Wessex Archaeology

Docking Shoal and Race Bank Offshore Wind Farms

Archaeological Desk-based Assessment

Draft

DOCKING SHOAL AND RACE BANK OFFSHORE WIND FARMS

ARCHAEOLOGICAL DESK-BASED ASSESSMENT

DRAFT

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Summary

Wessex Archaeology was commissioned by AMEC Wind Energy, on behalf of Centrica Renewable Energy Limited to undertake an archaeological desk-based assessment of the potential impact upon archaeological remains from the Docking Shoal and Race Bank Offshore Wind Farms. The Wind Farms will be linked to land by a cable route, the impact of which is discussed in Wessex Archaeology's Wash Cable Route Corridor Archaeological Desk-based Assessment (2006b).

Lying adjacent to each other, the wind farms are situated between approximately 7.5km and 25km off the north Norfolk coast respectively, at the entrance to the Wash. A buffer zone of a minimum of one kilometre was created around each of the wind farms to form the Docking Shoal Study Area and the Race Bank Study Area. Together they form an irregularly shaped study area covering an area no greater than 30 by 20 kilometres.

Searches for known archaeological material were conducted within the Study Areas. Information was sought from a wide range of local and national bodies, including the Historic Environment Record maintained by Norfolk County Council, the National Monuments Record and the UK Hydrographic Office.

This report sets out the methodology employed in carrying out the study and an account of the policy and legal framework affecting archaeological sites and wrecks in the UK. The archaeological heritage is discussed with particular reference to the maritime and prehistoric archaeology and history of the area. Maritime sites and the potential for the survival former prehistoric land-surfaces offshore form the main focus of this assessment.

In summary, the known and potential archaeology of the study areas comprises:

- 22 known wrecks and obstructions;
- 142 documented losses;
- Unknown and undocumented wrecks from various periods dating back to at least the Iron Age;
- Stray finds of ship borne debris from various periods;
- The potential for the presence of submerged prehistoric land-surfaces dating from 7000,000 BP to 4000 BC, possibly containing archaeological data and sites.

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Data sets were provided by the National Monuments Record, Metoc plc (Seazone) and Norfolk Historic Environment Record. Wessex Archaeology is grateful to the staff of all these organisations for their co-operation.

Margaret Christie and Brian Hession carried out the assessment and compiled this report. Kitty Brandon prepared the illustrations, and the project was managed for Wessex Archaeology by John Gribble.

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1. INTRODUCTION

1.1. PROJECT BACKGROUND

1.1.1. Wessex Archaeology (WA) was commissioned by Amec Wind Energy, on behalf of Centrica Renewable Energy Limited to prepare a desk-based assessment of the potential effect upon archaeological remains from the construction of the proposed Race Bank and Docking Shoal Offshore Wind Farms.

1.1.2. The Wind Farms will be situated on the eastern (seaward) side of the consented Lynn and Inner Dowsing Wind Farms. It is proposed that they will be connected to the coast via the Wash Cable Route Corridor (Wessex Archaeology 2006b) (**Figure 1**).

1.2. AIMS AND OBJECTIVES

1.2.1. This assessment outlines the known and potential archaeological resource within the Docking Shoal Study Area (DSSA) and Race Bank Study Area (RBSA). The full range of data searches includes maritime sites and those elements of the local terrestrial archaeology that may be represented in or on the seabed as a result of sea level change.

1.2.2. This assessment will supplement Environmental Statements on the potential impact of the offshore elements of the wind farm schemes. A summary of this report will be included in the Environmental Statement for each of the Wind Farms.

2. RELEVANT LEGISLATION AND POLICY

2.1. INTRODUCTION

2.1.1. England's heritage-related planning guidance and legislation is currently going through a period of major review. As a consequence, it is appropriate to highlight that changes, to both legislation and the planning process, may be made over the next three to five years. The majority of what is set out in this section reflects the situation as of April 2006.

2.2. PROTECTION OF WRECKS ACT (1973)

2.2.1. Under the Protection of Wrecks Act (1973) (PWA), wrecks and wreckage of historical, archaeological or artistic importance can be protected by way of designation. It is an offence to carry out certain activities in a defined area surrounding a wreck that has been designated, unless a licence for those activities has been obtained. Generally, the Secretary of State must consult appropriate advisors prior to designation (English Heritage in the case of the Docking Shoal and Race Bank Wind Farms), though it is also possible to designate a wreck in an emergency without first seeking advice.

2.2.2. There are no sites presently designated under this legislation within the DSSA and RBSA. However, if any important wreck or ship borne artefact is discovered during the construction of the wind farm, the designation of an area around the find remains a possibility.

2.3. MERCHANT SHIPPING ACT (1995)

2.3.1. Within the context of the Merchant Shipping Act (1995), 'wreck' refers to flotsam, jetsam, derelict and lagan found in or on the shores of the sea or any tidal water. It includes a ship, aircraft or hovercraft, parts of these, their cargo or equipment. It may be of antique or archaeological value such as gold coins, a yacht or dinghy abandoned at sea, or items such as drums of chemicals or crates of foodstuffs (Definition from the Receiver of Wreck).

2.3.2. The ownership of underwater finds that turn out to be 'wreck' is decided according to procedures set out in the 1995 Act. If any such finds are brought ashore the salvor is required to give notice to the Receiver of Wreck that he/she has found or taken possession of them and, as directed by the Receiver, either hold them pending the Receiver's order or deliver them to the Receiver. This applies whether material has been recovered from within or outside UK Territorial Waters, unless the salvor can prove that title to the property has been vested in him/her (e.g. by assignment to him/her of rights devolving from the owner of the vessel or its contents at the time of loss). Even if ownership can be proved the salvor is still required to notify the Receiver.

2.3.3. The Crown makes no claim on wreck found outside UK Territorial Waters that remains unclaimed at the end of the statutory one year, and the property is returned to the salvor. Ownership of unclaimed wreck from within Territorial Waters lies in the Crown, or in a person to whom rights of wreck have been granted.

2.3.4. The Receiver of Wreck has a duty to ensure that finders who report their finds as required receive an appropriate salvage payment. In the case of material considered being of historic or archaeological importance, a suitable museum is asked to buy the material at the current valuation and the finder receives the net proceeds of the sale as a salvage payment. If the right to, or the amount of salvage cannot be agreed, either between owner and finder, or between competing salvors, the Receiver of Wreck will hold the wreck until the matter is settled, either through amicable agreement or by court judgement.

2.4. PROTECTION OF MILITARY REMAINS ACT (1986)

2.4.1. Under the Protection of Military Remains Act (1986) (PMRA), all aircraft that have crashed in military service are protected and the Ministry of Defence (MoD) has powers to protect vessels that were in military service when they were wrecked. The MoD can designate named vessels as Protected Places, even if the position of the wreck is not known. In addition, the MoD can designate Controlled Sites around wrecks whose position is known. In the case of Protected Places, the vessel must have been lost after 4th August 1914, whereas in the case of a wreck protected as a Controlled Site no more than 200 years must have elapsed since the loss.

2.4.2. In neither case is it necessary to demonstrate the presence of human remains on the site. Diving is not prohibited at a Protected Place but it is an offence to tamper with, damage, move or remove items from the wreck. However, diving, salvage and excavation are all prohibited on Controlled Sites, though licences for restricted activities can be sought from the MoD. Additionally, it is an offence carry out unauthorised excavations for the purpose of discovering whether any place in UK waters comprises any remains of an aircraft or vessel which has crashed, sunk or been stranded while in military service.

2.4.3. In November 2001, the MoD reported on the *Public Consultation on Military Maritime Graves and the Protection of Military Remains Act 1986.* The report recommended that a rolling programme of identification and assessment of vessels against set criteria be established to designate all other British vessels in military service when lost, as Protected Places. These criteria include:

- Whether or not human remains are known or likely to be present;
- Whether or not there is evidence of sustained disturbance and looting;
- Whether or not designation is likely to curb or put a stop to such disturbance and looting;
- Whether or not diving on the vessel or site attracts sustained and significant public criticism or approval.

2.5. PLANNING POLICY GUIDANCE

2.5.1. Planning law only applies within local authority regions which, as a general rule, extend only to the mean low water mark. However, English Heritage (EH) included the following statement in *England's Coastal Heritage* (1996):

'Although it remains government policy not to extend the Town and Country Planning system to the territorial sea, the principles set out in Planning Policy Guidance Note 16: Archaeology and Planning (PPG16) (Department of the Environment 1990) should be applied to the treatment of sub-tidal archaeological remains in order to secure best practice'.

2.5.2. PPG16 sets out the Secretary of States' policy on archaeological remains. It acknowledges the potentially fragile and finite or irreplaceable nature of such remains (para. 6), and states that the desirability of preservation of archaeological remains and their setting is a material consideration within the planning process (para. 18). PPG16 provides that there is a presumption in favour of the physical preservation of nationally important archaeological remains (para. 8), and that where preservation *in situ* is not justified it is reasonable for planning authorities to require the developer to make appropriate and satisfactory provision for excavation and recording of remains (para. 25).

2.5.3. Paragraph 19 of PPG16 suggests that it is in developers' own interests to include an initial assessment of whether the site is known or likely to contain archaeological remains as part of their research into the development potential of a site. Paragraph 22 adds: 'Local planning authorities can expect developers to provide the results of such assessments as part of their application for sites where there is good reason to believe there are remains of archaeological importance'. PPG16 also notes that in spite of the best pre-planning application research, there may be occasions when the

presence of archaeological remains only becomes apparent once development has commenced (para. 31).

2.5.4. *England's Coastal Heritage: A Statement on the Management of Coastal Archaeology* was published in 1996 by EH and the Royal Commission on the Historical Monuments of England (RCHME). The document sets out a number of principles for managing coastal archaeology:

- The coastal zone of England includes a finite, irreplaceable, and, in many cases, highly fragile archaeological resource which by virtue of its value, variety, and vulnerability justifies a presumption in favour of the physical preservation *in situ* of the most important sites, buildings, and remains;
- Although archaeological remains situated within inter-tidal and sub-tidal areas may be less visible and accessible than remains on dry land, this does not affect their relative importance and they should be managed in accordance with the principles which apply to terrestrial archaeological remains;
- As historic landscapes can extend seamlessly from dry land, through the inter-tidal zone, and into sub-tidal areas, effective management of the coastal archaeological resource cannot be achieved without due consideration of marine as well as terrestrial archaeological remains.

2.5.5. The document also made a number of detailed recommendations, which include the following notes under the heading Development Control and Environmental Assessment:

'Coastal archaeological interests should be adequately reflected in structure and local plans, and consistently and comprehensively included in Environmental Assessment procedures for coastal and marine developments (including harbour works, mineral extraction, oil and gas related projects, capital dredging projects, cable projects, and waste water treatment and disposal) and other activities requiring sectoral consent'.

2.5.6. *England's Coastal Heritage* identifies the Lincolnshire coast as an area of High Archaeological Potential. It goes on to state that within such areas:

'Survey priorities will be determined through a consideration of the level of threat to important archaeological remains and the need to contribute adequate archaeological data to wider coastal zone management initiatives such as Coastal Zone Management Plans, River Catchment Management Plans, Estuary Management Plans, Shoreline Management Plans and Coastal Planning Strategies, in partnership with other agencies'.

2.5.7. *Identifying and Protecting Palaeolithic Remains; Archaeological Guidance for Planning Authorities and Developers* (English Heritage 1998) draws attention to the importance of Palaeolithic remains and states that they must be considered in line with PPG16 when potentially affected by development proposals. Palaeolithic archaeological sites are defined as any land where artefacts or traces of a human presence of Pleistocene date have been found. The document notes that Palaeolithic remains have particular importance if:

- Any human bone is present in relevant deposits;
- The remains are in an undisturbed, primary context;

- The remains belong to a period or geographic area where evidence of a human presence is particularly rare or was unknown;
- Organic artefacts are present;
- Well-preserved indicators of the contemporary environment (floral, faunal, sedimentological) can be directly related to the remains;
- There is evidence of lifestyle (such as interference with animal remains);
- One deposit containing Palaeolithic remains has a clear stratigraphic relationship with another;
- Any artistic representation, no matter how simple, is present;
- Any structure, such as a hearth, shelter, floor, securing device, etc. survives;
- The site can be related to the exploitation of a resource, such as a raw material;
- Artefacts are abundant.

