Humber Estuary Shoreline Management Plan

Historic Environment Baseline Study

Volume 1

By
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Wetland
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NON-TECHNICAL SUMMARY

The Environment Agency commissioned, as part of *the Humber Estuary Shoreline Management Plan* (Environment Agency 2000), an *Historic Environment Baseline Study*. This study was aimed at assessing the archaeological and palaeoenvironmental potential of the Humber estuary in order to assist in advising on its future management. This report was conducted in addition to a previous desk-based assessment (HEEBS, Field *et al.* 1997) due to the large quantity of new data generated in the intervening period by the English Heritage funded *Humber Wetlands Project* (HWP) and the Natural Environment Research Council (NERC) funded *Land-Ocean Interaction Study* (LOIS).

The study was structured around eight sub-regions, or 'Management Units', of the Humber as defined by the Environment Agency (2000), including the further four-part sub-division of Management Unit 4. The area defined by the *Shoreline Management Plan* was further sub-divided into areas of Primary and Secondary interest.

Within each of these areas a complete range of archaeological and palaeoenvironmental sources was investigated in order to compile a listing of all sites and areas of interest, including the recent work by HWP and LOIS. These sites and areas were then discussed in relation to the evidence itself, the potential and value of this resource, and its vulnerability in the light of possible re-development initiatives. Areas of important archaeology were highlighted and the potential of other areas was assessed within the framework of existing knowledge.

In addition a range of areas that were found to have limited data, or which had not been investigated recently, were examined by a site visit in order to provide a more complete record for each region. A total of 15 such site visits were made.

The results from this desk-based assessment may be considered regionally and overall as:

Management Unit 1 (Spurn Head to Paull): Archaeological remains are concentrated in two areas – at Spurn Head and Paull. The area of Spurn and Easington contains two important landscapes. A Neolithic to Bronze Age ritual landscape including a henge and burial activity, and an important First and Second World War defensive landscape. At Paull there is also an important collection of defensive structures including a third sized decoy of Hull Docks. Smaller areas also include important Medieval landscapes and other areas hold the potential to reveal further areas of Medieval settlement. The area of Sunk Island is a reclamation development from the fifteenth century and may conceal earlier archaeology.

Management Unit 2 (Paull to North Ferriby): The most important zone in this unit is the foreshore at North Ferriby. Previous finds include parts of five Bronze Age boats and finds are continuously being discovered. Any work should avoid this area. The area of development from the Humber Bridge to Paull has the potential, in areas not previously developed, to reveal archaeology. Especially important is the zone in front of the Medieval core of Hull.

Management Unit 3 (North Ferriby to Trent Falls): The most important zones in this unit are the continuation of the foreshore zone from westwards North Ferriby and the area around Weighton Lock. The foreshore at Melton has revealed extensive evidence of activity from the Bronze Age onwards and should be avoided by any future work. The area around Weighton Lock has revealed extensive Roman activity and also includes an important Medieval landscape. The area around Brough is also important with the possibility of a Roman naval base. The area of Broomfleet has the potential to reveal archaeology in association with the River Foulness and Wallingen Fen, which further inland have produced a wide range of archaeological remains.

Management Unit 4a-b (Trent Falls to Boothferry Bridge and Boothferry Bridge to Whitgrift): The most important landscapes in this zone are those representing Medieval settlement. Little evidence of earlier settlement exists but this may be deeply buried. Settlements in this area are positioned close to the river and several larger estates are also present. Any work should avoid these areas where ever possible. Other areas have the potential to reveal archaeology buried at depth.

Management Unit 4c-d (Trent Falls to Keadby Bridge and Keadby Bridge to Whitton): This unit includes evidence from the prehistoric periods onwards. Extensive evidence exists from the Lincoln Edge for prehistoric activity. While this is outside of the region that will be affected by any works, the potential exists that associated activity next to the river may be buried at depth beneath subsequent alluvial deposits. Extensive Roman activity has been discovered at Trent Falls and continuing work is ever expanding this area of Roman occupation. Further Roman finds have been recovered from Amcotts. The important Early Medieval site at Flixborough lies outside the affected area but contemporary activity may have continued down towards the river. Important Medieval riverside settlements are also present. Two areas have been shown to have deep deposits with few archaeological remains having been recovered from the surface. Any archaeology in these areas will most likely be deeply buried so will only be disturbed by deep works.

Management Unit 5 (Whitton to South Ferriby Cliff): This area has a complex and extensive Roman landscape including the large Roman settlement at the end of Ermine Street at Winteringham and smaller Roman sites at Whitton, South Ferriby Sluice and South Ferriby Cliff. The presence of a Roman road in the foreshore zone assigns added importance to this zone. The presence of a buried forest at Whitton Ness highlights the potential of the foreshore zone in this unit. This area has suffered from lack of fieldwork but should be avoided as far as possible by any planned works due to this potential. This conclusion was confirmed by a walk-over survey which highlighted the potential of this area and the need for further study.

Management Unit 6 (South Ferriby Cliff to North Killingholme): For the majority of this zone the foreshore has been identified as important due to a range of finds present including a buried forest, a Bronze age fish trap and a large collection of Roman and Medieval finds. It includes the areas of Barton and Barrow Havens, recorded as possible trade points from the Early Medieval

period. Roman sites have been identified at Goxhill and East Halton Skitter, close to the river. Work should avoid the foreshore zone and has the potential to disturb Roman and later finds along most of the river edge.

Management Unit 7 (North Killingholme to Cleethorpes): Recent work in this unit has revealed Iron Age and Roman settlement at North Killingholme. Extensive evidence of Iron Age activity in Grimsby suggests that this area was extensively occupied during the period. Other important areas include Stallingborough Battery and an unusual site at Pyewipe that contains finds from the Mesolithic through to Medieval period. The area of Immingham Dock has suffered from heavy development and the potential for retrieving further information is low, as is the area of Grimsby Docks.

Management Unit 8 (Cleethorpes to Donna Nook): Evidence from the beach at Cleethorpes and further inland at Humberston attests prehistoric activity in the area, alongside the Bronze Age salt-working at Tetney. The majority of the southern section of this unit is an area of more recent reclamation dating from the sixteenth century onwards and any earlier archaeology will therefore be deeply buried.

The overall conclusions drawn in relation to the archaeological and palaeoenvironmental potential of the management units considered are:

- Archaeological and palaeoenvironmental work has not been carried-out evenly throughout the region.
- Certain areas that appear to be lacking actually reflect a lack of fieldwork or concealment beneath later alluvium.
- These areas retain the potential to reveal archaeology.
- Certain important landscapes have been highlighted where minimum impact on the archaeology should be sought.
- Areas that have been highlighted as having a lack of study have been divided into those with low and those with high potential for archaeology. This is assigned in light of current knowledge of the region. They are only a guide and all areas retain the potential to reveal archaeology.
- All areas will need to be evaluated on a case by case basis when detailed management plans are drawn-up. This report is to only serve as a guide to which areas **may** have the least impact on archaeology. **It does not replace any further mitigation that will be needed before works are carried out**.

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1. INTRODUCTION

The archaeological potential of the Humber estuary is well attested, with finds of both regional and national importance having been discovered during the past 100 years, and even earlier. However, finds from earlier periods frequently lack sufficient information regarding their provenance (Field *et al.* 1997). Archaeological remains have been discovered, dating from the Palaeolithic to the twentieth century, though many other important finds are likely to be concealed both along the shoreline zone, and in other key areas of previously accreting sediment (*cf.* Van de Noort and Davies 1993). In the light of this it may be considered that any works carried out by the Environment Agency as part of their *Shoreline Management Plan* may well impact on the archaeological and palaeoenvironmental resource of the region.

The Wetland Archaeology and Environments Research Centre (WAERC) was commissioned to produce a baseline survey of the archaeology and palaeoenvironmental resourse of the region in order that informed decisions could be made as part of the ongoing works in the estuary. In 1994 as part of the *Humber Estuary Environmental Baseline Study* (HEEBS), a baseline study was compiled that was used to inform the current *Shoreline Management Plan* (Environment Agency 2000). Following this, the present survey was considered to be an important requirement in order to update the previous study with the more recent work that had been undertaken in the Humber estuary. This was considered imperative due to the large quantity of new archaeological and palaeoenvironmental data that had been generated particularly by the English Heritage funded *Humber Wetlands Project*, which completed a major survey of the lowlands surrounding the Humber estuary between 1994 and 2000.

This report presents the information gained during this baseline survey. It accompanies the digital data which is currently held by WAERC as part of a Geographical Information System (GIS) database. This data structure enables the continual, and on-going, updating and manipulation of data to maintain the relevance of the model and to avoid the need to re-implement additional desk-based surveys. The completed GIS database will form part of the archive submitted to the Environment Agency in support of the written report.

2. AIMS AND OBJECTIVES

2.1 The Shoreline Management Plan

2.1.1 Background

The *Humber Estuary Shoreline Management Plan* (SMP) was devised by the Environment Agency in order to provide a 'strategy for managing the flood defences of the Humber Estuary over the next 50 years' within the framework of a series of key issues (Environment Agency 2000: 2-3). These issues comprise agriculture, defending assets (i.e. houses), compensation (for reduced defences), condition of defences, estuary behaviour, floodplain development, habitat losses, the historic environment, nature conservation, ports and navigation and sea-level rise and climate change.

The overall aim of SMP was to assess the possible options in managing the flood defences of the Humber. In the light of the results of specialist assessments four options have been considered (Environment Agency 2000: 26):

- *Monitor and review* – to take no action initially, but rather to monitor changes as the current flood defences deteriorate, whilst maintaining flood warning procedures. This option has been deemed inappropriate for the Humber.
- *Retreat the line* – to re-position defences further from the Humber so that land between the new and old defences will revert to mudflat or saltmarsh, and flood any houses or businesses contained on it. For the Humber it has been postulated from an assessment of estuary processes that retreating the defences of the inner estuary (west of the Humber Bridge) could reduce local water levels.
- *Hold the line* – to maintain defences as they are, only upgrading them as required given local rises in water levels. This approach has been criticised as expensive and difficult where erosion or falling foreshore levels threaten current defences, and it has been suggested that in the middle and outer estuary this may exacerbate 'coastal squeeze'.
- *Advance the line* – the line of defences is advanced towards the estuary. While this was considered inappropriate for coastal defence, other factors including commercial developments have influenced the inclusion of this option.

The archaeological implications of these four options are discussed below in section 2.3.

2.1.2 SMP – Aim 1

Two principal objectives were defined in the SMP. The first of these was to develop a coherent and realistic plan for the estuary's flood defences, that was compatible with natural estuary processes, compatible with adjacent developments and sustainable in relation to future natural and anthropogenic changes (Environment Agency 2000: 4).

2.1.3 SMP – Aim 2

The second aim defined by SMP was to ensure that all proposals were technically feasible, economically viable, environmentally appropriate and socially acceptable (Environment Agency 2000: 4).

2.1.4 SMP and heritage and cultural resources

Within the detailed objectives outlined in SMP, point 'L' relating to *Heritage and cultural resources* (Environment Agency 2000: 4) was classified as being):

- To avoid actions that might adversely affect the estuary's heritage and cultural resources
- To comply with all statutory obligations arising from national and local designations and related legislation
- To protect, where necessary, the estuary's heritage and cultural resources against erosion

In the SMP document (Environment Agency 2000: 22-23, 25) the archaeological resource was considered to be valuable in terms of regional identity, education, tourism and recreation. In addition, the high quality of preservation of this resource was also highlighted due to the survival of organic material within the anaerobic waterlogged sediments in this region.

2.1.5 SMP and heritage conservation designations

Under the Listed Buildings and Conservation Areas Act (1990) and the Ancient Monuments and Archaeological Areas Act (1979, amended 1984), a range of the more important features of the historic environment are given a measure of protection (Environment Agency 2000: 23). In the light of the number of protected areas within the region, the Environment Agency has noted that "Developments that would have an adverse effect on such designated features will normally be refused unless there is an over-riding justification. In these circumstances development would be conditional on a detailed record being made of the historic feature affected" (2000: 23), and mitigation would be carried out in accordance with PPG15 (Planning and the Historic Environment) and PPG16 (Archaeology and Planning).

2.2 Archaeological and palaeoenvironmental objectives

2.2.1 Background

In accordance with the specific objectives outlined in SMP (2.1.4 – Environment Agency 2000: 4) a desk-based project was commissioned by the Environment Agency aimed at assessing the quantity, nature and potential of deposits containing archaeological and palaeoenvironmental source material within a defined region of potential influence.

2.2.2 Previous research

Field *et al.* (1997) outlined the national and regional policies relating to current legislation on the management and mitigation of the coastal resource. Projects such as the English Heritage funded *Humber Wetlands Project* (HWP) have highlighted, on a regional basis, the range of sites which are considered significant in terms of the reconstruction of past landscape change and human interactions within those environments. Similarly, the LOIS (*Land-Ocean Interaction Survey*) project funded by NERC (Natural Environment Research Council) has sought to understand landscape changes in relation to sea-level change during the Holocene period (the last 10,000 years).

2.2.3 Circumstances for the current project

The quantity of archaeological and palaeoenvironmental research within the Humber region has increased exponentially over the last couple of years, particularly through the work of the HWP based at the University of Hull. This project was funded by English Heritage following a desk-based assessment (DBA) (Van de Noort and Davies 1993) aimed at identifying the potential of the Humber wetlands for the preservation of wet preserved archaeological and palaeoenvironmental source material. This initial DBA was the forerunner to the subsequent survey, which was one in a series of four studies of the wetlands in England, to receive systematic archaeological and palaeoenvironmental investigation. Previous research was carried out in the Somerset Levels, the East Anglian fens and the wetlands of the north-west of England.

The HWP surveyed seven discrete regions (within six surveys) in succession around the Humber, covering some 330,000 ha of land of which *c.* 220,000 ha had the potential to preserve waterlogged archaeological remains. The surveys concentrated on those areas below the 10 m contour as defined by the Ordnance Survey, with the exception to this being those areas of Holderness, which due to the prevailing till landscape, often occurred at greater elevations. It was considered that the defined area would hold the highest potential for the preservation of buried natural and anthropogenic biogenic material through waterlogging. Through saturation and the consequential absence of atmospheric oxygen, the activity of aerobic bacteria is reduced and so the degradation of this material is restricted, leading to such preservation.

2.3 Archaeological implications of the main options being considered for the Humber

All of the options under consideration involve the movement of heavy machinery. In areas were these have to divert from current trackways and metalled surfaces, compaction and disturbance of deposits can occur. The construction of temporary hard surfaces can also impact on the archaeology as compaction occurs. Other activities including the digging of borrow pits and scrapes will have direct impact on any archaeology.

2.3.1 Monitor and review

Is not discussed further as it is been deemed inappropriate for the Humber.

2.3.2 Retreat the line

To re-position defences further from the Humber so that land between the new and old defences will revert to mudflat or saltmarsh, and flood any houses or businesses contained on it. This would involve either the construction of a new defence at distance from the present one or allowing the water to retreat to the nearest high ground. The present defence would either be removed or breached. The constriction of scrapes and drains may also be undertaken in habitat creation. The implications of this work include:

- Disturbance of archaeology at the location of the new bank
- Possibility of buried archaeology in and under the old bank that is destroyed or breached.
- Disturbance of the archaeology by the scrapes and drains.
- Possible effects of erosion and warping from the flooding on archaeology buried close to the surface.
- Destruction of the landscape context of the archaeology.
- Loss of standing structures.

