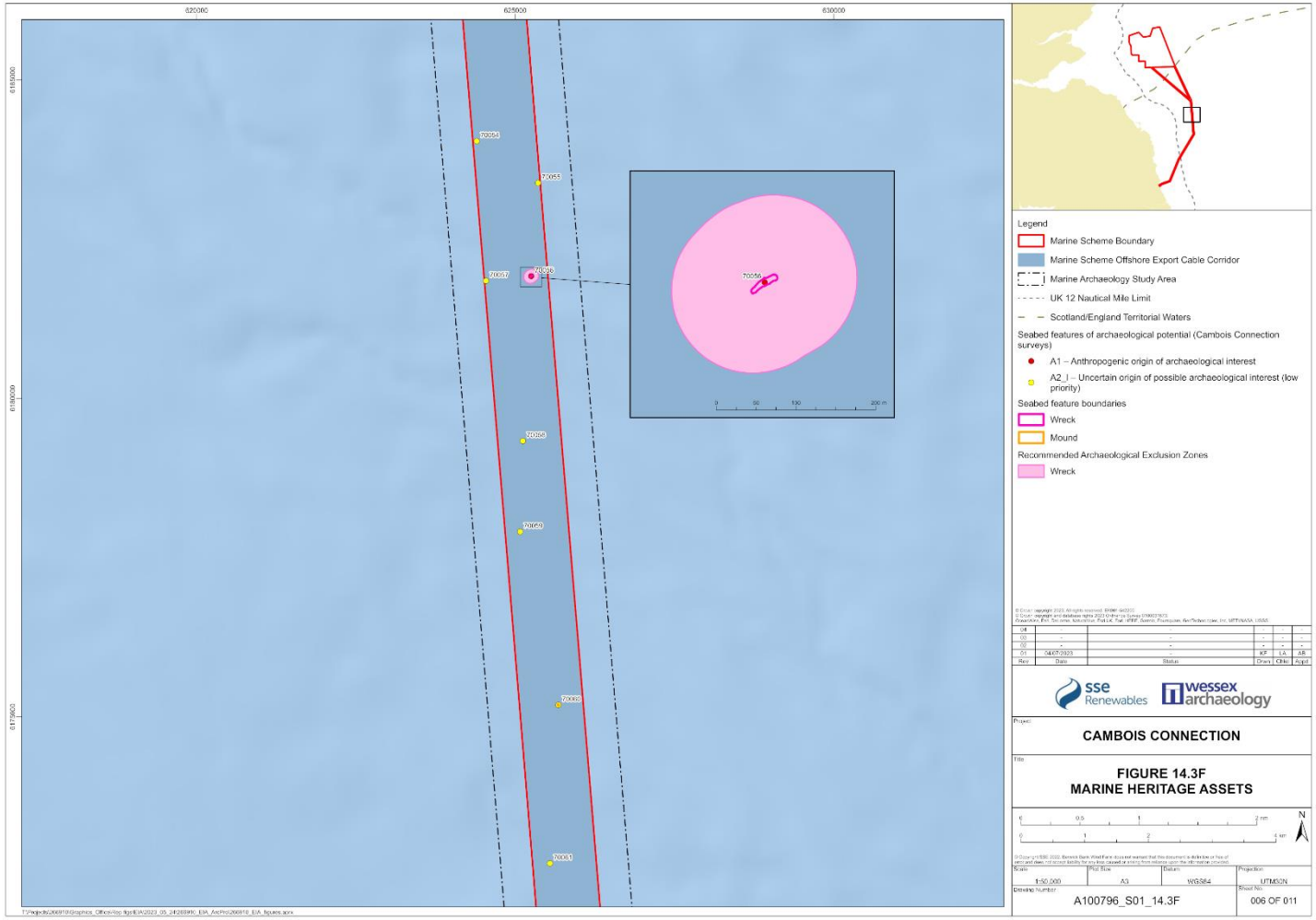

Figure 14.3f Marine Heritage Assets

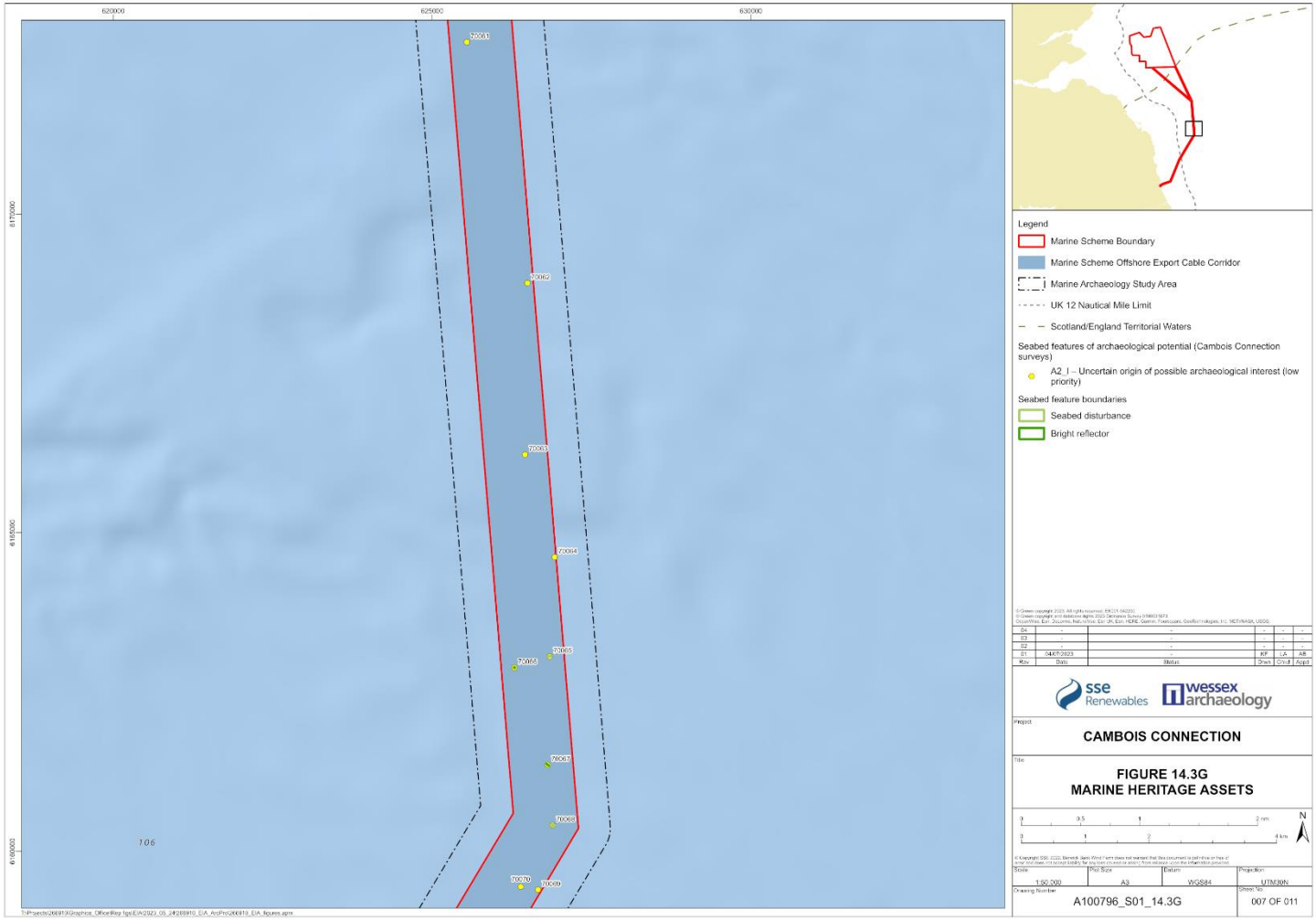

Figure 14.3g Marine Heritage Assets

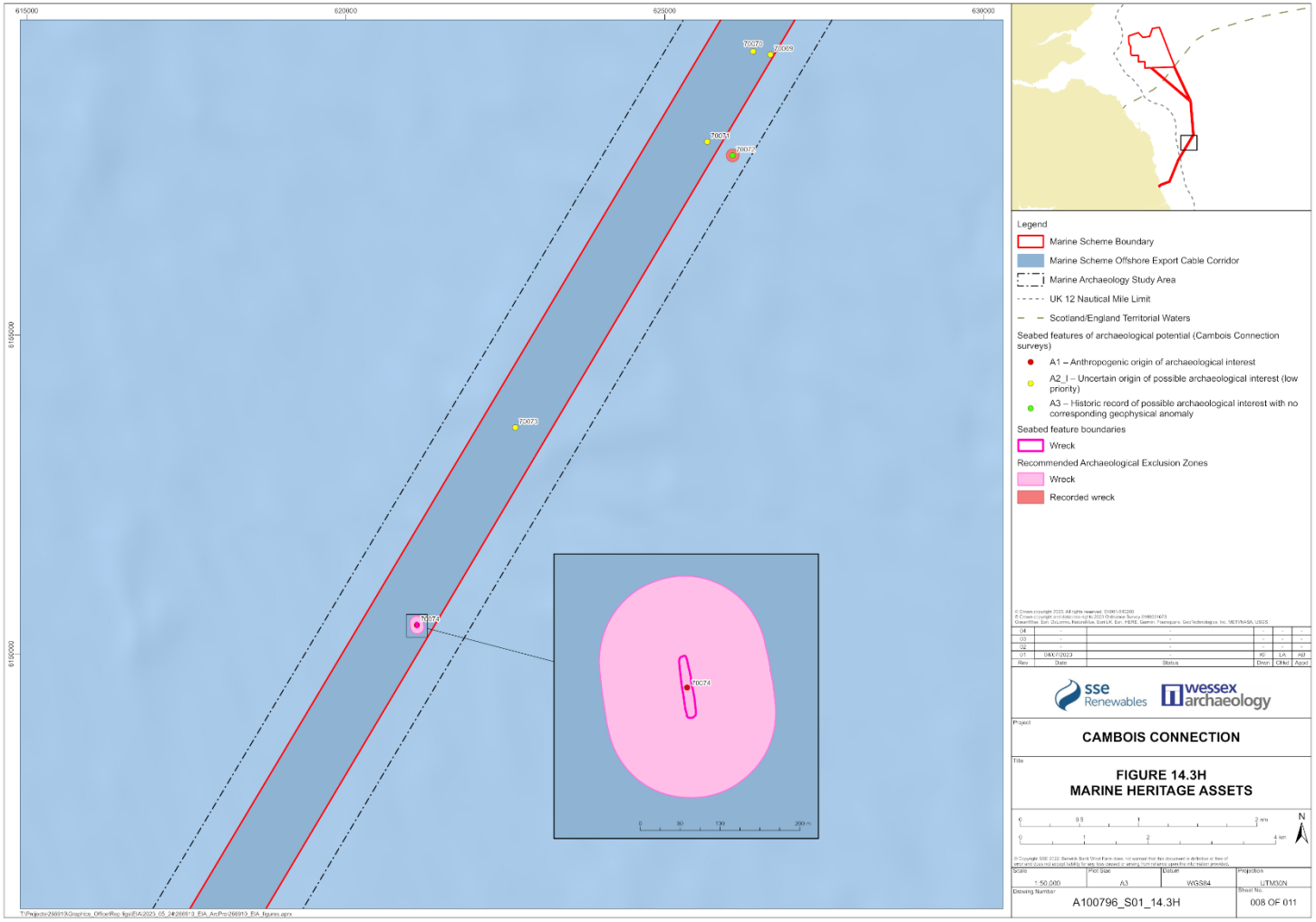

Figure 14.3h Marine Heritage Assets

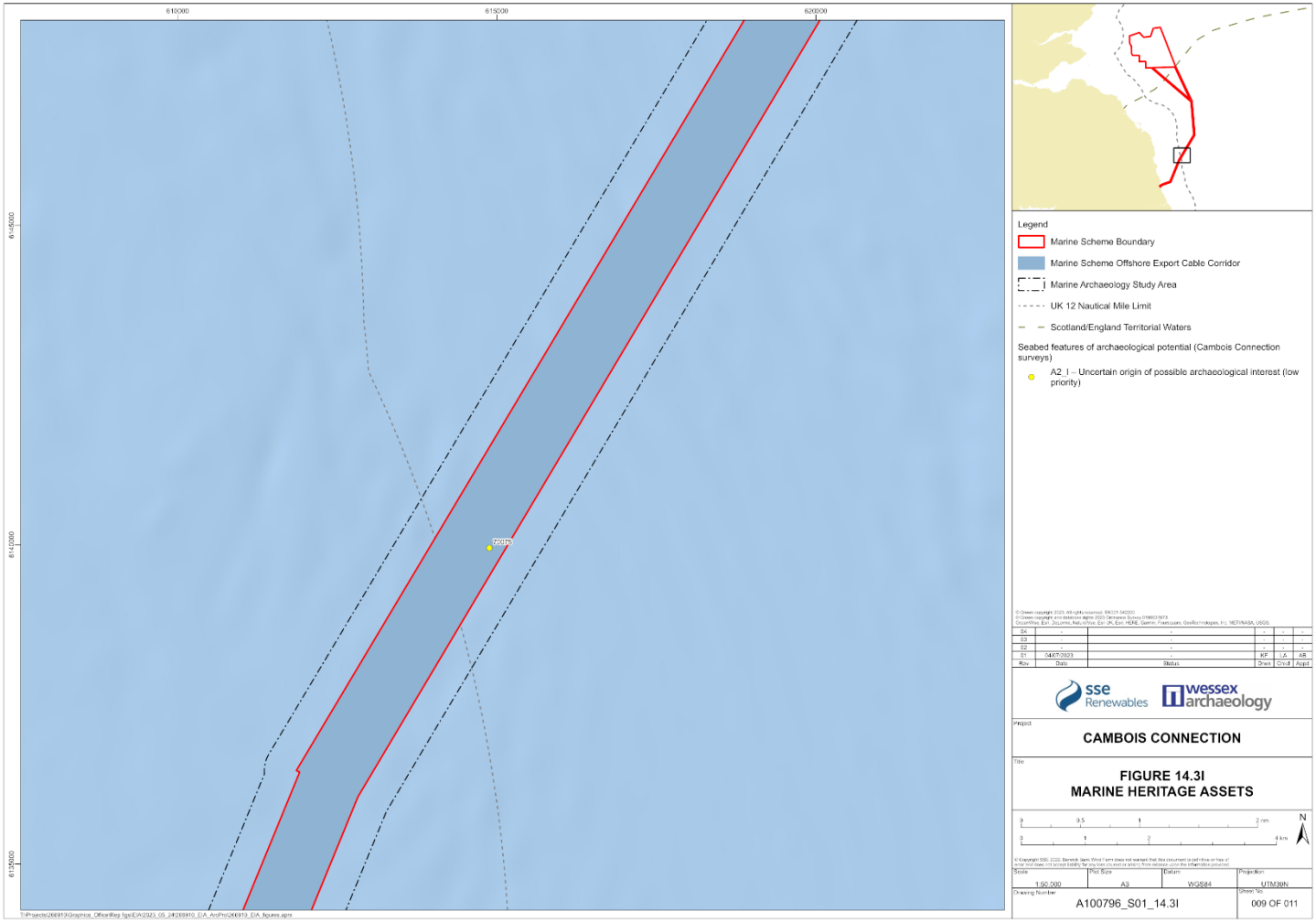

Figure 14.3i Marine Heritage Assets

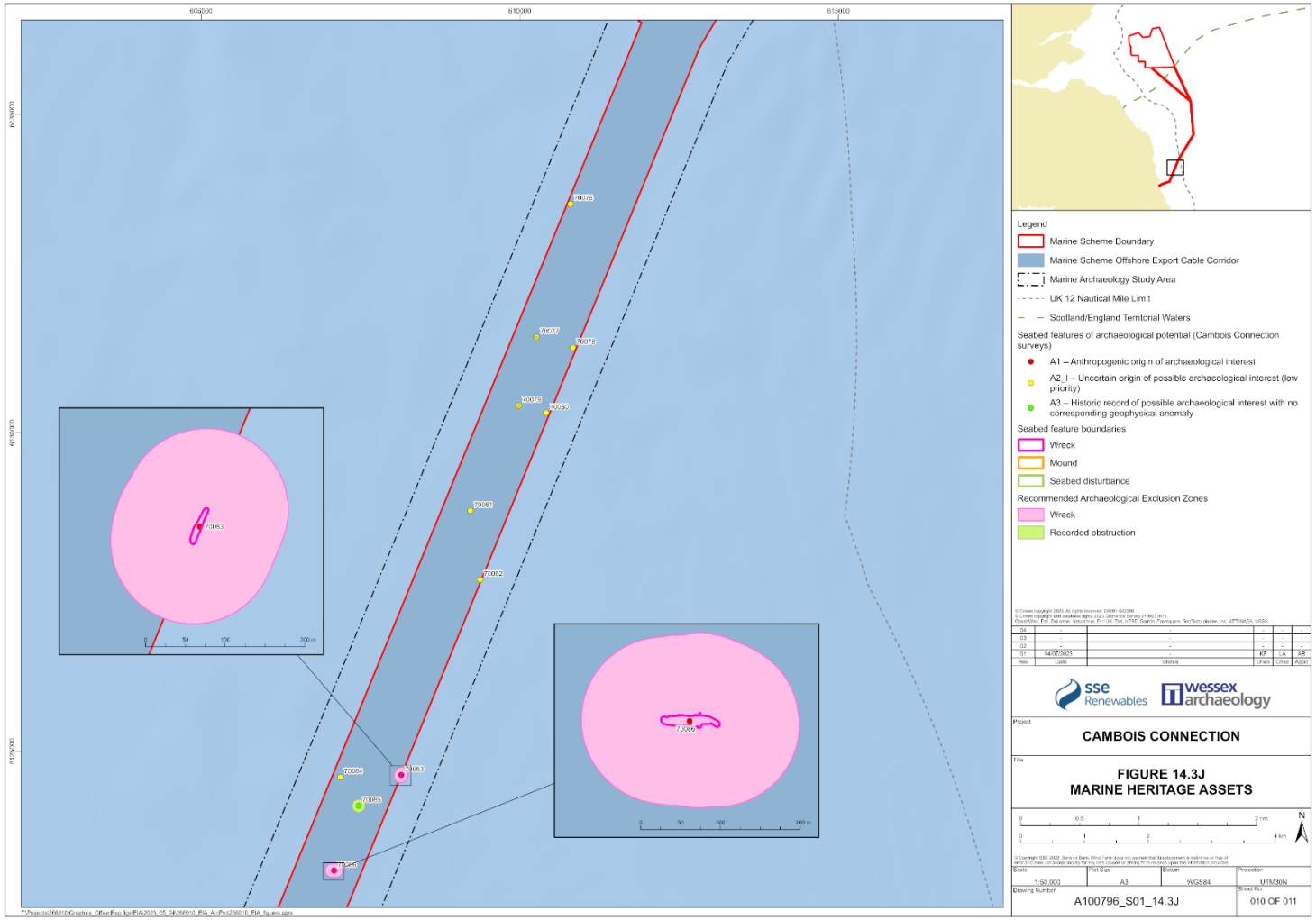

Figure 14.3j Marine Heritage Assets

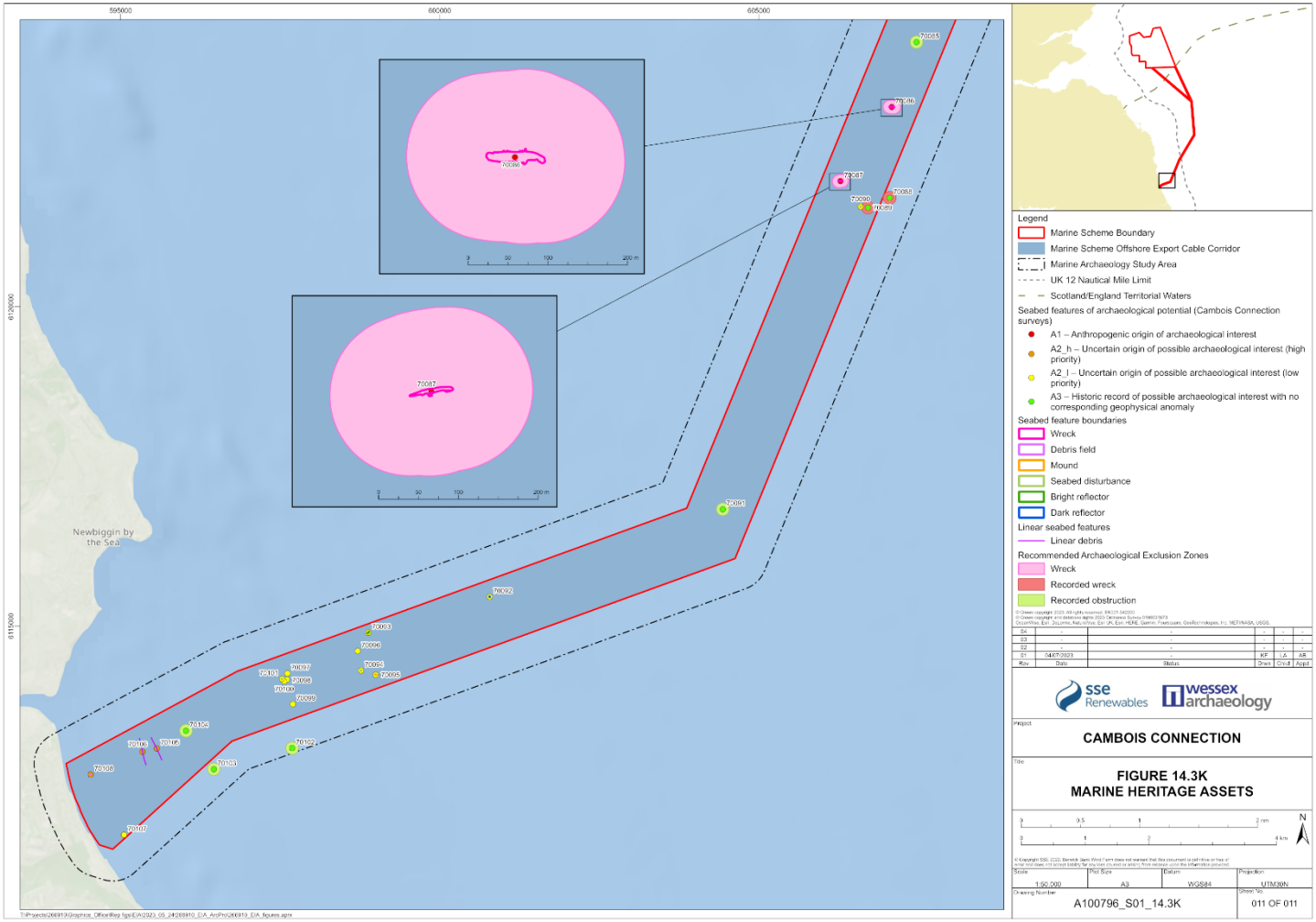

Figure 14.3k Marine Heritage Assets

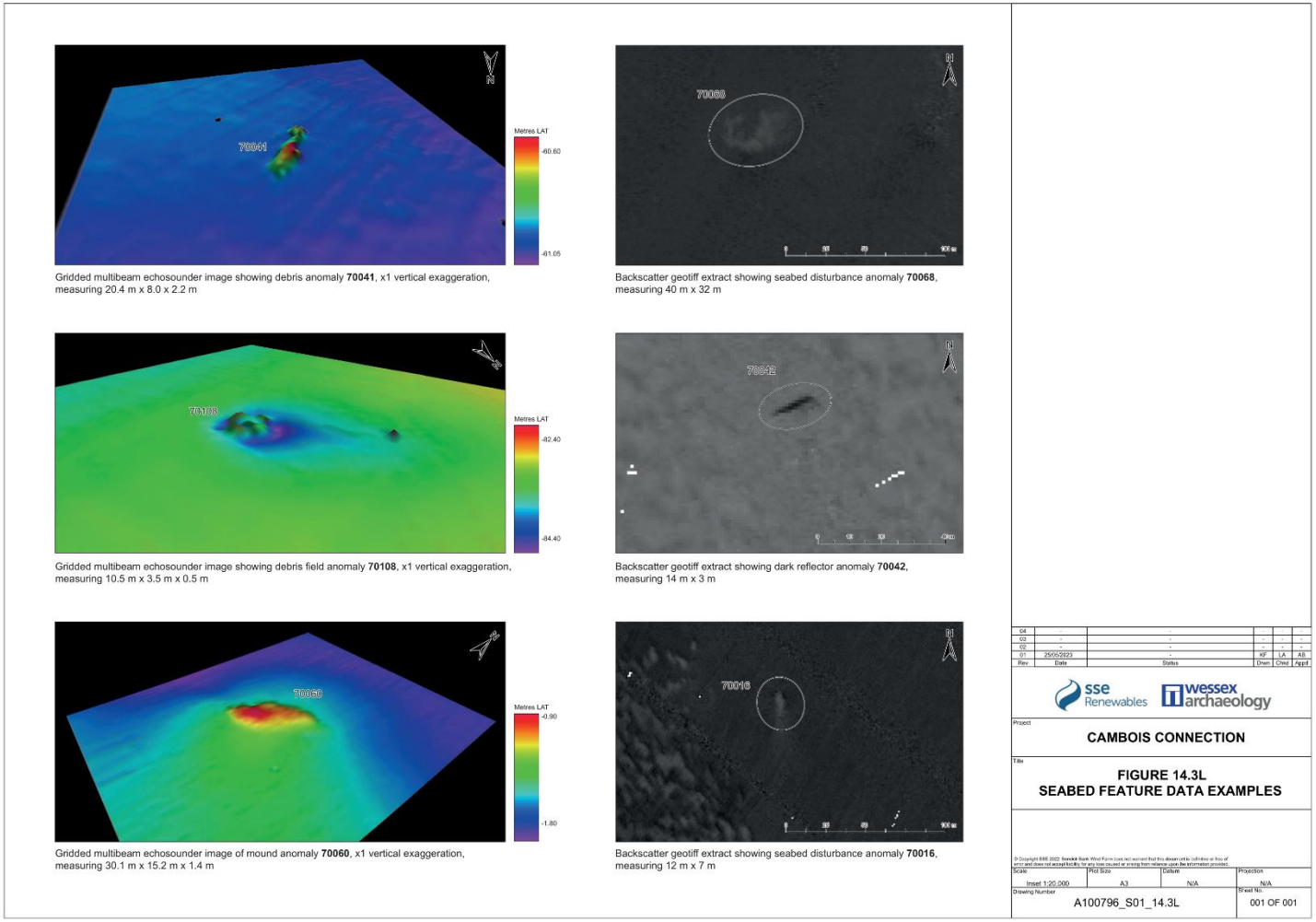

Figure 14.3l Marine Heritage Assets

5.2 Designated Sites

5.2.1 There are currently no sites within the Marine Archaeology study area that are subject to statutory protection from the Protection of Wreck Act 1973, the Protection of Military Remains Act 1986 or the Ancient Monument and Archaeological Areas Act 1979.

5.3 Known Maritime Sites

Scottish offshore waters

5.3.1 Within the Marine Archaeology study area located in the Scottish offshore waters there are three known sites. These are the Swedish steamship *Oswin,* which was built in 1890 in Whitby and was captured and sunk in 1918 by UB-62 whilst carrying a cargo of coal from Methil to Malmo (**2004**), and one unknown wreck and a large piece of associated debris (**2015, 2019**).

English offshore waters

5.3.2 Five known documented sites are located within the English offshore waters (Figure 14.3b-h), including the possible wreck of the British trawler Acantha (**70056**), three unknown wrecks (**70022**, **70039**, **70074**), and the loss position of British steamship San Bernardo (**70072**).

English inshore waters

5.3.3 Ten known sites are located within English inshore waters (Figure 14.3i-k). These include the probable wreck of HMSM Unity (**70087**), the British steamship Svava (**70086**), the possible steamship Ragnhild (**70088**), the British collier Bangarth (**70089**), a wreck site possibly of HMS Herring (**70083**), three obstructions (**70091**, **70102**, **70103**), possible debris (**70085**) and a rectangular timber with metal strip observed during seabed development in 2017 (**70104**).

5.4 Known Aviation Sites

5.4.1 There are no known aviation sites in the Marine Archaeology study area.

5.5 Geophysical Assessment of Seabed Features

Introduction

5.5.1 The geophysical data were assessed to identify features of archaeological potential relating to maritime and aviation activity within English waters.

5.5.2 The results of this assessment are collated in gazetteer format detailed in Annex 3 and illustrated in Figures 14.3 a – k.

English offshore waters

5.5.3 After the anomaly and discrimination phase outlined in section 3.7, a total of 109 features have been identified as being of possible archaeological potential within the geophysical data and are discriminated as shown in Table 6.

Table 6 Anomalies of archaeological potential within Offshore English Waters

Archaeological discrimination	Number of anomalies	Interpretation
A1	4	Anthropogenic origin of archaeological interest

Archaeological discrimination	Number of anomalies	Interpretation
A2_h	1	Anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature
A2_l	69	Anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature
A3	2	Historic record of possible archaeological interest with no corresponding geophysical anomaly
Total	**76**	

5.5.4 Furthermore, these anomalies can be classified by probable type, which can further aid in assigning archaeological potential and importance (Table 7).

Table 7 Types of anomaly identified within Offshore English Waters

Anomaly classification	Definition	Number of anomalies
Wreck	Areas of coherent structure including wrecks of ships, submarines and some aircraft (where coherent structure survives)	3
Debris	Distinct objects on the seabed, generally exhibiting height or with evidence of structure, that are potentially anthropogenic in origin	1
Seabed disturbance	An area of disturbance without individual, distinct objects. Potentially indicates wreck debris or other anthropogenic features buried just below the seabed.	6
Bright reflector	Individual objects or areas of low reflectivity, characteristic of materials that absorb acoustic energy, such as waterlogged wood or synthetic materials. Precise nature is uncertain	10
Dark reflector	Individual objects or areas of high reflectivity, displaying some anthropogenic characteristics. Precise nature is uncertain	23
Mound	A mounded feature with height not considered to be natural. Mounds may form over wreck sites or other debris. Precise nature is uncertain	27
Depression	An area of disturbed seabed with depth. Potentially indicates scour around a buried feature or where a feature has been cleared	4
Recorded wreck	Position of a recorded wreck at which previous surveys have identified definite seabed anomalies, but for which no associated feature has been identified within the current data set.	2
Total		**76**

5.5.5 A total of four anomalies have been discriminated as A1 - Anthropogenic origin of archaeological interest. Of these, three (**70039**, **70056** and **70074**) have been classified as wrecks.

5.5.6 Anomaly **70039** (Figure 14.3d, Wreck Sheet 1 [Annex 6]) has been identified in both the Backscatter and MBES data sets as a large, irregular area measuring 61.4 m x 24.8 m x 5.0 m, comprising mounds of varying shapes and sizes. It is interpreted as a fairly constrained but well-degraded wreck. This position has a corresponding UKHO record (65638) which reports a well-broken and degraded unknown wreck, last examined in 2005, lying at a general depth of 61.8 m with reported measurements of 58 m x 25 m x 5.7 m. These measurements differ from those recorded in the MBES dataset, and the decreased height and increased length may indicate the wreck is collapsing further and spreading within the surrounding sediments.

5.5.7 Anomaly **70056** (Figure 14.3f, Wreck Sheet 2 [Annex 6]) has been identified in both the Backscatter and MBES data sets as a distinct, rectangular mound with an irregular internal composition, measuring 38.0 m x 8.0 m x 2.6 m, and interpreted as a wreck. This position has a corresponding UKHO record (65637) which reports it to be the British trawler *Acantha*