2.5.8. The document goes on to note that sites containing any of these features are so rare in Britain that they should be regarded as of national importance and whenever possible should remain undisturbed.

2.5.9. The advice offered to developers and planning officers includes the following:

- It is advisable for prospective developers to research the archaeological potential of their sites (including that for Palaeolithic remains) at an early stage;
- It is the responsibility of developers to supply the relevant planning authority on the archaeology of their sites, with proposals for the way in which this will be accommodated within the development scheme, so that an informed planning decision can be reached. Information on the Palaeolithic remains or the potential for such remains within a certain site may be acquired from a desk-based assessment but when this is inadequate it may be necessary to obtain further information from a limited field evaluation by suitably qualified archaeologists;
- Planning authorities may apply a condition to a consent which prohibits the start of development until the applicant has ensured appropriate provision has been made for an adequate record of the site's archaeological remains.
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2.5.10. The Joint Nautical Archaeology Policy Committee *Code of Practice for Seabed Development* was first published in 1995. The Code has recently been reviewed and an updated version published in April 2006.

2.5.11. The Code sets out archaeological principles applicable to seabed developments which are similar to those to be found in current policy and practice on land. Procedures for consultation and co-operation between seabed developers and marine archaeologists are outlined, as are their respective roles in the development process. The aim of the Code is to ensure a best practice model for seabed development both within and beyond the remit of the formal Environmental Impact Assessment (EIA) process.

2.5.12. The document offers guidance to developers on issues such as risk management and legislative implications and provides a comprehensive list of expert contacts for further advice. The Code also highlights the responsibility of developers in

protecting the UK's marine heritage and identifies the potential benefits to companies which follow best practice.

2.6. PREHISTORIC ARCHAEOLOGICAL REMAINS

2.6.1. In 2002 the Department of Trade and Industry produced a document: *The scope of Strategic Environmental Assessment of North Sea areas SEA3 and SEA2 in regard to prehistoric archaeological remains*. Although not legislative the paper makes suggestions for discussion of protocols and a reporting regime for the commercial sector:

'The ideal structure would require or encourage the industry and its sub-contractors to check whether their activities are in archaeological prospective zones, and to identify, and report, when their activities positively detect prehistoric artefacts, or, in the case of acoustic surveys, provide very strong evidence. If this can be achieved at a minimal or acceptable cost/delay to industry, then there is a positive advantage in allowing operators to start activities in zones of archaeological potential, while avoiding positively identified sites, if any.' (8.6).

2.7. PROTECTING OUR MARINE HISTORIC ENVIRONMENT

2.7.1. In March 2004, a consultation document was circulated setting out the key issues and questions in relation to legislation and the management of the marine historic environment (DCMS, 2004). The document includes various suggestions for change, including a more unified designation scheme (combining the PWA and the Ancient Monuments and Archaeological Areas Act 1979). The document also includes provision for publishing the criteria that marine cultural heritage sites will need to satisfy in order to be designated. Standardised restrictions are also proposed, so that all sea-users can broadly anticipate what activities are allowed.

2.8. MARITIME DESIGNATIONS

2.8.1. There are no sites within the DSSA and RBSA subject to designation under the PWA (1973).

2.8.2. There are seven sites protected as 'Protected Places' under the PMRA. All of these sites are military aircraft lost during WWII for which the exact point of loss is not known. They are:

WA No	Name	Location
WA2443	SPITFIRE MK I L1051	Not known
WA2447	BLENHEIM MK IV R3765	Not known
WA2456	HAMPDEN MK I X3021	Not known
WA2458	WELLINGTON MK IV Z1285	Not known
WA2459	WHITLEY MK VII Z6960	Not known
WA2460	DORNIER DO217M-1 (6045) U5+GK	Not known
WA2461	DORNIER DO217K-1 (4412) U5+BA	Not known

Table 2: Sites Protected under the Protection of Military Remains Act (1986)

3. METHODOLOGY

3.1. INTRODUCTION

3.1.1. This assessment is intended to inform the preparation of the Environmental Statements that will accompany the applications for the wind farms. The methodology adopted reflects best practice in carrying out archaeological desk-based assessments, as codified by the Institute of Field Archaeologists (IFA) *Standard and Guidance for Archaeological Desk-based Assessment* (IFA 1999).

3.1.2. Although much of this assessment is derived from desk-based (i.e. secondary) sources, provision was also made for the archaeological interpretation of primary geophysical data. An audit and review by WA of geophysical data supplied by AMEC is ongoing at the time of writing of this report and will be reported separately.

3.1.3. The approach adopted also reflects the requirements of Environmental Assessment arising from European Council Directive 85/337/EEC as amended by Directive 97/11/EC.

3.2. SEARCH AREAS

3.2.1. Because several options were being considered for the route of the export cable a broad study area was established. This encompassed the Wash Cable Route Corridor, Docking Shoal Wind Farm and Race Bank Wind Farm, including a minimum 1km buffer zone around each. This broad study area was then divided into three, creating the Cable Route Study Area (CRSA), Docking Shoal Study Area (DSSA) and Race Bank Study Area (RBSA). The DSSA and RBSA, along with the CRSA and the Lynn and Inner Dowsing Data Search Area can be seen on (**Figure 1)**.

3.2.2. The co-ordinates for the two wind farm study areas are as follows:

DSSA		
Point	**UTM Easting**	**UTM Northing**
0	339259	5891855
1	341200	5892946
2	346991	5901032
3	347314	9502066
4	362033	5890656
5	359611	5888658
6	347694	5880454
7	339259	5891855
RBSA		
0	347314	5902066
1	347572	5902893
2	348245	5912563
3	348583	5913245
4	349112	5913485
5	355845	5912722
6	366065	5902962
7	366234	5902407
8	365934	5894160
9	365660	5893648

10	362033	5890656
11	347314	5902066
Projection: WGS 84 UTM 31N		

Table 1: Wind Farm Co-ordinates

3.2.3. Records of known maritime sites and casualty positions within the study areas were overlaid on a base map of the development area in a Geographical Information System (GIS).

3.2.4. In order to assess the potential for prehistoric sites within the study areas models of sea level change in the Southern North Sea were analysed to establish the periods when the area was dry land, and hence inhabitable by humans.

3.3. SOURCES

3.3.1. The principal sources consulted in this assessment are as follows:

- Records of wrecks and obstructions collated by the UK Hydrographic Office (UKHO) and obtained from Metoc plc as Seazone data.
- Records of known wrecks and recorded losses held in the maritime section of the National Monuments Record (NMR).
- Records of known terrestrial archaeological sites and finds from the NMR.
- Records of known archaeological sites and finds from the Norfolk Historic Environment Record (NHER).
- Aerial photographs held by the NMR.
- Various secondary sources relating to the palaeo-environment and to the Palaeolithic and Mesolithic archaeology of Northern Europe.
- Secondary sources relating to known and potential wreck sites and casualties, including historical charts and sailing directions held by the UKHO.
- The MoD (Naval Staff Directorate) was approached with respect to the PMRA (1986)
- The Receiver of Wreck at the Marine and Coastguard agency was approached with regards to reports of historic wrecks.

3.4. SITE NUMBERING

3.4.1. The numerical sequences used in this report follow on from the sequences used in the Wash Cable Route Corridor (Wessex Archaeology 2006b), which in turn follow on from the numbering used for the Lynn and Inner Dowsing Offshore Wind Farms (Wessex Archaeology 2002a) and the Lincs Offshore Wind Farm (Wessex Archaeology 2006a).

3.4.2. The records were split into the DSSA and RBSA and tabulated under a new numerical sequence.

3.4.3. Known sites within the DSSA are covered by the numbers **WA2300-2307**, and recorded losses by **WA2308-2311** (**Appendix I**, **Figure 2**). Within the RBSA the known sites are listed as **WA2317-2330**, and **WA2331-2463** cover the recorded losses (**Appendix II**, **Figure 3**).

3.5. MARITIME RECORDS

3.5.1. In order to assess the maritime archaeological resource within the DSSA and RBSA records of wrecks and casualties were obtained, principally from the NMR, Seazone, and NHER. Known wreck sites and obstructions as well as recorded losses were superimposed on a base map of the area within ArcMAP GIS software.

3.5.2. Recorded Losses refer to records of known losses for which there are no known seabed remains. They are often based on descriptive definitions or dead reckoning and they tend to be less accurate, particularly for older shipwrecks.

3.5.3. As a general rule, positions of live wrecks given in the NMR, Seazone and NHER data were plotted, whilst casualty records which are based on the NMR's recording practice of assigning documentary records to Named Locations were mapped to central buffered points. These points do not necessarily represent the wreck locations. The documented losses for the DSSA and RBSA are presented in full in **Appendix I** and **Appendix II**.

3.6. TERRESTRIAL RECORDS

3.6.1. As part of The Wash Cable Route Corridor report (Wessex Archaeology 2006) records of archaeological sites of all time periods were obtained from the NMR and NHER. In order to enhance the understanding of the DSSA and RBSA, particularly with respect to Palaeolithic and Mesolithic activity in these areas, these records were reused for this report. A full list of these sites is available in the above report, however only those discussed in this report are listed in **Appendix III** of this report. ArcMAP 9 was used to display the records.

3.7. CHRONOLOGY

3.7.1. Archaeological dating of remains relies on three distinct chronologies. These are as follows:

- Absolute (or calendar) dates, which are suffixed with **BC** (**B**efore **C**hrist), generically known as **big BC**. Such dates can be considered as part of our present day calendar, i.e. a date of 3,523 BC occurred 5,529 years ago.
- Calibrated radiocarbon dates, which are either related to our modern calendar as BC (**calBC**) dates, or presented as **BP** (before present) dates. BP dates are calculated in years before 1950, and take into account the increased radioactivity background count following the proliferation of nuclear testing after this date. Therefore, a calibrated date of 4,500 BP indicates a point in time 4,556 years before today (i.e. 2,550 BC).
- Uncalibrated radiocarbon dates, which are suffixed with **bc** (i.e. **little bc**), and are the original radiocarbon determinations based on the half-life of C14 without compensating for changes in the background count.

3.8. MARINE GEOPHYSICAL ASSESSMENT

3.8.1. Marine Geophysical data provided by AMEC is currently undergoing review and audit by Wessex Archaeology and the results were not available for inclusion in the discussion of archaeological features at the time of writing this report.

4. BASELINE CONDITIONS

4.1. MORPHOLOGY, GEOLOGY AND SEASCAPE

4.1.1. The DSSA consists of an irregular shaped polygon that abuts the northern end of the Cable Route Study Area (Wessex Archaeology 2006b) approximately 8km off the north Norfolk coast. The RBSA is of an irregular polygon that lies adjacent to the DSSA, approximately 20km off the coast of Norfolk (**Figure 1**).

4.1.2. The seabed morphology of the DSSA consists mainly of Docking Shoal, a sandbank with a depth range of 3m-9m below Chart Datum (CD). The channel between Docking Shoal and Race Bank is also partially encompassed within the Study Area and has a maximum depth of 19m below CD. The RBSA includes Race Bank sandbank in the south and North Ridge and Dudgeon Shoal in the north of the study area, with areas of deeper seabed between these banks. The area ranges in depth from 2m below CD on Race Bank to 22m below CD in the channel between the banks in roughly the centre of the study area.

4.1.3. The underlying sediment within the DSSA and RBSA is the Boulders Bank Formation (BDK). This has been described by the British Geological Survey (BGS) in their Spurn Quaternary Sheet as consisting of red-brown, calcerous, gravelly, sandy clay with erratics predominately of chalk, red-brown sandstone and grey mudstone (British Geological Survey 1991). Modern sea bed sediments directly overly the BDK Formation. Docking Shoal and Race Bank are made up of slightly gravelly sand, while the surrounding seabed consists of gravelly sand.