2.3.3 Hold the line

To maintain defences as they are, only upgrading them as required given local rises in water levels. This would involve a case by case improvement of a section of defence when necessary. This could be by construction of a new line, raising the line, piling, concrete walls, revetment and stoning. The option for concrete walls is usually limited to urban and industrial areas. The implications of this work include:

- Destruction of current defence which may contain or be burying archaeology.
- Destruction of archaeology by key trenching associated with the construction of a new defence.
- Piling has direct effect on the archaeology and can also affect the water table and introduce oxygen into the burial environment.
- Burial of deposits by heavy material which causes compaction e.g. stoning. If this is undertaken on the intertidal zone it may also cause differential erosion to the surrounding deposits.

2.3.4 Advance the line

The line of defences is advanced towards the estuary. While this was considered inappropriate for coastal defence, other factors including commercial developments have influenced the inclusion of this option for the Humber. The implications of this are the same as *hold the line*, but with further possible intrusion into the intertidal zone which has a high archaeological potential.

3. METHODOLOGY

The current desk-based assessment of the archaeological and palaeoenvironmental resource is primarily based upon a range of archive and written documentation (section 3.1). In addition to this a walk-over survey was conducted in three locations that were highlighted during the current project as lacking recent appraisal (section 15).

3.1 Data sources

3.1.1 Introduction

The desk-based assessment compiled data from a combination of sources including previous archaeological surveys, Sites and Monuments Records, primary aerial photographic data, primary borehole data and published sources.

The Environment Agency defined eight management units (MU) encompassing the Humber estuary and lower River Trent (Figure 1) (Environment Agency 2000). Each of these sub-regions was further divided into *Primary* and *Secondary* survey areas by the Environment Agency. The aim of the current project was to assess Primary survey areas in detail, and to examine the Secondary survey areas in a more peripheral manner in order to provide a broader context to the management units.

The data for each management unit is discussed in the relevant section and listed at the end of each section. Full listings of the data are presented in the Appendices (Volume 2).

3.1.2 Sites and Monuments Records

The study region comprises areas maintained by four separate SMRs:

- Humber Archaeology Partnership (HAP SMR) covering the areas of Hull and the East Riding of Yorkshire
- North Lincolnshire SMR (NLincs SMR)
- North East Lincolnshire SMR (NELincs)
- Lincolnshire SMR (Lincs SMR)

The majority of the study area is contained within the regions that are the responsibility of HAP SMR and Nlincs SMR. NELincs and Lincs SMR only hold information on MU7 and MU8.

Each of the SMRs was visited and the records inspected. Each regional SMR currently manages its information in a differing format to the others. HAP SMR is, at present, paper-based and as such a combination of map sheets, map overlays and record documents was thoroughly examined. The information contained includes listed buildings and aerial photographic data.

The NLincs SMR is presently operating a computer-based GIS system. Areas of interest were examined using the GIS, and a selection of

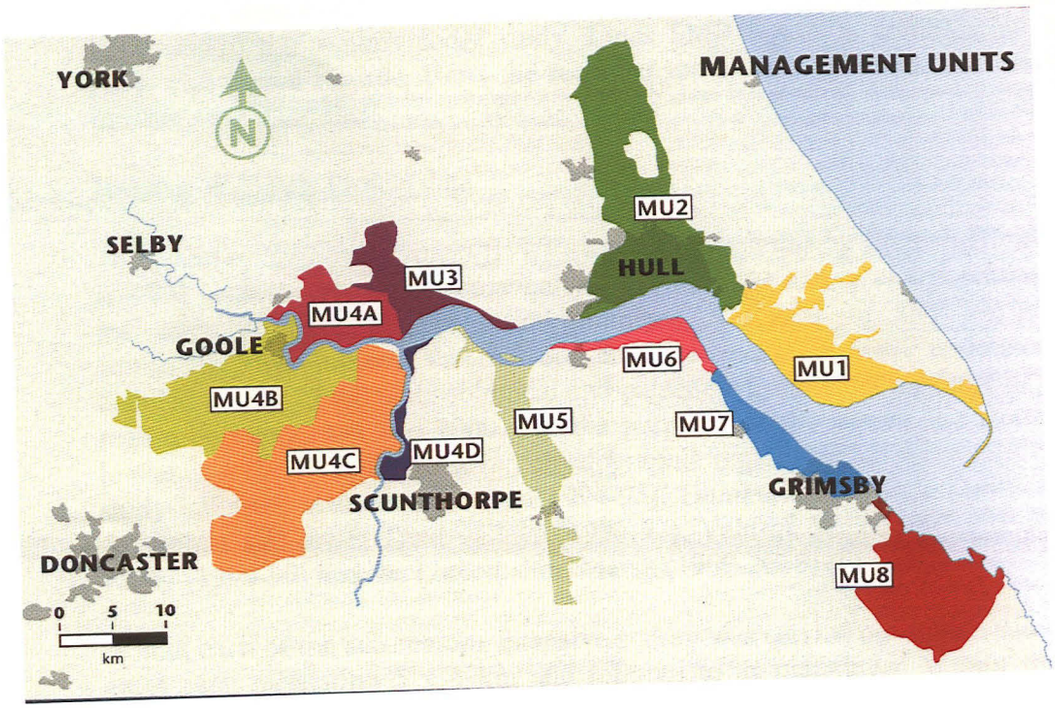


Figure 1: Humber estuary shoreline plan management units (Environment Agency 2000).

record cards was viewed. NELincs also employs a computer-based GIS system that was utilised in order to examine the known archaeology and any previous work within the regions under study. Lincs SMR houses a combination of paper and digital records. Here, the record maps of the study area and parish records were examined.

3.1.3 Humber Wetlands Project data

The *Humber Wetlands Project* (HWP) was commissioned by English Heritage in 1992 with the aim of systematically examining the nature and potential of the archaeological and palaeoenvironmental resource of the lowlands surrounding the Humber (Van de Noort and Etté 1995). The HWP undertook a detailed survey of the archaeological and palaeoenvironmental resource of the region between 1994 and 2000. For the purposes of the survey the Humber lowlands were divided into seven physiographic regions which were split into study units: Holderness (surveyed 1994-95), Humberhead Levels (1995-96), Ancholme and lower Trent valleys (1996-97), Vale of York (1997-98), Hull valley (1998-99) and the Lincolnshire Marsh (1999-2000) (Figure 2).

Within each of the sub-regions intensive survey was carried out within sample areas each measuring 5 x 4 km and referred to as mapviews. Within these areas a combination of field walking and coring was undertaken extensively, with occasional small-scale excavation, geophysical survey and topographic survey. The resulting information was combined with pre-existing knowledge for the area including data from SMR records and aerial photographs to provide an overview and context for each mapview. In areas of the intertidal zone, site-visits were undertaken at low tide and sites discovered were cleaned, photographed and located using high-accuracy differential Global Positioning System (GPS) equipment. The range of areas studied in such a manner was limited on grounds of Health and Safety and access, despite the use of a Rigid Inflatable Boat (RIB). The areas most intensively studied included those between the Humber Bridge and Faxfleet on the north bank and between the Humber Bridge and Grimsby on the south bank.

The results of the survey of each region have been published (Van de Noort and Ellis 1995, 1997, 1998, 1999, 2000 and Ellis *et al.* forthcoming). These publications were consulted and combined with the raw data from the HWP archive, housed at WAERC, University of Hull. The data include both archaeological and palaeoenvironmental records.

3.1.4 Other archaeological reports

The other principal archaeological report which has been prepared on the archaeology of the Humber is the specialist archaeology report for the *Humber Estuary Tidal Defences Urgent works Paull to Kilnsea, Whitton to Pyewipe* undertaken by Lindsey Archaeology Services on behalf of the Environment Agency (Field *et al.* 1997). The data gathered during this survey have been integrated into the current assessment in order to ensure full coverage of the known archaeology of the region.

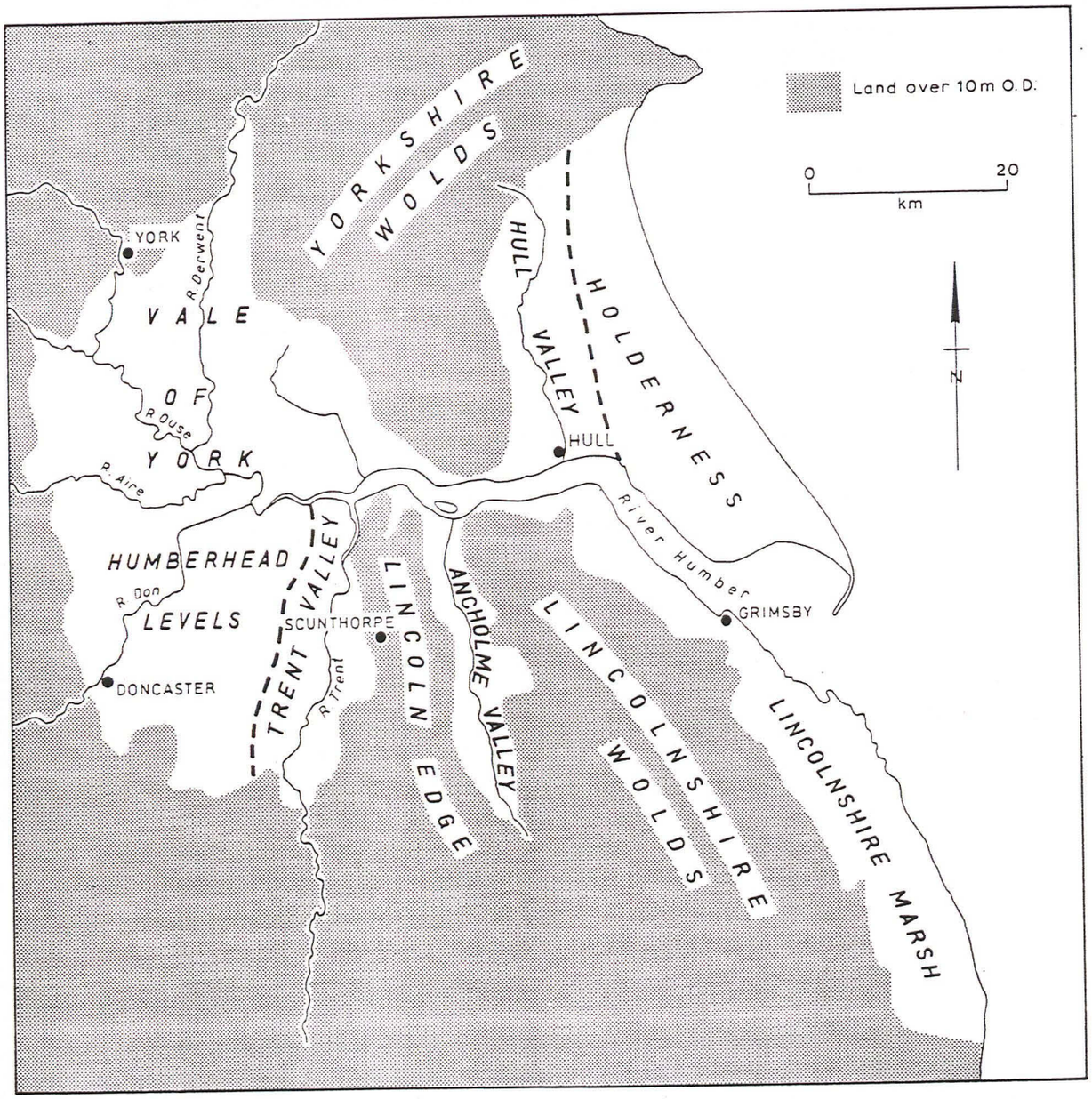


Figure 2: Humber Wetland Project regions.

3.1.5 Aerial photographs

The principal collection of aerial photographs relating to the archaeology of the region is that curated at the National Monuments Record Centre (NMRC) in Swindon. All specialist oblique aerial photographs taken within the study area were examined and identified features were recorded. Further aerial photographs were examined in the Cambridge University Committee for Aerial Photography (CUCAP) collection. Examined material included both specialist oblique and non-specialist vertical photographs. References to sites identified from aerial photographic sources within the SMRs were also recorded.

Additional aerial photographs were viewed from the Environment Agency's collection housed at the Willerby office. This collection of vertical photographs was taken in April 1989 in colour by JASAIR printed at 1:10,000 scale. This collection covered the area between Spurn to King George/Queen Elizabeth Docks, from Hessle to North Ferriby and from Welton Waters to the confluence of the Ouse and Trent, and up the Ouse to Barmby on the Marsh. The spring date of the photography reduces the potential for identifying crop marks since the majority of crops are not ripening at this time. Earthwork features were visible, but the scale of the photographs meant that no more detail was added than from the specialist vertical photography in the other collections.

In addition to the aerial photographic records for the study region a sample of the Environment Agency's LIDAR data was assessed for its archaeological potential. This dataset covered the area between Goole and the River Trent and was assessed through ArcView GIS, using both DEM surface and image analyses. Further assessment of the LIDAR data for other areas was not undertaken. Whilst the source was viewed as extremely useful for archaeological approaches, this was considered to be contextual within this landscape, providing setting to the archaeology, rather than directly highlighting features in itself.

3.1.6 Palaeoenvironmental data

The combination of previously published reports on palaeoenvironmental sites within the region (e.g. Hulme and Beckett 1973, Long *et al.* 1998), alongside data reported in the regional BGS monographs (e.g. Berridge and Pattison 1994, Gaunt *et al.* 1992, Gaunt 1994), provide a detailed regional outline of the known palaeoenvironmental resource prior to the more recent HWP and LOIS surveys. The regional monographs of the *Humber Wetlands Project* (Van de Noort and Ellis 1995, 1997, 1988, 1999, 2000 and Ellis *et al.* forthcoming) and the results of the LOIS survey (Shennan and Andrews 2000) serve to place much of this previous data into context. The data presented here combines all available sources for the region in order to address the limitations inherent in an area of dynamic land-sea interaction, as has prevailed in the Humber region throughout much of the Holocene.

3.1.7 Archives and documentary sources

A full survey of all available archive information was beyond the scope of this study. A full list of the information held at the University of Hull Archives is provided in Appendix 6. It may be worthwhile viewing other archives such as those held at Lincolnshire Archives office and the East Riding of Yorkshire Records office on a more specific basis, depending on future planned works. These archives were not viewed as part of the current survey.

3.1.8 Other published sources

Loughlin and Miller (1979) provide a parish by parish list of the archaeological sites in the former county of Humberside. The majority of these sites have been added to the relevant SMR lists but where this was not the case the original source was used.

Other sources such as Pevsner's *The buildings of England* series and the published enclosure maps produced by Rex Russell were consulted and lists produced of areas mentioned.

3.1.9 Sources not consulted during the assessment

Due to time constraints the records of the National Monuments Record (NMR) were not searched. From the previous surveys conducted in the area it was deemed that these data would only duplicate those from the other sources. The NMRC vertical aerial photographic collection was also not viewed as they have been shown to be little use in identifying archaeology. The University of Hull aerial photographic collection was peripherally examined but the collection is of vertical photographs only and of little use for identifying archaeology compared with oblique collections.