(possibly), which was reportedly sunk on 5 April 1915 after being torpedoed. It was lasted surveyed in 2005 and located at a general depth of 79.2 m with recorded measurements of 43.0 m x 16.0 m x 5.5 m, and was reported to be intact though collapsed. These measurements differ from those recorded in the MBES dataset, and the decreased height and width may indicate the wreck is collapsing further and becoming buried within the surrounding sediments.

5.5.8 Anomaly **70074** (Figure 14.3h, Wreck Sheet 3 [Annex 6]) has been identified in both the Backscatter and MBES data sets as a distinct, elliptical mound, measuring 78.6 m x 14.6 m x 6.4 m, and interpreted as a wreck. This position has a corresponding UKHO record (4370), which reports the location of an unknown wreck, last examined in 1999. The wreck was previously located at a general depth of 97 m, with recorded measurements of 78 m x 12 m x 8 m. The wreck was last reported to be intact and upright, with superstructure visible, which appears generally consistent with its appearance in the 2022 datasets.

5.5.9 The remaining A1 anomaly (**70041**) has been classified as debris. It was identified in both the Backscatter and MBES data an elongate and irregular feature measuring 20.4 m x 8.0 m x 2.2 m lying on a north-east to south-west alignment. There is no obvious appearance of distinguishable features or superstructure which would indicate that this is a wreck, however, several peaks are visible along its length which may indicate separate sections or segmented structure. It is anomalous in appearance to other features within the dataset, and has therefore been interpreted as a significant piece of debris (See Data example Figure 14.3l).

5.5.10 One anomaly (**70040**) has been discriminated A2_h - Anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature. This anomaly has been classified as a large, elongate depression, measuring 16.0 m x 6.9 m x -0.3 m, and located 57 m east of wreck **70039**. This feature may be natural but given its proximity to the wreck has been interpreted as possible sediment disturbance around buried, or partially buried wreck debris.

5.5.11 A total of 69 anomalies (for full list see Annex 3) have been discriminated as A2_l - Anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature.

5.5.12 Six anomalies (**70012**, **70018**, **70020**, **70043**, **70065** and **70068**) have been classified as seabed disturbances; a feature or group of features of uncertain origin.

5.5.13 These seabed disturbances range in size from 14 m x 13 m (**70012**) up to 40 x 32 m (**70068**). All may be natural features but have been interpreted as having the potential to be possible debris.

5.5.14 Ten anomalies (for full list see Annex 3) have been classified as bright reflectors; a feature of uncertain origin identified in the Backscatter data only.

5.5.15 These features range in size from 4 m x 3 m (**70075**) up to 41 m x 6 m (**70067**). All may be natural features but have been interpreted as having the potential to be possible debris.

5.5.16 A total of 23 anomalies (for full list see Annex 3) have been classified as dark reflectors; a feature of uncertain origin identified in the Backscatter data only.

5.5.17 These features range in size (area) from 3 m x 1 m (**70005**) up to 15 m x 5 m (**70021**). All may be natural features but have been interpreted as having the potential to be possible debris.

5.5.18 A total of 27 anomalies (for full list see Annex 3) have been classified as mounds; mounded areas identified in the MBES data which may indicate the presence of possible debris but may also be natural features.

5.5.19 These features range in size from 2.0 m x 2.0 m x 0.1 m (**70004**) up to 30.1 m x 15.2 m x 1.4 m (**70067**). All may be natural features but have been interpreted as having the potential to be possible debris.

5.5.20 Three anomalies (**70028**, **70046** and **70051**) have been classified as a depression; an area of disturbed seabed with depth and may indicate the presence of possible debris.

5.5.21 These features range in size from 7.8 m x 4.6 m x -0.6 m (**70046**) up to 16.5 m x 9.5 m x -0.3 m (**70028**). All may be natural seabed depressions, or may indicate the presence of possible debris.

5.5.22 Two historic records (**70022** and **70072**) have been discriminated as A3 - Historic record of possible archaeological interest with no corresponding geophysical anomaly. Both have been classified as recorded wrecks.

5.5.23 Record **70022** is the reported UKHO position (4492; Canmore 322987) of a wreck lying at a general depth of 72 m on a north-west to south-east alignment. This wreck was shown on fisherman's charts and surveyed in 1964. This location was last surveyed in 2006 and no wreck was located. No anomalous features were identified in the Backscatter or MBES data at this location and it is possible that any remains associated with this record are either buried or located elsewhere. However, this position has been retained within this gazetteer for reporting purposes.

5.5.24 Record **70072** is the reported UKHO position (4384; Canmore 322883) of British steamship *San Bernardo*, which was sunk by a German submarine 17 miles from Longstone, in a north-west position and at a general depth of 85 m. This location was last surveyed in 1999 and no wreck was located. This recorded position was not covered by the Backscatter or MBES data sets and therefore no comment can be made on its current presence of condition within this assessment, therefore, it has been retained within this gazetteer.

English inshore waters

5.5.25 After the anomaly and discrimination phase outlined in section 2.5, a total of 33 features have been identified as being of possible archaeological potential within the geophysical data and are discriminated as shown in Table 8.

Table 8 Anomalies of archaeological potential within Inshore English Waters

Archaeological discrimination	Number of anomalies	Interpretation
A1	3	Anthropogenic origin of archaeological interest
A2_h	3	Anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature
A2_l	20	Anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature
A3	7	Historic record of possible archaeological interest with no corresponding geophysical anomaly

Archaeological discrimination	Number of anomalies	Interpretation
Total	**33**	

5.5.26 Furthermore, these anomalies can be classified by probable type, which can further aid in assigning archaeological potential and importance (Table 9).