4.2. PREHISTORIC ARCHAEOLOGY

Glaciation and Sea Level Change

4.2.1. The archaeological potential of the study area is closely related to relative sea level change through time. Between 700,000 BP- 0 AD much of the North Sea Basin was dry land, and at times is likely to have been suitable for human occupation (Wenban-Smith 2001: 2).

4.2.2. The North Sea Basin has been shaped by numerous periods of glaciation and associated marine transgressions, including three major glaciations: the Anglian (c.478,000 BP to 423,000 BP), the Wolstonian (c.380,000 BP to 130,000 BP) and the Devensian (c.70,000 BP to 13,000 BP). Ice sheets would have affected the landscape in a number of different ways:

- Erosion caused by glaciers;
- Erosion caused by glacial outwash;
- Deposition of sediment caused by glacial outwash;
- Isostatic change resulting from the effect of the ice sheet upon the landmass.

4.2.3. Relatively small changes in sea level would have had a marked effect on the coastline. Any coastline models therefore can only be approximate. **Table 3** provides an indication of the main warm and cold periods and estimates the sea level stands that prevailed during these periods:

Oxygen Isotope Stage	Age in years BP/BC	British Conventional Chronology	Archaeological Period	Climate	Sea Level Age	Relative Sea Level
–	4,000 BC	Flandrian	Mesolithic	Warm	c. 4,000 BC	-6m
	5,500 BC				c. 5,500 BC	-10m
					c. 6000 BC	-17m
					c. 6300 BC	
					c. 6,700 BC	-20m
					c. 9,000 BP c. 7,000 BC	-25m
	7,500 BC		Early Mesolithic		c. 9,500 BP c. 7,500 BC	-30m
1	10,000 BP/ 8,000 BC	Devensian	Late Upper Palaeolithic		c. 10,000 BP c. 8,000 BC	-35m
					c. 11,000 BP c. 9,000 BC	-40m
						-50m
2	12,000 BP/ 10,000 BC				c. 12,000 BP c. 10,000 BC	-60m
					c. 13,500 BP c. 11,500 BC	
	16,000 BP/ 14,000 BC					
2	18,000 – 25,000	Devensian	Early Upper Palaeolithic	Mainly cold	c. 18,000 BP c. 16,000BC	-120m
3	25,000 – 50,000				c. 40,000 BP c. 38,000BC	-50m
4	50,000 – 70,000		Middle Palaeolithic			
5a-d	70,000 – 110,000					
5e	110,000 – 130,000	Ipswichian		Warm	c. 122,000 BP	+8m
6	130,000 – 186,000	Wolstonian		Cold	c. 128,000 BP	-100
7	186,000 – 245,000			Warm	c. 186,000 BP	High?
8	245,000 – 303,000		Lower Palaeolithic	Cold	c. 250,000 BP	Low?
9	303,000 – 339,000			Warm	c. 300,000 BP	High?
10	339,000 – 380,000			Cold	c. 339,000 BP	
11	380,000 – 423,000	Hoxnian		Warm	c. 380,000 BP	High?
12	423,000 – 478,000	Anglian		Cold	c. 425,000 BP	-120m+?
13	478,000	Cromerian		Variable	c. 480,000 BP	Varying
17 or 19?	700,000 BP				c. 700,000 BP	

Table 3: Relative Sea Level Changes (after Wymer (1999), Shennan et al. (2000), Wenban-Smith (2002), Coles (1998), Jeglersma (1979), Parfitt et al. (2005) and the work of the Land-Ocean Evolution Perspective Study (LOEPS).

4.2.4. All or part of the DSSA and RBSA would have been free of ice and above sea level during some of the colder periods of the Lower and Middle Palaeolithic (c.700,000 to 50,000 BP), and potentially habitable for humans. This would also have been the case between the end of the last cold period of the Devensian Glaciation (known as the Loch Lomond Stadial 13,000-11,500 BP) and the Mesolithic.

4.2.5. The discovery of lithic remains from Pakefield in Suffolk dated to c.700,000 BP has revealed evidence of occupation on what is described as a floodplain that extended off the east coast of Britain. This provides evidence for a previously unknown warm period during the Cromerian (Parfitt et al. 2005: 1008). At times during this period the DSSA and RBSA may have been exposed and therefore possibly suitable for occupation by archaic humans.

4.2.6. The most extensive ice cover of Britain occurred during the Anglian glacial phase (c.478,000 to 423,000 BP), when the ice sheet is believed to have extended almost as

far south as the Thames (Wymer 1999: 17). The DSSA and RBSA would have been completely covered in ice during the glacial maximum. However there would have been a period as the ice retreated when the DSSA and RSSA was exposed, although the Hoxnian stage immediately thereafter may have seen the rapid rise of sea level sea level to cover the area.

4.2.7. The full extent of Wolstonian ice cover (c.380,000 to 130,000) is unknown, but it is considered likely that at its maximum the ice sheet may have reached as far south as the Wash, covering the DSSA and the RBSA (May 1976: 17-18). The advance of the later Devensian ice is also likely to have reached past the southern limit of the present-day Wash (Brew 1997: 137). The intervening warm period of the Ipswichian (c.110,000 to 130,000 BP) is predicted to have had sea levels 8m higher than today, completely inundating the DSSA and the RBSA.

4.2.8. The speed and effect of the last marine transgression upon the area is difficult to quantify. A model developed by Shennan et al. (2000: 291) suggests that the DSSA and RBSA would have been most recently inundated c.6,000 BP. Sea level curves for the Fenlands indicate a relative sea level of nine metres below its current position at around 7,000 BP (ibid. 2000: 292). If a 6m tidal range is assumed this suggests a Mesolithic low water mark at -12m, placing the coastline in the north of the DSSA. Based on the modern bathymetry of the study areas the -12m low water mark suggests that there may have been a system of lagoons in the area of the RBSA during this period. Reconstructions of the postulated changes in sea level toward the end of the Devensian are illustrated in **Figure 4**.

Periods of Potential Human Occupation

4.2.9. The Lower and Middle Palaeolithic landscape of Britain is difficult to reconstruct, but it is possible to make some generalisations based on existing evidence. There is a strong likelihood that the Cromerian period (c.700,000 to 478,000 BP) contained a number of warm phases that may have allowed human occupation (Parfitt et al. 2005: 1008). Fossil evidence from the West Runton Freshwater bed on the North Norfolk coast indicates a temperate climate and palaeobotanical material points to a habitat of woodland and grass (Stuart and Lister 2001: 1678). The Cromer Bed sediments have revealed that large grazing mammals such as mammoth, elephants and giant deer would have traversed the landscape at this time (Wymer 1999: 129).

4.2.10. The Anglian glaciation (c.423,000 BP) brought ice cover and a periglacial climate to Britain. Although for a time, at the end of the period, the DSSA and RBSA may have been exposed, harsh conditions are likely to have precluded occupation. While the Hoxnian stage was to be warmer a sea level higher than today is probable, inundating the DSSA and RBSA.

4.2.11. The Wolstonian (c.380,000 to 130,000 BP) period appears to have been comprised of a number of warm and cold periods. There have been no substantial studies of this period specifically dealing with the southern North Sea, but evidence from other parts of Britain has revealed some details of interglacials during the Wolstonian, such as the Purfleet interglacial (320,000 - 290,000 BP / OIS 9), when Schevre believes Britain to have been inhabited by Neanderthals, and the Aveley interglacial (180,000 - 230,000 BP / OIS 7) (2001: 1698).

4.2.12. While the Ipswichian (c.130,000 to 110,000 BP) period was temperate and suitable for the human occupation of Britain the DSSA and the RBSA are likely to have been inundated during this period. Following this there may have been a period before the Devensian glacial maximum where the climate was sufficiently warm and sea level low enough to expose the DSSA and the RBSA, presenting the possibility of human occupation of the areas.

4.2.13. The retreat of the last glacial ice sheet (Devensian) around 13,000 BP would once again have exposed the North Sea Basin. The immediate post-glacial landscape was colonised by grasses, sedges and herbs and increasingly mild temperatures provided a suitable environment for initial birch, willow, poplar, hazel and pine vegetation (Fryer et al. 2005: 10). Late Upper Palaeolithic (c.16,000 to 11,000 BP) evidence from Tichwell, just to the south of the DSSA, demonstrates human occupation of the region in this period (Wymer 1994).

4.2.14. At the transition into the Mesolithic (c.11,000 BP) the southern North Sea would have been an area of low-lying fresh and brackish-water wetlands and lagoons, supporting animals such as deer and aurochs (Murphy 2005: 6). As sea level rose it eventually inundated first the RBSA and later the DSSA in the Mesolithic period around 6,000 BC.

Known and Potential Archaeology

4.2.15. Three major glaciations have reworked the landscape of the DSSA and the RBSA since the earliest known Lower Palaeolithic occupation of Britain in the Cromerian. It can be assumed that there was no human occupation of the ice sheets, but glacial maxima would not have been achieved quickly and occupation may well have taken place near the advancing and retreating fringes of the ice sheets in all periods (Wymer 1999: 18)

4.2.16. Material remains from the earliest periods of the human occupation in Britain are relatively rare. It is useful therefore to refer to evidence from across Britain as a whole and the wider environmental context, as discussed above, to establish the potential for the presence of archaeological remains within the DSSA and the RBSA.

4.2.17. The most easily identifiable features of the prehistoric landscapes described above are the buried remains of former river systems or ‘palaeochannels’. These systems incised new valleys into the landscapes, and often cut through previous layers removing and redepositing sediments. Despite the extensive reworking of the landscape, some deposits from these earlier periods may survive *in situ* in the North Sea (Hosfield 2001), and therefore in the DSSA and RBSA.

4.2.18. The Cromerian landscape would have extended across the whole of the southern North Sea. The woodland and wildlife would have made Norfolk an attractive habitat for hominid occupation and some of the earliest hominid sites in Britain have been found at Pakefield in Suffolk and Happisburgh in Norfolk, on the North Sea coast. This suggests the potential for evidence of human occupation in the DSSA and RBSA may date back at least as far as these discoveries. Subsequent glaciations have shaped the landscape and are likely to have moved archaeological material from this period from its original site of deposition (primary context) to other locations (secondary context).

4.2.19. The opportunity for occupation would next have presented itself at the beginning and end of the Hoxnian interglacial. Hand-axes from this period have been found in Lynford and Little Cressington in Norfolk (Wymer 2005b: 13) and a flint flake with trimmed edge (**WA1662**), interpreted as part of the Clactonian industry (c.400,000 BP), was found in Hunstanton in 1951. It is very likely however that the DSSA and the RBSA would have been inundated throughout this period.

4.2.20. The Middle Palaeolithic (c.245,000 to 50,000 BP) period is marked by a significant absence of finds in Britain despite evidence that the Wolstonian included of a number of warm phases suitable for occupation. Wymer has suggested that Britain may have been uninhabited at this time (1999: 33). Norfolk however contains a rare site at Lynford Quarry in Mundford (approximately 50 miles south of the DSSA) where a number of *in situ* flint artefacts have been recovered dating to the later Middle Palaeolithic period c.65,000-32,000 BP and attributed to Neanderthal inhabitants (Wymer 2005b: 13).

4.2.21. Human occupation of Britain increased in the Upper Palaeolithic (c.50,000 to 11,000 BP). *In situ* flintwork from Titchwell, directly south of the DSSA and RBSA, has been attributed to the late Upper Palaeolithic tradition of tool making and may date to just after the glacial maximum c.13,000 to 12,000 BP. Wymer et al. believe the extent of such human occupation in Britain, so soon after the Devensian glaciation, to have been very limited (1994: 35-36).

4.2.22. As a post-Devensian *in situ* site within peat deposits Titchwell suggests some potential for similar sites elsewhere on the Norfolk coast. However, the nature and effect of marine transgression on this area of coastline may have varied substantially due to local conditions. There is currently no evidence for the presence of likely peat deposits offshore in the DSSA or RBSA. However, WA recorded blocks of peat washing ashore on the beaches near Hunstanton (Wessex Archaeology 2006b).