Two English Heritage funded projects, The Monuments at Risk and The Monuments at Risk in England's Wetlands have also not been consulted. The latter project has been briefly investigated but no new information was forth coming. Also the recently published 'Defence of Britain' reports have not been consulted but the majority of information from the Fortress Study Group has been added to the SMRs.

3.2 Data manipulation

3.2.1 Introduction

The data from the SMRs, other archaeological projects, aerial photographs and palaeoenvironmental sources were recorded on pro-forma sheets and entered into three separate databases – archaeology, aerial photos and palaeo. These data sets were then added to the project GIS known as 'Humber'. This GIS is currently based in ArcView (version 3.2) GIS, housed at WAERC but will be transferred to the current holders of the Environment Agency GIS – Binnie Black and Veatch. This GIS is currently using MAPInfro but there are

possibilities that a change to ArcView will occur in the future. In the meantime the data for the current project are easily transferable to MAPInfo.

3.3 Walk-over survey

Three locations were highlighted as requiring walk-over surveys and site-visits. These were MU1 (Paull to Spurn Point), MU5 and MU6 (Whitton Ness to Barton clay pits), and MU4a (Blacktoft to Skelton) (Figure 3). The results of these surveys are discussed in the management units below as well as in section 16.

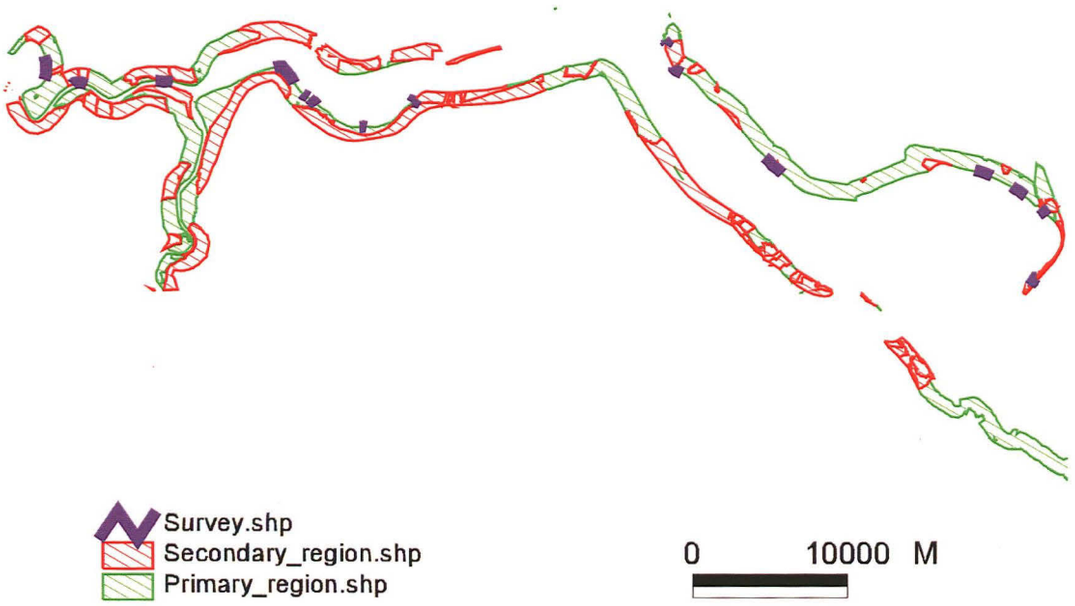


Figure 3. Areas covered during the walk-over survey.

4. Background to the Humber estuary

This section provides an overall background to the development of the Humber region. A summary is given below to the main geological and archaeological periods used in the text and further information can be found in Appendix 1.

Geological Periods (BP = years before present)

Quaternary-present geological period starting 2 million years ago including most recently:

Wolstonian *c.* 200,000-130,000 BP
Ipswichian *c.* 130,000-70,000 BP
Devensian *c.* 70,000-10,200 BP
Holocene *c.* 10,200-present day

Archaeological Periods

Palaeolithic *c.* 200,000-8000 BC
Mesolithic *c.* 8000-3700 BC
Neolithic *c.* 3700-2000 BC
Bronze Age *c.* 2000-700 BC
Iron Age 700 BC-AD 43
Roman AD 43-410
Early Medieval AD 410-1066
Medieval AD 1066-1535
Post-Medieval AD 1535-modern day

4.1 Physical background

4.1.1 The local setting

The Humber originates at the confluence of the Rivers Ouse and Trent on the eastern side of the Vale of York, entering the North Sea between Spurn Point and Grimsby some 60 km away. The river is never narrower than 1 km wide and ranges between 2 and 10 km after the first 3 km of its course. The river flows through the gap between the Yorkshire and Lincolnshire Wolds before being joined by the River Hull flowing south from the plain of Holderness.

4.1.2 The estuary

Pethick (1990) has discussed the physical characteristics of the Humber estuary. The following is based largely on this account. The Humber estuary is one of the largest in the UK with a maximum width of 14 km and a tidal length of approximately 140 km. It drains approximately one-fifth of the area of England and this contributes to a channel depth in the outer estuary of over 18 m. Around 160 million cubic metres of water pass through the mouth of the estuary at each tide, providing a maximum tidal range of 7.2 m.

These high flows along the Humber cause massive sediment movement and it has been calculated that, during winter months, 2000 parts per million (p.p.m.) are common – a total suspended sediment load of over 3 million tonnes. This accounts for the high levels of sediment accretion experienced by the intertidal

environment in many parts of the river. Wilkinson *et al.* (1973) provide estimations from navigation charts from the past 100 years pointing to an average 15% reduction in channel width between 1851-1966. High deposition rates within the estuary have resulted in regular swings in the direction of the main channels and consequently periods of bank erosion and deposition rapidly succeeding one another.

4.1.3 Quaternary development of the Humber region

Much of the Vale of York as well as the Lincolnshire Marsh and Holderness is situated below the 15 m contour. The chalk escarpment of the Wolds rises to over 160 m at Cave Wold and High Hunsley to the north of the river, reaching Malton and then swinging eastwards to Flamborough Head. With a high point of 100 m OD at Saxby Wold, the Lincolnshire Wolds do not reach the same height as their northern counter parts. The bedrock geology of the Humber consists of north-south trending bands of Sherwood Sandstones and Mercia Mudstones (formerly Bunter sandstones and Keuper marls) in the west with Liassic, Oolitic limestone and Cretaceous chalk in the east. These rocks are overlain by Quaternary 'drift' deposits that mainly relate to landscape developments in the area during the Devensian and the most recent Holocene period (Figure 4).

The history of the river itself, however, goes back at least some 100,000 years ago as a minimum estimate (Catt 1990). The morphology of the estuary during this period (the Ipswichian) would have been somewhat different to today, with the river flowing into the North Sea approximately 45 km west of the current position at Spurn. Indeed, the coastline during this period is marked by a cliffline running north-south along the eastern edge of the Lincolnshire wolds and buried beneath Devensian deposits (Catt 1990). This is located at the foot of the Wolds dipslope, running north from the Humber beneath Cottingham, Beverley and Hutton Cranswick before turning east just to the south of Nafferton and Burton Agnes and reaching Sewerby on the southern side of Flamborough Head. Changes in the morphology of the inner estuary would have occurred from this period through into the early and mid-Devensian. As such this part of the river may be regarded as 'mature', in contrast to that of the outer estuary which owes it's formation very much to the last 3-4000 years when sea-level attained its current level.

It was during the latter part of the Devensian glaciation (*c.* 18,000 BP) that the Dimlington till (boulder clay – glacial till and glaciofluvial material) which masks most of the Mesozoic solid geology of the area around the Humber, was deposited by icesheets. An earlier till (the basement till) underlies this unit and may have been deposited during the Wolstonian glaciation (140,000 BP) (Catt 1990).

During the later part of the Devensian a tongue of glacial ice reached southwards into the Vale of York, whilst another segment of the ice sheet extended west across Holderness and east Lincolnshire. The ice blocked the flow of water from east to west, effectively isolating the inner from the outer estuary. This led to the formation of a large water body referred to as Lake

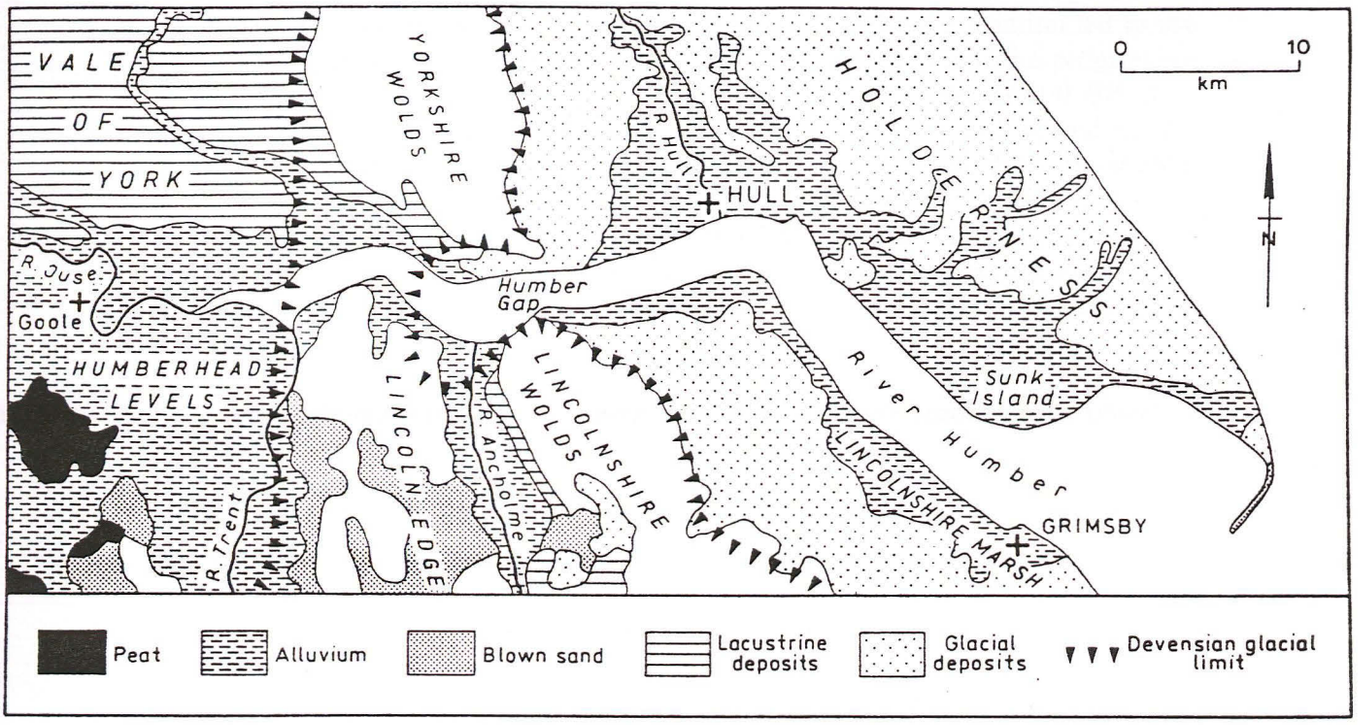


Figure 4: Quaternary deposits around the Humber estuary.

Humber in the area to the west of the Yorkshire Wolds and Lincoln edge. This lake is evidenced by a series of lacustrine clays, silts and sands (the Hemingborough Formation) across the floor of much of the region. The subsequent retreat of the ice sheet towards the end of the glaciation led to the resumption of water flow east through the Humber Gap and the progressive siltation of Lake Humber, a process that was complete by 11,000 BP. It is shortly after this period, during the cold phase of the Loch Lomond stadial (11,000-10,000 BP), that re-working of these sands and silts by aeolian activity took place (Gaunt 1981). Areas of glaciofluvial sands and gravels were deposited both beneath the ice and in front of it as the glaciers retreated some 10,000 years BP. These are apparent in isolated patches throughout the area, such as to the south of Beverley and the eastern side of the Hull valley around Leven.

Sea-level was substantially lower during this period, leading to a phase of down-cutting or incision of river channels to as low as -20 m OD. The climatic amelioration at the beginning of the Holocene led to a switch from erosion to aggradation with substantial depths of alluvium being deposited in the river valleys. Episodic fluctuations in relative sea-level during the Holocene resulted in periods of organic sedimentation, where vegetation communities were able to colonise areas previously below water. With rises in sea-level, these sediments were either buried under alluvium or partially or completely eroded. These organic deposits can be very valuable for palaeoenvironmental study and may also preserve archaeological remains (4.2). The morphology of the estuary would have looked very different during episodes of relative sea-level rise. For example, the area of Walling Fen would have been a large tidal inlet extending northwards into the southeastern part of the Vale of York. Sea-level appears to have reached OD by around 1800 cal BC, although there is evidence for a series of oscillations after this time (Dinnin and Lillie 1995a), particularly during the Roman period.

Previous research has confirmed the existence of extensive areas of anthropogenic warp deposits in the areas adjacent to the major rivers of the Humberhead Levels, Trent valley and Vale of York (Lillie 1997, 1998a, 1999). Areas close to the Humber were allowed to flood and the water held on the fields by a series of drains and sluices. Once the water had deposited its sediment load, it was then released back into the river. The process of warping served a two-fold function; primarily the deposition of fertile warp deposits derived from the suspended sediment load of the regions rivers served to mask the unproductive clays and peats of the low-lying areas around the Humber. Secondly, the deposition of this material helped to raise the level of the land above that of the prevailing tides, thereby reducing the impact of seasonal flooding (Lillie 1999).

The chronology of warping endeavours within the region commences in the Trent valley at 1756, with repeated endeavours occurring through the 1800s and up to the post-war period, with the final recorded warping endeavour occurring at Blacktoft in 1948 (Lillie 1997, 1998a, 1999). In total some 20,600 ha of low-lying land adjacent to the regions rivers have been subjected to anthropogenic warping. In addition to this, vast tracts of the region have also

been inundated by natural flood events. These phenomena result in significant depths of alluvial material being deposited throughout the Humber basin. The maximum proven depth of anthropogenic material in the Humberhead Levels is 1.6 m, sufficient to effectively protect, but also mask any buried landsurfaces and archaeology adjacent to the regions rivers. Recent research as part of an archaeological evaluation in the vicinity of Goole has confirmed the existence of buried landsurfaces beneath historical warp deposits, and shown the potential for the recovery of waterlogged archaeological remains at such locations (Lillie and Chapman 2001).

4.2 Archaeological background

4.2.1 Introduction

The numerous nationally important sites that have been discovered over the last 100 years have highlighted the potential of the Humber. This potential includes all archaeological periods from the Palaeolithic through to the modern day. The resulting deep alluvium which has covered previous landsurfaces during sea-level fluctuations has preserved a unique record of the past vegetation, environment and human activity of the region.

4.2.2 Palaeolithic

Relatively little evidence for activity in the Palaeolithic period has been identified within the Humber region but this reflects the general lack of material remains from this period, rather than a specific lack of this resource within the area. Finds that have been made were generally recovered during the nineteenth century and are often lacking firm locations and identifications. Material that has been assigned a Palaeolithic date has often been re-examined at a later date and re-dated to the Mesolithic period.

The main evidence for Palaeolithic activity has been recovered from areas away from the principal areas of wetlands and therefore has little impact on the understanding of the current study area. There is a likelihood that the heavy alluvial cover of the Humber may be masking sites of an earlier date and therefore any deep excavations could reveal Palaeolithic material.