Table 9 Types of anomaly identified within English Inshore Waters

Anomaly classification	Definition	Number of anomalies
Wreck	Areas of coherent structure including wrecks of ships, submarines and some aircraft (where coherent structure survives)	3
Debris field	A discrete area containing numerous individual debris items that are potentially anthropogenic, and can include dispersed wreck sites for which no coherent structure remains	1
Linear debris	Distinct linear objects, or a linear series of objects on the seabed, either straight or curved. Potentially anthropogenic in origin. May represent linear anthropogenic debris which are unlikely to be (solely) rope or chain	2
Seabed disturbance	An area of disturbance without individual, distinct objects. Potentially indicates wreck debris or other anthropogenic features buried just below the seabed.	4
Bright reflector	Individual objects or areas of low reflectivity, characteristic of materials that absorb acoustic energy, such as waterlogged wood or synthetic materials. Precise nature is uncertain	3
Dark reflector	Individual objects or areas of high reflectivity, displaying some anthropogenic characteristics. Precise nature is uncertain	9
Mound	A mounded feature with height not considered to be natural. Mounds may form over wreck sites or other debris. Precise nature is uncertain	3
Depression	An area of disturbed seabed with depth. Potentially indicates scour around a buried feature or where a feature has been cleared	1
Recorded wreck	Position of a recorded wreck at which previous surveys have identified definite seabed anomalies, but for which no associated feature has been identified within the current data set.	2
Recorded obstruction	Position of a recorded obstruction (e.g. foul ground, fisherman's fastener recorded by the UKHO), but for which no associated feature has been identified within the current data set	5
Total		**33**

5.5.27 A total of three anomalies (**70083**, **70086** and **70087**) have been discriminated as A1 - Anthropogenic origin of archaeological interest. All three have been classified as wrecks

5.5.28 Anomaly **70083** (Figure 14.3j, Wreck Sheet 4 [Annex 6]) is only partially covered by the MBES and Backscatter data sets, but has been identified as a large, compact, elliptical mound measuring 50.0 m x 7.3 m x 1.5 m, and interpreted as a wreck. As the wreck was only partially covered, these measurements should be considered a minimum. This position has multiple associated records and is recorded in the UKHO database (58047) as a wreck last examined in 2000 at a general depth of 58 m, measuring 46.0 m in length and 14.0 m wide. No debris was associated with the site, and it was recorded as being intact and probably upright. The NRHE (1001479) reports this wreck has been identified as HMS *Herring*, which sank on 22 April 1943.

5.5.29 Anomaly **70086** (Figure 14.3j, Wreck Sheet 5 [Annex 6]) has been identified in both the Backscatter and MBES data sets as a large, compact and elliptical mound and interpreted as a wreck measuring 78.0 m x 15.0 m x 8.7 m. The wreck has multiple records associated with it; the UKHO record (4341) describes it as the British steamship *Svava* which sank after collisions with the *Fort Beausejoir* en route from Warworth to Thames with a cargo of

coal on 10 March 1943. It was last surveyed in 2000 at a general depth of 52 m, and measured 74.0 m in length and 12.0 m wide. It was recorded as being intact, upright, and with superstructure visible. These measurements slightly differ from those recorded in the MBES dataset, and the increased height and width may indicate the wreck is becoming more exposed from the surrounding seabed sediments.

5.5.30 Anomaly **70087** (Figure 14.3k, Wreck Sheet 6 [Annex 6]) has been identified in both the Backscatter and MBES data sets as a large, elongate mound measuring 57.0 m x 15.0 m x 3.5 m and interpreted as a wreck. This position has an associated UKHO record (4334) which report it as probably the British submarine HMSM *Unity*. The submarine was lost on 29 April 1940 due to a collision with SS *Atle Jarl* 6.5 miles off Newbiggin-by-the-sea during a North Sea patrol. The UKHO records the site as last surveyed in 2000, located at a general depth of 50 m, measuring 54.0 m in length and 9.0 m wide. No debris was previously identified associated with the wreck, and it was thought to be intact and lying on its side. The increase in width dimensions may suggest the wreck has become more exposed from the surrounding mobile seabed sediments.

5.5.31 Three anomalies (**70105**, **70106** and **70108**) have been discriminated A2_h - Anomaly of likely anthropogenic origin but of unknown date; may be of archaeological interest or a modern feature.

5.5.32 Anomaly **70108** is classified as a debris field; an area of numerous debris items with no coherent structure, and was identified with overall dimensions of 10.5 m x 3.5 m x 0.5 m.

5.5.33 This feature was identified in the Backscatter and MBES data as a distinct, sub-angular mound, measuring 4.3 m x 3.5 m x 0.5 m. The mound appears to have four outer peaks and a central peak within a slight scour and may be one large object with varying height or several closely-spaced smaller objects. Visible only in the MBES data was a possibly attached thin, straight linear mound extending 6 m from the southern end of the larger feature to the WSW with a further small rounded mound at the end (1.3 m x 1.3 m x 0.5 m). The feature is interpreted as anthropogenic debris and may be modern, but this cannot be certain without visual inspection.

5.5.34 Anomalies **70105** and **70106** have been classified as linear debris. These measure 390.1 m x 2.1 m x -0.1 m and 427.0 m x 4.1 m x -0.3 m, respectively. Both are characterised as a linear series of small depressions and may represent possible modern linear debris such as fishing gear, but have been retained within this gazetteer subject to confirmation by visual inspection.

5.5.35 A total of 20 anomalies (for full list see Annex 3) have been discriminated as A2_l - Anomaly of possible anthropogenic origin but interpretation is uncertain; may be anthropogenic or a natural feature.

5.5.36 Four anomalies (**70077**, **70090**, **70094** and **70101**) have been classified as seabed disturbances; a feature or group of features of uncertain origin.

5.5.37 These seabed disturbances range in size from 11 m x 4 m (**70101**) up to 13 m x 7 m (**70077** and **70094**). All may be natural features but have been interpreted as having the potential to be possible debris.

5.5.38 Three anomalies (**70093**, **70097** and **70098**) have been classified as bright reflectors; a feature of uncertain origin identified in the Backscatter data only.

5.5.39 These features range in size from 2 m x 1 m (**70098**) up to 34 m x 4 m (**70093**). All may be natural features but have been interpreted as having the potential to be possible debris.

5.5.40 A total of 9 anomalies (for full list see Annex 3) have been classified as dark reflectors; a feature of uncertain origin identified in the Backscatter data only.

5.5.41 These features range in size from 3.0 m x 1.5 m (**70100**) up to 11 m x 4 m (**70092**). All may be natural features but have been interpreted as having the potential to be possible debris.

5.5.42 Three anomalies (**70079**, **70095** and **70099**) have been classified as mounds; mounded areas identified in the MBES data which may indicate the presence of possible debris but may also be natural features.

5.5.43 These features range in size from 3.5 m x 3.5 m x 0.3 m (**70099**) up to 13.2 m x 7.2 m x 0.5 m (**70079**). All may be natural features but have been interpreted as having the potential to be possible debris.

5.5.44 One anomaly (**70081**) has been classified as a depression; an area of disturbed seabed with depth and may indicate the presence of possible debris. This feature measures 6.6 m x 6.4 m x -0.3 m and may be a natural seabed depression, or may indicate the presence of possible debris.

5.5.45 Seven historic records (**70085**, **70088**, **70089**, **70091**, **70102**, **70103** and **70104**) have been discriminated as A3 - Historic record of possible archaeological interest with no corresponding geophysical anomaly.

5.5.46 Two of these (**70088** and **70089**) have been classified as recorded wrecks.

5.5.47 Record **70088** is the reported UKHO position (4335; Canmore 322834; NRHE 943539) of the Norwegian steamship *Ragnhild* (possibly), which was sunk on 27 April 1917 after detonating a German laid mine. The site was last amended in 2000, when the wreck was located at a general depth of 52 m and reported to be well broken up. The recorded position of this wreck is located outside the coverage of the current Backscatter and MBES data, and so no comment on the condition of the site can be made at this time.

5.5.48 Record **70089** is the reported location (UKHO 4336; HER 25537) of the wreck of the English collier *Bangarth*, a steamer which was torpedoed by the German submarine *UB-34* on 13 December 1917. The wreck is reported to have been dived and identified, be well broken-up in appearance, lying at a general depth of 50 m, and is reported to have been salvaged. However, despite this positive identification of substantial wreck, no anomalies were visible in the current Backscatter or MBES datasets at this recorded location. There do appear to be mobile seabed sediments at this location, but they are not considered sufficiently thick to completely cover a substantial shipwreck. As such, it is likely that the HER recorded position is erroneous and the actual wreck is located elsewhere close by, probably beyond the geophysical data coverage.

5.5.49 The remaining five historic records have been classified as recorded obstructions.

5.5.50 Record **70085** is the reported location of a foul ground present within both the UKHO (4343) and Canmore (322842) records. The feature was last surveyed in 1999 and found to be a sonar contact measuring 15.0 m x 0.3 m x 0.1 m and interpreted as possible debris. No anomalies were identified within the current MBES or Backscatter data, and the feature may be buried at present.

5.5.51 Record **70091** is the reported location of an unidentified seabed obstruction reported by fisherman and recorded in the NRHE database (1003622). Recorded as potentially indicative of wreckage or a submerged feature. No anomalous features were identified in the current MBES or Backscatter datasets at this location, suggesting the feature is either buried or located elsewhere.

5.5.52 Record **70102** is the reported position of a seabed obstruction (NHRE 1003614; HER 30302), reported by fishermen in 1976. Possibly indicative of wreckage or a submerged feature. This record was not covered by the Backscatter or MBES datasets and so no comment can be made on whether a feature is present at this location. Retained in this gazetteer as a precaution.

5.5.53 Record **70103** is the reported position of a seabed obstruction (UKHO 4557; CANMORE 323019) which reports an obstruction consisting of pipes, tubes and diffusers marking the end of a completed outfall pipe, at a recorded depth of 12.2 m. This record was not directly covered by the Backscatter or MBES datasets. and so no comment can be made on whether a feature is present at this location. Retained in this gazetteer as a precaution for positional purposes.

5.5.54 Record **70104** is the reported location of previously identified debris (NHRE 1618665; HER 30299), comprising a rectangular timber with a metal strip attached with nails. Discovered in 2017 during a nearshore dive inspection whilst carrying out an investigating for potential unexploded ordnance on the North Sea Link Interconnector. It measures 1.20 m x 0.30 m x 0.25 m and remains on the seabed. The discovery was reported via ORPAD. No anomalous features were identified in the Backscatter or MBES data at this location and may have since been buried in the surrounding seabed sediments.

5.6 Maritime Archaeological Potential

Introduction and general historical background

5.6.1 There is potential for discoveries of maritime craft from the Mesolithic to the modern period. Post-medieval and modern wrecks, as they were generally made of more substantial material, are more likely to have been discovered through surveys undertaken by UKHO and others, and thus recorded in the archaeological record. However, there is still potential for discovery of previously unrecorded wreck sites, particularly of wooden wrecks, broken up wrecks or partially buried wrecks that are more difficult to detect through geophysical survey. The key areas of potential are summarised in **Table 10** below.

Table 10 Summary of Maritime Potential for Key Time Periods

Period	Summary
Pre-1500 AD	Low potential for material associated with prehistoric maritime activities. Prehistoric maritime activities include coastal travel, fishing and the exploitation of other marine and coastal resources. Vessels of this period include rafts, hide covered watercraft and log boats.
	Low potential for material associated with later prehistoric maritime activities, including seaworthy watercraft suitable for overseas voyages to facilitate trade and the exploitation of deep water resources. Such remains are likely to comprise larger boat types, including those representing new technologies such as the Bronze Age sewn plank boats which are associated with a growing scale of seafaring activities.
	Low potential for material of Romano-British date, associated with the expansion and diversification of trade with the Continent. Watercraft of this period, where present, may be representative of a distinct shipbuilding tradition known as 'Romano-Celtic'

	shipbuilding, often considered to represent a fusion of Roman and northern European methods.
	Low potential for material associated with coastal and seafaring activity in the 'Dark Ages,' associated with the renewed expansion of trade routes and Germanic and Norse invasion and migration. Vessels of this period may be representative of new shipbuilding traditions such as the technique.
	Low potential for material associated with medieval maritime activity, including that associated with increasing trade between the UK and Europe, the development of established ports around the southern North Sea and the expansion of fishing fleets and the herring industry. Vessels of this period are representative of a shipbuilding industry which encompassed a wide range of vessel types (comprising both larger ships and vernacular boats). Such wrecks may also be representative of new technologies (e.g. the use of flush-laid strakes in construction), developments in propulsion, the development of reliable navigation techniques and the use of ordnance.
1500 to 1815	Medium potential for post-medieval shipwrecks representative of continuing technological advances in the construction, fitting and arming of ships, and in navigation, sailing and steering techniques. Vessels of this period continued to variously represent both the clinker techniques and construction utilising the flush-laid strakes technique.
	Medium potential for post-medieval shipwrecks associated with the expansion of transoceanic communications and the opening up of the New World.
	Medium potential for post-medieval shipwrecks associated with the establishment of the Royal Navy during the Tudor period and the increasing scale of battles at sea.
	Medium potential for post-medieval shipwrecks associated with continuing local trade and marine exploitation including the transport of goods associated with the agricultural revolution.
1816 to 1913	Higher potential for the discovery of shipwrecks associated with the introduction of iron and later steel in shipbuilding techniques. Such vessels may also be representative of other fundamental changes associated with the industrial revolution, particularly with regards to propulsion and the emergence of steam propulsion and the increasing use of paddle and screw propelled vessels.
	Higher potential for the discovery of shipwrecks demonstrating a diverse array of vernacular boat types evolved for use in specific environments.
	Higher potential for wrecks associated with large scale worldwide trade, the fishing industry or coastal maritime activity including marine exploitation.
1914 to 1945	Higher potential for the discovery of shipwrecks associated with the two world wars including both naval vessels and merchant ships. Wrecks of this period may also be associated with the increased shipping responding to the demand to fulfil military requirements. A large number of vessels dating to this period were lost as a result of enemy action.
Post-1946	Potential for wrecks associated with a wide range of maritime activities, including military, commerce, fishing and leisure. Although ships and boats of this period are more numerous, loses decline due to increased safety coupled with the absence of any major hostilities. Vessels dating to this period are predominantly lost as a result of any number of isolated or interrelated factors including human error, adverse weather conditions, collision with other vessels or navigational hazards or mechanical faults.

Recorded Losses

5.6.2 Recorded Losses are records for ships or aircraft that are known to have wrecked or crashed offshore, but for which the exact locations are not known. Recorded Losses are often grouped together by their general area of loss into Maritime Named Locations (displayed spatially as polygons or centre points of polygons, often associated with NRHE data), however many records (particularly from the HER dataset) are given co-ordinates (displayed spatially as points), although these are similarly unsubstantiated.

5.6.3 Recorded Losses can be considered as an indication of the potential for archaeological maritime remains to exist within the Marine Archaeology study area and the type and

number of wrecks that could be present. These records relate to vessels reportedly lost for which no physical wreck remains have ever been identified. There are 24 recorded losses in the Marine Archaeology study area. **Table 11** shows the distribution of these documented losses according to the date of loss for those records whose positions fall within the Marine Archaeology study area. Details regarding these losses are presented in **Annex 4**.

Table 11 Summary of recorded losses by period

Period	Number of recorded losses of ships	Number of recorded losses of aircraft
Post-medieval	1	-
19th century	12	-
Modern	9	-
Unknown	2	-
Total	**24**	**0**

5.6.4 No Recorded Losses are recorded prior to the beginning of the post-medieval period, and while this to some extent could represent a significant increase in shipping during the post medieval period, it could also be a reflection of the improvements in record keeping, and the maintaining of those records, which improved significantly over time.

5.7 Aviation Archaeological Potential

5.7.1 There is potential for the presence of aviation material dating from the early 20th century until more recent times, with a concentration dating to the World Wars and in particular to the Second World War. Discoveries may occur anywhere within the Marine Archaeology study area, but potential may increase nearer the coastlines in the vicinity of coastal defence networks protecting the strategically important military and civil infrastructure on England's east coast.

5.7.2 The North East of England was subject to strategic bombing during the Second World War. Many aircraft were intercepted over the North Sea, with raids carrying on through to 1945. These raids affected all the towns and cities along the East Coast. Although the Marine Archaeology study area lies outside of the areas of highest aircraft activity, the area would still have seen significant activity: shipbuilding facilities in the North East would have been a target for Luftwaffe attack, as would the coastal convoys, and in addition to aircraft defending against this, there would also have been patrol activity, both by Fighter Command and Coastal Command aircraft. As such there is considerable potential for undiscovered aircraft remains to be located in the Marine Archaeology study area.

5.7.3 There were also a significant number of training squadrons and airfields within the wider area, and with loss rates of around 15% from training accidents there is the potential for a wide range of allied aircraft types to be found within the Marine Archaeology study area, in addition to both Allied and Axis losses during combat, and losses from other mishaps.

5.7.4 The key areas of aviation potential that may be uncovered within the Marine Archaeology study area are summarised in Table 12.

Table 12 Summary of Aviation Potential for Key Time Periods

Period	Summary
Pre-1939	Minimum potential for material associated with the early development of aircraft. Aircraft of this period may represent early construction techniques (e.g. those constructed of canvas covered wooden frames) or may be associated with the mass-production of fixed wing aircraft in large numbers during the First World War.

	Minimum potential for material associated with the development of civil aviation during the 1920s and 1930s, associated with the expansion of civilian flight from the UK to a number of European and worldwide destinations.
1939 to 1945	Very high potential for Second World War aviation remains, particularly as the east coast acted as a hub for hostile activity. Aircraft of this period are likely to be representative of technological innovations propelled by the necessities of war which extended the reliability and range of aircraft.
Post-1945	Potential for aviation remains associated with military activities dominated by the Cold War, the evolution of commercial travel and recreational flying and the intensification of offshore industry (including helicopter remains). Aircraft of this period may be representative of advances in aerospace engineering and the development of the jet engine.

Recorded Losses

5.7.5 There are no recorded losses of aircraft in the Marine Archaeology study area (Table 11).

6 MARINE ARCHAEOLOGICAL ASSESSMENT: INTERTIDAL HERITAGE ASSETS

6.1 Introduction

6.1.1 A gazetteer of intertidal heritage assets in included in Annex 5. Their locations are shown in Figure 3. The baseline has been consolidated following an intertidal walkover survey (Section 3.2).