4.2.23. During the early Mesolithic Norfolk would have formed the western edge of a great plain extending over what is now the North Sea. As sea level rose the RBSA would have been slowly inundated, although some areas of higher ground may have been left exposed and a system of lagoons and islands may have formed. The wetland habitat that would have existed during this period formed the type of terrain known to have been favoured by Mesolithic hunters and fishers who would have hunted the game and used the waterways to navigate through the landscape.

4.2.24. No Mesolithic finds are known within the DSSA and the RBSA but human artefacts including flints, spear-heads and mammal remains have been dredged from locations on Dogger Bank in the North Sea (Department of Trade and Industry 2002: 33). A bone tool and flints (**WA1540, WA1455, WA1614, WA1663**) have been found on shore to the south west of the study areas and Mesolithic microliths and distinctive long blades have been found elsewhere in Norfolk and suggest occupation by small groups of hunter-gatherers during this period (Wymer 2005a: 15).

4.2.25. While the DSSA and the RBSA are both likely to have been entirely inundated by 6,000 BP there is the potential for early Mesolithic *in situ* material and derived material to be found in these areas. After this date any archaeological material in the study areas will be of a marine nature only.

4.3. MARINE ARCHAEOLOGY

Known Wrecks and Anomalies

4.3.1. A full listing of all known wrecks and aircraft within the DSSA and RBSA can be found in **Appendix I** and **Appendix II** respectively. These sites can be divided into four categories:

Wreck Classification	Number in DSSA	Number in RBSA
Live - a wreck/obstruction considered to be a hazard to navigation by the UKHO or to exist by the Receiver of Wreck	5	11
Dead - a wreck/obstruction not detected by repeated survey and therefore considered to no longer pose a hazard to navigation by the UKHO	1	2
Abey – previously reported but not detected by survey, leading to doubts about its reported position or existence	-	1
Unknown - a wreck/obstruction detected by the NMR and therefore not categorised as Live or Dead	2	-

Table 4: Wreck Classification

Docking Shoal Study Area

4.3.2. Eight known sites are recorded within the DSSA (**WA2300-WA2307**) (**Appendix I**). Six of these sites (**WA2302-2307**) are clustered in a line along the northern edge of Docking Shoal. Their position on the edge of the shipping channel between Docking Shoal and Race Bank suggests these are likely to be vessels that foundered on the shoal while navigating this passage. The two remaining sites are located on the edge of Docking Shoal to the south-east (**WA2300**) and west (**WA2301**) (**Figure 2**).

4.3.3. Of the six possible wrecks on the northern edge of Docking Shoal **WA2304** is the only one to be positively identified as a wreck. Although classified as dead by the UKHO remains of the wreck may still exist, particularly below the seabed.

4.3.4. Three other sites, **WA2302**, **WA2303** and **WA2305** are classified as obstructions. **WA2302** was first reported in 1918 and its only available dimension is a height (0.8 metres). **WA2303** was first reported in 1925 and is a substantial obstruction on the seafloor; exact dimensions can be seen in **Table 5**. **WA2305** is a small obstruction first reported in 1993 measuring only 1m x 1m x 1m.

4.3.5. The remaining sites within the channel, **WA2306** and **WA2307** are both described as obstructions but have not been surveyed.

4.3.6. **WA2300**, on the south eastern edge of Docking Shoal is has been identified as the British fishing vessel *MV Sverre,* lost in 1945. **WA2301,** on the north western side of the shoal is recorded as a modern machinery unit lost in 1997.

WAID	Length	Width	Height
WA2300	-	-	-
WA2301	2	2	1
WA2302	-	-	0.8
WA2303	15	9	2.2
WA2304	-	-	-
WA2305	1	1	1.1
WA2306	-	-	-

WAID	Length	Width	Height
WA2307	-	-	-

Table 5: Dimensions of known sites on the seabed within DSSA as recorded by UKHO survey

Race Bank Study Area

4.3.7. The RBSA contains fourteen known sites, the majority of which lie on or near Race Bank, North Ridge or Dudgeon Shoal. They may represent wrecks that have foundered on these banks (**Appendix II**) (**Figure 3**).

4.3.8. Twelve of the fourteen sites (**WA2317-WA2328**) are known to be wrecks. **WA2329** is recorded as a possible wreck and classed as dead by the UKHO and **WA2330** is thought to be a natural feature and has not been surveyed by the UKHO.

4.3.9. Only one of the wrecks is known to have been lost before 1900. **WA2317** is the wreck of the British ketch *Jane and Elizabeth* lost in 1885. Although the site is classified as dead by the UKHO the remains of the wreck may still exist below the seabed.

4.3.10. Two vessels were lost during WWI: the German submarine *UB54* (**WA2318**) lost in 1918 and noted as abey, and the British steamship *Laurium* (**WA2319**), which was also lost in 1918, but is not noted as a wartime casualty.

4.3.11. **WA2320** is the only other wreck to have been identified: *MV Mirabel* a fishing vessel lost in 1993.

4.3.12. **WA2321** is recorded as a steamship carrying a cargo of pig iron, its name and date of loss is unknown. A debris field has been described close to the site and may be linked to the vessel.

4.3.13. The remaining seven known wrecks within the RBSA (**WA2322-2328**) are all classified by the UKHO as live. These wrecks are all of substantial size and have a height of at least 0.8 metres above the seabed. Their recorded dimensions can be seen in **Table 6**. With the exception of **WA2325** and **WA2328** all of these wrecks were located in 1993. This should not necessarily be seen as indicative of a recent date for these sites, but, rather, a reflection of the UKHO survey history of the area.

WAID	Length	Width	Height
WA2317	-	-	-
WA2318	-	-	-
WA2319	50	20	2.3
WA2320	9	-	-
WA2321	66	23	2.6
WA2322	33	12	1.3
WA2323	52	10	0.8
WA2324	68	14	3.2
WA2325	62	19	1.8
WA2326	18	5	1
WA2327	80	20	1.4
WA2328	28	13	2.2
WA2329	-	-	-
WA2330	12	-	-
All dimensions are in metres			

Table 6: Dimensions of known sites on the seabed within RBSA as recorded by UKHO survey

Recorded Losses and Archaeological Potential for Further Maritime Sites

4.3.14. Twenty of the 22 known maritime sites within the DSSA and RBSA were located by the UKHO. These sites show a bias that is a result of a reliance predominantly on UKHO survey records. The distribution of known wreck sites reflects the intensity of past UKHO surveys in areas important to navigation rather than a true indication of the number and extent of all vessels remains across the entire seabed of the DSSA and RBSA. UKHO data also reflects the UKHO's concern in identifying metal wrecks that present a hazard to navigation.

4.3.15. In addition to the known sites recorded by the UKHO and NMR there are records of vessels lost in the area for which the exact position and extent of survival (if any) is not known. These documented losses, listed by the NMR, are assigned to points known as named locations, two of which exist within the DSSA and two within the RBSA. Named locations represent losses within a broader area and therefore any losses recorded at these four named locations do not necessarily lie within the study areas.

4.3.16. The NMR records 9 losses within the DSSA. The earliest recorded loss is that of an unknown vessel in 1890 (**WA2308**) one of three vessels documented to be lost before 1914, the latest year of loss is 1941. Four cargo vessels are documented and are of British (**WA2311**), Polish (**WA2314**) and Norwegian (**WA2312**, **WA2313**) nationality. Four of the vessels (**WA2311**, **WA2313**, **WA2314** and **WA2316**) were lost as result of military action in the two world wars (**Appendix I**).

4.3.17. 126 losses are recorded by the NMR within the RBSA. The vessels are made up of sailing and cargo ships. There are also 7 aircraft lost during World War II (**Appendix II**).

4.3.18. The earliest loss within the RBSA is that of the *Ipswich* (**WA2331**), an English cargo vessel lost in 1763 and the most recent is the *Straton* (**WA2463**) a British trawler which foundered after hitting a mine in 1948 (**Appendix II**).

4.3.19. Thirteen of the 126 casualties are recorded to have been lost off Spurn Head approximately 60km to the north-east and are therefore unlikely to lie within the study areas (**Appendix II**).

4.3.20. Prior to 1898, when the Dudgeon lightship is recorded to have been lost, 12 vessels were reported to have foundered in its vicinity (**Appendix II**). The position of the lightship is unknown but it is likely to have been used as navigational warning to keep ships clear of the Shoals. If this is the case it is likely to have been located either at the south-east corner of Dudgeon Shoal within the RBSA or outside the study area near the northern tip of East Dudgeon Shoals. A further 12 vessels have been recorded to be lost near Dudgeon Shoal which partially lies within the RBSA (**Appendix II**).

4.3.21. The recorded losses are displayed in **Table 7** below.

Date of Loss	DSSA no of wrecks	RBSA no of wrecks	DSSA no of Aircraft	RBSA no of Aircraft
1763 – 1800	-	6	-	-
1801 – 1850	-	32	-	-

1850 – 1913	3	64	-	-
1914 – 1918	2	7	-	-
1919 – 1938	4	2	-	-
1939 – 1945	-	14	-	7
1946 – 2001	-	1	-	-
Totals	9	126		7

Table 7: Wrecks and Aircraft classified by date of loss

4.3.22. The temporal distribution of the losses shown in **Table 7** is not thought to be indicative of an absence of maritime losses during earlier periods, nor is it thought to be a comprehensive catalogue of all losses during the periods shown.

4.3.23. Documented losses are generally limited in that they are dependent on the survival of historical written records. Records of maritime casualties were not systematically kept until the 18th century and even then, the records cannot be considered comprehensive. The distance of the DSSA and RBSA from the shore may also have influenced the number of recorded losses in the area as foundering vessels may easily have gone unnoticed. As the known sites and recorded sites in the DSSA and RBSA may not be representative of the true number of sites that survive there, the potential for as yet unrecorded and unknown archaeological material representing the past maritime use of the DSSA and RBSA is considered here in addition to the recorded losses.

4.3.24. Estimates of the true number of maritime casualties around the UK coast vary substantially, and cannot be considered wholly reliable. 'Best guesses' vary between 100,000 and 500,000 losses which suggests an average of 8 to 40 wrecks for every mile of coastline. While this equation is overly simple it is useful as an illustration of the potential for wreck densities per mile of the UK coast. Based on these numbers the sea off the 27km of coast adjacent to the DSSA and the RBSA could potentially contain between 144 and 720 wrecks. The sandbanks of Docking Shoal, Race Bank, North Ridge and Dudgeon Shoal are navigational and shipping hazards and are surrounded by busy shipping routes. The potential for wrecks within the region therefore is high.

4.3.25. Mesolithic people are known to have favoured waterways and used boats to navigate them. The gradual inundation of first the RBSA and then the DSSA during this period means human exploitation of the coastal region is highly likely. While this implies potential for finds of this date within the DSSA and RBSA the survival of wooden artefacts of this date would be extremely unusual.

4.3.26. During the Neolithic the sea level would still have been several metres below its current level and the coastline would have been at least 500 metres seaward of today's position. The Neolithic inhabitants of Norfolk and Lincolnshire made use of water transport to exploit the resources of the area, using vessels such as log boats which are well attested from this period (McGrail 2004: 173). The possible use of this area as a focus for vessels used in seafaring across the southern North Sea is speculative, but distributions of stone artefacts within the British Isles indicate a seafaring tradition dating to the Neolithic (ibid: 171).

4.3.27. The ties Bronze Age people had to the coast are well attested to in Norfolk with the discovery of 'Seahenge' just to the south west of the DSSA. Vessels from the Bronze

Age have been discovered to the north in the Humber Estuary in Lincolnshire. The Brigg raft and Ferriby boats are believed to have been restricted to tidal waters, and possibly used as cargo ferries on the Humber (McGrail 2004: 184-188). However the possibility of coastal traffic, possibly engaged in voyages across the southern North Sea is likely.