Palaeolithic flint has been recovered from near the Romano-British settlement at South Ferriby Cliff (HAP SMR 2074) and hand axes have been recovered from Hotham on the Yorkshire Wolds and Risby Warren near Scunthorpe.

4.2.3 Mesolithic

Mesolithic activity in the region is more extensive with evidence in the form of small flint scatters, but these again are often located away from the Humber and are found associated with the smaller tributaries. This observation is supported by the recent discovery of a late Mesolithic activity site adjacent to the River Hull at Wawne (Chapman *et al.* 2000). This site has shown the potential for the recovery of biogenic sequences intimately associated with evidence for human activity adjacent to the regions rivers. Such evidence

enables valuable insights into the environmental background of the region during the earlier stages of human-landscape interactions.

Flints recovered from the site of the later settlement site at Redcliffe, North Ferriby have been dated to the late Mesolithic period (Fletcher *et al.* 1999). Other Mesolithic flint scatters have been recovered on the Lincoln Edge with extensive settlement evidence from the Risby Warren area near Scunthorpe showing extensive activity in this upland zone.

Overall, evidence from the *Humber Wetlands Project* has shown a concentration of Mesolithic flint scatters in areas adjacent to the Humber tributaries floodplains, including the site at Stone Carr, Wawne. Field walking around the Halton Beck, Winteringham has revealed lithic material from the slopes adjacent to the Beck (Fenwick *et al.* 1998), finds recovered near to the early Medieval site at Flixborough were also dated to the late Mesolithic period (Fenwick *et al.* 1998).

4.2.4 Neolithic

Neolithic evidence is more prolific from the region with find spots of stone and flint axes coming from Cleethorpes, Hull, Paull, Easington, Wintringham, East Halton, Grimsby, and Humberston, and finds of flint scatters and other flint artefacts have been made from Winterton, Winteringham, North Killingholme, South Killingholme, Patrington, Alkborough and Burton upon Stather. In addition to these isolated find spots more structural and monumental evidence exists from this period.

Neolithic long barrows have been reported in the area of Barrow Castles, Barrow upon Humber (Loughlin and Miller 1979) and a possible Neolithic mound has been recorded at North Ferriby. Finds of wooden stakes from the lower edge of the foreshore at Melton probably reflect activity during the Neolithic period and appear to reflect the relatively lower sea levels at this time (Fletcher *et al.* 1999). Neolithic landscape features have also been identified from the Humber region. On the beach at Easington the remains of a hengiform monument were discovered and excavated (Figure 5) (Van de Noort and Head 1999). Close to this monument, excavation has revealed an earlier, Neolithic phase, under a Bronze Age barrow mound (R. Mackay pers. comm.).

4.2.5 Bronze Age

Finds from the Bronze Age period are plentiful from the Humber estuary and its environs. In particular, the finds from the foreshore at North Ferriby have produced the most extensive, and earliest evidence of a sewn-plank boat yard in the world (Wright 1990, 1997). A total of five boats or boat fragments have been found from this region which have been radiocarbon dated to the middle Bronze Age, with one dated to the later Bronze Age (Figure 6) (Switsur and Wright 1989). Evidence of boat building and use also exists elsewhere within the Humber with finds of paddles from the Ferriby region (Wright 1990) and a further section of a boat from Kilnsea (Van de Noort *et al.* 1999).

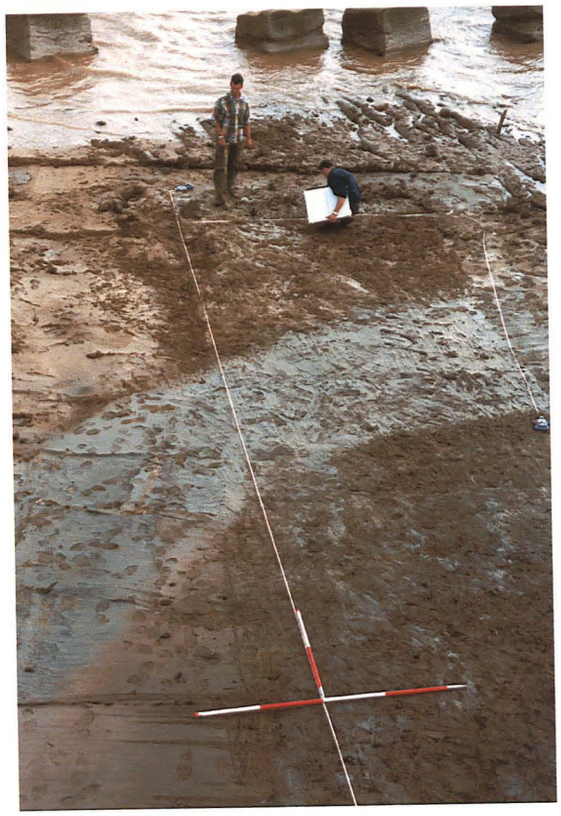


Figure 5: Neolithic henge monument at Easington. © Humber Wetlands Project.

Figure 6: One of the Ferriby boats under excavation (Wright 1990).

Other foreshore finds dating to the Bronze Age consist of fish traps, weirs and isolated stakes, recovered on both the north and south banks of the Humber, are exposed in areas of sediment erosion (Fletcher *et al.* 1999, Fenwick *et al.* forthcoming). In addition, two trackways have been found on the foreshore near Melton on the north bank of the Humber apparently bridging small alluvial creeks between the more solid peat deposits (Wright 1990, Fletcher *et al.* 1999).

Other Bronze Age finds from the foreshore include a number of metal items from the north bank, such as an axe and spearhead (Wright 1990). Isolated finds spots of Bronze Age metal work have also been located from Easington, Barrow upon Humber, Cleethorpes, South Killingholme and Broomfleet. Isolated pottery finds from the region are rarer, with beakers from South Ferriby, Faxfleet and North Ferriby, and late Bronze Age pottery from a pit exposed in the cliff section at Easington (Head *et al.* 1995). The *Humber Wetlands Project* have also recovered numerous flint scatters dating from this period which indicate activity along most of the riverine areas.

One characteristic Bronze Age activity that has been identified from the region is the tradition of burying metal objects in wet places. Hoards of this nature have been recovered from areas including Appleby, Bagmoor and Hotham Carrs. Other hoards from the region have been recovered from Winteringham and Broomfleet.

Landscape features include a number of ring ditches identified from aerial photography that may represent burial monuments. Extant monuments have also been identified from the area around Easington, in the region of the hengiform monument (see 4.2.4 above). Burial mounds have also been identified from Grimsby, Cleethorpes and Winteringham. Late Bronze Age salt-working has also been identified within the region at Tetney (Palmer Brown 1993).

4.2.6 Iron Age

Evidence from the Humber of Iron Age activity is also abundant. A series of settlements are known from the region including the Weelsby Avenue site in Grimsby (Wise 1990, Fenwick, Van de Noort *et al.* forthcoming) and a recently excavated site at South Killingholme. Settlements have also been identified at South Ferriby and Winteringham, and further inland at Kirmington and Dragonby. Many sites have evidence from the Iron Age continuing into the Roman period (e.g. Redcliff and Faxfleet).

Other Iron Age evidence includes several finds of pottery and coins from North Ferriby, Melton, South Ferriby, Winteringham, Brough, Easington, Kilnsea, and Barrow upon Humber. A large concentration of Iron Age gold coins has been recovered from the area of Grimsby.

For the first time there seems to be a definite divide between the people living on the north and south sides of the Humber. To the north were located the *Parisi* tribe with a distinct burial ritual comprising square barrow burials

which have been named 'Arras culture' burials. To the south of the Humber were the *Corieltauvi* for whom little is known of their burial practices, but with greater detail of their settlement sites. They also struck their own coins, a feature that was not characteristic of the *Parisi* on the north bank of the Humber.

4.2.7 Roman

During the Roman period, the Humber had connections via the Ouse to the important town of *Eboracum* (York). The numerous settlements along the edges of the Humber highlight the trade potential of this river system, which continued on from the important role established during the Iron Age.

The Romans reached the banks of the Humber in AD 48 and built a settlement at Winteringham. This marks the northern-most point of Ermine Street with a direct link to London (Figure 7), and the boundary with the north until AD 71. Subsequently the Romans crossed the Humber, building a fort at Brough that later developed into a Roman town. This location may also have served as a naval port for the Roman fleet (Wacher 1995).

Settlements have been located along most stretches of the Humber estuary and also along a number of its tributaries. Evidence includes excavated settlements and large pottery and artefact scatters. Such sites have been located at North Killingholme, South Killingholme, East Halton, Goxhill, Barrow upon Humber, South Ferriby Cliff, South Ferriby Sluice, Whitton, Amcotts, Keadby, Adlingfleet, Faxfleet, Brough, Redcliffe and Easington. Other sites will no doubt become apparent with further research, as has been exemplified by the recent discovery of the extensive Roman settlement site at East Halton in advance of development. The number of settlements and the pottery found in association suggests that extensive trade was being conducted along the Humber.

These sites are located close to the rivers, with direct transport and trade connections by water transport. Further inland, on the higher ground are countless additional settlements that were connected to other Roman settlements and towns by the extensive road network. As noted above, Ermine Street, heading from London via Lincoln to the Humber, meets the river in the vicinity of Winteringham. A second road, which runs along the Lincolnshire Wolds, ends in the vicinity of the South Ferriby Cliff settlement site. In addition, another road has been identified connecting the ends of both these roads, running along the Humber, and can be seen exposed in the foreshore at South Ferriby Sluice (Chapman *et al.* 1998). Finally, a road leading from the Roman town at Brough runs northwards to York.

The majority of the settlements identified have been interpreted as trade and/or agricultural centres. On the higher ground, away from the rivers and the region under study, numerous villa sites have been identified. Villa locations include Brantingham, Welton, Winterton and Horkstow. This would suggest the preferred location of such sites was the higher land away from the wetlands.

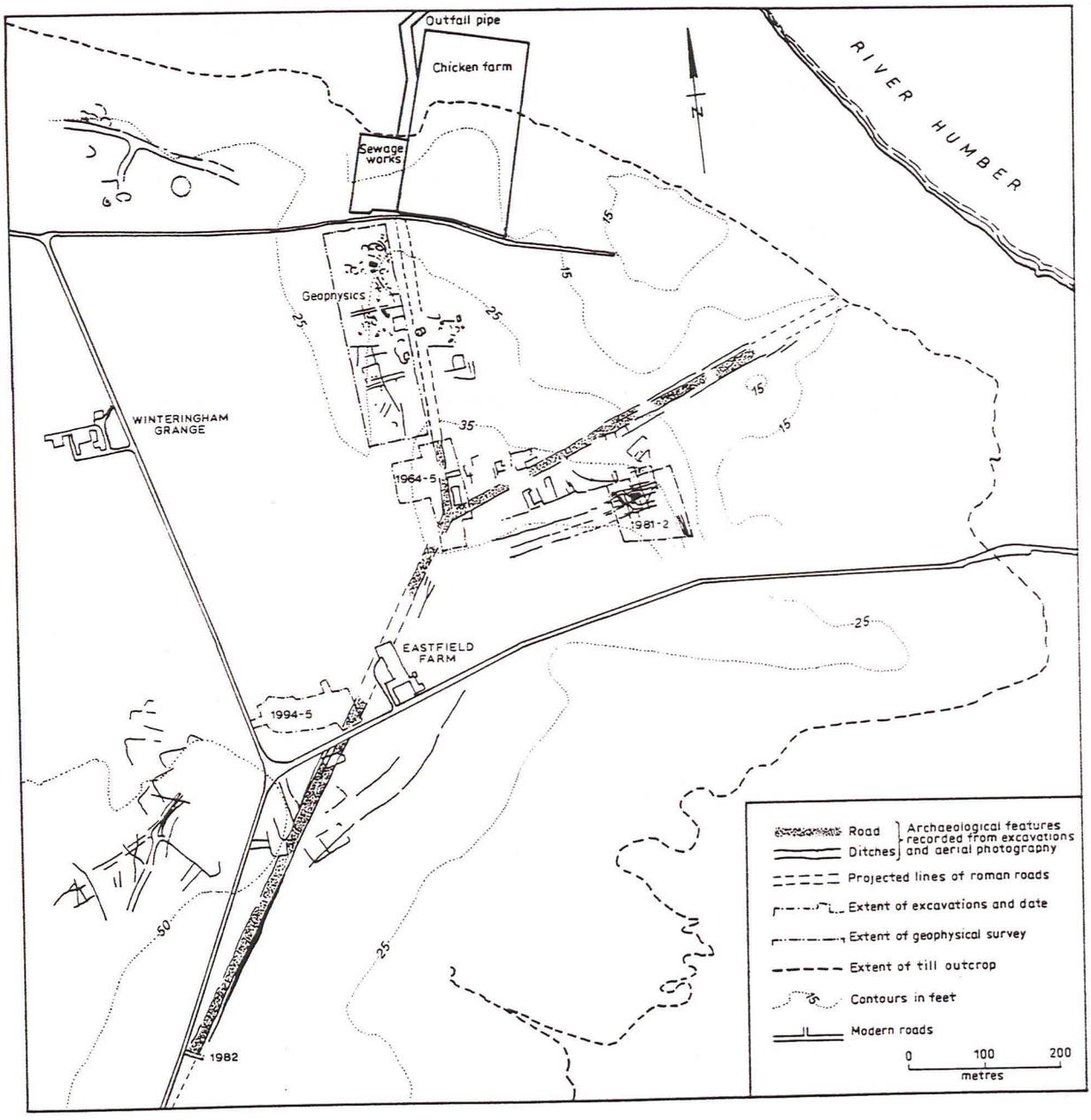


Figure 7: Roman settlement in the area of Eastfield Farm, Winteringham (Chapman *et al.* 1998).

In addition to the Humber being the base for large-scale trade, but there is evidence for industrial activity including pottery manufacture, with kilns recovered from South Ferriby and extensive evidence from areas inland from the Humber at Holme on Spalding Moor.

Numerous scatters of pottery and isolated finds have also been recovered from the region, highlighting the extensive nature of Roman occupation in the region. A final, intriguing find has been the Amcotts bog body that was discovered in 1747. The body of a female was laid on her side and wearing shoes, one of which still survives. The style of the shoe has been dated to the Roman period (Turner and Rhodes 1992), thereby indicating a date for the body.

4.2.8 Early Medieval

With the withdrawal of the Roman army from England in AD 410 there is a dramatic change in the nature and quantity of archaeological evidence. At some sites there is slight evidence of continued occupation, with Anglo-Saxon finds from South Ferriby (including inhumations), Whitton, Winteringham and Dragonby. By the late sixth century, the Humber formed the boundary between North and South Anglian regions. The *provincia* of Lindsey lay to the south of the Humber (Field *et al.* 1997). By AD 679 Lindsey came under Mercian control. To the north of the Humber, the East Riding was part of Deira until AD 616.

Evidence for occupation in this period has been recovered from Barrow upon Humber. In AD 669 St Chad was given land to build a monastery 'at Barwe'. Excavations in Barrow have recovered evidence for a tenth century church and burials from the site suggest that an earlier church may have been in existence in the preceding period, close to the site of the tenth century church.