6.2 Data assessment

6.2.1 There is one known sites in the intertidal zone (up to MHWS).

6.2.2 **1003** (Figure 14.4) is the record of a Second World War trench that was located on Cambois Beach. It was one element of numerous 20th century coastal defences along this coast. This was demolished before 1998.

6.2.3 An intertidal walkover survey was conducted on 16 May 2023, within the intertidal zone of the proposed Landfall. No sites or features of archaeological interest were observed during the walkover. One steel wheel was observed (Figure 14.5a-d), along with 12 timber posts (Figure 14.5c-d) aligned with a watercourse, both located just north and south of an existing outflow pipe. These are both considered to be modern and as such are not included in the gazetteer of intertidal heritage assets (Annex 5).

6.3 Potential for heritage assets within the intertidal zone

6.3.1 There is the potential for further unknown heritage assets to be located within the intertidal zone of the Marine Archaeology study area. These assets may be of a maritime nature, relating to coastal infrastructure, or may represent individual finds.

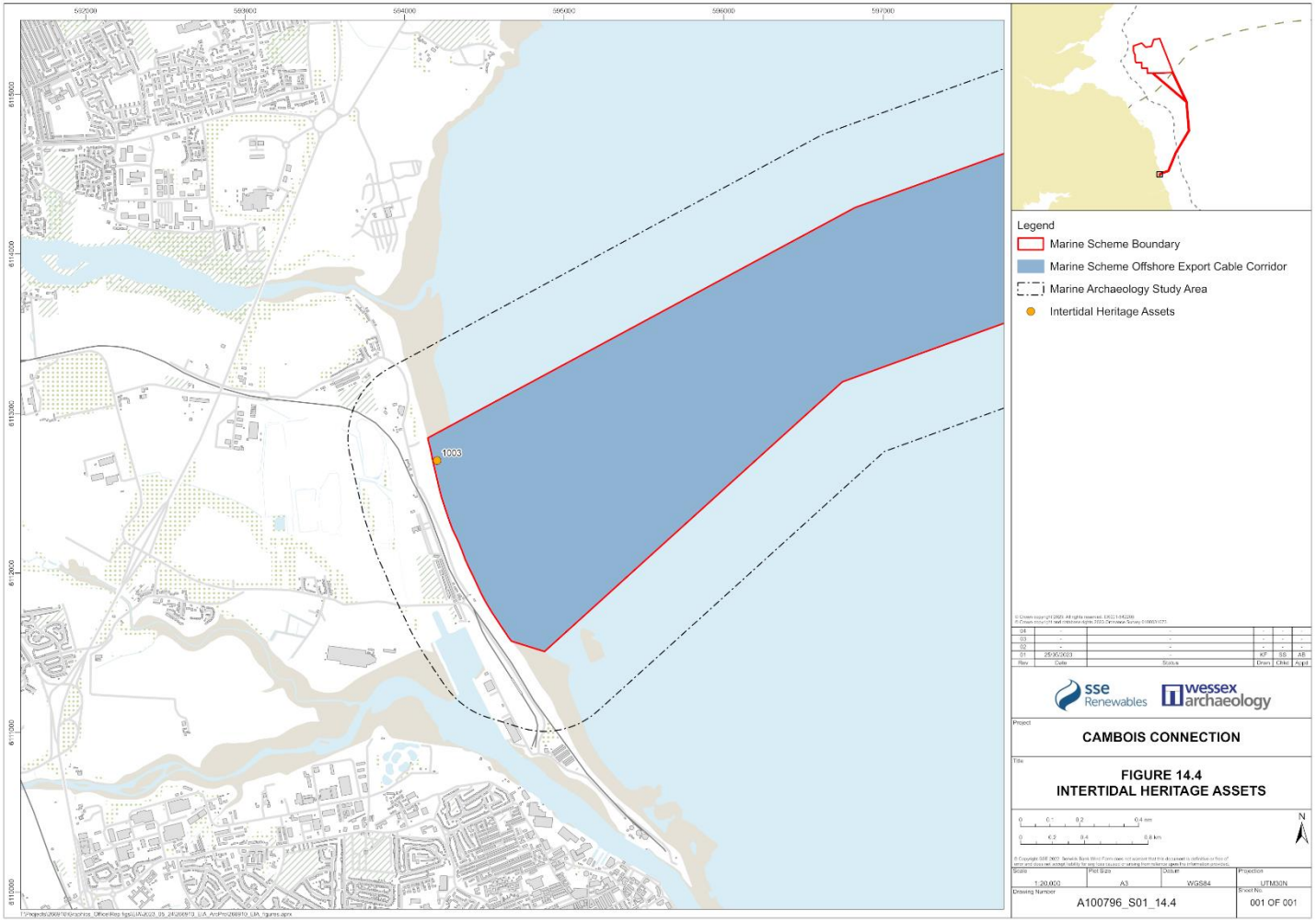

Figure 14.4 Intertidal Heritage Assets

A: Steel wheel observed during walkover survey
(photograph taken facing West)

C: Timber posts observed during walkover survey
(photograph taken facing West)

B: Steel wheel observed during walkover survey
(photograph taken facing West)

D: Timber posts observed during walkover survey, with overflow pipe visible
in the backdrop (photograph taken facing North)

Rev	Date	Status	Drwn	Chkd	Appd
04	-	-	-	-	-
03	-	-	-	-	-
02	-	-	-	-	-
01	25/05/2023	-	KF	SS	AB

Project:
CAMBOIS CONNECTION

Title:
FIGURE 14.5
PHOTOGRAPHS

Scale	Plot Size	Datum	Projection
N/A	A3	N/A	N/A

Drawing Number: A100796_S01_14.5
Sheet No.: 001 OF 001

Figure 14.5 (a-d) Photographs

7 ASSESSMENT OF HISTORIC SEASCAPE CHARACTER

7.1.1 The National Historic Seascape Characterisation Consolidation Project completed assesses and defines areas with HSC types that promote an understanding of historic trends and processes, in so doing it informs the sustainable management of change over time (LUC 2017). This is achieved by splitting the marine zone into five tiered levels: the coastal area (Table 13), the sea surface (Table 14), the pelagic character or water column (Table 15), the benthic character or sea floor (Table 16), and the sub-benthic character or subsea floor (Table 17). The characterisation is GIS based, enabling key characteristics to be identified. The results of the characterisation of each level are summarised in the five following tables.

7.1.2 The known and potential prehistoric, maritime and aviation heritage assets that form part of the HSC have been discussed in the relevant baseline characterisations above. The character descriptions below refer only to the cultural processes which have shaped the historic seascape of the Marine Archaeology study area.

Table 13 Seascape Characterisation – coastal area

Broad Character Types	Character Sub-Types
Communications	Road
Cultural Topography	Dunes Watercourse
Fishing	Bottom trawling Fishing ground Fixed netting Longlining Potting
Industry	Hydrocarbon installation Hydrocarbon pipeline Industrial production (unspecified) Mining (unspecified) Power station (fossil fuel) Renewable energy installation (wind)
Navigation	Navigation route Submerged rocks Wreck hazard
Ports and Docks	Harbour
Recreation	Holiday park Leisure beach Leisure sailing
Settlement	Urban settlement Village

Table 14 Seascape Characterisation – sea surface

Broad Character Types	Character Sub-Types
Fishing	Bottom trawling

	Fishing ground Fixed netting Longlining Seine netting Submerged rocks Wreck hazard
Industry	Hydrocarbon installation Renewable energy installation (wind)
Ports and Docks	Harbour
Navigation	Dredged channel/area Navigation route
Recreation	Leisure sailing

Table 15 Seascape Characterisation – water column

Broad Character Types	**Character Sub-Types**
Fishing	Bottom trawling Fishing ground Fixed netting Longlining Seine netting
Industry	Hydrocarbon installation Renewable energy installation (wind)
Navigation	Dredged channel/area Submerged rocks Wreck hazard
Ports and Docks	Harbour

Table 16 Seascape Characterisation – sea floor

Broad Character Types	**Character Sub-Types**
Cultural Topography	Coarse sediment plains Fine sediment plains Mixed sediment plains Mud plains
Fishing	Bottom trawling Potting
Industry	Hydrocarbon installation Hydrocarbon pipeline Renewable energy installation (wind) Spoil and waste dumping
Navigation	Submerged rocks Wreck hazard

Table 17 Seascape Characterisation – sub-sea floor

Broad Character Types	**Character Sub-Types**
Cultural Topography	Coarse sediment plains Fine sediment plains Mixed sediment plains Mud plains
Fishing	Bottom trawling
Industry	Hydrocarbon installation Hydrocarbon pipeline Renewable energy installation (wind)

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ANNEXES

Annex 1: Terminology

Glossary

Archaeological interest	There will be archaeological interest in a heritage asset if it holds, or potentially may hold, evidence of past human activity worthy of expert investigation at some point. Heritage assets with archaeological interest are the primary source of evidence about the substance and evolution of places, and of the people and cultures that made them.
Conservation	The process of maintaining and managing change to a heritage asset in a way that sustains and, where appropriate, enhances its significance.
Designated heritage assets	World Heritage Sites, Scheduled Monuments, Listed Buildings, Protected Wreck Sites, Registered Park and Gardens, Registered Battlefields and Conservation Areas designated under the relevant legislation.
Heritage asset	A building monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. Heritage assets include designated heritage assets and assets identified by the local planning authority (including local listing).
Historic environment	All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora.
Historic environment record	Information services that seek to provide access to comprehensive and dynamic resources relating to the historic environment of a defined geographic area for public benefit and use.
Setting of a heritage asset	The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.
Significance	The value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.
Value	An aspect of worth or importance.

Chronology
Where referred to in the text, the main archaeological periods are broadly defined by the following date ranges:

Prehistoric		**Historic**	
Palaeolithic	970,000 – 9500 BCE	**Romano-British**	AD 43 – 410
Lower Palaeolithic	970,000 – 300,000 BCE	**Saxon**	AD 410 – 1066
Middle Palaeolithic	300,000 – 40,000 BCE	**Medieval**	AD 1066 – 1500
Upper Palaeolithic	40,000 – 10,000 BCE	**Post-medieval**	AD 1500 – 1800
Late Upper Palaeolithic	12,000 – 9500 BCE	**19th Century**	AD 1800 – 1899
Early Post-glacial	9500 – 8500 BCE	**Modern**	1900 – present day
Mesolithic	8500 – 4000 BCE		
Neolithic	4000 – 2400 BCE		
Bronze Age	2400 – 700 BCE		
Iron Age	700 BCE – AD 43		

Annex 2: Legislation

Designated Heritage Assets[2]

Designation	Associated Legislation	Overview
World Heritage Sites	-	The UNESCO World Heritage Committee inscribes World Heritage Sites for their Outstanding Universal Value (OUV) – *cultural and/ or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity.* England protects its World Heritage Sites and their settings, including any buffer zones or equivalent, through the statutory designation process and through the planning system. The National Planning Policy Framework sets out detailed policies for the conservation and enhancement of the historic environment, including World Heritage Sites, through both plan-making and decision-taking.
Scheduled Monuments and Areas of Archaeological Importance	*Ancient Monuments and Archaeological Areas Act* 1979	Under the *Ancient Monuments and Archaeological Areas Act* 1979, the Secretary of State (DCMS) can schedule any site which appears to be of national importance because of its historic, architectural, traditional, artistic or archaeological interest. The historic town centres of Canterbury, Chester, Exeter, Hereford and York have been designated as Archaeological Areas of Importance under Part II of the *Ancient Monuments and Archaeological Areas Act* 1979. Additional controls are placed upon works affecting Scheduled Monuments and Areas of Archaeological Importance under the Act. The consent of the Secretary of State (DCMS), as advised by Historic England, is required for certain works affecting Scheduled Monuments.
Listed Buildings	*Planning (Listed Buildings and Conservation Areas) Act* 1990	In England, under Section 1 of the *Planning (Listed Buildings and Conservation Areas) Act* 1990, the Secretary of State is required to compile lists of buildings of special architectural or historic interest, on advice from English Heritage/ Historic England. Works affecting Listed Buildings are subject to additional planning controls administered by Local Planning Authorities. Historic England is a statutory consultee in certain works affecting Listed Buildings. Under certain circumstances, Listed Building Consent is required for works affecting Listed Buildings.

[2] As the Marine Archaeology study area covers to MHWS, terrestrial designations and relevant legislation have been included in the table for completeness.

Designation	Associated Legislation	Overview
Conservation Areas	*Planning (Listed Buildings and Conservation Areas) Act* 1990	A Conservation Area is an area which has been designated because of its special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance. In most cases, Conservation Areas are designated by Local Planning Authorities. Section 72 (1) of the *Planning (Listed Buildings and Conservation Areas) Act* 1990 requires authorities to have regard to the fact that there is a Conservation Area when exercising any of their functions under the Planning Acts and to pay special attention to the desirability of preserving or enhancing the character or appearance of Conservation Areas. Although a locally administered designation, Conservation Areas may nevertheless be of national importance and significant developments within a Conservation Area are referred to Historic England.
Registered Parks and Gardens and Registered Battlefields	*National Heritage Act* 1983	The Register of Parks and Gardens was established under the *National Heritage Act* 1983. The Battlefields Register was established in 1995. Both Registers are administered by Historic England. These designations are non-statutory but are, nevertheless, material considerations in the planning process. Historic England and The Garden's Trust (formerly known as The Garden History Society) are statutory consultees in works affecting Registered Parks and Gardens
Protected Wreck Sites	*Protection of Wrecks Act* 1973	The *Protection of Wrecks Act* 1973 allows the Secretary of State to designate a restricted area around a wreck to prevent uncontrolled interference. These statutorily protected areas are likely to contain the remains of a vessel, or its contents, which are of historical, artistic or archaeological importance.
Protected Places and Controlled Sites	*Protection of Military Remains Act 1986*	The *Protection of Military Remains Act* 1986 provides protection for designated military vessels and for all aircraft that crashed while in military service. The Act provides two types of protection: Protected Places (wrecks designated by name and can be designated even if the location of the site is not known) and Controlled Sites (sites designated by location – covers wrecks within the last 200 years). It is illegal to disturb sites or remove anything from sites. Protected Places can be visited by divers, but the rule is look but do not touch. For Controlled Sites it is illegal to conduct any operations (including diving or excavation) within the Controlled Site unless licensed to do so by the Ministry of Defence.
Historic Marine Protected Areas	Marine (Scotland) Act 2010	The *Marine (Scotland) Act 2010* allows the protection of 'a marine historic asset of national importance located, or believed to be located, in the area'.

Other relevant legislation

Legislation	Overview
Merchant Shipping Act 1995	This Act sets out the procedures for determining the ownership of underwater finds that turn out to be 'wreck,' defined as any flotsam, jetsam, derelict and lagan found in or on the shores of the sea or any tidal water. It includes ship, aircraft, hovercraft, parts of these, their cargo or equipment. If any such finds are brought ashore, the salvor is required to give notice to the Receiver of Wreck. This Act is administered by the Maritime and Coastguard Agency.
Marine and Coastal Access Act 2009 (Marine Policy Statement 2011)	Marine licensing and marine planning made the responsibility of the Marine Management Organisation (MMO). England's inshore and offshore waters have been divided into 11 plan areas, for which marine plans are being produced by the MMO.
UNESCO Convention on the Protection of the Underwater Cultural Heritage	The UNESCO Convention was concluded in 2001, and is a comprehensive attempt to codify the law internationally, with regards to underwater cultural heritage. The UK abstained in the vote on the final draft of the Convention, however it has stated that it has adopted the Annex of the Convention, which governs the conduct of archaeological investigations, as best practice for archaeology. Although the UK is not a signatory, the Convention entered into force on 2nd January 2009, having been signed or ratified by 20 member states.