4.3.28. Sea level is likely to have reached a similar level to its present position at the end of the Iron Age. From this period, maritime activity within the DSSA and RBSA is likely to be closely linked to activity within the Wash, as any traffic heading to the Wash from the east must pass through the passage between the two shoals or travel further out to sea to pass north of Race Bank. The high concentration of Iron Age gold torcs found in the north and west of Norfolk suggests that people living in this area were able to obtain gold by controlling the trade in the Wash (Hutcheson 2005: 26), much of which will have passed through the DSSA and the RBSA.

4.3.29. During this period human occupation to the south of the DSSA is known at Hunstanton and coastal activity in this area would have included small scale industrial processes such as salt extraction and fishing.

4.3.30. During the Roman period maritime activity in the area can be inferred from the construction of shore forts. The fort at Brancaster to the south of the DSSA, for example, was built in the 3rd century AD. Originally thought to have been built as military base and depot controlling and safeguarding trade routes and merchant shipping it became part of the string coastal defences guarding the *Litus Saxonicum* or 'Saxon Shore' against the 'barbarian' raiders (Gurney 2002: 5).

4.3.31. The seafaring abilities of the people who settled Britain from the continent, including the Angles (who lent their name to the modern region of East Anglia) are clearly evident from the well known Saxon period boat burials at Sutton Hoo and Snape (Carver 1990: 117). Viking activity is recorded in East Anglia from the 9th century and is likely to have started with periods of overwintering followed by gradual settlement. Although the precise location of Viking landings is not known evidence of Viking activity, in the form of Trefoil brooches and weights, has been found in rivers accessible from the North coast of Norfolk at Blakeney and Wells-next-the-Sea (Pestall 2005: 36).

4.3.32. Shipping and sea-borne trade in Medieval Norfolk is dominated by the ports of Great Yarmouth and King's Lynn (known as Bishop's Lynn until the mid 16th century but commonly referred to as Lynn) (Rutledge 2005: 78). Vessels travelling from Lynn to the Rhineland, France and Germany as well as local ports such as Blakeney are all likely to have passed through the DSSA and RBSA (ibid: 78).

4.3.33. Lynn supported an extensive foreign trade in various periods exporting corn, wool, cloth and herring. In the 13th century the port of Lynn collected the fourth highest duties of any south or east coast port including London but by the 15th century Bishop's Lynn was in decline (ibid: 78). Some trade and fishing from local ports including Blakeney continued into the Post-medieval period.

4.3.34. Since the Post-medieval period a successful fishing industry has survived on the north Norfolk coast south of the DSSA and RBSA at Thornham and Brancaster. Areas of Docking Shoal and the RBSA are likely to have been fished from this time.

A chart from the 19th century however records areas of Docking Shoal as drying out at low tide during this period (From Cromer to Trusthorpe 1843) and the Shoal is noted as a hazard in the 1858 Pilot for the region (UKHO: 104). Both these factors are likely to have limited use of the area during this period.

4.3.35. In addition to the potential for shipwrecks within the DSSA and RBSA, there is potential for stray finds of items lost or thrown overboard from vessels crossing the area, such material may indicate past sailing routes.

4.3.36. In summary, the marine archaeological potential of the DSSA and RBSA consists of:

- 22 known wrecks and obstructions in the DSSA and RBSA
- 142 documented losses, some of which may lie within the CRSA or the DSSA and RBSA.
- Unknown and undocumented wrecks or other watercraft from various periods possibly dating back to the Mesolithic
- Stray finds of ship-borne debris from various periods.
-

4.4. IMPORTANCE OF THE KNOWN SITES

Docking Shoal Study Area

4.4.1. Both sites within the DSSA that have a recorded date (**WA2300** and **WA2301**) are modern, post-dating 1945 and are likely to be of limited archaeological importance.

4.4.2. Very little is known about the remaining recorded obstructions. **WA2304** is a wreck of unknown origin and **WA2303** is of interest because if its size and height above the seabed (**Table 5**). Both of these sites are of interest but are at present unquantifiable and therefore may warrant further investigation.

4.4.3. The remainder of the known and documented wrecks are relatively modern but have little or no information associated with them. Their importance is thus also unquantifiable at this time, although their archaeological potential is likely to be limited

Race Bank Study Area

4.4.4. **WA2317,** the ketch *Jane and Elizabeth* lost in 1885 may be of some interest. Although the ketch is a relatively common sailing craft examples of which can still be seen sailing today, small craft often vary on a local level. The cargo and other contents of such a vessel may also contribute to the archaeological record in the area.

4.4.5. Two of the wrecks within the RBSA were known to have been lost during WWI (**WA2318** and **WA2319**) and although not necessarily archaeologically important in terms of form, they may need be viewed within the context of EH initiatives on the recording of wartime remains (The Defence of Britain Project) (English Heritage 2003). These initiatives have not been formulated into guidance that clearly states that the sites in question are of a specified level of importance, but in this instance it may be appropriate to assume national importance to those World War I wrecks.

4.4.6. The steamship **WA2321** may also be of archaeological interest but this would depend on the period it was built: i.e. it may be a rare survival if built at the

beginning of the industrial revolution when the technology and form of vessels was changing rapidly. Its importance is unquantifiable based on the information currently available.

4.4.7. **WA2329** may be a wreck but is classified as dead by the UKHO. Without further information its importance cannot be assessed.

4.4.8. Very little information is available pertaining to **WA2322-WA2328** although UKHO survey data has revealed that these sites are all of a substantial size and height above the seabed. As a result, they would warrant further investigation to ascertain the importance and archaeological potential.

4.5. IMPORTANCE OF ANY UNKNOWN SITES

4.5.1. Any further wreck sites that come to light during the course of development will have to be assessed for importance on a site by site basis. A level of importance from negligible to sites of international importance is possible for each site.

4.5.2. Although no submerged prehistoric remains are known within the DSSA and RBSA at the present time, were any to come to light during the course of the development they are likely to be of national or international importance. This assessment is based on the relative paucity of such sites within the British and European archaeological record.

4.5.3. The importance of any isolated or chance finds of submerged prehistoric material is more problematic. Although the finds themselves will be associated with a high level of importance, where they are derived (i.e. removed from their original depositional context) the physical area from which they come is not necessarily important.

4.5.4. *England's Coastal Heritage* (English Heritage 1996) notes that the Wash has an apparent lack of intertidal archaeology as much of the Saxon and medieval intertidal zones are now extensively buried under more recent land reclamations. While, this is true of the Fenland edges of the Wash, certain areas such as those near Holme have not undergone reclamation and must be considered to be of high potential. The reduction of the beach deposits in this area suggest further as yet unknown material may be exposed which may be of national or international importance.

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5.3. DOCUMENTARY RECORDS

Reference	Date	Title	Seen	Copy
OCB1455	1843-1874	England East Coast Sheet IV from Cromer to Trusthorpe	Y	N

APPENDIX I: GAZETTEER OF MARITIME ARCHAEOLOGICAL SITES IN THE DSSA

KNOWN WRECKS AND OBSTRUCTIONS THAT LIE WITHIN THE DSSA

WA ID	UKHO/NMR ID	State	Name	Description	Date Lost	UTM Easting	UTM Northing
WA2300	UKHO8598	Live	Sverre	British motor fishing vessel.	02/01/1945	355637	5886494
WA2301	UKHO9182	Live	Foul	Machinery unit. 6 tonnes. Measuring 2x2x1m on the seabed	Jul-97	343190	5893884
WA2302	UKHO8608	Live	Obstruction	Obstruction. 0.8m high on the seabed. First reported in 1918	Unknown	350878	5897318
WA2303	UKHO8610	Live	Obstruction	Obstruction. Measuring 15x9x2.2m on the seabed. First reported in 1925	Unknown	349538	5899292
WA2304	UKHO8611/ NMR892359	Dead	Unknown	Wreck. First reported in 1916	Unknown	348027	5900222
WA2305	UKHO9172	Live	Obstruction	Obstruction. Measuring 1x1x1.1m on the seabed. First reported in 1993	Unknown	349289	5898744
WA2306	NMR892358	Unknown	Unknown	Possible obstruction	Unknown	348685	5899923
WA2307	NMR892356	Unknown	Unknown	Unidentified seabed obstruction reported by fishermen. Possibly indicative of wreckage or a submerged feature.	Unknown	351936	5897037

DOCUMENTED LOSSES THAT LIE WITHIN THE DSSA

WA ID	NMR ID	Named Location	Name	Description	Date Lost	UTM Easting	UTM Northing
WA2308	1348216	26	Unknown	Unknown	1890	348362	5893259
WA2309	1302111	26	Wide Awake	English dandy. Built 1871	1895	348362	5893259
WA2310	1349159	26	Kate and Mary	English cutter. Built 1868	1906	348362	5893259
WA2311	1352076	26	Laurium	British cargo vessel. 13 guns. Lost after hitting a German mine. 1 life lost.	1918	348362	5893259
WA2312	943141	25	Freidig	Norwegian cargo vessel	1918	348361	5893249
WA2313	1349656	26	Trajan	Norwegian cargo vessel. 1744 tons of cargo. Bombed by German aircraft. Vessel reported to be broken up	1941	348362	5893259
WA2314	1349669	26	Czestochowa	Polish cargo vessel built in 1930. Foundered after being torpedoed by German e-boats	1941	348362	5893259

WA2315	1349672	26	Antiope	English cargo steamship built in 1930. 1 life lost	1941	348362	5893259
WA2316	1349717	26	Glendalough	British cargo vessel built 1936.foundered after hitting a mine. Vessel dispersed by explosives after	1941	348362	5893259

APPENDIX II: GAZETTEER OF MARITIME ARCHAEOLOGICAL SITES IN THE RBSA

KNOWN WRECKS AND OBSTRUCTIONS THAT LIE WITHIN THE RBSA

WA ID	UKHO ID	State	Name	Description	Date Sunk	UTM Easting	UTM Northing
WA2317	8618	Dead	Jane and Elizabeth	British ketch. 51 tonnes	18/08/1885	361371	5903526
WA2318	8616	Abey	UB54	German Submarine. 650 tonnes. 55.5m Long x .8m Wide.	11/03/1918	349769	5902486
WA2319	8612	Live	Laurium (possibly)	British steam ship. Coal cargo. 582 tonnes. Length: 53m, beam: 8m, draught: 3.7m.	23/04/1918	354635	5897542
WA2320	9176	Live	Mirabel	British Motor Fishing. 9.8m long	17/12/1993	355699	589618
WA2321	8613	Live	Unknown	Steam Ship. Cargo Of Pig Iron, 1500 tonnes. Measuring 66x23x2.6m on the seabed. First reported in 1963	Unknown	361190	5900501
WA2322	9168	Live	Unknown	Wreck. Measuring 33x12x1.3m on the seabed. First reported in 1993	Unknown	354687	5904127
WA2323	9166	Live	Unknown	Wreck. Measuring 52x10x0.8m on the seabed. First reported in 1993	Unknown	365685	5899755
WA2324	9154	Live	Unknown	Wreck. Measuring 68x14x3.2m on the seabed. First reported in 1993	Unknown	358560	5910009
WA2325	8619	Live	Unknown	Wreck. Measuring 62x19x1.8m on the seabed. First reported in 1963	Unknown	359384	5904388
WA2326	9169	Live	Unknown	Wreck. Measuring 18x5x1m on the seabed. First reported in 1993	Unknown	359375	5895854
WA2327	9170	Live	Unknown	Wreck. Measuring 80x20x1.4m on the seabed. First reported in 1993	Unknown	360132	5895399
WA2328	8625	Live	Unknown	Wreck. Measuring 28x13x2.2m on the seabed. First reported in 1910	Unknown	361166	5907629
WA2329	8634	Dead	Unknown	Possible Wreck. First reported in 1921	Unknown	352602	5910127
WA2330	9167	Live	Unknown	Possible Natural Feature. 12 Metres long on the seabed	Unknown	362878	5902107