At Barton-upon-Humber excavations have revealed over 50 inhumation burials dating from AD 500 - AD 675. Some of the burial items included imported goods from parts of France and Germany, suggesting trading contacts with the continent (Watkin and Whitwell 1987).

Excavations at Flixborough have revealed evidence of a settlement dating to the mid-seventh to tenth centuries. The site includes foundations for over 30 buildings, boundaries and other structural features (Figure 8). Imported goods from the continent and evidence for craft working suggest that this site possibly acted as a wealthy 'vill' centre. Material culture in the form of styli may indicate a monastic component to the settlement and the site may have been a monastery in the period from mid-eight to mid-ninth centuries (Fenwick *et al.* 1998).

St Peter's Church at Barton-upon-Humber includes late Anglo-Saxon features and other churches in the region have early fragments in their fabric, including Patrington.

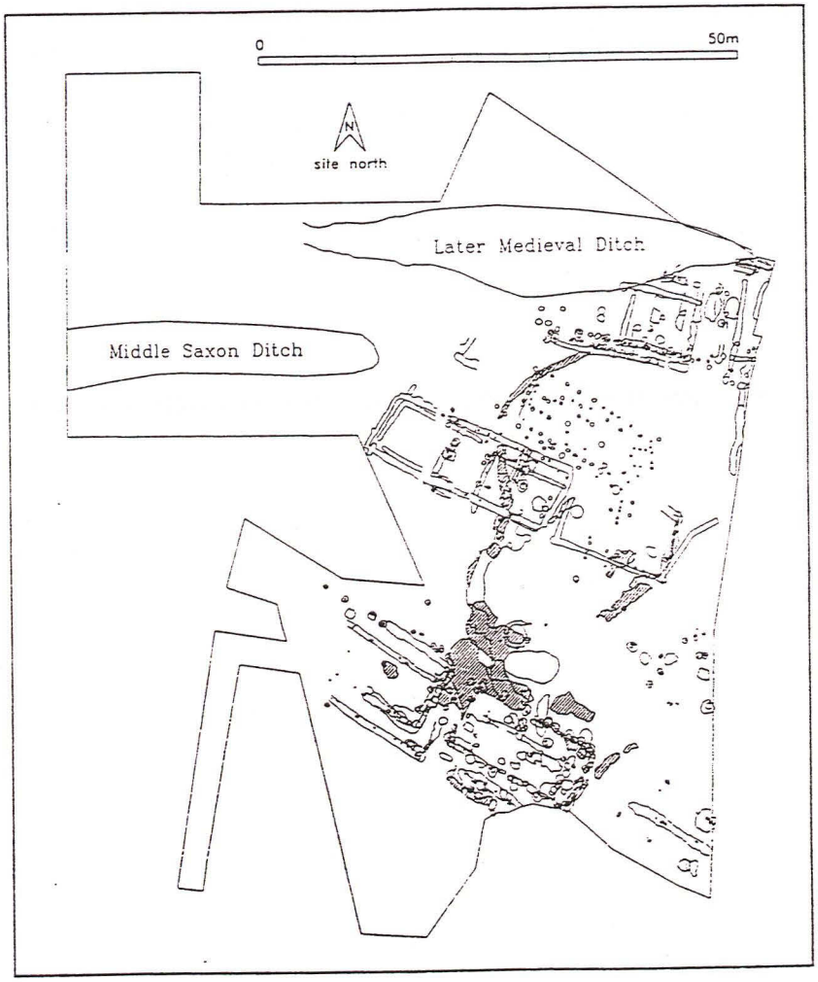


Figure 8: Excavated features at Flixborough Early Medieval settlement (Fenwick *et al*. 1998).

Scandinavian influences were significant in areas that were easily accessible by river to the North Sea, and both the Trent and Ouse were important route ways for Scandinavian armies and traders. Documentary evidence mentions the army of Danish king Sweyne overwintering on the Trent, possibly at Adlingfleet. A Saxon monastery is also recorded at *Donaemuthe* in AD 758-9 that is also reported to be in the Adlingfleet area.

Other isolated finds of Anglo-Saxon and Early Medieval pottery and metal work have been recovered from Goxhill.

4.2.9 Medieval

As with previous periods, trade was important to the region. Kingston upon Hull developed into one of the largest ports in the country, handling most of the goods that were entering and leaving via the Humber. The Ouse still played an important role with links to York. Grimsby developed as a small port but had problems with the continual silting of its harbours. Barton-upon-Humber was also an important market centre.

Known ferry connections are recorded from Domesday onwards with ferries at Winteringham, South Ferriby, Barton-upon-Humber and Grimsby.

A motte and bailey castle survives at Barrow upon Humber, on Barrow Haven (Figure 9). Most of the settlements in the study area were in existence at this time and contain many Medieval elements in their plan, and Medieval structures in their churches. The one exception is the town of Goole, which developed in the nineteenth century.

Settlement desertion and shrinkage have both occurred in the Humber region for various reasons, with many areas having upstanding earthworks Where structures once stood (e.g. Cotness, Waterton and Amcotts). Settlements have not only been lost in the region due to desertion, but coastal and estuarine processes have also removed settlements. The town of Ravenserodd on the north bank of the Humber, was lost by 1367 and other settlements in the area between Sunk Island and Spurn Head have been lost including Penisthorpe, Sunthorp and Orwithfleet (Muir 1982). Many such settlements are mentioned in documents but their exact locations are unknown.

Moated sites are present throughout the region and have been shown to be associated with the reclamation of wetlands and to be linked to the main water routes, possibly for transport and trade access (Fenwick 1997, 1999). They are usually dated to the twelfth to fourteenth centuries although later examples are known. The agricultural landscape of the region comprised a variety of activities, with much of the land adjacent to the Humber being used as pasture and grazing until the construction of defences and later parliamentary enclosure.

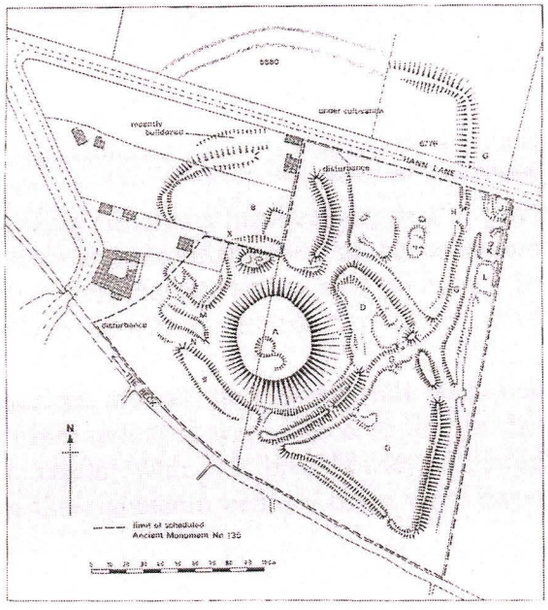


Figure 9: Barrow Castles, Barrow upon Humber. © Humber Archaeology Partnership.

The Lincolnshire coast is characterised by extensive evidence for salt-working. Material from earlier periods has already highlighted the presence of activity from the Bronze Age onwards. In the Medieval period extensive salt extraction was conducted in the area from Tetney southwards. Documentary evidence also suggests salt-working activity in areas to the north from East Halton to Immingham. The waste products of the salt industry were effectively used to reclaim land in the coastal margins, expanding the landscape eastwards.

Further features such as sea defences, fish traps and wrecks are also present from this period.

4.2.10 Post-Medieval

The history of the Humber and it archaeological potential continues beyond the Medieval period. The strategic position of the Humber has meant that a myriad of defensive structures has been erected to protect the Humber from attack. This important resource needs to be considered, and many of the defences, by their very nature, are located along the Humber banks and are therefore intimately associated with the area under consideration.

Defensive structures around the city of Hull were begun in the fourteenth century and further defences were added to this in the seventeenth century, with a central 'castle' with two blockhouses, constructed on the orders of Henry VIII. In the eighteenth century these were incorporated into the Hull Citadel structure.

During the Napoleonic Wars in the nineteenth century further defences were constructed at Paull Point, Stallingborough, and Spurn Point. By the late nineteenth century the defences at Paull Point and Stallingborough were extended (Dorman 1990). With the outbreak of the First World War, defences were extended and new batteries constructed at the above site. A timber and chain boom was laid across the River between Killingholme and Sunk Island. By 1915 new batteries were built at Kilnsea and Spurn Head and the island forts of Bull and Hail Sands were constructed (Figures 10 and 11) (Dorman 1990). During the Second World War defences were strengthened further and new anti-aircraft batteries were constructed and deployed around the Humber (Dorman 1990). This work also included the building of a 1:3 scale replica decoy of Hull docks in the area to the south of Paull Point Battery.

Alongside these defensive structures, many of the Medieval settlements along the Humber continued to be occupied and grow in size. Post-Medieval buildings are still standing in these villages and many are Listed Buildings. Other structures such as jetties, lighthouses and sea defences, all intrinsically linked to the rivers, are also still visible. Many wrecks are also recorded from this period with some being incorporated into later sea defences (e.g. Sand Hall near Goole ARC7). Parliamentary enclosure dramatically changed the ownership and pattern of the landscape and its use. In many of the areas records exist which describe the nature of these changes.

Figure 10: Bull Sands Fort. © Humber Wetlands Project.

Figure 11: Defences at Spurn. © WAERC.

Industrial activities are also in evidence in the region with brick making playing an important role on the south bank of the Humber and other activities such as quarrying and milling occurring at several locations.

4.3 Archaeology of the outer estuary

The archaeology of the north and south banks of the Humber at this point has been influenced by the evolution of the estuary. The north bank is dominated by Sunk Island, an area that is thought to have only developed from the fifteenth century onwards with reclamations carried-out from the seventeenth century onwards. The continuing shifting nature of the area of Spurn point and erosion on the Holderness coast has meant that areas which were once dryland have now disappeared into the sea or are in the process of doing so. On the south bank, it appears that there has been minimal change to the position of the estuary until south of Grimsby where there has been gradual accumulation and the coastline has extended further seawards.

The prehistoric archaeology on the north bank is concentrated in the area of Easington and Kilnsea. Here a series of Bronze Age round barrows are present and a Neolithic henge was discovered on the beach. Prehistoric activity has also been noted in the area of Paull with collections of flint being recovered from islands in the wetlands. Roman activity has only been located from the area of Kilnsea and Easington. Early Medieval evidence is restricted to structural remains from churches. The evidence of Deserted Medieval Villages shows the inhospitable nature of this area. Villages are recorded from several areas along Sunk Island to Spurn point but didn't survive into later periods due to the changing estuary. Other Medieval settlement is concentrated in the two areas with the earlier archaeology such as Paull and Easington with other settlements set further back from the estuary. Attempts at colonising the area can be seen by the evidence of several moated sites along this stretch of the estuary.

In contrast the archaeology on the southern bank is more extensive. Casual finds from the area of Killingholme, Cleethorpes and Humberston attest to prehistoric activity in the area. Excavations at Tetney have revealed evidence of salt-working from the Bronze Age. Iron Age settlement evidence is extensive with evidence from East Halton, Killingholme and Weelsby Avenue, Grimsby. Roman activity continues at several of these sites, and additional sites appear with further occupation at Goxhill and Killingholme suggesting riverside settlements along the Humber. Early Medieval evidence is rare and is concentrated at settlements on the higher ground. Medieval settlement is also set-back from the Humber with strings of settlement like those of East Halton, South and North Killingholme which have a equal division of land on the higher ground and a section of marshland used mainly for grazing. A small town developed at Grimsby relying on trade. One important factor in the development of this area has been the Medieval salt industry. Evidence for this activity stretches from East Halton in the north and continues south along the Lincolnshire Coast. Especially to the south of Grimsby, this industry has resulted in the reclamation of large areas of the saltmarsh from the sea as can be seen by the saltern mounds in the Tetney area.

One feature that is seen on both sides of the outer estuary is the important defensive structures. With the Humber playing an important role in trade, settlement and transport it has been a focus for defensive structures from at least the Medieval period onwards. The important First and Second World War defences are nationally important as in other areas of the country they have not survived in such a well-preserved state.

4.4 Archaeology of the inner estuary

Archaeological evidence for the prehistoric period is concentrated within the intertidal zone. Finds dating from the early Bronze Age onwards, from both sides of the Humber, indicate that this was an important resource during this period. Its use as a transport network is indicated with the presence of at least five Bronze Age boats from North Ferriby. Access to the foreshore area was maintained through the construction of trackways such as those found at Melton, and the use of the river as a food resource has been shown by the discovery of a fish trap at New Holland.

Roman settlement has been identified along both sides of the Humber with settlements such as the two at Faxfleet, Brough, Whitton, Winteringham, South Ferriby and Goxhill. The settlements at Winteringham and Brough served as the two ends of the Roman road network and a ferry most likely operated between the two.

Evidence for Early Medieval occupation is concentrated on the south bank with settlements and burial sites from Barton and Barrow upon Humber. Finds have also been recovered from South Ferriby. Medieval settlement on the South bank continues in these locations, at a distance from the Humber itself and often on the high ground. Settlement on the north bank is located closer to the river such as at Faxfleet and North Ferriby. The town of Kingston upon Hull also developed and had a considerable affect on the trade and settlement of the Humber. During the Medieval period, and continuing to the modern day, industrial activities in the area included brick-making and chalk quarrying leaving a considerable effect on the landscape such as the Barton clay pits.

4.5 Archaeology of the River Ouse and Trent

The nature of the archaeology from Trent Falls along the Rivers Ouse and Trent is noticeably different to that from the Humber. Prehistoric material is concentrated on the high ground bounding the Rivers, for instance on the Lincoln Edge and the Isle of Axholme. Some isolate finds have been found from the lower areas but no evidence of settlement has been located. Evidence from sites such as Adlingfleet has shown that Roman occupation was located on the edges of these rivers, continuing the pattern that has been seen in the Humber. Current work in the area of Adlingfleet and Garthorpe is gradually expanding this evidence and casual finds of pottery at other locations along the Trent and Ouse suggest further settlement on the edges of the rivers.

Although evidence for the Early Medieval period is rare, the Rivers Ouse and Trent were important waterways at this time. Excavations on the Lincoln Edge

have revealed the important settlement site at Flixborough and documentary evidence records a Viking camp at Adlingfleet. Many of the Medieval settlements in this area take the form of riverside settlements with occupation concentrated in linear villages along the river banks. The villages that survive today maintain this form such as Blacktoft, Yokefleet, Skelton, Swinefleet, Ousefleet and Amcotts. This region lacks the defensive structures that have been seen in the Humber but contains some important industrial archaeology with bridges and locks on both rivers.

5. NATURE OF THE ARCHAEOLOGICAL EVIDENCE

The nature of the archaeological resource constitutes remains including those that are now deeply buried to those still standing. Within the Humber estuary the archaeological remains provide the added advantage of holding high potential for preservation of wooden structures, particularly on the foreshore. The following is an outline of the different types of archaeological sites in the region, and the typical conditions in which they may be viewed.