Annex 3: Gazetteers

Palaeogeographic Features of Archaeological Potential

ID	Classification	Archaeological discrimination	Depth range (mBSB)		Description	Anomaly type	Dataset	Section	Jurisdiction
			From	To					
75000	Dune feature	U1	0.5	3.5	Top of a possible sand dune feature. Identified as two, possibly three mounds, overlying interpreted till which may form an old land surface. Some evidence of cross cutting, although this is uncertain. The fill of the possible dune is generally unstructured. Feature is overlain by a more chaotic unit interpreted as sands. Possibly indicative of terrestrial land formations, however, may also be subaqueous in formation.	SBP	SBP_L05	L05	English Offshore Waters
75001	Cut and fill	P2	1.1	3.3	Narrow, shallow cut and fill into a slope of interpreted till with faint non-uniform fill. Feature has a relatively faint basal reflector and acoustically unstructured fill. Overlain by a unit characterised by parallel reflectors which possibly represent Unit 4a. May be an internal till feature but has the potential of being remnant of a fluvial feature and so has been retained as a precaution.	SBP	SBP_L05	L05	English Offshore Waters
75002	Cut and fill	P2	1.0	5.1	Possible cut and fill identified cutting into interpreted till. Feature has a relatively distinct basal reflector and generally acoustically chaotic fill with some occasional sub-horizontal reflectors. Overlain by an acoustically chaotic deposit interpreted as sands in the south-west, may be overlain by a layer of till in the north-east, but this is uncertain. Only definitively seen on two lines and may extend further WNW and ESE, but extents not visible in the data so this is uncertain. May be an internal feature within the till; however, has the potential of being remnant of a fluvial feature and so has been retained as a precaution.	SBP	SBP_L12	L12	English Offshore Waters
75003	Cut and fill	P2	0.7	1.4	Possible cut and fill with a relatively distinct basal reflector, identified cutting into interpreted till. Overlain by a more chaotic unit interpreted as sand. May be an internal feature within the till; however, has the potential of being remnant of a fluvial feature and so has been retained as a precaution.	SBP	SBP_L15	L15	English Inshore Waters

Seabed Features of Archaeological Potential

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70039	Wreck	618257	6204025	A1	61.4	24.8	5.0	A large, irregular but generally compact area of mounds of varying shapes and sizes identified in the MBES data. Interpreted as a fairly constrained but well degraded wreck. It lies at a general depth of -61.5 m and is aligned north-east to south-west. The mounds are generally small, irregular and low-lying, though taller mounds are visible at the north-east, central and south-west extents. The central area contains two larger elongate mounds, the largest measuring 14.5 x 6.0 x 1.5 m. The tallest mound is visible at the south-west end, measuring approximately 12.0 x 7.0 x 5.4 m, and has an irregular form which may indicate individual sections. There is a slight surrounding scour within the surrounding sediments which extends primarily to the north-east, and some possible small surrounding mounds along the western and eastern edges, which may indicate potential for further debris. The wreck has also been identified in the Backscatter data, although is somewhat affected by the nadir. It appears as a large, elongate seabed disturbance comprising dark and bright reflectors with a defined south-western edge but no obvious internal structure. This wreck has a corresponding UKHO record (65638) which reports an unknown well broken and degraded wreck last examined in 2005. Recorded at a general depth of 61.8 m with measurements of 58 x 25 x 5.7 m. These measurements differ from those recorded in the MBES dataset, and the decreased height and increased length may indicate the wreck is collapsing further and spreading within the surrounding sediments.	MBES, Backscatter, Historic record	MBES_L07, Backscatter_L07	L07	English Offshore Waters	UKHO 65638, Canmore 324106

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70041	Debris	618832	6202931	A1	20.4	8.0	2.2	An elongate and irregular mound, identified in the MBES data, on a north-east to south-west alignment and with multiple peaks, which may indicate separate sections or structure. The north-east end appears to be wider than the south-west end, bulging out in a subrounded mound that is 4.8 x 5.1 x 2.2 m. The south-west end appears to be low-lying with an upstanding peak with a similar height at the very south-west extents. Data is missing on the very south-west end of the anomaly which may impact interpretation. Some slight scour is visible around the very southern end. Identified in the Backscatter data as a distinct, elongate feature comprising dark and bright reflectors. Another anomaly, **70042**, is located approximately 70 m to the south-east on a similar alignment. The surrounding area is clear with some areas of possible mobile seabed sediment. Interpreted as a possible significant piece of debris.	MBES, Backscatter	MBES_L07, Backscatter_L07	L07	English Offshore Waters	-
70056	Wreck	625250	6181920	A1	38.0	8.0	2.6	A distinct rectangular mound with an irregular internal composition, lying on a north-east to south-west alignment in the MBES data, and interpreted as a wreck. There is some data missing over the centre which may have removed some important features. It is not clear which end is the bow and which is the stern, but the south-west end is tentatively more pointed. The wreck appears most prominent at the north-east end, with the south-west end more low-lying, which may indicate it is more broken-up or degraded here or is partially buried in surrounding sediments. The lowest point is at 12.5 m from the south-west end and is 0.6 m tall. The tallest point is 2.6 m at 21 m from the south-west edge towards the centre. There is some encircling scour, visible predominantly to the south and west, and also visible along the northern edge. Some possible mounds are visible at the northern edge which may represent associated debris. There also appears to be some sediment build-up around the scour at the south-west end which may obscure additional debris. Also identified in the backscatter dataset as a distinct, compact, elongate area of dark and bright reflectors with no obvious structure discernible. This wreck has a corresponding UKHO record (65637) which reports it to be the British trawler *Acantha* (Possibly). Recorded in Lloyds War Losses WWI as sunk on 5 September 1919 after being torpedoed, however it seems to have actually sunk on 5 April 1915 (Anon. 1915; Canmore 324137). It was lasted surveyed in 2005 and located at a general depth of 79.2 m with recorded measurements of 43.0 x 16.0 x 5.5 m, and was reported to be intact though collapsed. These measurements differ from those recorded in the MBES dataset, and the decreased height and width may indicate the wreck is collapsing further and becoming buried within the surrounding sediments.	MBES, Backscatter, Historic record	MBES_L12, Backscatter_L12	L12	English Offshore Waters	UKHO 65637; CANMORE 324105
70074	Wreck	621115	6150451	A1	78.6	14.6	6.4	A distinct elliptical mound identified in the MBES data, aligned generally north to south, and interpreted as a wreck. A more pointed end is visible to the north and a more angular end at the south, suggesting that this is the bow and stern respectively, although this cannot be certain. The southern end is also more irregular suggesting that there is damage in that area. The centre the wreck is slightly raised, and there appears to be generally angular holes along the top, indicating the appearance of structure. There are small amounts of data missing over the anomaly which may have removed some features. There appears to be scouring along each side, with some slight sediment build-up at the north and southern extents. The wreck appears generally intact with no obvious surrounding debris. Also identified in the backscatter data as an elongate but compact area of dark and bright reflectors, with a defined edge, indicating the hull outline. This wreck has a corresponding UKHO record (4370), which reports the location of an unknown wreck, last examined in 1999. The wreck was located at a general depth of 97 m, with recorded measurements of 78 x 12 x 8 m. The wreck was last reported to be intact and upright, with superstructure visible, which appears generally consistent with its appearance in the 2022 datasets.	MBES, Backscatter, Historic record	MBES_L12, Backscatter_L12	L12	English Offshore Waters	UKHO 4370; CANMORE 322869

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70083	Wreck	608138	6124628	A1	50.0	7.3	1.5	A large, compact elliptical mound with multiple peaks and steep sloped sides identified in the MBES dataset. The feature is on a northeast - southwest alignment and there are no nearby similar seabed features. There is an associated scour visible around the north-eastern tip, and no associate debris fields have been identified. The feature is only partially covered by the MBES data and, as such, the dimensions recorded here should be considered a minimum. Partially covered by Backscatter data and visible as an indistinct area of seabed disturbance. There are multiple records associated with this feature, and it is recorded in the UKHO database as a non-dangerous wreck. The wreck was last examined in 2000 at a general depth of 58 m, measuring 46.0 m in length and 14.0 m wide. No debris was associated with the site, and it was recorded as being intact and probably upright. The wreck is believed to be identified as HMS *Herring*, which sank on 22 April 1943, by the NRHE.	MBES, Historic record	MBES_L15	L15	English Inshore Waters	UKHO 58047, Canmore 323761, NHRE 1001479, HER 255559
70086	Wreck	607082	6123128	A1	78.0	15.0	8.7	A large, compact elliptical mound identified in both the MBES and Backscatter datasets and interpreted as a wreck. The wreck is aligned east-west, and the western end appears more pointed which possibly indicates it is the bow. The wreck appears to be relatively intact in the centre and towards the western end with possible superstructure visible, although appears to be severely degraded, broken-up or collapsed at the eastern extents. There is a scour around entire wreck, although this appears more pronounced at the western end, where it measures approx. 20.0 x 9.0 x -2.0 m. There is no nearby debris visible. There is possible sediment accumulation at the south-eastern end and around the scour, which has the potential to contain further buried debris. The wreck has multiple records associated with it; the UKHO record describes it as the British steamship *Svava*. This was built in 1904 by Kjobenhavens Flydedok & Skinsveart, and owned at the time of loss by the Ministry of Transport (S. Marshall & Co.). The ship sank after collisions with the *Fort Beausejoir* en route from Warworth to Thames with a cargo of coal on 10 March 1943. It was last surveyed in 2000 at a general depth of 52 m, and measured 74.0 m in length and 12.0 m wide. It was recorded as being intact, upright, and with superstructure visible.	MBES, Backscatter, Historic record	MBES_L15, Backscatter_L15	L15	English Inshore Waters	UKHO 4341, Canmore 322840, NRHE 1001478, HER 25597
70087	Wreck	606278	6121968	A1	57.0	15.0	3.5	A large, elongate mound, aligned ENE-WSW identified in the MBES and Backscatter datasets and interpreted as wreck. Both ends of the wreck are relatively pointed, with the ENE end being slightly wider. A small, irregular mound protrudes approximately 2.4 x 2.0 x 3.0 m out of the central section of its southern side. The feature appears to be relatively intact, and has an appearance consistent with that of a submarine, lying on its side. Slight scour is present around the entire wreck, and no additional debris fields or individual pieces of debris were identified. The wreck is present within numerous records, and the UKHO record it as probably the British submarine HMSM *Unity*. The submarine was constructed from steel with diesel engines and commissioned by Vickers Armstrong in 1938, and was lost on 29 April 1940 due to a collision with SS *Atle Jarl* 6.5 miles off Newbiggin-by-the-sea during a North Sea patrol. The UKHO lists this record as a non-dangerous wreck. The site was last surveyed in 2000, located at a general depth of 50 m, measuring 54.0 m in length and 9.0 m wide. No debris was previously identified associated with the wreck, and it was thought to be intact and lying on its side.	MBES, Backscatter, Historic record	MBES_L15, Backscatter_L15	L15	English Inshore Waters	UKHO 4334

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70040	Depression	618329	6204021	A2_h	16.0	6.9	-0.3	A large, elongate depression identified in the MBES dataset. There is possibly a slight mound in the bottom of it, although this is unclear, which may indicate a possible object. Located 57 m east of wreck **70039**, and may be related. There is no anomalous feature identified in the backscatter data at this location. The surrounding area is clear with some areas of possible mobile seabed sediment. May indicate sediment disturbance around buried, or partially buried, debris.	MBES	MBES_L07	L07	English Offshore Waters	-
70105	Linear debris	595566	6113083	A2_h	390.1	2.1	-0.1	A seabed disturbance identified in the MBES data comprising a series (at least 14) of regularly spaced rounded depressions, each approximately 2.1 m in diameter, on a NNW/SSE alignment. Tentatively visible in the Backscatter data as multiple small bright reflectors on a linear alignment. Interpreted as a possible long length of linear debris, and potentially fishing gear, but this cannot be confirmed without visual inspection.	MBES	MBES_L16	L16	English Inshore Waters	-
70106	Linear debris	595343	6113032	A2_h	427.0	4.1	-0.3	A seabed disturbance identified in the MBES data comprising a series (at least 16) of regularly spaced rounded depressions, each approximately 4.1 m in diameter, on a NNW/SSE alignment. Also identified in the Backscatter data as a distinct linear alignment of small bright reflectors. Interpreted as a possible long length of linear debris, and potentially fishing gear, but this cannot be confirmed without visual inspection.	MBES, Backscatter	MBES_L16, Backscatter_L16	L16	English Inshore Waters	-
70108	Debris field	594531	6112676	A2_h	10.5	3.5	0.5	A debris field identified in the MBES data as a distinct, sub-angular mound, measuring 4.3 x 3.5 x 0.5 m, with a thin, straight linear mound extending 6 m from the southern end of the larger feature to the WSW with a further small rounded mound at the end (1.3 x 1.3 x 0.5 m). The larger mound appears to have four outer peaks and a central peak within a slight scour and may be one large object with varying height or several closely-spaced smaller objects. Also identified in the Backscatter data as a distinct rounded, bright reflector surrounded by a thin, dark reflector. The linear feature and smaller mound are not visible. The feature is isolated within a generally featureless seabed. Interpreted as a possible debris field.	MBES, Backscatter	MBES_L16, Backscatter_L16	L16	English Inshore Waters	-
70000	Dark reflector	599327	6212844	A2_l	3.0	2.0	-	A small sub-angular dark reflector with possible bright reflector indicating scour identified in the Backscatter data. Located on the nadir visible in the data and could be a data artefact. No anomalous features were identified in the MBES data at this location. May be a data artefact but may also be a possible natural feature or may be possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70001	Dark reflector	600332	6212677	A2_l	7.0	5.0	-	An irregular dark reflector, slightly darker than the surrounding seabed, identified in the Backscatter data. Visible as a distinct depression in the MBES data. Interpreted as a possible natural feature or may be possible debris within a depression/scour.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70002	Mound	599881	6212071	A2_l	3.0	2.5	0.1	A rounded mound within a rounded depression identified in the MBES data. Also identified in the Backscatter data as an elongate, dark reflector. Interpreted as a possible natural feature or may be possible debris within a depression/scour.	MBES, Backscatter	Backscatter_L05, MBES_L05	L05	English Offshore Waters	-
70003	Mound	600788	6212365	A2_l	5.0	1.5	0.3	A small angular area with multiple peaks, within a wide elongate depression (0.7 m deep), identified in the MBES data. Also identified in the Backscatter dataset as a sub-rounded bright reflector. No similar features nearby. Interpreted as a possible natural feature or may be possible debris within a depression/scour.	MBES, Backscatter	Backscatter_L05, MBES_L05	L05	English Offshore Waters	-

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70004	Mound	600936	6212122	A2_l	2.0	2.0	0.1	A rounded mound with a sharp peak in a depression -0.4 m deep identified in the MBES data. Also identified in the Backscatter dataset as a very small, rounded bright reflector with diffuse edges. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	Backscatter_L05, MBES_L05	L05	English Offshore Waters	-
70005	Dark reflector	601561	6211843	A2_l	3.0	1.0	-	An elongate dark reflector with surrounding sediment disturbance identified in the Backscatter data. Observed in the MBES data as a small mound. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70006	Dark reflector	601334	6211621	A2_l	5.0	4.0	-	A faint curved edge of a dark reflector with flaring bright reflector to south which may indicate possible scour, as identified in the Backscatter data. Associated with an elongate depression visible in the MBES data. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70007	Bright reflector	601985	6211418	A2_l	13.0	4.0	-	An elongate bright reflector with some possible scour identified in the Backscatter dataset. A small, elongate depression is visible in the MBES data at this location. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70008	Mound	601699	6210499	A2_l	4.0	3.9	0.7	A sub-rounded mound with regular sides in a small depression as identified in the MBES data. Located in an area of mobile seabed sediment. Also identified in the Backscatter data set as a sub-rounded dark reflector. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L05, Backscatter_L05	L05	English Offshore Waters	-
70009	Dark reflector	602336	6210390	A2_l	4.0	3.0	-	A sub-angular dark reflector with some encircling bright reflector as identified in the Backscatter data. Located on the nadir visible in the data and could be a data artefact. No anomalous features were identified in the MBES data at this location. May be a data artefact or could be a possible natural feature or possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70010	Mound	602925	6210506	A2_l	5.0	4.0	0.4	An elongate mound located within an isolated depression as identified in the MBES data. Also identified in the Backscatter data as a sub-rounded dark reflector with some possible scour to the north-west. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	Backscatter_L05, MBES_L05	L05	English Offshore Waters	-
70011	Dark reflector	603050	6210061	A2_l	4.0	4.0	-	A small sub-rounded dark reflector with corresponding bright reflector and possible scouring to south identified in the Backscatter data. Also visible in the MBES data as slight mound within an isolated depression. Interpreted as a possible natural feature or may be possible debris within a depression/scour.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70012	Seabed disturbance	603212	6210140	A2_l	14.0	13.0	-	Seabed disturbance made up of two sub-angular dark reflectors. One approximately 11 x 3 m, the other 7 x 4 m. Located on the nadir visible in the Backscatter data, but also identified as an area of possible disturbance in the MBES data. Interpreted as a possible natural feature or may indicate possible debris buried just below the surface.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70013	Bright reflector	603425	6210036	A2_l	11.0	5.0	-	An elongate bright reflector with a dark reflector in centre, identified in the Backscatter data. Tentatively observed in the MBES data as a mound in a depression. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70014	Dark reflector	604153	6209328	A2_l	5.0	4.0	-	A sub-rounded dark reflector with a neighbouring bright reflector, identified in the Backscatter data. Also visible in the MBES data as sub-rounded depression. Interpreted as possible natural feature or may be possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70015	Bright reflector	604374	6209140	A2_I	12.0	5.0	-	An elongate bright reflector, aligned north to south, identified in the Backscatter data and visible in the MBES dataset as a sub-rounded mound within a depression. Interpreted as possible natural feature or may be possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70016	Bright reflector	605523	6208044	A2_I	12.0	7.0	-	A sub-rounded reflector, slightly lighter than the surrounding seabed, identified in the Backscatter data. Also observed in the MBES data as an elongate depression, anomalous to the seabed patterning visible to the west. Interpreted as a possible natural feature or may be possible debris within a depression/scour.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70017	Bright reflector	607437	6206683	A2_I	15.0	6.0	-	A large, elongate bright reflector identified in the Backscatter data. Also visible in the MBES data as a small mound within a depression, with a short scour extending to the SSE. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70018	Seabed disturbance	608075	6205788	A2_I	37.9	22.7	0.5	A seabed disturbance comprising a large, irregular area of bright reflector identified in the Backscatter dataset. Also identified in the MBES data as a pair of large, sub-rounded mounds with rounded peaks, surrounded by slight scour. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	Backscatter_L05, MBES_L05	L05	English Offshore Waters	-
70019	Dark reflector	608250	6205854	A2_I	11.0	5.0	-	An elongate dark reflector identified in the Backscatter dataset. Located on the nadir and could be a data artefact. No anomalous features were identified in the MBES data at this location. May be a data artefact or could be a possible natural feature or possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70020	Seabed disturbance	613354	6200619	A2_I	31.0	16.0	0.2	An irregular, relatively flat area of data different in appearance to the surrounding seabed identified in the MBES data. No similar seabed features nearby. May be a data artefact, but appears crossing the background artefacts in the data. No anomalous features were identified in the Backscatter data at this location. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L05	L05	English Offshore Waters	-
70021	Dark reflector	616234	6198190	A2_I	15.0	5.0	-	An isolated, elongate dark reflector with possible sediment disturbance to north, identified in the Backscatter data. No anomalous features were identified in the MBES dataset at this location. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70023	Dark reflector	621079	6194100	A2_I	4.0	3.0	-	A small, sub-rounded bright reflector identified in the Backscatter data. Tentatively observed as a small mound within a scour in the MBES dataset. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L05	L05	English Offshore Waters	-
70024	Dark reflector	608443	6224245	A2_I	6.0	5.0	-	Indistinct sub circular feature identified in the Backscatter data adjacent to the nadir, with a possible scour on the southern side. A small mound within a slight scour is visible in the MBES data at this location. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L07	L07	English Offshore Waters	-
70025	Mound	608595	6224292	A2_I	2.9	2.2	0.3	A small rounded mound in a depression identified in the MBES data. Also identified in the Backscatter data as a small indistinct dark reflector with a slight scour. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L07, Backscatter_L07	L07	English Offshore Waters	-
70026	Dark reflector	608918	6223218	A2_I	4.0	2.0	-	Indistinct sub-angular dark reflector with possible scour adjacent to nadir in the Backscatter data. Visible as a small distinct mound within scour in the MBES data. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L07	L07	English Offshore Waters	-