DOCUMENTED LOSSES THAT LIE WITHIN THE RBSA

WAID	NMR ID	Named Location	Name	Description	Date Lost	UTM Easting	UTM Northing
WA2331	1371004	28	Ipswich	English cargo vessel	1763	355610	5911584
WA2332	1325827	27	Juffrouw Anna Maria	Dutch craft	1783	360941	5904005
WA2333	1326992	27	Mayflower	Wreck of English craft which foundered near the Dudgeon light; a wooden sailing vessel.	1785	360941	5904005
WA2334	1390162	27	Boscawen	Wreck of British cargo vessel which foundered off the "floating light", presumed to be the Dudgeon light vessel, following a collision en route from Newcastle-Upon-Tyne to London with coal; a wooden sailing vessel.	1788	360941	5904005
WA2335	1336463	27	Neptune	English cargo vessel	1794	360941	5904005
WA2336	1337829	27	Latona	Craft	1797	360941	5904005
WA2337	1339283	27	Fanny	Craft	1803	360941	5904005
WA2338	1397062	27	Thomas and Hannah	Wreck of English sloop which foundered near the Dudgeon light vessel on her passage from Newcastle-Upon-Tyne; a wooden sailing vessel.	1805	360941	5904005
WA2339	1339844	27	Swift	Wreck of English craft which stranded on or near the Dudgeon Shoal; a wooden sailing vessel.	1805	360941	5904005
WA2340	1340411	27	Jane and Sarah	Wreck of English cargo vessel which foundered off the Dudgeon light during a gale, while on her passage with coal; a wooden sailing vessel.	1806	360941	5904005
WA2341	1399020	27	Unknown	Wreck of French lugger which foundered 9 miles off the Dudgeon light vessel after a collision with one of her intended victims; a wooden sailing vessel.	1808	360941	5904005
WA2342	1399932	27	Unity	Wreck of English cargo vessel which foundered off the Dudgeon light vessel, on her passage with coal; a wooden sailing vessel.	1810	360941	5904005
WA2343	1342883	27	Iris	British craft	1813	360941	5904005
WA2344	1343382	27	Unknown	Craft	1814	360941	5904005
WA2345	1197003	27	New Bradford	Wreck of English cargo vessel which exploded and foundered off the Dudgeon after catching fire en route from London to Kingston-upon-hull. Laden with gunpowder and rum, she was a wooden sailing vessel.	1817	360941	5904005
WA2346	1403344	27	Fly	Wreck of British schooner which foundered 12 miles from the Dudgeon light vessel, after a collision. En route from great Yarmouth to Leith with barley, she was a wooden sailing vessel.	1817	360941	5904005
WA2347	1347609	27	John	Wreck of British brig which was abandoned to founder approximately 8 miles sw of the Dudgeon light vessel en route from shields to London; a wooden sailing vessel.	1820	360941	5904005

WAID	NMR ID	Named Location	Name	Description	Date Lost	UTM Easting	UTM Northing
WA2348	1347961	27	Mold	Wreck of British craft which foundered 4 or 5 miles east of the Dudgeon after springing a leak. En route from shields to London, she was a wooden sailing vessel.	1821	360941	5904005
WA2349	1351292	28	Unknown	Cargo vessel	1823	355610	5911584
WA2350	1406603	27	Unknown	Wreck of brig which foundered 8 miles NNW of the Dudgeon light vessel. Thought to have been on her passage south, she was a wooden sailing vessel.	1824	360941	5904005
WA2351	1352101	27	Fortune	Wreck of Scottish brig which foundered near the Dudgeon light vessel following a collision. En route from St. David's to London, she was a wooden sailing vessel.	1824	360941	5904005
WA2352	1358933	27	Dandy	Wreck of British craft which foundered off the Dudgeon Shoal following a collision with a wreck. En route from Dundee to London, she was a wooden sailing vessel.	1825	360941	5904005
WA2353	1237062	27	Hero	Wreck of English craft which foundered 10 miles north of the Dudgeon light vessel, or "float", after a collision; a wooden sailing vessel.	1827	360941	5904005
WA2354	1309100	27	Unknown	Wreck of Scottish sloop which foundered near the Dudgeon Shoal after a collision. Laden with an unspecified cargo, she was a wooden sailing craft.	1830	360941	5904005
WA2355	1309103	27	Maria	Wreck of English brig which foundered near the Dudgeon Shoal following a collision, en route from King's Lynn to London and Portsmouth. Laden with a cargo variously described as corn or coal, she was a wooden sailing vessel.	1830	360941	5904005
WA2356	1407182	27	Success	Wreck of British craft which foundered off the Dudgeon Shoal. En route from Newcastle-Upon-Tyne to Great Yarmouth, she was a wooden sailing vessel.	1832	360941	5904005
WA2357	1237951	27	Harriet	British cargo vessel	1832	360941	5904005
WA2358	1237947	27	Lowther	British packet	1832	360941	5904005
WA2359	1358854	27	Robert and sarah	Wreck of Eritish craft which foundered after grounding on the Dudgeon Shoal during a "heavy gale". On her passage from Sunderland, she was a wooden sailing vessel.	1832	360941	5904005
WA2360	1237934	27	Atlas	British craft	1832	360941	5904005
WA2361	1238005	27	Ely	Wreck of English brig which foundered after grounding on the Race Bank; a wooden sailing vessel.	1833	360941	5904005
WA2362	1350391	27	Unknown	Craft	1833	360941	5904005
WA2363	1432710	27	Resolution	Wreck of English craft which was abandoned to founder off the Dudgeon, after springing a leak; a wooden sailing vessel.	1833	360941	5904005
WA2364	1238084	27	Robert	British craft	1833	360941	5904005
WA2365	1237957	27	Haddow house	British cargo vessel	1833	360941	5904005
WA2366	1350281	27	Sarah	English brig	1836	360941	5904005

WAID	NMR ID	Named Location	Name	Description	Date Lost	UTM Easting	UTM Northing
WA2367	928933	27	Thomas and Mary	British cargo vessel	1841	360941	5904005
WA2368	1435472	27	Unknown	Wreck of craft which was burnt, presumed foundered, 5 miles se of the Dudgeon light vessel. Constructed of wood, she was a sailing vessel.	1841	360941	5904005
WA2369	1337295	27	Venus	British schooner	1851	360941	5904005
WA2370	1238955	27	Unknown	Schooner	1851	360941	5904005
WA2371	1235561	27	Rambler	English sloop	1852	360941	5904005
WA2372	927811	27	Rival	English sloop	1852	360941	5904005
WA2373	927812	27	Unknown	English billyboy	1852	360941	5904005
WA2374	1240029	27	Pattison	English brig	1852	360941	5904005
WA2375	1341772	27	Industry	British craft	1853	360941	5904005
WA2376	1341774	27	Happy return	English lugger	1854	360941	5904005
WA2377	1245421	27	Borneo	British barque	1854	360941	5904005
WA2378	1245444	27	Josephine	English barque	1854	360941	5904005
WA2379	1341812	27	Devon	English brig	1858	360941	5904005
WA2380	1341797	27	Jessie	British brig	1858	360941	5904005
WA2381	1341817	27	Devonian	English snow	1859	360941	5904005
WA2382	1341837	27	Four brothers	British ketch	1859	360941	5904005
WA2383	1341860	27	George	British cargo vessel	1865	360941	5904005
WA2384	1370570	28	H Smethurst	An English dandy which burnt and foundered 22 miles east of Spurn Head. The wind conditions were north-north-east force 5. She departed from Grimsby on a fishing and return trip. The wooden sailing vessel was built in 1865.	1865	355610	5911584
WA2385	1350022	28	Olive	English smack	1865	355610	5911584
WA2386	1432571	27	Unknown	Wreck of schooner or barque which foundered between the Dudgeon Shoal and the outer dowsing; a wooden sailing vessel.	1866	360941	5904005
WA2387	1341889	27	J and S martin	British schooner	1868	360941	5904005
WA2388	1341964	27	Mira	Canadian barque	1870	360941	5904005
WA2389	1341998	27	Venus	English brig	1871	360941	5904005
WA2390	1350987	28	Leonie	French cargo vessel	1871	355610	5911584
WA2391	1342072	27	Place	British dandy	1872	360941	5904005
WA2392	928010	27	Thetis	English brig	1873	360941	5904005
WA2393	1350993	28	Ann	English brigantine	1873	355610	5911584
WA2394	1342098	27	Alert	English cutter	1874	360941	5904005

WAID	NMR ID	Named Location	Name	Description	Date Lost	UTM Easting	UTM Northing
WA2395	928012	27	Deborah	English schooner	1875	360941	5904005
WA2396	1342107	27	Tweed	English schooner	1876	360941	5904005
WA2397	1342101	27	Sarah Jane	English brigantine	1876	360941	5904005
WA2398	1351097	28	Don Colino	Channel island schooner	1877	355610	5911584
WA2399	1351111	28	Kron Prinz Ernst August	German schooner	1878	355610	5911584
WA2400	1347343	27	Reprisal	English ketch	1879	360941	5904005
WA2401	1351150	28	Dora	English smack	1880	355610	5911584
WA2402	1377823	27	Tabor	Wreck of English collier presumed to have foundered off the Dudgeon while en route from the Tyne for London with coal. This steam vessel was built in 1871.	1881	360941	5904005
WA2403	943080	28	Rescue	Channel island brigantine	1883	355610	5911584
WA2404	1351202	28	Wonderful	English ketch	1883	355610	5911584
WA2405	1347800	27	Hastings	English cargo vessel	1888	360941	5904005
WA2406	1347838	27	Maglona	English cargo vessel	1889	360941	5904005
WA2407	1370547	28	William and Susannah	An English dandy which collided with another vessel and foundered 14 miles east of New Sand light vessel in 1889. Wind conditions were east north east force 2. She departed from Grimsby on a fishing and return trip. The wooden sailing vessel was built in	1889	355610	5911584
WA2408	1351281	27	Richard and Frances	English sloop	1890	360941	5904005
WA2409	1348394	27	Claremont	English cargo vessel	1891	360941	5904005
WA2410	1370602	28	Sarah	An English schooner which foundered 18 miles south east of Spurn Head in 1891; wind conditions were west north west force 10. She departed from King's Lynn for Stockton on tees with a cargo of wheat. The wooden sailing vessel was built in 1861.	1891	355610	5911584
WA2411	1348470	27	Wave	English keel	1893	360941	5904005
WA2412	1351864	27	Francis	English ketch	1894	360941	5904005
WA2413	942997	27	Hero	English cargo vessel	1894	360941	5904005
WA2414	1371421	28	Savills	Wreck of English ketch which foundered 20 miles east south east of Spurn Head in a gale. This wooden sailing vessel, built 1860, was en route from Wisbech to Middleborough with wheat.	1894	355610	5911584
WA2415	943005	27	Pacifique	French barque	1895	360941	5904005
WA2416	1372306	28	Twiggs	Wreck of English schooner which foundered 20 miles east of Spurn Head in a gale. This wooden sailing vessel, built 1860, was en route from Middleborough to Grimsby with salt.	1895	355610	5911584