5.1 How archaeology is discovered and located

Archaeology can be located in a variety of ways. Firstly sites have been identified in the past and are therefore already recorded. Secondly finds are made when the deposits in which they are buried are disturbed. This could happen through ploughing, drain digging, building work or from natural effects such as erosion. Finally various methods can be used to investigate areas to see if they hold any archaeology. Many of these techniques are non-intrusive; that is they use techniques which do not involve digging into the ground and thereby disturbing what is there. Documentary evidence can be useful in locating past settlement, especially from the Medieval period onwards. Aerial photographs can be used to record features that cannot be seen from the ground (Figures 12 and 13). Earthworks can been clearly seen in these photographs but sites that are buried can also be seen due to either differential crop growth over buried features or by changes in soil colour. Geophyical surveys can be conducted across possible sites. These measure either electrical resistance or the magnetic response of the ground. Both of these factors vary depending on what is buried under the ground (e.g. either a wall or a pit filled with rubbish). Finally sites can be located by walking across ploughed fields and locating any finds that have been disturbed during the ploughing.

All these techniques will locate areas with archaeology but vary in success depending on different factors such as type of soil, the depth at which the archaeology is buried and even the weather. Once located the only way to verify what the site is and the time-span of activity is through excavation. Excavations are undertaken at various scales from small 2 x 2 m holes across certain areas, to larger trenches and even the excavation of a whole site.

5.2 Importance of palaeoenvironmental evidence

Sedimentary deposits build-up through time and so different layers or levels will hold the potential for information relating to environmental conditions at a particular time. Whilst some information can be gained from assessing the structure of these layers themselves, much greater detail can be gained from preserved material in wet areas and organic deposits such as those within and surrounding the Humber estuary. The saturated conditions mean that bacterial and fungal degradation is reduced so that microscopic and macroscopic plant remains can be preserved. These include pollen and other very small biological material, in addition to leaves, seeds, wood and other larger

Figure 12: Example of an aerial photograph showing crop marks of enclosures and ditches from a Roman period settlement. © Crown Copyright.

Figure 13: Example of an aerial photograph of an earthwork site (Ousefleet moated site).

remains. Through the detailed analysis of these materials it is possible to both date the various layers and also to interpret contemporary environmental conditions. Furthermore, within some areas it is possible to identify changes in sea level. Where discovered these layers can be dated and so past intertidal conditions can be reconstructed.

The Humber region is particularly valuable in this respect. Evidence discovered during the *Humber Wetlands Project* demonstrated that sea-level change, and its effects upon the local contemporary environment, was earlier downstream, developing gradually further upstream during the Bronze Age. This complexity is currently not fully understood, but has far reaching implications with regards to human/landscape interaction particularly during the Bronze Age, but also during other periods. The palaeoenvironmental potential of deposits here provide a unique study opportunity since they may be considered in relation to archaeological structural remains that together can build a more complete picture of the past than is available elsewhere.

5.3 Buried archaeological sites on 'dry' land

Sites such as settlements and agricultural features can become buried for a variety of reasons. This usually happens after the sites have been abandoned and the buildings have either decayed or been pulled down. With time this results in a flat ground-surface where the evidence for the existence of the structures may only be seen through excavation. Discoveries may include building foundations, but more commonly the remains consist only of series' of pits and ditches (Figures 14 and 15). Generally, the more distant the time period being studied the less substantial the remains that are often discovered. Often this is because much of the original building material is taken away from the site shortly after its abandonment to be re-used in new constructions elsewhere.

5.4 Foreshore zone on the Humber

Within the estuary the foreshore provides a range of environments that characterise the nature of archaeological remains in such areas. Typically, due to the nature of wet-preservation in these areas, the principal archaeological remains consist of the base of wooden stakes driven into the foreshore. In the Humber such remains have been dated to nearly all periods between the later Neolithic through to the modern period. These stakes can normally be dated either through a visual analysis of tool-marks on the wood which have been shown to change through time as technology developed, or through scientific dating such as radiocarbon or dendrochronology. Occasionally such structures will be associated with more substantial remains including trackways, fish traps or jetties (Figures 16 and 17). Inorganic archaeological remains are visible on the foreshore and include scatters of worked flint, pottery and stone structures. However, the Humber estuary is best known for having produced the earliest sewn boat remains in Britain at North Ferriby.

The dynamics of the Humber mean that the river presents an ever-changing regime of erosion and sediment accumulation. This process has profound

Figure 14: Buried archaeological features. The red and black area has a large quantity of pottery and burnt material in a shallow gully. You can see the feature due to the difference in colour of the fill of the gully to the natural grey clay that it is cut into. © Humber Wetlands Project.

Figure 15: Archaeological trench with pits and gullies visible as darker areas to the natural deposits. These features have been partially excavated to gain information on their shape and the nature of the deposits filling them. © Humber Wetlands Project.

Figure 16: Part of the South Ferriby Roman road structure. © Humber Wetlands Project.

Figure 17: Bronze Age trackway on the Melton foreshore. © Humber Wetlands Project.

effects upon both the preservation of archaeological remains and their discovery. Areas being eroded by the action of the river (e.g. south of North Ferriby) present a direct physical threat to the archaeological deposits on the foreshore, but equally present the opportunity for such sites to be discovered. Conversely areas of sediment accumulation (e.g. Brough) provide additional protection to potential deposits of archaeological material but conceal them. Alterations in the dynamics of the estuary mean that areas of either erosion or sedimentation may alter with time.

The nature of the deposits that preserve material within the Humber foreshore area provide the preservation of naturally deposited organic remains such as peat and organic alluvium. These deposits within the Humber have been formed since early prehistory and contain microscopic and macroscopic remains that may be analysed to build up an understanding of past environmental conditions including contemporary sea level, local wetness and local and regional vegetation patterns. They can also provide an indication into the effects of human activity on the landscape at different periods.

5.5 Foreshore zone on the coast

The study region includes a small section of the Holderness coastline, and a larger section of the Lincolnshire coast. The nature of archaeological remains in these areas is somewhat different to that within the estuary. The Holderness coast region is an area of significant erosion and so the nature of archaeological remains often reflect what were originally dryland activities (Figure 18). The remains from such activities have become located on the foreshore as the coastline has receded in the intervening years.

To the south, the coast of the Lincolnshire Marsh is characterised mostly by sediment accumulation. Here much of the archaeology has become buried as the coastline developed seawards through time. As a result of this, much of the archaeology of past foreshore environments is either concealed, or buried within dryland contexts. On the coastal foreshore, therefore, many of the remains date to more recent periods. Off the coast wreck sites are common, trapped in the soft sediments (Figure 19). Occasional exposures of peat have been recorded and in some areas there are remains of fish traps, but this is of a much lower density compared with the estuarine area of the Humber.

5.6 Standing structures

Archaeology does not just deal with what is buried under the ground but is also concerned with features that are visible above ground and structures that are still standing. These sites can include features such as field boundaries that are still in use to the more obvious sites such as churches and other historic buildings (Figure 20). This also includes the large amount of structural evidence in the Humber in the form of First and Second World War defences (Figure 21). Once these sites have been destroyed the remains then fall into the buried archaeological category.

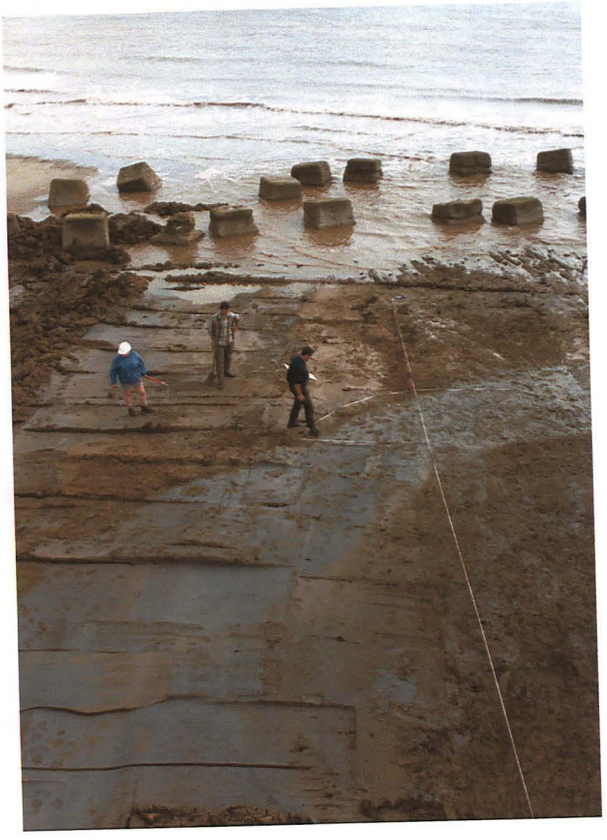


Figure 18: Easington henge on the Holderness coast. © Humber Wetlands Project.

Figure 19: Wreck on Cleethorpes beach. © Humber Wetlands Project.

Figure 20: St Peter's Church, Barton-upon-Humber. © Humber Wetlands Project.

Figure 21: Standing war-time structure (pillbox) at Kilnsea. © WAERC.

5.7 Earthwork sites

Areas that have not suffered from ploughing or re-development can often retain traces of archaeology in the form of earthworks. These sites are represented by low bumps, mounds and hollows in a field that conceal the locations of banks and ditches. Other features such as house platforms and the locations of other buildings may also be represented in this way. These sites are becoming increasingly rare as more pasture land is converted to arable but are an invaluable resource when studying archaeology. Topographical survey can record the nature of the site, and the buried archaeology is often in a better state of preservation than that of sites that have been ploughed.

5.8 Casual finds

Many archaeological discoveries are made when the ground is disturbed and artefacts brought to the surface (e.g. by ploughing or drain digging). These finds are often removed from their *context*. This means that the exact location of the find has been lost, for example, if the find had been buried in a pit or in the interior of the building. These types of finds help pinpoint activity in an area and hint at buried archaeology. They therefore can be used to help pinpoint areas that hold the potential to have buried archaeology.

5.9 Archaeological importance

Importance is a difficult quality to place on archaeology. Archaeological value is usually assessed using a range of factors such as rarity, condition, vulnerability, diversity, potential and period. Hence sites are looked at in their international, national and regional context. If finds or sites are unique whether it be internationally or just regionally then they will be granted more importance than a site for which there are numerous examples. The condition of the site also influences importance. If many examples of the find or site are already known but the condition of the example in question is excellent and far better then the other examples, then it will gain importance. Although finds of an earlier date are older they may not necessarily be more importance than a rare find from a more recent period. Therefore archaeological importance is assigned on a case by case basis in the context of international, national and regional archaeological knowledge. The suggested importance of sites within the current survey have been assigned using the above criteria within the international, national and regional context of the sites and finds.

6. PRESENTATION OF FINDINGS

Information is provided on a management unit basis. Each unit has a general background to the archaeology making specific references to sites in the Primary study areas with additional consideration of sites in the Secondary survey regions. This is followed by detailed information on the archaeology and palaeoenvironment of the Primary area. Two maps are provided - one with known archaeology points and the other with data from the *Humber Wetlands Project*. A statement of potential of the archaeology and a statement regarding vulnerability follow this. This is followed by a section on importance and recommendations. A map shows areas of importance and potential. This map needs to used alongside the text and with the recommendation statements. At the end is a summary list of the finds from the Primary survey region. These lists include archaeological, palaeoenvironmental, *Humber Wetlands Project* and aerial photographic data. A full list of the data, subdivided by management unit is presented in Appendices 2-5 (Volume 2).

7. Management Unit 1: Spurn Head to Paull

7 .1 Background

The region between Spurn Head and Paull contains a large area of 're-claimed' land. Reclamation at Sunk Island, towards the centre of MU1, began in the late seventeenth century around 'Old Island'. The channel that extended around the northern side of Old Island was narrowed, effectively to the size of a drain, by successive periods of embankment throughout the nineteenth century (Allison 1976). As a consequence, a large proportion of MU1 is artificially created thereby potentially concealing earlier deposits. Given that a channel previously occupied much of the area, it seems unlikely that significant archaeological deposits exist, as these may have been eroded prior to sediment accretion in the Post-Medieval period.

The earliest evidence from MU1 dates to the Neolithic/Bronze Age period, with a number of struck flints identified during the *Humber Wetlands Project* survey (Head *et al.* 1995), although these were found from the Secondary areas of the MU. However, a recent find of a hengiform monument on the foreshore at Easington reflects activity during the Neolithic period within the Primary area of the present survey.

The most common finds and sites of the prehistoric period date to the Bronze Age. Five possible round barrows have been identified from the region, clustering mostly around the Kilnsea area, mainly within the Primary study region, and are located in the vicinity of the earlier hengiform monument (Van de Noort and Head 1999) (see Figures 5 and 18). The recent discovery of a plank fragment from a sewn-plank boat on the foreshore near Kilnsea has been dated to the Bronze Age at *c.* 1870-1670 cal BC (Van de Noort *et al.* 1999) (Figure 22). This dating makes the fragment the oldest known example from England. The plethora of boat finds in and around the Humber estuary highlight an exceptional potential for further discoveries of this kind. In MU1, later prehistoric activity is also reflected by a sherd of pottery from the northern end of Spurn Point.

The Roman period is well represented by find spots of pottery from the field walking carried out by the *Humber Wetlands Project* (Head *et al.* 1995). A settlement southeast of Easington is recorded by the SMR, within the Primary study area. Roman coins have also been recovered from Paull (ARC154) and Easington (ARC303).

The Medieval period is well represented, with a broad range of monument types. Within MU1 a haven has been identified along with deserted settlement remains located to the southeast of Patrington. Similarly, moated sites, a church and other features clustering around Skeffling all date to the Medieval period. A sixteenth century tower survives at Paull Holme and this has extensive earthworks associated with a moated site and Medieval field boundaries.

Figure 22: The Kilnsea plank – a section of a Bronze Age boat. © Humber Wetlands Project.

Figure 23: Pill box at Spurn. © WAERC.

The majority of features dating to the Post-Medieval period relate to the reclamation of Sunk Island and the control of watercourses, including sluices and floodbanks. Chapels, jetties and a lighthouse are also recorded by the SMR. More recent activity within MU1 is reflected by the extensive remains of Second World War defences and other military features. These include anti-aircraft batteries, pillboxes, decoys, anti-tank blocks and other structures. The most substantial of the surviving structures is Paull Point Battery, originally a Napoleonic fort, which was expanded and used during the Second World War (Dorman 1990). Extensive remains of the wartime Humber defences also survive in the area of Spurn Point (Dorman 1990) (Figure 23).

Palaeoenvironmental data relating to the development of this management unit are lacking. The majority of the available data comes from the more recent HWP and LOIS projects, which is presented below. Berridge and Pattison (1994:59-72) discuss the occurrence of late- and Post-glacial lakes or meres that developed in the till deposits of Holderness. Perhaps the best known site for this region is The Bog, Roos, which has been studied by Beckett (1981) and Blackham *et al.* (1984). This particular site has produced the most complete record of Post-glacial vegetation and climate history for the immediate region. The meres of Holderness (Sheppard 1956, 1957, Dinnin and Lillie 1995b) have been shown to vary both spatially and temporally, with many former meres no longer preserving evidence for Holocene landscape developments (Dinnin and Lillie 1995b: 82-5). As outlined below, the meres of southern Holderness (Dinnin and Lillie 1995a) compliment the regional data provided by locations such as The Bog at Roos, while also enhancing the available record relating to sea-level change in the region.