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70027	Mound	609904	6222259	A2_l	5.8	3.5	0.2	A small rounded mound at the base of a wider depression (-0.4 m deep) identified in the MBES dataset. The feature is deeper and more irregular than surrounding depressions. Also identified in the Backscatter data as a large diffuse seabed disturbance with an irregular shape measuring 29 x 10 m. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L07, Backscatter_L07	L07	English Offshore Waters	-
70028	Depression	611023	6220857	A2_l	16.5	9.5	-0.3	A large elongate depression with a possible linear mound at the base, identified in the MBES dataset. Visible in the Backscatter data as a straight linear dark reflector with possible scour. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L07	L07	English Offshore Waters	-
70029	Dark reflector	610492	6219913	A2_l	2.0	2.0	-	A small but distinct dark reflector identified adjacent to the nadir in the Backscatter dataset. A small mound is visible in the MBES data at this location. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L07	L07	English Offshore Waters	-
70030	Dark reflector	610656	6219538	A2_l	5.0	4.0	-	Indistinct sub circular reflector with a possible scour to the south identified in the Backscatter data. A small elongate depression visible in the MBES data at this location. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L07	L07	English Offshore Waters	-
70031	Mound	611108	6219490	A2_l	4.5	4.1	0.2	An isolated, rounded mound within a depression, identified in the MBES data. Also identified in the Backscatter data as a distinct sub-oval dark reflector with diffuse edges located on top of the nadir. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L07, Backscatter_L07	L07	English Offshore Waters	-
70032	Dark reflector	612189	6217730	A2_l	8.0	6.0	-	Distinct sub-rounded feature identified in the Backscatter data. Located at the position of a small mound in the MBES data. The surrounding area is clear and surrounded by possible mobile seabed sediment. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L07	L07	English Offshore Waters	-
70033	Dark reflector	612551	6217628	A2_l	9.0	8.0	-	Large, distinct, approximately oval dark reflector with a slight scour identified alongside the nadir in the Backscatter data. A mound with a scour is also visible in the MBES data at this location. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L07	L07	English Offshore Waters	-
70034	Dark reflector	612690	6217365	A2_l	5.0	4.0	-	Distinct approximately oval dark reflector position located on the nadir identified in the Backscatter data. There are no anomalous features identified in the MBES data at this location. The surrounding area is clear and surrounded by possible mobile seabed sediment. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L07	L07	English Offshore Waters	-
70035	Mound	611864	6217049	A2_l	2.0	2.0	0.3	An isolated, rounded mound within a distinct scour identified in the MBES data. The mound itself is not clearly visible in the Backscatter data, but there are several linear dark reflectors radiating out from its location, indicating a wider seabed disturbance. This could be caused by an anchor or mooring point with loose rope or chain. There are no charted features at this location. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L07	L07	English Offshore Waters	-
70036	Mound	614991	6211548	A2_l	4.5	4.0	0.4	A distinct, rounded mound within a slight scour identified in the MBES data. A small dark reflector is visible in the Backscatter data at this location within an area of natural seabed variation. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L07	L07	English Offshore Waters	-
70037	Mound	615690	6208973	A2_l	4.0	3.8	0.3	An elongate mound within slight scour, identified in the MBES data. Also visible in the Backscatter data as a small elongate bright reflector within an area of interpreted mobile sediment. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L07	L07	English Offshore Waters	-

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70038	Mound	618240	6204481	A2_I	5.0	4.1	1.5	An irregular mound with irregular sides within some encircling scour up to -0.4 m, identified in the MBES data. Visible as an area of irregular low seabed reflectivity in the Backscatter data. The surrounding seabed is clear with some areas of possible mobile seabed sediment. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L07	L07	English Offshore Waters	-
70042	Dark reflector	618883	6202871	A2_I	14.0	3.0	-	A distinct elongate feature, aligned ENE to WSW and comprising dark and bright reflectors, identified in the Backscatter data. Also visible in the MBES data as an elongate depression with some small mounds visible at the ENE end. The feature is located approximately 70 m south-east of possible debris **70041**. The surrounding area is clear with some areas of possible mobile seabed sediment. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L07	L07	English Offshore Waters	-
70043	Seabed disturbance	619850	6202403	A2_I	32.0	16.0	-	Distinct irregular area of dark and bright reflectors identified in the Backscatter data. The feature is approximately sub-angular with a possible bright reflector or scour extending from the nadir to the south west. There are no anomalous features identified in the MBES data at this location, although there is some slight seabed variation. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L07	L07	English Offshore Waters	-
70044	Mound	624446	6192140	A2_I	2.4	2.0	0.6	A sub-circular mound with steep varying sides and a slightly pointed top identified in the MBES data. No anomalous features were identified in the backscatter data at this location. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L12	L12	English Offshore Waters	-
70045	Mound	624551	6191522	A2_I	4.6	3.1	0.7	A slightly elongate and irregular mound identified in the MBES data. Tentatively visible in the backscatter data as an isolated, sub-rounded bright reflector. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L12, Backscatter_L12	L12	English Offshore Waters	-
70046	Depression	624586	6191134	A2_I	7.8	4.6	-0.6	A distinct rounded depression identified in the MBES data. Also identified in the backscatter data as an irregular bright reflector. Located 35 m north of similar anomaly **70047**. Interpreted as a possible natural feature or may indicate presence of possible debris.	MBES, Backscatter	MBES_L12, Backscatter_L12	L12	English Offshore Waters	-
70047	Bright reflector	624591	6191099	A2_I	5.0	3.0	-	A distinct elongate bright reflector identified in the backscatter data. Tentatively observed in the MBES data as an elongate depression. Located 35 m south of similar anomaly **70046**. Interpreted as a possible natural feature or may indicate presence of possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70048	Dark reflector	623971	6189131	A2_I	2.0	2.0	-	An isolated, small round dark reflector identified in the backscatter data. Tentatively observed in the MBES data as a small, rounded mound. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70049	Mound	624543	6189130	A2_I	5.0	2.1	0.8	An elongate, ridged and possibly segmented, mound within surrounding scour identified in the MBES data. Identified as a distinct, elongate sub-angular bright reflector (measuring 12.0 x 9.0 m) in the backscatter data. This feature is situated 21 m north-east of anomaly **70050**. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L12, Backscatter_L12	L12	English Offshore Waters	-
70050	Mound	624529	6189110	A2_I	5.2	3.1	0.1	A low-lying elongate mound identified in the MBES data on the edge of a large, irregular scour. Identified in the backscatter as a distinct, irregular bright reflector measuring 10.0 x 9.0 m. Located 21 m south-west of anomaly **70049**. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L12, Backscatter_L13	L12	English Offshore Waters	-

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70051	Depression	625014	6187799	A2_I	8.9	5.9	-0.3	A distinct, sub-angular depression with an uneven base identified in the MBES data, which may indicate partially buried objects. Identified in the backscatter data as a distinct, isolated sub-rounded bright reflector with diffuse edges. Interpreted as a possible natural feature or may be indicate presence of possible debris.	MBES , Backscatter	MBES_L12, Backscatter_L12	L12	English Offshore Waters	-
70052	Mound	624607	6187344	A2_I	5.0	2.1	0.3	An isolated and distinct sub-rounded mound, surrounded by a scour. Also observed in the backscatter data as a sub-rounded bright reflector. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L12	L12	English Offshore Waters	-
70053	Mound	624532	6186584	A2_I	3.1	2.5	0.2	A low-lying elongate mound forming a slight ridge, identified in the MBES data. No anomalous features were identified in the backscatter data at this location. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L12	L12	English Offshore Waters	-
70054	Mound	624395	6184040	A2_I	4.5	4.3	0.2	A small, low-lying, sub-rounded mound within a slight scour, identified in the MBES data. Identified in the backscatter as a seabed disturbance comprising a rounded dark reflector with an elongate bright reflector to the south-east, measuring approximately 12 x 10 m in total. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter,	MBES_L12, Backscatter_L12	L12	English Offshore Waters	-
70055	Mound	625358	6183383	A2_I	3.5	2.6	0.6	A distinct, isolated, elongate mound within scour identified in the MBES data. Tentatively observed in the backscatter data as a rounded bright reflector. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L12	L12	English Offshore Waters	-
70057	Mound	624541	6181846	A2_I	9.1	6.9	-0.4	A large, distinct, elongate mound forming a rounded ridge with shallow encircling scour, identified in the MBES data. Also identified in the backscatter data as a rounded dark reflector within an irregular area of scour. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L12, Backscatter_L12	L12	English Offshore Waters	-
70058	Mound	625120	6179332	A2_I	3.1	2.9	0.1	A small, indistinct, low-lying mound within a large, sub-rounded depression identified in the MBES data. Also identified in the backscatter data as an elongate bright reflector measuring 5.0 x 4.0 m. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L12, Backscatter_L12	L12	English Offshore Waters	-
70059	Mound	625077	6177907	A2_I	5.5	3.5	1.4	A distinct sub-angular mound within wide elongate scour identified in the MBES data. Tentatively visible in the backscatter data as a sub-rounded bright reflector at the centre of interpreted scour. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L12	L12	English Offshore Waters	-
70060	Mound	625676	6175186	A2_I	30.1	15.2	1.4	A large elongate mound with irregular sides and a fairly level top, which slopes more steeply on the east side. Identified in the MBES data on an approximate north-west to south-east alignment with no evidence of any internal structure. No surrounding scour visible. Also identified in the backscatter data as an isolated, generally oval-shaped bright reflector. This feature appears very anomalous to the surrounding seabed. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L12, Backscatter_L12	L12	English Offshore Waters	-
70061	Mound	625544	6172698	A2_I	3.0	2.5	0.1	A small low-lying mound within a wider depression (measuring 17 x 11 m), identified in the MBES data. Tentatively visible in the backscatter data as a sub-rounded dark reflector. Interpreted as a possible natural feature or may be possible debris.	MBES	MBES_L12	L12	English Offshore Waters	-
70062	Mound	626492	6168918	A2_I	3.0	2.0	0.2	Visible in the MBES dataset as a low lying mound in the centre of a larger scour. Identified as an isolated, rounded bright reflector in the backscatter data measuring 7 x 4 m. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70063	Dark reflector	626458	6166226	A2_I	3.0	3.0	-	An isolated, rounded dark reflector identified on the nadir in the backscatter data. Also visible in the MBES data as a small mound, surrounded by a depression. May be a data artefact, or may be a possible natural feature, or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70064	Mound	626920	6164616	A2_I	4.8	4.0	0.7	A distinct elongate mound identified in the MBES data which tapers in width and height from the south to the north and has a slight scour on the south-west edge. Identified as a slightly elongate bright reflector with a dark reflector to the south-west, measuring 12.0 x 6.0 m in the backscatter data. Interpreted as a possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L12, Backscatter_L12	L12	English Offshore Waters	-
70065	Seabed disturbance	626841	6163058	A2_I	56.0	9.0	-	A long, generally straight and compact linear disturbance comprising indistinct dark and bright reflectors identified in the backscatter data. Aligned ENE to WSW, perpendicular to the nadir, with a slightly more bulbous end to the west. Tentatively observed in MBES data as an elongate area of irregular seabed, but missing data means the feature is harder to distinguish. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70066	Bright reflector	626289	6162882	A2_I	15.0	14.0	-	An isolated, irregular area of dark and bright reflectors identified in the backscatter data. Tentatively visible in the MBES data as a cluster of small mounds within a depression. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70067	Bright reflector	626811	6161358	A2_I	41.0	6.0	-	An elongate, isolated bright reflector, identified in the backscatter data. Tentatively observed in the MBES dataset as a slight elongate mound. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70068	Seabed disturbance	626887	6160410	A2_I	40.0	32.0	-	A seabed disturbance comprising a curvilinear and irregular bright reflector which appears to curve around a central area of dark reflector measuring 18 x 16 m in the backscatter data. Tentatively visible in the MBES data as a large, rounded mound which appears to extend out of a larger natural seabed feature and so may be partially buried. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70069	Dark reflector	626660	6159396	A2_I	7.0	5.0	-	A rounded dark reflector with some surrounding bright reflector, identified in the backscatter dataset. Visible in the MBES data as a small sub-angular mound at the bottom of a depression. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70070	Bright reflector	626388	6159445	A2_I	5.0	3.0	-	An isolated, irregular bright reflector identified in the MBES data. Observed in the MBES data as a small mound at the bottom of a slight elongate depression. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70071	Dark reflector	625668	6158028	A2_I	5.0	5.0	-	An isolated, elongate dark reflector, observed in the nadir of the backscatter dataset. Visible in the MBES data as a rounded mound within elongate scour. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70073	Dark reflector	622658	6153548	A2_I	4.0	1.0	-	An isolated, elongate dark reflector, identified in the nadir of the backscatter data. No anomalous features were observed but there are some missing data in the MBES data set at this location. Retained as a precaution. May be a data artefact, a possible natural feature, or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-
70075	Bright reflector	614884	6139948	A2_I	4.0	3.0	-	An isolated, sub-angular dark reflector within a slight bright reflector identified in the backscatter data. No anomalous features were observed in the MBES data at this location. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L12	L12	English Offshore Waters	-

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70076	Dark reflector	610794	6133592	A2_I	3.0	3.0	-	An isolated, sub-rounded dark reflector identified in the Backscatter data, and tentatively visible as a small mound in the MBES data. The surrounding seabed is generally featureless, but with numerous small depressions. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-
70077	Seabed disturbance	610260	6131503	A2_I	13.0	7.0	-	An isolated, sub-rounded seabed disturbance identified in the Backscatter data. The anomaly is made up of an elongate dark reflector aligned north/south, measuring approx. 9.0 x 3.0 m with sub-rounded bright reflectors on its east and west edges. The anomaly is visible as a small, elongate depression in the MBES data. The surrounding seabed contains numerous small depressions, some of which may form a linear alignment SSE of this anomaly, but that is potentially coincidental. Interpreted as possible debris or possible natural feature.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-
70078	Dark reflector	610831	6131337	A2_I	5.0	3.0	-	An isolated, sub-rounded dark reflector identified in the Backscatter data, at the location of a small mound visible in the MBES data. The surrounding seabed is relatively featureless, with some potential mobile sediment build up to the south. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-
70079	Mound	609981	6130427	A2_I	13.2	7.2	0.5	A sub-rounded seabed disturbance made up of a bright reflector, surrounded by a thin dark reflector identified in the Backscatter data. Identified as a distinct, elongate mound in the MBES dataset. There are no similar seabed features nearby, and the surrounding seabed is relatively featureless. Interpreted as possible debris or a possible natural feature.	Backscatter, MBES	Backscatter_L15, MBES_L15	L15	English Inshore Waters	-
70080	Dark reflector	610414	6130313	A2_I	3.0	2.0	-	An angular dark reflector identified in the Backscatter data. There are no anomalous features in the MBES data at this location. The surrounding seabed is clear and flat. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-
70081	Depression	609223	6128777	A2_I	6.6	6.4	-0.3	An isolated, rounded depression identified in the MBES data, and visible as an indistinct rounded dark reflector within the nadir of the Backscatter data. There is a potential small feature in the base of the depression, but this is unclear. There are no similar features nearby in either the MBES or Backscatter dataset, and the surrounding seabed is relatively featureless. Interpreted as possible debris or possible natural feature.	MBES, Backscatter	MBES_L15, Backscatter_L15	L15	English Inshore Waters	-
70082	Dark reflector	609377	6127695	A2_I	8.0	2.0	-	An isolated, elongate dark reflector identified in the Backscatter data. There are no anomalous features in the MBES data at this location. The surrounding seabed is clear and flat. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-
70084	Dark reflector	607182	6124596	A2_I	3.0	2.0	-	An isolated, sub-rounded dark reflector identified in the Backscatter data, and tentatively visible as a small mound in the MBES data. The surrounding seabed is clear and flat. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-
70090	Seabed disturbance	606594	6121568	A2_I	14.0	6.0	-	A seabed disturbance made up of 2 rounded dark reflectors identified in the Backscatter data. The features are alongside one another and aligned north-east/south-west, and each measures approximately 4m across. Two small depressions are visible in the MBES data at this location. The surrounding seabed is covered with poorly developed bedforms, potentially indicating an area of mobile seabed sediment. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70092	Dark reflector	600783	6115458	A2_I	11.0	4.0	-	An elongate dark reflector identified in the Backscatter data. There are no anomalous features identified in the MBES data at this location. The surrounding seabed is clear and flat. Interpreted as possible debris or a possible natural feature.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-
70093	Bright reflector	598881	6114898	A2_I	34.0	4.0	-	An elongate bright reflector identified in the Backscatter dataset. The feature is aligned north-east/south-west and there appears to be some sediment disturbance around its south-west end. There are no anomalous features identified in the MBES data at this location. The anomaly is on the edge of an area of natural geological outcropping at seabed, and may be related by this is uncertain. Interpreted as possible debris or possible natural feature.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-
70094	Seabed disturbance	598766	6114304	A2_I	13.0	7.0	-	An isolated, irregular seabed disturbance identified in the Backscatter data. The feature is made up of a sub-rounded bright reflector, measuring 10.0 x 6.0 m, with an elongate dark reflector in the south-west corner measuring 6.0 x 3.0 m. There are no anomalous features identified in the MBES data at this location, but the feature is located on the edge of an area of natural geological outcropping at seabed. Interpreted as possible debris or possible natural feature.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-
70095	Mound	598998	6114238	A2_I	17.0	2.3	0.2	A long, linear mound identified in the MBES dataset. The feature is aligned south-east/north-west. There are no anomalous features identified in the Backscatter data at this location. The anomaly may be possibly part of a surrounding rock outcrop, but appears more distinct than the background geology. Interpreted as possible debris or possible natural feature.	MBES	MBES_L15	L15	English Inshore Waters	-
70096	Dark reflector	598715	6114609	A2_I	4.0	3.0	-	A small, distinct dark reflector identified within the nadir of the Backscatter data. There are no anomalous features within he MBES at this location, but the anomaly is situated within an area of natural geological outcropping at seabed and may be related, although it appears more distinct than the background geology. Interpreted as possible debris or a possible natural feature.	Backscatter	Backscatter_L15	L15	English Inshore Waters	-
70097	Bright reflector	597614	6114260	A2_I	3.5	2.5	-	An isolated, sub-rounded bright reflector identified in the Backscatter data. Tentatively observed in the MBES data as an irregular mound. Located in a wider area of large, natural disturbance. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L16	L16	English Inshore Waters	-
70098	Bright reflector	597606	6114163	A2_I	2.0	1.0	-	An isolated, rounded bright reflector identified in the Backscatter data. No anomalous features were identified in the MBES data at this location, though this position is within a wider area of irregular seabed. Interpreted as possible natural feature or may be possible debris.	Backscatter	Backscatter_L16	L16	English Inshore Waters	-
70099	Mound	597699	6113778	A2_I	3.5	3.5	0.3	An isolated and distinct small rounded mound within an irregular depression (approximately 10 x 10 m) identified in the MBES data. There appear to be several additional smaller mounds visible in the scour pit. Also identified in the Backscatter data as an elongate bright reflector surrounded by a dark reflector with diffuse edges. Located in a generally featureless area of the seabed. Interpreted as possible natural feature or may be possible debris.	MBES, Backscatter	MBES_L16, Backscatter_L16	L16	English Inshore Waters	-
70100	Dark reflector	597564	6114135	A2_I	3.0	1.5	-	An isolated sub-rounded dark reflector identified in the Backscatter data. A tentative small mound is visible in the MBES data at this location within a wider area of natural seabed features. Interpreted as possible natural feature or may be possible debris.	Backscatter	Backscatter_L16	L16	English Inshore Waters	-