WAID	NMR ID	Named Location	Name	Description	Date Lost	UTM Easting	UTM Northing
WA2417	928324	27	Juanita	English brig	1897	360941	5904005
WA2418	1351917	27	Glencairn	English brig	1898	360941	5904005
WA2419	1351919	27	Dudgeon lightship	English lightship	1898	360941	5904005
WA2420	1341961	27	Test	British ketch	1898	360941	5904005
WA2421	1348708	27	Obedient	English cargo vessel	1898	360941	5904005
WA2422	943021	28	Edwin	English cargo vessel	1899	355610	5911584
WA2423	1372611	28	Presto no 1	1901 wreck of English dandy which foundered 25 miles east south east of Spurn Head. This wooden sailing vessel departed from Grimsby on a fishing and return trip.	1901	355610	5911584
WA2424	928726	27	Dudgeon lightship	English light vessel	1902	360941	5904005
WA2425	943046	27	Wave	English schooner	1904	360941	5904005
WA2426	1302213	28	Seagull	British lugger	1904	355610	5911584
WA2427	943102	28	Cramlington	English merchant steamer	1908	355610	5911584
WA2428	927539	27	Silver spray	English ketch	1909	360941	5904005
WA2429	1302268	27	Anaconda	English dandy	1910	360941	5904005
WA2430	1225550	27	Gertrude	English cargo vessel	1912	360941	5904005
WA2431	929012	27	Scots Greys	Scottish fishing drifter	1913	360941	5904005
WA2432	1374683	28	Umbe	Wreck of Spanish cargo vessel which foundered 20 miles east of Spurn Head light vessel following collision. This steel steam vessel, built 1907, was en route from Bilbao to Middleborough with iron ore.	1913	355610	5911584
WA2433	1302304	28	Torquay	Norwegian cargo vessel	1914	355610	5911584
WA2434	1374766	28	Khartoum	Wreck of English cargo vessel which foundered 20 miles east south east of Spurn Head having been mined. This steel steam vessel, built 1893, was en route from the river Tyne to Oran with coal.	1914	355610	5911584
WA2435	1374851	28	Schieland	Wreck of Dutch cargo vessel which foundered 20 miles east south east of spurn light vessel after detonating a mine. This steel steam vessel was en route from Goole to Rotterdam with coal.	1915	355610	5911584
WA2436	1302307	27	Bogatyr	Danish cargo vessel	1916	360941	5904005
WA2437	1374948	27	Lavinia Westoll	Wreck of English cargo vessel which foundered about 30 miles south east of Spurn Head light vessel after detonating a mine, in a snow storm. This steel steam vessel was en route from Almeria to Middleborough with iron ore.	1916	360941	5904005
WA2438	1375335	28	Hanna Larsen	Wreck of English cargo vessel which foundered 20 miles east of Spurn Head after being scuttled. This steel steam vessel, built 1903, was requisitioned by the royal	1917	355610	5911584

WAID	NMR ID	Named Location	Name	Description	Date Lost	UTM Easting	UTM Northing
				navy and was en route from London to the river Tyne in ballast in order to load coal.			
WA2439	1377215	28	Eros	Wreck of British trawler which foundered 36 miles ENE of Spurn Head after detonating a mine. This steel steam vessel was on a fishing and return trip.	1918	355610	5911584
WA2440	1352096	28	Polzella	British cargo vessel	1928	355610	5911584
WA2441	929142	27	Borce	French cargo vessel	1936	360941	5904005
WA2442	1349572	27	Baron Ailsa	Scottish cargo vessel	1940	360941	5904005
WA2443	1325173	27	Spitfire MK I l1051	British fighter	1940	360941	5904005
WA2444	1349570	27	Giorgio Ohlsen	Italian cargo vessel	1940	360941	5904005
WA2445	1383893	27	Chevychase	Wreck of an English cargo vessel which foundered on the Dudgeon Shoal after detonating a mine. This steel steam vessel, built in 1926, was en route from Blyth to London with coal.	1940	360941	5904005
WA2446	1349574	27	Burgos	Norwegian cargo vessel	1940	360941	5904005
WA2447	1323066	28	Blenheim MK IV R 3765	British bomber	1940	355610	5911584
WA2448	1349644	27	Ambrose Fleming	English cargo vessel	1941	360941	5904005
WA2449	1349703	27	Fireglow	English cargo vessel	1941	360941	5904005
WA2450	1352183	27	Cormarsh	English cargo vessel	1941	360941	5904005
WA2451	1352164	27	Schieland	Dutch cargo vessel	1941	360941	5904005
WA2452	1349692	27	Empire Newcomen	British cargo vessel	1941	360941	5904005
WA2453	1349633	27	Herport	English cargo vessel	1941	360941	5904005
WA2454	1349673	27	Brynmill	English cargo vessel	1941	360941	5904005
WA2455	943161	28	Mamari iii	British tender	1941	355610	5911584
WA2456	1354038	28	Hampden MK I X3021	British bomber	1941	355610	5911584
WA2457	1352224	27	Chatwood	English cargo vessel	1942	360941	5904005
WA2458	1354212	28	Wellington MK IV Z1285	British heavy bomber	1942	355610	5911584
WA2459	1354383	28	Whitley MK	British heavy bomber	1942	355610	5911584

WAID	NMR ID	Named Location	Name	Description	Date Lost	UTM Easting	UTM Northing
			VII Z6960				
WA2460	1404780	28	Dornier DO217M-1 (6045) U5+GK	Wreck of a German Dornier DO217 which was shot down and crashed off Spurn Head. It was part of squadron 2/KG2.	1943	355610	5911584
WA2461	1404778	28	Dornier DO217K-1 (4412) U5+BA	Wreck of a German Dornier DO217 which was shot down and crashed 15 miles east of Spurn Head. It was part of stab/KG2.	1943	355610	5911584
WA2462	1352230	28	HMS Dalemoor	English cargo vessel	1945	355610	5911584
WA2463	1381280	28	Straton	Wreck of a British trawler which foundered 26 miles east of the river Humber light vessel after detonating a mine. This steel steam vessel was on a fishing trip.	1948	355610	5911584

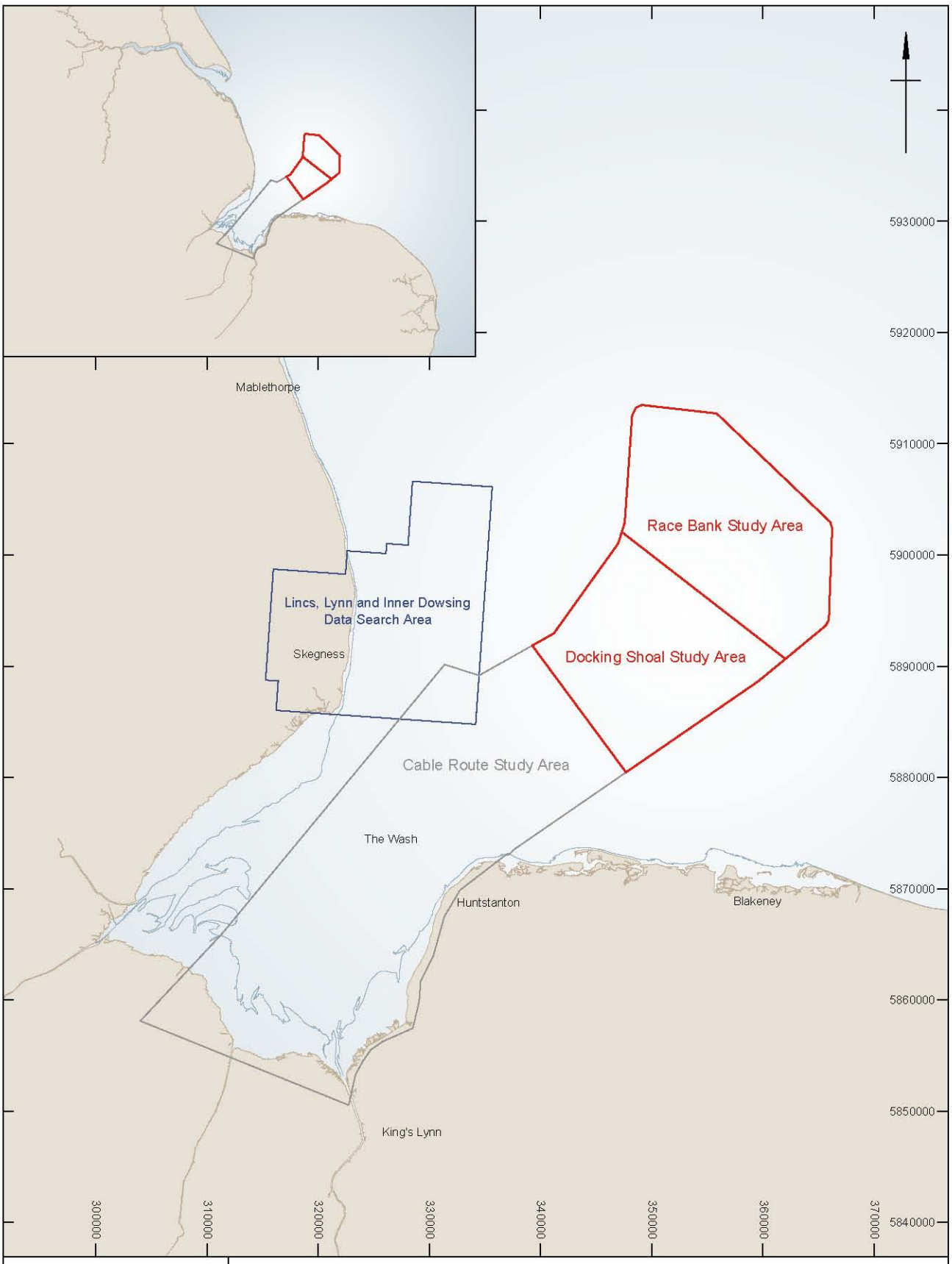
APPENDIX III: TERRESTRIAL SITES WITHIN CRSA TAKEN FROM THE WASH CABLE ROUTE REPORT 62550.01

KNOWN TERRESTRIAL SITES

WAID	HER(MNF)/ NMR ID	Description	Date	UTM Easting	UTM Northing
WA1455	MNF1101	Flint Blade	Mesolithic	333371	5870233
WA1540	MNF1292	St. Edmund's Church	Post-medieval	331490	5868605
WA1614	MNF1146	Post	Unknown	332096	5869490

TERRESTRIAL SITE POLYGONS WITHIN THE CRSA INDICATING LARGE SITES OR GENERAL SITE AND FIND LOCATIONS

WA ID	HER/MNF ID	Description	Date	Record type
WA1662	MNF1143	Clactonian trimmed edge flint flake	Palaeolithic	Polygon indicating a large archaeological feature or indicating a general location of a site or find.
WA1663	MNF1145	Mesolithic flints and Middle Saxon inhumations	Mesolithic, Middle Saxon	Polygon indicating a large archaeological feature or indicating a general location of a site or find.