7.2 Identified archaeology (MAPS 1a and 1b)

Within MU1, the majority of the archaeological sites and features identified are from the Primary study area. The archaeology of earlier periods, however, is under-represented, with the exception of the hengiform structure at Easington (Van de Noort and Head 1999). The Palaeolithic and Mesolithic periods have proven elusive despite more intensive surveys such as the *Humber Wetlands Project*. The barrows (ARC224, ARC273, ARC294, ARC309 & ARC310) provide clear evidence of Bronze Age activity towards the southeastern extremity of the Primary research area. Further Bronze Age activity is also evidenced by the boat remains from the Kilnsea foreshore (ARC302) and from lithic remains (Kilnsea-18). Iron Age pottery was also recovered within the Primary study area (ARC318). The Roman period is represented by settlement remains and a scatter of pottery (e.g. ARC267, Kilnsea-8).

Medieval sites within the Primary study area include moated sites (ARC228, ARC229 and ARC230), deserted settlements (ARC192, ARC215 and ARC239), pottery (ARC334 and ARC335), a settlement (ARC548), a haven (ARC211), a church (ARC226) and a cross (ARC227).

The Post-Medieval features in MU1 relate mostly to land reclamation and are therefore within the lower-lying land of the Primary study area. These include

watercourses (ARC172, ARC174, ARC179, ARC217, ARC218 and ARC220) and floodbanks (ARC219, ARC234 and ARC329). Other features represent coastal activities, including a jetty (ARC134), sluices (ARC212, ARC231, ARC232 and ARC233) and groynes (ARC323). In addition, chapels (ARC124, ARC125 and ARC189), inns (ARC126 and ARC128), a coastguard building (ARC170), a well (ARC299) and a beacon (ARC298) are all recorded from this area. Also, a lighthouse exists on the western edge of the study area (ARC161) and pottery have been found (ARC129).

More recent remains within the Primary study area include a wide range of Second World War structures. These include the Hull dock decoys (ARC151, ARC152, ARC153 and ARC194), pillboxes (ARC166, ARC277, ARC278, ARC280, ARC283 and ARC284), a signal station (ARC167), blockhouses (ARC168 and ARC177), anti-aircraft batteries (ARC171 and ARC214), a camp (ARC178), anti-tank blocks (ARC235, ARC276 and ARC288), road blocks (ARC282 and ARC308), 'defences' (ARC275) and a listening post (ARC301).

7.3 Humber Wetlands Project data (MAPS 2a and 2b)

During the survey of Holderness (1994-95), two mapviews were surveyed in this management unit. The Paull mapview was placed over an area from Salt End southwards and falls partly within this management unit and partly in MU2. The Easington mapview was placed over the area of Kilnsea and Easington incorporating both the estuary to the west and the coast to the east.

Finds from within this area include general background 'noise' in the form of flint and pottery. Sites identified show activity in the unit from the Neolithic through to Medieval period (see section 7.10).

Further to the survey work of the *Humber Wetlands Project*, excavations were carried out in 1998-99, on behalf of English Heritage. These excavations were undertaken on a hengiform monument on the beach at Easington.

7.4 Palaeoenvironmental data

General

Until recently (Dinnin 1995), the palaeoenvironmental development of southern Holderness, as determined in MU1, had received relatively little attention (e.g. Sheppard 1913, Swinnerton 1931, Wright and Churchill 1965, de Boer 1978, Gaunt and Tooley 1974). British Geological Survey borehole logs (LOEPS – Land-Ocean Evolution Perspective Study; Metcalfe *et al.* 2000), in the vicinity of this management unit indicate that in excess of 8 m of Holocene intertidal channel/sand flat deposits occur close to the eastern side of Hull at TA1603027480. At TA18210281070 a similar depth of Holocene material comprising alternating deposits of sandflat through saltmarsh and mudflat to saltmarsh sequences are recorded, with organic-rich material at depth. These sequences are mirrored further east, with maximum depths of 10 m occurring, and with the shallowest recorded depth of Holocene material being located on the inner edge of Spurn Point at TA4212114563.

Specific data

In terms of the evolutionary development of the estuary, the deposits recorded by the BGS are the result of rising sea-levels at the end of the Late-glacial and into the Holocene. Between *c.* 10,300 BP and *c.* 5880 cal BC (*c.* 7000 BP) sea-level rise resulted in rapid inundation from -65 m OD up to less than -10 m OD, after which time sea-level continued to rise, though more slowly, to around OD (Jelgesma 1979, Dinnin 1995). During the Holocene period a series of alternating transgressive and regressive phases have characterised the sea-level curve for the Humber region (Gaunt and Tooley 1974, Dinnin and Lillie 1995a:116-7, Long *et al.* 1998). While the latter paper does not provide information directly relating to MU1, it does serve to emphasise the fact that this particular area, studied in recent surveys by the English Heritage funded *Humber Wetlands Project* and the LOIS (*Land-Ocean Interaction Study*) project (Shennan and Andrews 2000), exhibits considerable potential for the reconstruction of past environments, and understanding the evolutionary history of the estuary.

Core HMB-12 (Lockham: TA3900017200), recorded from the outer estuary (north bank) produced a sequence of deposits comprising weathered till at the base overlain by sterile deposits (Ridgway *et al.* 2000). At a height of 250 mm above the till, the base of a peaty silt deposit contained freshwater and brackish diatoms at the base. All of the identified species prefer organic-rich eutrophic environments, as such a body of standing water with abundant macrophyte vegetation is indicated, and is interpreted as oak fenwood (Ridgway *et al.* 2000: 30). Increasing evidence for salinity is attested towards the top of this peaty silt, reflecting rising watertables and the development of reedswamp (*ibid.* 2000).

Further up in this core the evidence for increasing saline influences is highlighted by the continued occurrence of marine and marine-brackish taxa, indicating the continuation of nutrient-rich conditions, although with a shift towards saltmarsh conditions (Ridgway *et al.* 2000). By -1.75 m OD the evidence suggests that the saltmarsh development has resulted in increasingly nutrient poor environments, leading to the development of mudflats. Towards the upper part of this sequence fluctuations in marine influences occur, with regressive contacts indicating periodic removal of marine conditions. At around OD the sediment reflects sandflat environments that are subsequently replaced by a final saltmarsh unit.

This particular BGS core highlights the considerable environmental/landscape evolution evidence that can be recovered from areas adjacent to the estuary. Radiocarbon determinations obtained from a range of biogenic materials, including *in situ* peats, rootlets and *Scrobicularia* shells suggest that these deposits have formed over the period 6200 to 1700 cal BC as a minimum range. Of key importance in this observation is the fact that the more recent part of the Holocene record remains the least understood and also the most poorly preserved. In addition, intercalated *in situ* peats are essential for the dating and understanding of Holocene sea-level changes, which at HMB-12 are under direct marine influence, being in the outer part of the Humber estuary.

Recent analysis by Dinnin and Lillie (1995a) in the catchments of the three main alluviated valleys of the region – Burstwick, Keyingham and Winestead Drains – has shown that the pre-alluvium valleys of the early Holocene were deep, with the valley bottoms being in excess of 9 m below their present level (1995b: 107). The work of Dinnin and Lillie (1995b) has shown that these valley bottoms contain a significant palaeoenvironmental resource in the form of infilled meres. The available evidence suggests that sediment accumulation may have been sufficient to enable carr woodland to colonise the mere margins before the succeeding phase of clastic sedimentation occurred. The pollen data relating to these meres, suggests that Halsham (TA261285) had infilled sufficiently to enable colonisation by *c.* 3800-1700 cal BC.

Continued rising sea-levels throughout the Holocene led to the expansion and diversification of the region's wetlands (Dinnin and Lillie 1995b: 108). Tidal incursions would have created marine environments adjacent to the estuary, with brackish wetland environments such as tidal creeks, saltmarshes and lagoons, occurring in more marginal areas.

A number of BGS and other boreholes relate to the eastern end of the outer estuary in the vicinity of MU1 (Dinnin and Lillie 1995a, Ridgway *et al.* 2000, Metcalfe *et al.* 2000).

7.5 Walk-over survey

During the HWP survey intertidal areas were visited and attempts were made to walk this zone. The conclusion drawn from these attempts was that it was beyond the scope of traditional survey techniques, such as walking from the shoreline, as the alluvial clays were too wet and deep making any foray into this area too treacherous.

The visits carried out during the current survey confirmed this observation and any area along this management unit that may be affected by works should be subjected to a full survey with health and safety controlled techniques and boat support. Observations made during the survey are noted below and areas visited are shown in Figure 3.

Paull Hedon Haven TA166266: Deep alluvial foreshore with shale and shingle next to the sea defences. Large silt deposit build-up from haven. Three ship hulks are used as water breaks next to shipyard. Land the behind defences is either arable or settlement.

Thorngumbald Clough TA171251: Deep alluvial foreshore. No remains are visible. Pillbox to north in the sea defences (TA17072508). Two lighthouses. Land to rear of defences all arable. Very undulating land surface with high potential for finds (Paull-2 to Paull-5 HWP survey).

Stone Creek TA235188: Large saltmarsh area in front of defences (*c.* 100 m). After saltmarsh there is again a deep alluvial intertidal zone. No remains are visible in this foreshore area. Within the creek itself there are areas of saltmarsh and alluvial deposits and these could contain archaeological deposits

relating to crossings of this creek or of boats moored along side (Figure 24). On the southern side of the creek are the remains of an army camp with several upstanding structures, the one nearest the sea defences displaying some damage. Land behind defences is mainly arable.

Skeffling Clough TA369183: Large area of saltmarsh in front of defences, followed by a wide flat expanse of intertidal alluvial deposits. Only a single stake was visible in intertidal zone. Land behind defences is mainly arable.

Easington Clough TA393172: Large expanse of saltmarsh and intertidal deposits. Anti-Tank blocks to the rear of defences and a sea defence at right angles to the shore, as well as concrete blocks (Figure 25). Land behind defences is mainly arable.

Kilnsea TA409158: Large expanse of intertidal deposits that can be surveyed with care. Visible remains include a pillbox incorporated into sea defences and some timber sea defences parallel to the coast stretching for *c.* 200 m to the south. The section to the north of this point may reveal archaeology. Land behind defences is either settlement or pasture.

Spurn Point TA402112: Many war-time defences. This area is outside of the current plans.

7.6 Potential

Previous research in MU1 has identified high archaeological and palaeoenvironmental significance at a national and international scale. In terms of prehistoric archaeology, the area around Kilnsea and Easington has produced finds dating to the later Neolithic through to the Bronze Age. The prevailing wet conditions mean that such areas hold the potential for preserving organic materials through the absence of air and therefore inhibiting the activity of destructive aerobic bacteria. This indicates that waterlogged material from these areas holds the potential for providing insights into these periods that may not be achieved on dryland sites. The continual addition of new sites in this area indicates the potential for yet more sites to be discovered in the future.

Sites of Medieval date are also plentiful within MU1, providing a picture of the landscape at this time. Changes to the landscape are also represented by the ambitious engineering works of the Post-Medieval period, particularly with the reclamation of Sunk Island from the Humber.

The Second World War defences around the Humber are also significant, and have been included within a recent survey by the Council for British Archaeology in the 'Defence of Britain' survey. While each feature or monument may contain its own intrinsic value, it is the potential of these

Figure 24: Stone Creek. © WAERC.

Figure 25: Easington Clough sea defences. © WAERC.

features taken together that exceeds their individual value as elements of a Second World War landscape.

7.7 Vulnerability

The vulnerability of the deposits in MU1 is very high, as exemplified by the erosion that has revealed sites such as the henge on the Easington foreshore (Van de Noort and Head 1999). Due to the heavily alluviated nature of the majority of this unit, and the Health & Safety implications, little work has been carried out in the immediate foreshore zone. Erosion in this zone has been noted at Paull and Hawkins point. The area of Paull also coincides with an area of nationally important twentieth century defences. Areas on the foreshore at Kilnsea have revealed archaeology in the past and one area has an erosive contact with no protection. This is mirrored on the coastal side with extensive archaeology exposed at Easington. Further, the area to the south of Paull has an unique Second World War landscape which would be seriously affected if any works were to be carried out in this area. If the option taken was to retreat the line the relationship between these structures could be lost.

7.8 Importance (MAP 3a and 3b)

Two main areas of importance have been highlighted from this management unit. The area of Spurn Point has two important landscapes – the Neolithic-Bronze Age ritual and burial landscape and the modern defensive landscape of the Spurn defences. Three smaller zones have highlighted due to the Medieval or defensive landscapes. Two zones are identified as having a lack of work but high potential. The smaller zone (zone 33) is due to the close proximity of Roman remains, and zone 34 is due to the documentary evidence of deserted Medieval villages in the area. The areas with a lack of work and low potential are concentrated on the presumably recently reclaimed land of Sunk Island.

7.9 Recommendations

These recommendations are based on the existing, available knowledge of archaeology for the region. Areas of high potential are those that already have a large collection of archaeological materials, where such remains are either still present *in situ* or where additional discoveries should be anticipated. Areas described as having a lack of knowledge and a low potential are those where little work has been carried-out, and where work has been undertaken has revealed few archaeological remains. The potential exists in these areas for significant discoveries of previously unknown sites. Areas described as having a lack of investigation but high potential are those where little work has been carried-out but the work which has been undertaken has indicated a high probability for the recovery of archaeological remains in the area. These recommendations are preliminary and further analysis should be undertaken on each area when management plans are produced.

The SMP selected strategy for this management unit is possible compensation for inter-tidal loss and to hold on present alignment until lengths need to be

repaired or improved. Two large areas have been highlighted for their high potential from the information that is already available – Paull and Spurn. Any work in these areas should attempt to keep the defences on their current alignment with minimal impact on either side of this line. Smaller areas of importance have been highlighted due to the presence of monuments and sites. It would also be best to hold the line in these areas.

Areas with a lack of information and high potential would need further investigation before a decision should be made to whether to hold the line or to move it. The large area of this management unit that has a lack of data and low potential is that of Sunk Island. It is presumed that there is little archaeology here, due to the recent date of the area's creation but the possibility exists that earlier landsurfaces may be present but buried. Any works extending to greater depth may encounter archaeology. Any works that require the line to move would need site by site evaluation.