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70101	Seabed disturbance	597529	6114172	A2_l	11.0	4.0	-	A seabed disturbance comprising four sub-angular bright reflectors in a curved line aligned north-west to south-east, each measuring approximately 2 m across, identified in the Backscatter data. No anomalous features were identified in the MBES data at this location, though this position is within a wider area of irregular seabed. Interpreted as possible natural feature or may be possible debris.	Backscatter	Backscatter_L16	L16	English Inshore Waters	-
70107	Dark reflector	595053	6111731	A2_l	4.0	1.5	-	An isolated elongate dark reflector, located in an area of rock outcrop at the seabed, identified in the Backscatter data. Visible in the MBES data as a short, straight and ridged linear mound with some slight scouring within an area of generally rounded rocks. Interpreted as a possible natural feature or may be possible debris.	Backscatter	Backscatter_L16	L16	English Inshore Waters	-
70022	Recorded wreck	618144	6197489	A3	-	-	-	The recorded position of UKHO record 4492 which reports the presence of a wreck at a general depth of -72 m and on a north-west to south-east alignment. Has been shown on fisherman's charts and surveyed in 1964, then again in 1972 and lastly surveyed in 2006, and was not located and has been amended to dead. No anomalous features were identified in the Backscatter/MBES data at this location. Any remains associated with this record are either buried or located elsewhere.	Historic record	-	L05	English Offshore Waters	UKHO 4492; CANMORE 322987
70072	Recorded wreck	626065	6157814	A3	-	-	-	The recorded position of British steamship *San Bernardo*, which was sunk on 9 August 1916 by a German submarine 17 miles from Longstone in a north-west position. It has a general depth of 85 m and was carrying a cargo of ballast. Last surveyed in 1999 but was not located and has been amended to dead. This record was not directly covered by the Backscatter or MBES dataset and therefore no comment can be made on its presence or condition in this assessment but retained within this gazetteer for recording purposes.	Historic record	-	L12 Buffer	English Offshore Waters	UKHO 4384; CANMORE 322883
70085	Recorded obstruction	607470	6124144	A3	-	-	-	The recorded location of a foul ground present within both the UKHO and Canmore records. The feature was last surveyed in 1999 and found to be a sonar contact measuring 15.0 x 0.3 x 0.1 m and interpreted as possible debris. No anomalies were identified within the current MBES or Backscatter data, and the feature may be buried at present.	Historic record	-	L15	English Inshore Waters	UKHO 4343, Canmore 322842
70088	Recorded wreck	607050	6121706	A3	-	-	-	The recorded location of the wreck of the Norwegian steamship *Ragnhild* (possibly), recorded in a number of sources. The ship was built in 1909 by Bergens MV, Bergen containing one boiler, a triple expansion engine and a single shaft, and at the time of loss was owned by N. H. Hartmary and Co. It sank on 27 April 1917 after detonating a German laid mine, whilst en route from Skien to Tyne. Norwegian sources suggest she was torpedoed by *UC-19*. The site was examined in 1967 and swept clear, with another clearance sweep undertaken in 1986 and the wreck depth amended to 42 m. The site was last examined 2000, when the wreck was located at a general depth of 52 m and reported to be well broken up. The wreck is located outside the coverage of the current MBES and Backscatter data, and so no comment on the condition of the site can be made at this time.	Historic record	-	L15 Buffer	English Inshore Waters	UKHO 4335, Canmore 322834, NRHE 943539

ID	Class	Easting	Northing	Archaeological. discrimination	Length (m)	Width (m)	Height (m LAT)	Description	Anomaly type	Dataset	Section	Jurisdiction	External reference
70089	Recorded wreck	606709	6121553	A3	-	-	-	The recorded location of the wreck of the English collier *Bangarth*, a steel-hulled steamer that was torpedoed by the German submarine *UB-34* on 13 December 1917 while en route from Methil to Dunkirk with a cargo of coal. This wreck was formerly believed to be the remains of the Norwegian cargo vessel *Ragnhild*, and before that was believed to be the *Upcerne*. The wreck is reported to lie on a seabed of sand and mud in a general depth of 50 m. It is reported as being very substantial, but well broken up, with the two boilers, donkey engine, condenser, and engine block exposed and surrounded by a large pile of twisted, broken machinery, steel plates and girders. There are reported to be quantities of bent and flattened copper pipes, brass flanges, and valves intermingled with the pile of steel debris, but it appears that the wreck has been salvaged at some time or another (The Comprehensive Guide to Shipwrecks of the North East Coast, Vol 2 1918-2000, page 190). The site was dived on in 2008 (10 September) at the listed position and positively identified as the *Bangarth* (Digital marine geographic information derived from SeaZone Hydrospatial 05-Jan-17; United Kingdom Hydrographic Office (UKHO) wreck report 4336). Despite this positive identification of a substantial wreck, no anomalies were visible in the current MBES or Backscatter datasets at the recorded location. There do appear to be mobile seabed sediments at this location, but they are not considered sufficiently thick to completely cover a substantial shipwreck. As such, it is likely that the HER recorded position is erroneous and the actual wreck is located elsewhere close by, probably beyond the geophysical data coverage.	Historic record	-	L15	English Inshore Waters	HER 25537
70091	Recorded obstruction	604434	6116829	A3	-	-	-	The location of an unidentified seabed obstruction reported by fisherman and recorded in the NRHE database. Recorded as potentially indicative of wreckage or a submerged feature. No anomalous features were identified in the current MBES or Backscatter datasets at this location, suggesting the feature is either buried or located elsewhere.	Historic record	-	L15	English Inshore Waters	NRHE 1003622
70102	Recorded obstruction	597688	6113089	A3	-	-	-	The recorded position of a seabed obstruction (NHRE 1003614; HER 30302), reported by fishermen in 1976. Possibly indicative of wreckage or a submerged feature. This record was not covered by the Backscatter or MBES datasets and so no comment can be made on whether a feature is present at this location. Retained in this gazetteer as a precaution.	Historic record	-	L16 Buffer	English Inshore Waters	NHRE 1003614; HER 30302
70103	Recorded obstruction	596460	6112759	A3	-	-	-	The recorded position of a seabed obstruction (UKHO 4557; CANMORE 323019) which reports an obstruction consisting of pipes, tubes and diffusers marking the end of a completed outfall pipe, at a recorded depth of -12.2 m. This record was not directly covered by the Backscatter or MBES datasets. and so no comment can be made on whether a feature is present at this location. Retained in this gazetteer as a precaution for positional purposes.	Historic record	-	L16 Buffer	English Inshore Waters	UKHO 4557; CANMORE 323019
70104	Recorded obstruction	596024	6113361	A3	-	-	-	The reported location of previously identified debris (NHRE 1618665; HER 30299), comprising a rectangular timber with a metal strip attached with nails. Discovered in 2017 during a nearshore dive inspection whilst carrying out an investigating for potential unexploded ordnance on the North Sea Link Interconnector. It was found approximately 1.7 nautical miles south-east of Newbigging Bay. It measures 1.20 x 0.30 x 0.25 m and remains on the seabed. The discovery was reported via ORPAD. No anomalous features were identified in the Backscatter or MBES data at this location and may have since been buried in the surrounding seabed sediments.	Historic record	-	L16	English Inshore Waters	NHRE 1618665; HER 30299

1. Co-ordinates are in WGS84 UTM30N
2. Positional accuracy estimated ±2 m

Annex 4: Maritime recorded losses (by Date of Loss)

Canmore ID	HER ID	NRHE ID	Name	Date of loss	Description	Jurisdiction
	26693	973151	*Simpson*	1752	Wreck of British craft, which stranded north of Shields, at North Seaton during a storm.	Scotland
		1399517	Unknown	1809	Wreck of a Swedish wooden sailing vessel which foundered between Newbiggin-by-the-sea.	England
	26096	1314456	*Gleaner*	1831	An English schooner stranded near Cambois during a gale en route to London from Shields.	England
	26767	1364471	*Trafalgar*	1836	In Blyth on 18 of February 1836, *Trafalgar* was driven out of Cambois on the Bar of the port and is a total wreck.	England
296965			*Ceres*	1874	This vessel sunk on the 21 February 1874 after a collision and sunk near Berwick. Classified as a schooner, with a cargo of potatoes. The map sheet assigned to this wreck is essentially arbitrary, and the loss of this vessel may have occurred in English waters.	Scotland
	26492		*Mary and Jane*	1876	English schooner built in 1850 which stranded 0.25 miles north of the Wansbeck River. It was en route from London to Tyne.	England
	25799		*Carl*	1879	Swedish schooner which stranded near the entrance to the River Wansbeck in wind conditions SW force 5, while en route from Halmstad to Newcastle-upon-Tyne with deals; a wooden sailing vessel. Vessel stranded and lost in wind conditions SW force 5.	England
325267			*Eliza Blagden*	1882	Listed as a wooden schooner, registered in Goole. Built in 1856 and foundered on the 15 April 1882 with a cargo of manure.	Scotland
	25643		*Andreas*	1882	Danish schooner which stranded on the Rockers in 1882 while en route from Dunkirk to Blyth in ballast; a wooden sailing vessel built in 1834. Vessel stranded and lost in wind conditions N force 2.	England
	26700		*Sleipner*	1884	Norwegian brig, stranded and lost in wind conditions.	England
	26017	1371150	*Evelina*	1890	Welsh schooner that foundered 2.25 miles E/SE of Newbiggin Point in 1890 while en route from Caernarfon to Sunderland with roofing slate. Vessel was wooden and built in 1862.	England
		1371145	*Humber*	1890	A Scottish schooner which foundered 3 miles off the coast of Blyth in 1890. Was en route to Invergordon with coal	England

					from Sunderland. Wooden sailing vessel built in 1829	
	26060	1371514	*Fremad*	1898	Wreck of a Norwegian sloop, which stranded on Cambois Sands. Was a wooden sailing vessel built in 1869, en route from Douarnenez to Dysart.	England
		1035980	*Friedrich*	1900	Vessel built in 1864 was stranded and lost in wind conditions. Destination was specified as West Wemyss.	England
		1035981	*Aspirant*	1900	Norwegian schooner stranded and lost in wind conditions in 1900. It was built in 1864 by B Hoeren in Stavanger.	England
	25669	1371709	*Archimedes*	1906	1906 wreck of English brig which stranded in Cambois Bay. This wooden sailing vessel, built in 1855, was en route from Lowestoft to Sunderland in ballast	England
201119			*Lilydale*	1915	This vessel was lost on 28 April 1915 after being captured and sunk by a submarine 37 miles east of St Abbs Head. It was built in 1899 in North Shields and had a length of 29 m and a beam of 6 m. The map sheet and quasi-administrative area assigned to this wreck are arbitrary, being derived from the location cited by Whittaker.	Scotland
	26723		*St Olive*	*1916*	British trawler that foundered 11 miles east of Coquet Island, after being bombed on a fishing out to Aberdeen.	Scotland
201621			*Harald Klitgaard*	1917	This vessel was lost on 6 June 1917 whilst en route between Copenhagen and Seaham Harbour in Northumberland when it was torpedoed and sunk by a U-77. The wreck is broken and highly degraded and is in a depth of 60 m and has a length of 70 m. Two intact boilers and two cylinder engines have survived for identification. The vessel was built in 1884 by Richardson, Duck and co in Stockton on Tees and was owned by Danske Russike Danske Shipping Line. Possibly associated with UKHO record 3147 which lies outside of the Marine Archaeology study area	Scotland
324688			*Rameses*	1917	Possible remains of *Rameses* lost on the 18 April 1917. Positional data is approximate.	Scotland
328827			*Grecian*	1917	Grecian was built in 1896 in Grimsby. It had a length of 27 m and a beam of 6 m. It was sunk on the 20 of April 1917 after being torpedoed by a submarine22 miles NE/E of Longstone.	Scotland
	26911		*Ju88*	1940	1940 wreck of German Junkers bomber which was shot down into the sea 3	England

					miles east of Cambois, following gun action and an explosion.	
315751			Unknown	Unknown	The history of this record is unknown, but is noted in Whittaker as having an approximate position. It could possibly refer to a sonar contact or a net snag.	Scotland
	24130		Unknown	Unknown	Wreck of two possible vessels, Blyth Harbour. The wrecks of possibly two vessels of unknown date are visible as structures on air photographs taken in 1947, partially submerged in mud in the River Blyth, centred at NZ 30456 83073. The features are not visible on the latest 1988 Ordnance Survey vertical photography but may have been buried by shifting sands.	England

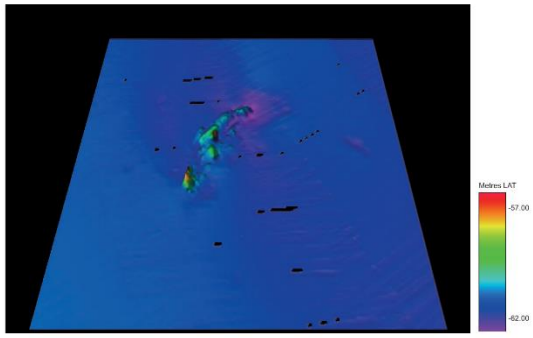
Annex 5: Intertidal heritage assets

WA ID	HER ID	NRHE ID	Date	Description	Eastings	Northings
1003	19855	1421588	Second World War	Trench constructed during World War II in the sand dunes between 1940-1941 and was demolished before 1998. Was a part of the Northumberland coast line defence.	430580	584290

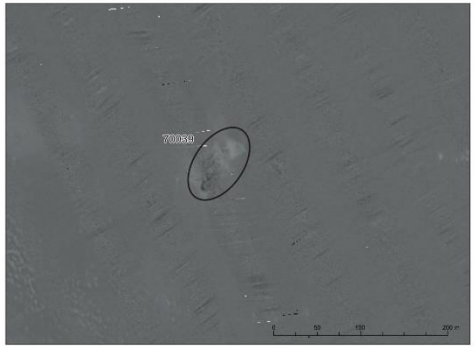
Annex 6: Wreck sheets

ID 70039 – Unknown - UKHO 65638

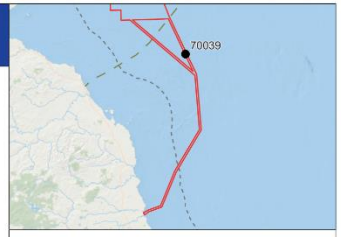
Location		618257 E 6204025 N	**Area**	L07
Archaeological Importance		High		
Geophysical survey dimensions and notes		Anomaly **70039** is situated within L07, and corresponds with the charted UKHO record for an unknown wreck (65638). is interpreted as a wreck, orientated approximately north-east to south-west The wreck is visible in the MBES data as a large, irregular but generally compact area of mounds of varying shapes and sizes, measuring 61.4 x 24.8 x 5.0 m and oriented approximately north-east to south-west. The mounds are generally small, irregular and low-lying, though taller mounds are visible at the north-east, central and south-west extents. The central area contains two larger elongate mounds, the largest measuring 14.5 x 6.0 x 1.5 m. The tallest mound is visible at the south-west end, measuring approximately 12.0 x 7.0 x 5.4 m, and has an irregular form which may indicate individual sections. There is a slight surrounding scour within the surrounding sediments which extends primarily to the north-east, and some possible small surrounding mounds along the western and eastern edges, which may indicate potential for further debris. The wreck is visible in the Backscatter data as a large, elongate seabed disturbance comprising dark and bright reflectors with a defined south-western edge but no obvious internal structure.		
Build	**Type**	Unknown		
	Construction	Unknown		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	**Cause**	Unknown		
Extent of Survival		The UKHO record reports the wreck was last surveyed in 2005 located at a general depth of -61.8 m measuring 58.0 x 25.0 x 5.7 m. It is described as being well broken up and degraded with no scour. In the 2022 geophysical data the wreck is fairly constrained but well degraded, the decreased height and increased length may indicate the wreck has collapsed and spread since the 2005 survey. The surrounding scour indicates mobile sediments in the area and so there is potential for surrounding debris to be buried in the vicinity.		



Multibeam echosounder image of wreck **70039**, facing north, x1 vertical exaggeration, measuring 61.4 m x 24.8 m x 5.0 m



Backscatter geotiff extract showing wreck **70039**, facing north



Legend
- Marine Scheme Boundary
- Scotland/England Territorial Waters
- UK 12 Nautical Mile Limit

Rev	Date	Status	Drwn	Chkd	Appd
04	-	-	-	-	-
03	-	-	-	-	-
02	-	-	-	-	-
01	25/05/2023	-	KF	SS	AB

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Project: **CAMBOIS CONNECTION**

Title: **WRECK SHEET 1**
ID 70039 – UNKNOWN - UKHO 65638

Inset only

Scale	Print Size	Datum	Projection
Inset 1:2,000,000	A3	WGS84	UTM30N

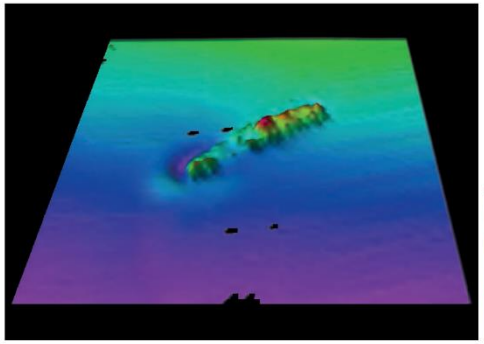
Drawing Number: A100796_S01_WRECK SHEET 1

Sheet No.: 001 OF 006

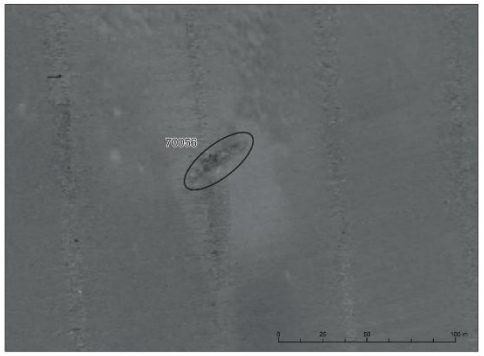
Wreck Sheet 1 – ID 70039 – Unknown – UKHO 65638

ID 70056 – *Acantha* (Possibly) – UKHO 65637

Location		625250 E 6181920 N	**Area**	L12
Archaeological Importance		High		
Geophysical survey dimensions and notes		Anomaly **70056** is situated within L12, and corresponds with the charted UKHO record for the British trawler *Acantha* (Possibly) (65637), also recorded by Canmore (324105). The wreck is visible in the MBES data as a distinct rectangular mound with an irregular internal composition, measuring 38.0 x 8.0 x 2.6 m and oriented north-east to south-west. The wreck appears most prominent at the north-east end, with the south-west end more low-lying, which may indicate it is more broken-up or degraded here or is partially buried in surrounding sediments. There is some encircling scour visible predominantly to the south and west, and visible along the northern edge. Some possible mounds are visible at the northern edge which may represent associated debris. There also appears to be some sediment build-up around the scour at the south-west end which may obscure additional debris. The wreck is visible in the Backscatter dataset as a distinct, compact, elongate area of dark and bright reflectors with no obvious structure discernible.		
Build	**Type**	British trawler		
	Construction	Unknown, likely steel		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	**Cause**	Torpedoed		
Extent of Survival		The UKHO record reports that the wreck lasted surveyed in 2005 and located at a general depth of -79.2 m with recorded measurements of 43.0 x 16.0 x 5.5 m. The wreck was reported to be intact though collapsed. The difference in measurements from those recorded in the 2022 MBES dataset may indicate the wreck is collapsing further and becoming buried within the surrounding sediments. The surrounding scour indicates mobile sediments in the area and so there is potential for surrounding debris to be buried in the vicinity.		