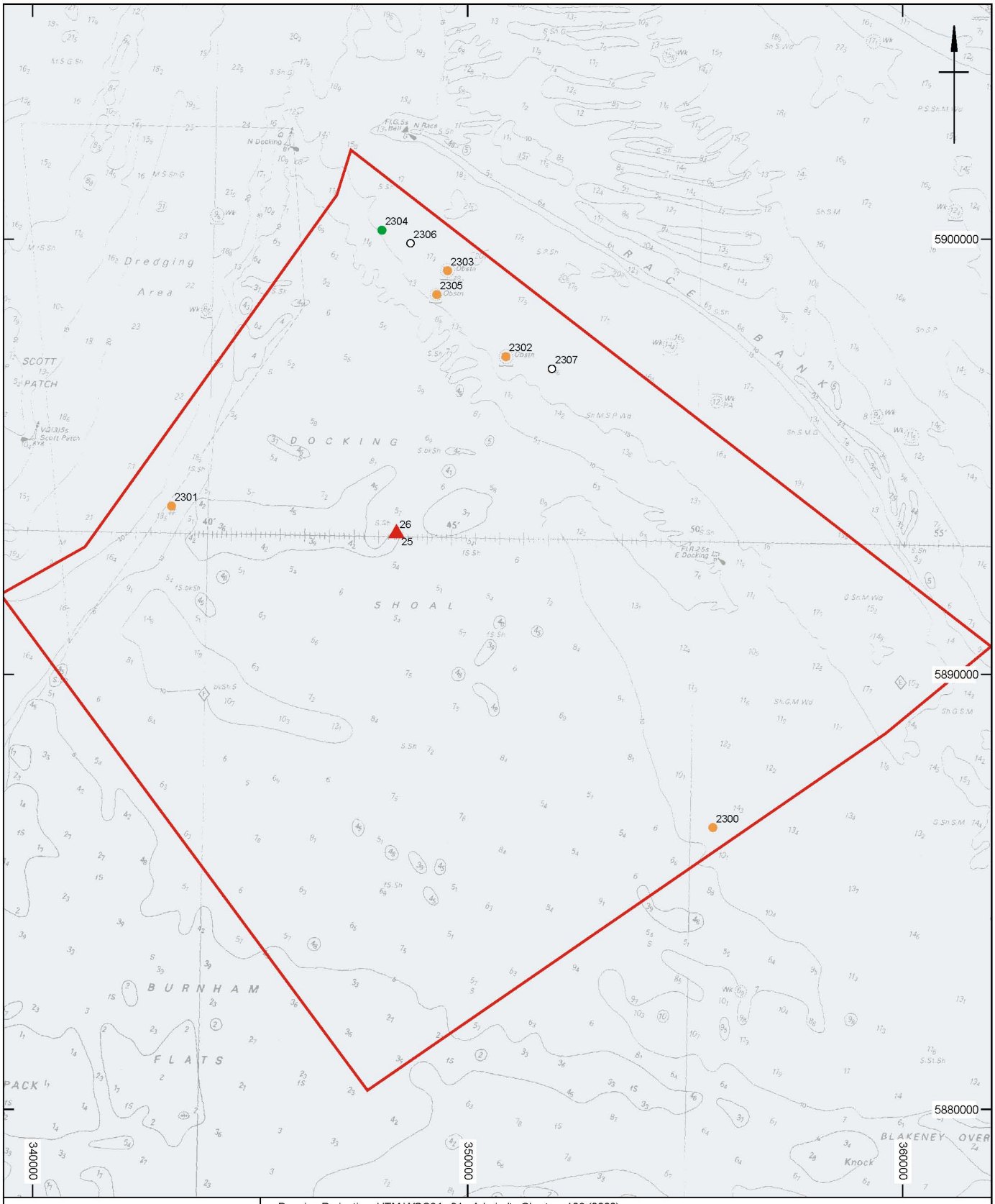


0 10 20km

Drawing Projection: UTM WGS84 z31	Date:	21/04/06	Revision Number: 0
Wessex Archaeology	Scale:	1:500,000	Illustrator: KJB
	Path:	W:\Projects\62550\Drawing Office\Report Figures\Docking Shoal\06_04_21	

DSSA and RBSA and adjacent windfarm areas

Figure 1



Docking Shoal Study Area
Named location
Live wreck
Dead wreck
Unknown

0 5km

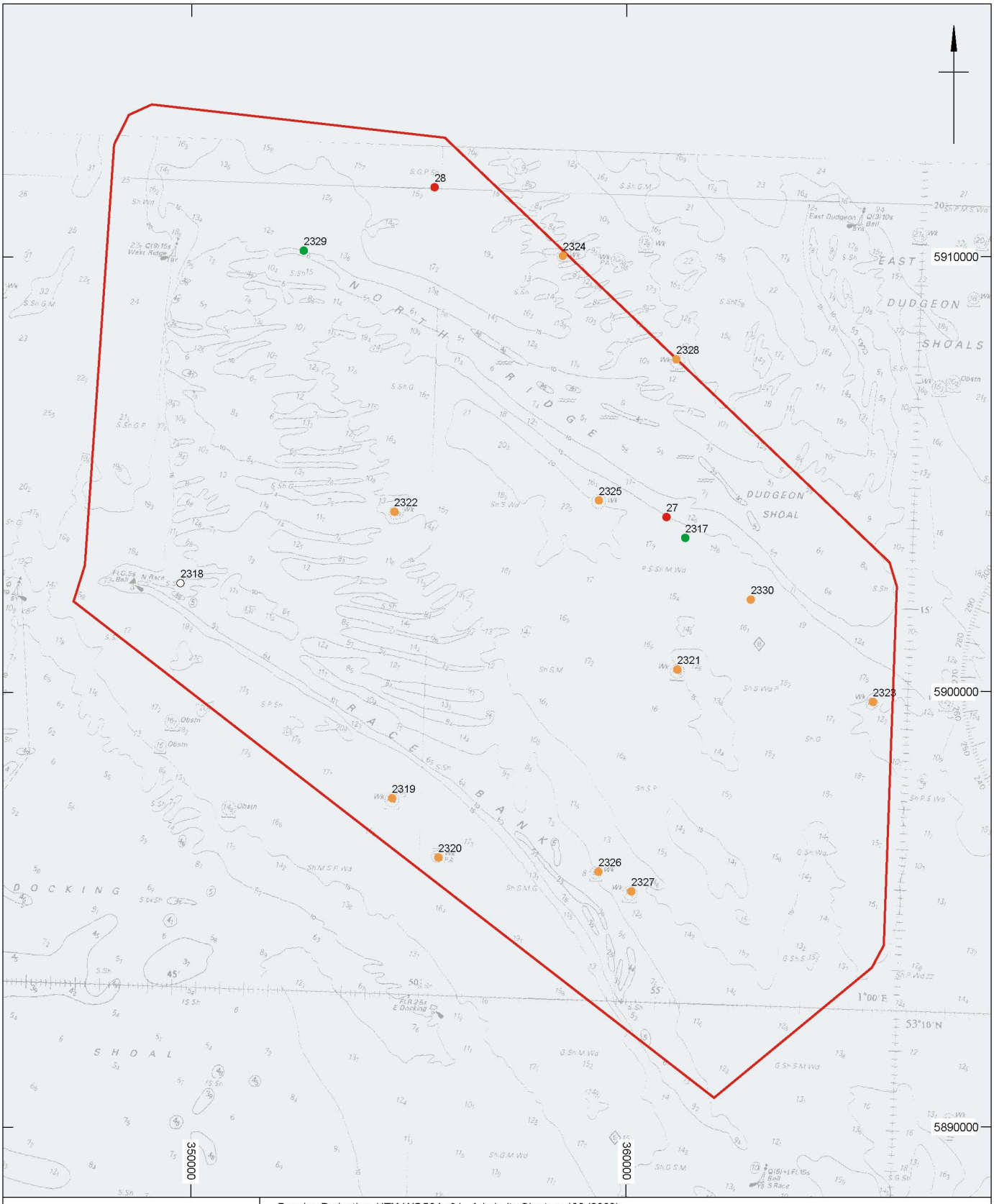
Wessex Archaeology

Drawing Projection: UTM WGS84 z31. Admiralty Chart no.108 (2000).

Date:	21/04/06	Revision Number:	0
Scale:	1:12,500	Illustrator:	KJB
Path:	W:\Projects\62550\Drawing Office\Report Figures\Docking Shoal\06_04_21		

Known maritime sites within the DSSA

Figure 2



Race Bank Study Area
Named location
Live wreck
Dead wreck
ABEY

0 5km

Wessex Archaeology

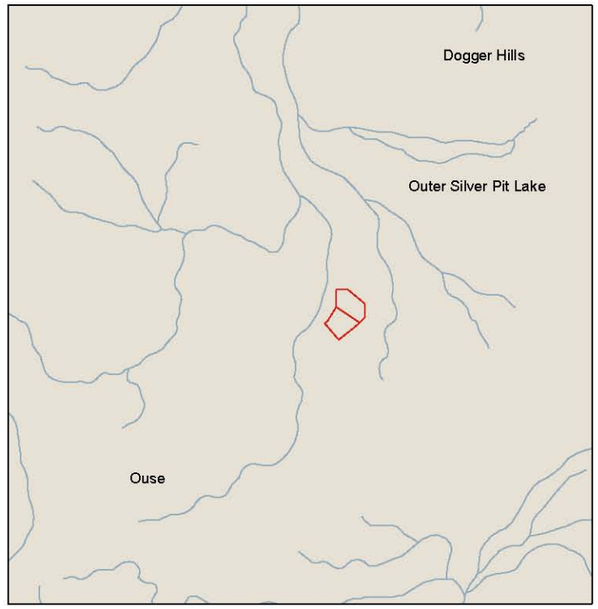
Drawing Projection: UTM WGS84 z31. Admiralty Chart no.108 (2000).

Date:	21/04/06	Revision Number:	0
Scale:	1:12,500	Illustrator:	KJB
Path:	W:\Projects\62550\Drawing Office\Report Figures\...\06_04_21		

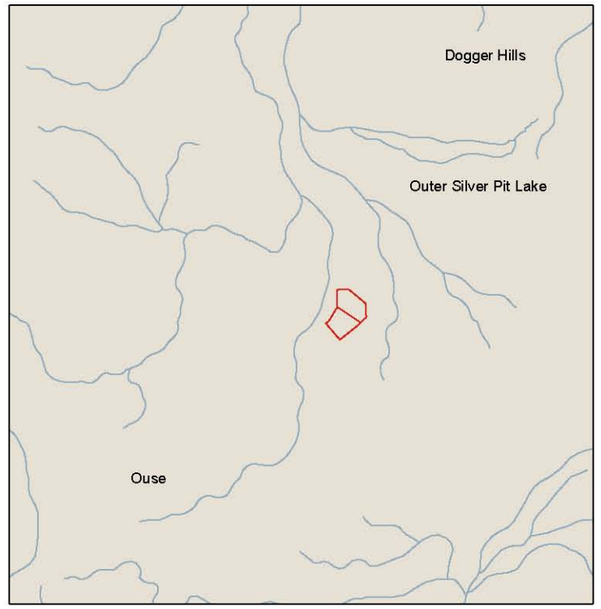
Known maritime sites within the RBSA

Figure 3

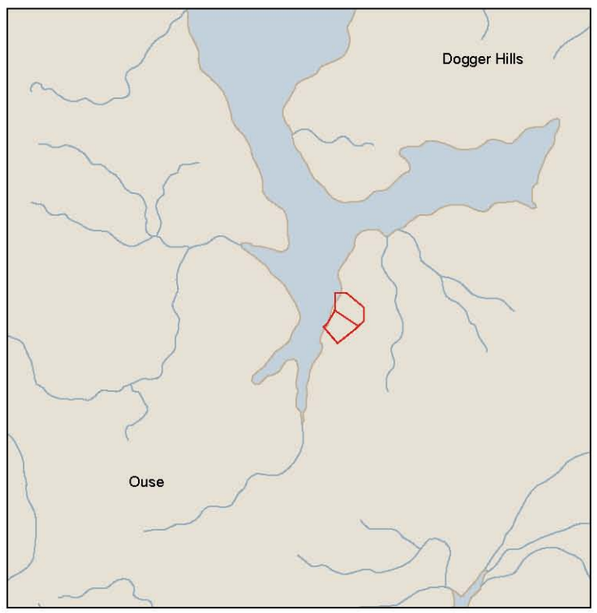
18,000BP



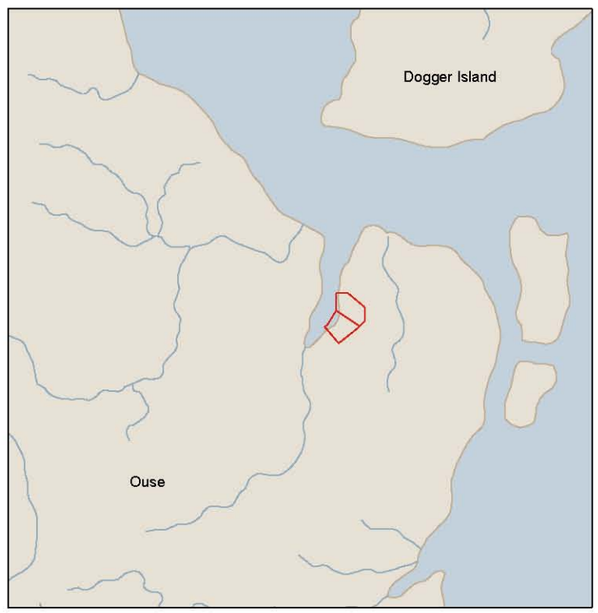
16,000BP



13,000BP



10,000BP



5,000BC

Current coastline

Docking Shoal and Race Bank Study Areas

0 100 200km

After Coles, 1998

Date:	27/02/06	Revision Number:	0
Scale:	1:4,000,000	Illustrator:	KJB
Path:	W:\Projects\62550\Drawing Office\Report Figures\...\06-04-21		

Post-Devensian sea level change

Figure 4

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