Multibeam echosounder image of wreck **70056**, facing north, x1 vertical exaggeration, measuring 38.0 m x 8.0 m x 2.6 m



Backscatter geotiff extract showing wreck **70056**, facing north

Legend
- Marine Scheme Boundary
- Scotland/England Territorial Waters
- UK 12 Nautical Mile Limit

Rev	Date	Status	Drwn	Chkd	Appd
04	-	-	-	-	-
03	-	-	-	-	-
02	-	-	-	-	-
01	25/05/2023	-	KT	SS	AB

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Project: **CAMBOIS CONNECTION**

Title: **WRECK SHEET 2**
ID 70056 – *ACANTHA* (POSSIBLY) - UKHO 65637

0 10 20 40 nm Inset only
0 25 50 100 nm
N

Scale	Plot Size	Datum	Projection
Inset 1:2,000,000	A3	WGS84	UTM30N

Drawing Number: A100796_S01_WRECK SHEET 2
Sheet No: 002 OF 006

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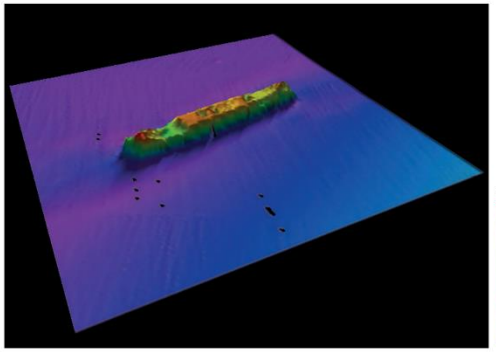
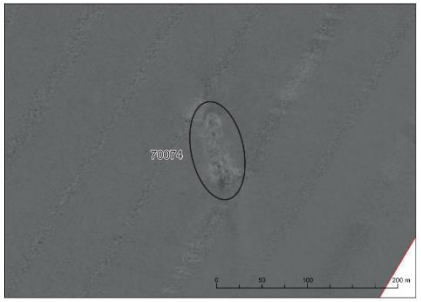
Wreck Sheet 2 – ID 70056 – *Achantha* (possibly) – UKHO 65637

ID 70074 – Unknown - UKHO 4370

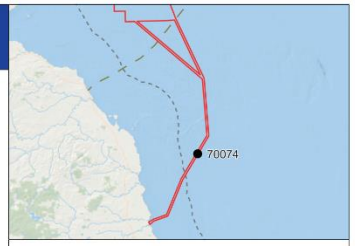
Location		621117 E 6150449 N	**Area**	L12
Archaeological Importance		High		
Geophysical survey dimensions and notes		Anomaly **70074** is situated within L12, and corresponds with a UKHO record for an unknown wreck (4370), also recorded in Canmore (322869). The wreck is visible in the MBES data as a distinct elliptical mound, measuring 78.6 x 14.6 x 6.4 m and oriented approximately north-south. A more pointed end is visible to the north and a more angular end at the south, suggesting that this is the bow and stern respectively, although this cannot be certain. The southern end is also more irregular suggesting that there is damage or it is degraded in that area. The centre of the wreck is slightly raised, and there appears to be generally angular holes along the top, indicating the surviving superstructure. The wreck has scouring along the interpreted hull, with some slight sediment build-up at the north and southern extents. The wreck is visible in the Backscatter data as an elongate but compact area of dark and bright reflectors, with a defined edge, indicating the hull outline.		
Build	**Type**	Unknown		
	Construction	Unknown		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	**Cause**	Unknown		
Extent of Survival		The UKHO record reports the wreck was last surveyed in 1999 with recorded measurements of 78.0 x 12.0 x 8.0 m, and with a moderate associated magnetic anomaly. The wreck was described as being intact and upright with superstructure visible. In the 2022 geophysical data the wreck appears generally intact with no obvious surrounding debris. The surrounding scour indicates mobile sediments in the area and so there is potential for surrounding debris to be buried in the vicinity.		



Multibeam echosounder image of wreck **70074**, facing ENE, x1 vertical exaggeration, measuring 78.6 m x 14.6 m x 6.4 m



Backscatter geotiff extract showing wreck **70074**, facing north



Legend
- Marine Scheme Boundary
- Scotland/England Territorial Waters
- UK 12 Nautical Mile Limit

Rev	Date	Status	Drwn	Chkd	Appd
04	-	-	-	-	-
03	-	-	-	-	-
02	-	-	-	-	-
01	25/05/2023	-	KH	SS	AB

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Project: **CAMBOIS CONNECTION**

Title: **WRECK SHEET 3**
ID 70074 – UNKNOWN - UKHO 4370

Inset only

Scale	Plot Size	Datum	Projection
Inset 1:2,000,000	A3	WGS84	UTM30N

Drawing Number	Sheet No.
A100796_S01_WRECK SHEET 3	003 OF 006

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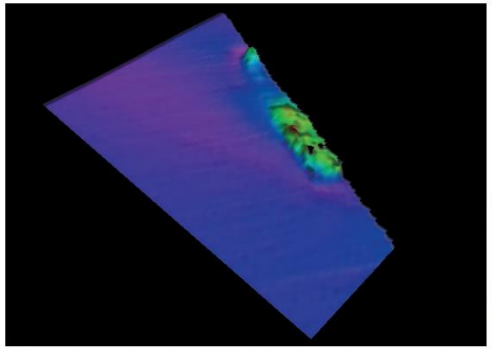
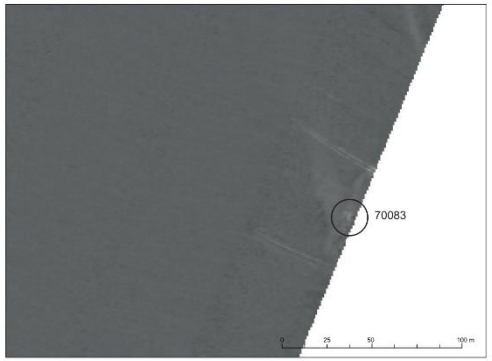
Wreck Sheet 3 – ID 70074 – Unknown – UKHO 4370

ID 70083 – Unknown - UKHO 58047

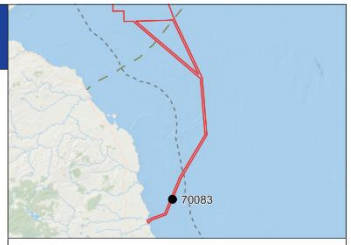
Location		608135 E 6124623 N	**Area**	L15
Archaeological Importance		High		
Geophysical survey dimensions and notes		Anomaly **70083** is situated within L15, and corresponds with the UKHO record for an unknown wreck (58047), also recorded in the NRHE as the *Herring* (1001479), Canmore (323761) and HER (255559). is interpreted as a wreck, oriented approximately north-east to south-west The wreck is visible in the MBES data as a large, compact elliptical mound with multiple peaks and steep sloped sides, measuring 50.0 x 7.3 x 1.5 m and oriented north-east to south-west. There is an associated scour visible around the north-eastern side of the wreck. The wreck is visible in the Backscatter data as an indistinct elliptical area of bright reflectors. The wreck is only partially covered by the MBES and Backscatter data and, as such, the dimensions recorded should be considered a minimum.		
Build	**Type**	Unknown		
	Construction	Unknown		
	Dimensions (m)	Unknown		
	Shipyard	Unknown		
Loss	**Cause**	Unknown		
Extent of Survival		The UKHO record reports that the wreck was last examined in 2000 at a general depth of -58 m, measuring 46.0 x 14.0 m x 5.3 m. The wreck is recorded as being intact and probably upright with a moderate magnetic anomaly associated. The longer length recorded in the 2022 geophysical data suggests the wreck may have become more exposed since the 2000 survey. The surrounding scour indicates mobile sediments in the area and so there is potential for surrounding debris to be buried in the vicinity.		



Multibeam echosounder image of wreck **70083**, facing north-west, x1 vertical exaggeration, measuring 50.0 m x 7.3 m x 1.5 m



Backscatter geotiff extract showing wreck **70083**, facing north



Legend
- Marine Scheme Boundary
- Scotland/England Territorial Waters
- UK 12 Nautical Mile Limit

Rev	Date	Status	Drwn	Chkd	Appd
04	-	-	-	-	-
03	-	-	-	-	-
02	-	-	-	-	-
01	25/05/2023	-	KF	SS	AB

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Project: **CAMBOIS CONNECTION**

Title: **WRECK SHEET 4**
ID 70083 – UNKNOWN - UKHO 58047

Inset only

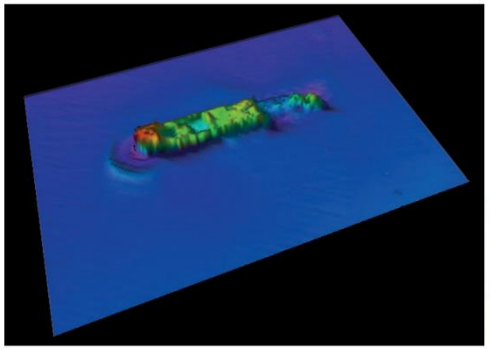
Scale	Plot Size	Datum	Projection
Inset 1:2,000,000	A3	WGS84	UTM30N

Drawing Number: A100796_S01_WRECK SHEET 4 | Sheet No: 004 OF 006

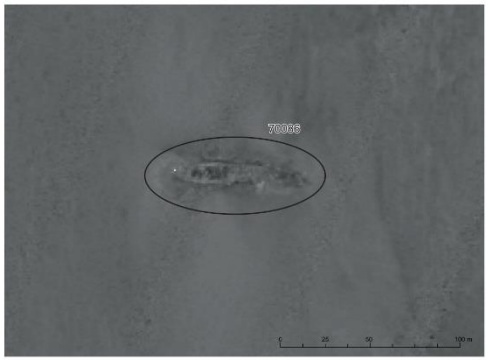
Wreck Sheet 4 – ID 70083 – Unknown – UKHO 58047

ID 70086 – *Svava* - UKHO 4341

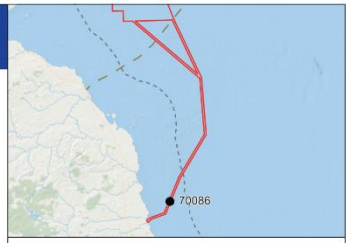
Location		607082 E 6123128 N	**Area**	L15
Archaeological Importance		High		
Geophysical survey dimensions and notes		Anomaly **70086** situated within L15, and corresponds with the charted UKHO record for the British steamship *Svava* (4341), it is also recorded in Canmore (322840), NRHE (1001478) and HER (25597) records. The wreck is visible in the MBES data as a large, compact elliptical mound measuring 78.0 x 15.0 x 8.7 m and aligned east-west. The western end of the wreck appears more pointed which possibly indicates it is the bow. The wreck appears to be relatively intact in the centre and towards the western end with possible superstructure visible, although appears to be severely degraded, broken-up or collapsed at the eastern extents. There is a scour around entire wreck, although this appears more pronounced at the western end, where it measures approximately 20.0 x 9.0 x -2.0 m. The wreck is visible in the Backscatter data as a large, compact elliptical dark reflector.		
Build	**Type**	British steamship		
	Construction	Built in 1904, triple expansion engines, likely steel		
	Dimensions (m)	71.0 x 10.4 x 4.9		
	Shipyard	Kjobenhavens Flydedok & Skinsveart		
Loss	**Cause**	Collision		
Extent of Survival		The UKHO record reports the ship sank after a collision with the *Fort Beausejoir* en route from Warworth to Thames with a cargo of coal on 10 March 1943. The wreck was last surveyed in 2000 at a general depth of -52 m and measured 74.0 X 12.0 x 10.0 m. It was recorded as being intact and upright with superstructure visible and a strong magnetic anomaly associated. The apparent increase in all dimensions in the 2022 geophysical data (excluding height) may indicate the wreck has become more exposed since the 2000 survey. The surrounding scour indicates mobile sediments in the area and so there is potential for surrounding debris to be buried in the vicinity.		



Multibeam echosounder image of wreck **70086**, facing NNW, x1 vertical exaggeration, measuring 78.0 m x 15.0 m x 8.7 m



Backscatter geotiff extract showing wreck **70086**, facing north



Legend
- Marine Scheme Boundary
- Scotland/England Territorial Waters
- UK 12 Nautical Mile Limit

Rev	Date	Status	Drwn	Chkd	Appd
01	25/05/2023	-	KF	SS	AB

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Project: **CAMBOIS CONNECTION**

Title: **WRECK SHEET 5**
ID 70086 – *SVAVA* - UKHO 4341

Inset only

Scale	Plot Size	Datum	Projection
Inset 1:2,000,000	A3	WGS84	UTM30N

Drawing Number: A100796_S01_WRECK SHEET 5
Sheet No.: 005 OF 006

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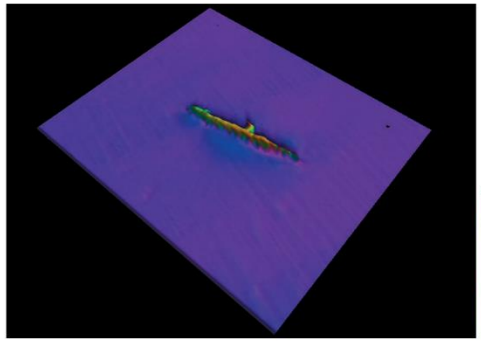
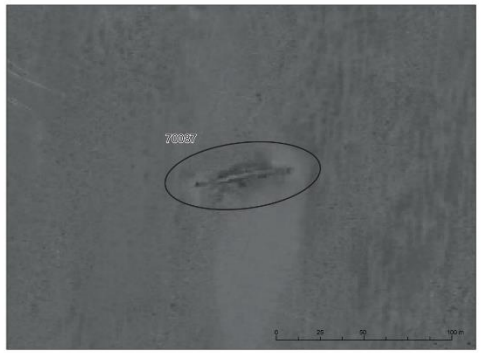
Wreck Sheet 5 – ID 70086 – *Svava* – UKHO – 4341

ID 70087 – HMSM *Unity* (Probably) – UKHO 4334

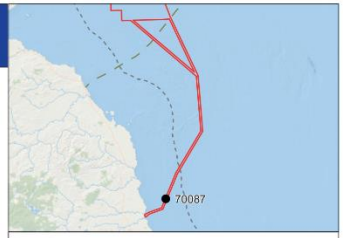
Location		606278 E 6121968 N	**Area**	L15
Archaeological Importance		High		
Geophysical survey dimensions and notes		Anomaly 70087 is situated within L15 and corresponds with the UKHO record for the British submarine HMSM *Unity* (Probably) (4334). The wreck is visible in the MBES data as a large, elongate mound measuring 57.0 x 15.0 x 3.5 m and oriented approximately ENE-WSW. Both ends of the wreck are relatively pointed, with the ENE end being slightly wider. A small, irregular mound protrudes approximately 2.4 x 2.0 x 3.0 m out of the central section of its southern side. The feature appears to be relatively intact, and has an appearance consistent with that of a submarine, lying on its side. Slight scour is present around the entire wreck. The wreck is visible in the Backscatter data as a long and elongate dark reflector with distinct edges.		
Build	**Type**	Submarine		
	Construction	Steel, diesel engines		
	Dimensions (m)	58.2 x 4.9 x 3.7 m		
	Shipyard	Unknown		
Loss	**Cause**	Collision with SS *Atle Jarl*		
Extent of Survival		The UKHO record reports that the submarine was commissioned by Vickers Armstrong in 1938, and was lost on 29 April 1940 due to a collision 6.5 miles off Newbiggin-by-the-sea during a North Sea patrol. The wreck was last surveyed in 2000 measuring 54.0 x 9.0 x 5.3 m with a poor associated magnetic anomaly, intact and lying on its side. The apparent increase in dimensions in the 2022 geophysical data (excluding height) may indicate the wreck has become more exposed since the 2000 survey. The surrounding scour indicates mobile sediments in the area and so there is potential for surrounding debris to be buried in the vicinity		



Multibeam echosounder image of wreck **70087**, facing south-west, x1 vertical exaggeration, measuring 57.0 m x 15.0 m x 3.5 m



Backscatter geotiff extract showing wreck **70087**, facing north



Legend
- Marine Scheme Boundary
- Scotland/England Territorial Waters
- UK 12 Nautical Mile Limit

Rev	Date	Status	Drwn	Chkd	Appd
D4	-	-	-	-	-
D3	-	-	-	-	-
D2	-	-	-	-	-
D1	25/05/2023	-	KF	BB	AB

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Project: **CAMBOIS CONNECTION**

Title: **WRECK SHEET 6**
ID 70087 – HMSM *UNITY* (PROBABLY) – UKHO 4334

Inset only

N

Scale	Plot Size	Datum	Projection
Inset 1:2,000,000	A3	WGS84	UTM30N

Drawing Number	Sheet No.
A100796_S01_WRECK SHEET 6	006 OF 006

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Wreck Sheet 6 – ID 70087 – HMSM *Unity* (Probably) – UKHO 4334