7.10 Detailed list

Archaeology from the Primary survey area

No	Xcoord	Ycoord	Source	Site Type	Date
ARC124	516610	426540	SMR11821	CHAPEL	PM
ARC125	516580	426480	SMR11822	CHAPEL	PM
ARC126	516540	426390	SMR11823	INN	PM
ARC128	516530	426290	SMR11826	INN	PM
ARC129	516570	426480	SMR17262	FIND:POTTERY	PM
ARC134	516490	426310	SMR8575	JETTIES	C18
ARC149	518400	424700	SMR8480	BUILDING:SITE	MED
ARC151	519100	424360	SMR19147	DECOY	C20
ARC152	518610	424100	SMR19148	DECOY	C20
ARC156	518900	424100	SMR18426	DECOY	C20
ARC161	517140	425050	SMR16597	LIGHTHOUSE	C19
ARC166	523510	418850	SMR18822	PILLBOX	C20
ARC167	525120	417700	SMR18823	SIGNAL STATION	C20
ARC168	524830	417540	SMR18824	BLOCK HOUSE	C20
ARC169	523600	418800	SMR10945	HARBOUR	
ARC170	523700	418900	SMR10941	COASTGUARD STATION	C19
ARC171	523810	418790	SMR4528	AA BATTERY	C20
ARC172	524200	418500	SMR7510	WATERCOURSE	
ARC173	524190	418610	SMR17509	BUILDING	PU
ARC174	542450	418000	SMR7511	WATERCOURSE	
ARC175	524300	419400	SMR19501	AP:CROPMARKS	PU
ARC177	524830	417540	SMR18824	BLOCK HOUSE	C20
ARC178	525000	417600	SMR9587	CAMP	C20
ARC179	525370	417770	SMR7502	WATERCOURSE	
ARC180	525000	417500	SMR7503	BUILDING	C19
ARC181	526300	417300	SMR10833	AP:ENCLOSURE	PU
ARC182	527800	417400	SMR10834	AP:CROPMARKS	PU
ARC183	526500	417700	SMR19478	AP	PU
ARC184	527000	417500	SMR19477	AP:ENCLOSURE	PU
ARC185	527400	417000	SMR19476	AP:ENCLOSURE	PU
ARC188	529100	417600	SMR19474	AP:CROPMARKS	PU

ARC189	527750	417500	SMR1779	CHAPEL:SITE	C18
ARC190	527700	417600	SMR1778	MOAT	PM
ARC191	529290	417750	SMR7776	BUILDING	C19:1855
ARC192	529300	417100	SMR8954	DMV	MED
ARC194	521100	422700	SMR18430	DECOY	C20
ARC195	521100	422300	SMR2673	AP:ENCLOSURE	PU
ARC199	522070	421950	SMR11800	BUILDINGS	PM
ARC200	527700	417600	SMR10940	BUILDING:HALL	PM
ARC201	528000	417300	SMR7507	WATERCOURSE	
ARC208	530000	417500	SMR19503	AP:CROP MARK	PU
ARC211	532320	419400	SMR2728	HAVEN	MED
ARC212	532920	419620	SMR10915	JETTY:SLUICE	PM
ARC213	533090	419720	SMR10918	ROAD	PM
ARC214	534040	419410	SMR18778	AA BATTERY	C20
ARC215	533000	420000	SMR2637	DMV	MED
ARC216	535310	419610	SMR11381	BUILDING	PM
ARC217	535470	418600	SMR10917	WATERCOURSE	PM
ARC218	535660	418620	SMR10916	WATERCOURSE	C17
ARC219	535650	418600	SMR10881	BANK	PM
ARC220	536950	418250	SMR10892	WATERCOURSE	
ARC221	536500	418900	SMR19485	AP:CROPMARK	PU
ARC222	537100	418400	SMR19486	AP:ENCLOSURE	PU
ARC223	537600	418370	SMR19487	AP:DITCH	PU
ARC224	539700	417300	SMR19488	AP:ROUND BARROW	PU
ARC225	539770	417560	SMR19498	BURIAL	PU
ARC226	537090	419050	SMR2562	BUILDING:CHURCH	MED
ARC227	537000	419000	SMR2564	CROSS	MED
ARC228	538050	418020	SMR2565	MOAT	MED
ARC229	538150	418320	SMR2566	MOAT	MED
ARC230	537100	419200	SMR2567	MOAT	MED
ARC231	538620	417500	SMR10850	SLUICE	PM
ARC232	539450	417000	SMR10851	SLUICE	PM
ARC233	539680	416830	SMR10852	SLUICE	PM
ARC234	539760	416900	SMR10853	FLOOD BANK	PM:1771?
ARC235	539320	417140	SMR18791	ANTI-TANK BLOCKS	C20
ARC237	539950	417590	SMR3384	AP:ROUND BARROW	PU
ARC239	533000	419000	SMR8791	DMV	MED
ARC267	540900	418600	SMR3370	SETTLEMENT	RO
ARC269	540500	418200	SMR19493	AP:CROPMARK	PU
ARC270	540200	417700	SMR19494	AP:CROPMARK	PU
ARC271	540700	417500	SMR19496	AP:CROPMARK	PU
ARC272	541200	416600	SMR19489	AP:CROPMARKS	PU
ARC273	540400	416300	SMR19491	ROUND BAROW	BA
ARC275	540540	418600	SMR18766	DEFENCES	C20
ARC276	540960	418410	SMR18761	ANTI-TANK BLOCKS	C20
ARC277	541110	418060	SMR18762	PILLBOX	C20
ARC278	540880	418520	SMR18760	PILLBOX	C20
ARC280	541180	417510	SMR18764	PILLBOX	C20
ARC282	540470	416910	SMR18772	ROAD BLOCK	C20
ARC283	540460	416770	SMR18774	PILLBOX	C20
ARC284	541180	417510	SMR18764	PILLBOX	C20
ARC288	540930	415800	SMR18776	ANTI-TANK BLOCKS	C20
ARC291	541680	415340	SMR18794	PILLBOX	C20

ARC293	540800	418700	SMR3373	ROAD	C20
ARC294	540870	418060	SMR3383	ROUND BARROW	BA
ARC295	541070	418000	SMR17257	STAKE ALIGNMENT	PU
ARC296	541200	417580	SMR11454	BEACON	PM
ARC297	541380	417030	SMR11465	BUILDING	PM
ARC298	541640	416900	SMR11473	BEACON:SITE	PM
ARC299	541260	416950	SMR11464	WELL	PM
ARC300	541400	417000	SMR16315	STAKE ALIGNMENT	PU
ARC301	541060	416640	SMR10816	LISTENING POST	C20
ARC302	541700	416600	SMR19596	BOAT	BA
ARC308	540510	416810	SMR19261	ROAD BLOCK	C20
ARC309	540740	416790	SMR3386	ROUND BARROW	BA
ARC310	540770	416530	SMR3385	ROUND BARROW	BA
ARC311	540760	416630	SMR15558	MOUND	PU
ARC312	540690	416620	SMR15559	MOUND	PU
ARC314	541100	415850	SMR3380	CHURCH	PM
ARC316	541900	415000	SMR	DEFENCE	C20
ARC317	541700	415100	SMR15214	FIND:FLINT	PRE
ARC318	541600	415200	SMR8328	FIND:POT	IA
ARC319	517600	424790	UW1A	FIND:SANDSTONE BLOCK	PM
ARC320	517720	424770	UW1B	EXPOSURE	PU
ARC321	518640	424020	UW1C	EXPOSURE	PU
ARC322	517800	424730	UW1D	TIMBER STRUCTURE	PM
ARC323	517880	424680	UW1E	GROYNE	PM
ARC324	518270	424340	UW1F	POSTS	PU
ARC325	518950	423580	UW1G	EXPOSURE	PU
ARC328	517670	424870	UW1K	DEPRESSION	PU
ARC329	517420	424910	UW1L	FLOOD BANK	PM
ARC330	517860	424750	UW1M	BUILDING:SHED	C20
ARC331	517840	424690	UW1N	PIPE	C20
ARC332	518650	424800	UW1O	SHORELINE	
ARC333	518900	424600	UW1P	STRUCTURE	C20
ARC334	533440	419280	UW2A	FIND:POT	MED
ARC335	533580	419200	UW2B	FIND:POTTERY	MED
ARC546	527000	417500	SMR MAP	AP:CROPMARKS	PU
ARC547	529000	417500	SMR MAP	AP:CROPMARKS	PU
ARC548	518700	424800	SMR MAP	SETTLEMENT	MED

Aerial Photographs in the Primary Survey area

No	Xcoord	Ycoord	Source	Site Type	Date
AP34	520100	423400	OBL	STRUCTURES	C20
AP35	523700	418900	OBL	STRUCTURES	C20
AP36	524900	417500	OBL	STRCUTURES	C20
AP37	525000	417400	OBL	STRUCTURES	C20
AP39	537900	417500	OBL	FORESHORE FEATURE	PU
AP40	539400	417000	OBL	EWKS	?MED:PM

HWP survey data in the Primary survey area

Kilnsea-8: Field walking finds. Collection of 95 Roman pottery sherds with associated 6 pieces of Later prehistoric flint found on a small island of till (Head *et al.* 1995: 290).

Kilnsea-18: Field walking finds. Collection of six flint flakes and one core. Probably Bronze Age or later in date found on a small island of till (Head *et al.* 1995:292-293).

HWP survey data in the Secondary survey area

Paull-2: Field walking finds. Collection of 20 pieces of worked flint found on a small island of till. Later prehistoric (Head *et al.* 1995: 241, 244).

Paull-3: Field walking finds. Collection of 13 pieces of flint found on the same island as Paull-2. Later prehistoric (Head *et al.* 1995: 244-245).

Paull-4: Field walking finds. Collection of 12 pieces of worked flint on the same island of till as Paull-2. Later prehistoric (Head *et al.* 1995: 245).

Paull-5: Field walking finds. Collection of 31 pieces of flint from the same island of till as Paull-2. Neolithic/Bronze Age in date (Head *et al.* 1995: 245-246).

Paull-6: Field walking finds. Collection of 15 pieces of flint on the same till island as Paull-2. Later prehistoric (Head *et al.* 1995: 246)

Paull-9: Field walking finds: Two pieces of flint, one a chunk possible used as a scraper (Head *et al.* 1995: 246).

Palaeoenvironmental data in the Primary survey area

NO	XCOORD	YCOORD	SOURCE	FORM	SITE_TYPE	DEPTH
PAL9	539000	417200	PAPER	HMB12	CORE	0.00
PAL13	541000	415000	PAPER		EXPOSURE	0.00
PAL65	538290	417820	BGS	1720	BOREHOLE	30.48
PAL66	538760	417630	BGS	1721	BOREHOLE	30.48
PAL67	539180	417390	BGS	1722	BOREHOLE	18.28
PAL68	539580	417180	BGS	1723	BOREHOLE	18.28
PAL69	540400	416610	BGS		BOREHOLE	30.50
PAL74	541080	416970	BGS		BOREHOLE	30.50
PAL75	540920	417430	BGS		BOREHOLE	30.50
PAL76	540820	417920	BGS		BOREHOLE	30.50
PAL77	540720	418360	BGS		BOREHOLE	30.50
PAL78	540580	416830	BGS		BOREHOLE	30.50
PAL81	539310	417190	BGS		BOREHOLE	56.00
PAL82	535080	419050	BGS	1713	BOREHOLE	18.30
PAL83	535570	418890	BGS	1714	BOREHOLE	18.30
PAL84	536030	418740	BGS		BOREHOLE	18.30
PAL85	536480	418590	BGS	1716	BOREHOLE	30.50
PAL86	538290	417820	BGS	1720	BOREHOLE	30.50
PAL87	538760	417630	BGS	1721	BOREHOLE	30.50
PAL88	539180	417390	BGS	1722	BOREHOLE	18.30
PAL89	539580	417810	BGS	1723	BOREHOLE	18.30
PAL90	539990	416890	BGS		BOREHOLE	30.50
PAL91	540400	416610	BGS		BOREHOLE	30.50
PAL96	541080	416970	BGS		BOREHOLE	30.50
PAL97	540920	417430	BGS		BOREHOLE	30.50
PAL98	540820	417920	BGS		BOREHOLE	30.50

PAL99	540720	418360	BGS		BOREHOLE	30.50
PAL100	527560	416770	BGS	HMB3	BOREHOLE	169.00
PAL101	526830	416770	BGS	1634	BOREHOLE	18.30
PAL102	527290	416710	BGS	1635	BOREHOLE	18.30
PAL103	527780	416620	BGS	1636	BOREHOLE	18.30
PAL104	528270	416570	BGS	1637	BOREHOLE	18.30
PAL105	528730	416710	BGS	1638	BOREHOLE	18.30
PAL106	529180	416860	BGS	1639	BOREHOLE	18.30
PAL107	529620	417020	BGS	1639	BOREHOLE	18.30
PAL108	528970	417430	BGS	1640	BOREHOLE	18.30
PAL109	529480	417440	BGS		BOREHOLE	18.30
PAL110	529930	417380	BGS		BOREHOLE	18.30
PAL111	528670	417050	BGS		BOREHOLE	18.30
PAL112	528980	417410	BGS		BOREHOLE	18.30
PAL113	530100	417190	BGS		BOREHOLE	18.30
PAL114	530560	417370	BGS		BOREHOLE	18.30
PAL115	530970	417570	BGS		BOREHOLE	18.30
PAL116	531410	417780	BGS		BOREHOLE	18.30
PAL117	531870	418020	BGS		BOREHOLE	18.30
PAL118	532310	418230	BGS		BOREHOLE	18.30
PAL119	532710	418450	BGS		BOREHOLE	18.30
PAL120	533190	418660	BGS		BOREHOLE	18.30
PAL122	534010	419180	BGS		BOREHOLE	18.30
PAL123	534410	419470	BGS		BOREHOLE	18.30
PAL124	534200	419470	BGS		BOREHOLE	18.30
PAL126	525870	417040	BGS		BOREHOLE	17.00
PAL127	523100	419690	BGS		BOREHOLE	18.30
PAL128	523320	419240	BGS		BOREHOLE	18.30
PAL129	523690	418910	BGS		BOREHOLE	18.30
PAL130	524040	418570	BGS		BOREHOLE	18.30
PAL131	524410	418240	BGS		BOREHOLE	18.30
PAL132	524760	417810	BGS		BOREHOLE	18.30
PAL133	524510	418190	BGS		BOREHOLE	18.30
PAL134	524760	418420	BGS		BOREHOLE	18.30
PAL135	522217	420207	BGS		BOREHOLE	18.30
PAL136	522869	420092	BGS		BOREHOLE	18.30
PAL137	525100	417580	BGS		BOREHOLE	18.30
PAL138	525440	417240	BGS		BOREHOLE	18.30
PAL139	525890	417080	BGS		BOREHOLE	18.30
PAL140	523480	418990	BGS	HMB1	BOREHOLE	64.00
PAL141	520388	423016	BGS		BOREHOLE	0.00
PAL142	520774	422757	BGS		BOREHOLE	0.00
PAL143	521167	422492	BGS		BOREHOLE	0.00
PAL144	521547	422114	BGS		BOREHOLE	0.00
PAL145	521881	421740	BGS		BOREHOLE	0.00
PAL146	522424	421005	BGS		BOREHOLE	0.00
PAL147	522609	420595	BGS		BOREHOLE	0.00
PAL148	522217	420207	BGS		BOREHOLE	0.00
PAL149	522527	420519	BGS		BOREHOLE	0.00
PAL150	522412	420995	BGS		BOREHOLE	0.00
PAL151	520000	423260	BGS		BOREHOLE	0.00
PAL154	518100	425180	BGS	BH18	BOREHOLE	8.00
PAL170	540580	416830	BGS		BOREHOLE	30.50

KEY TO MAPS

KNOWN ARCHAEOLOGY

The known archaeology is displayed with shading showing the Primary and Secondary areas at a scale of 1:50,000. The records for all the points can be found in the Appendices (Volume 2). The data shown include the location of archaeology, palaeoenvironmental sampling sites, wreck sites and aerial photographs. Where there is a large cluster of points these areas are shown in separate boxes at a scale of 1:20,000.

HUMBER WETLANDS PROJECT DATA

The management unit is shown at a scale of 1:50,000 with shading showing the Primary and Secondary areas. Overlaying this, further shading shows the fields that were studied by the HWP. These are subdivided into 5 classes depending on the type of survey which was carried out. Only classes 1 to 3 are shown on the maps. Classes 4 and 5 are areas that were visited but couldn't be surveyed due to either the presence of pasture or industrial development.

Classes 1 and 3 are fields that were field walked. Class 2 reflects fields that were visited or were excavations were carried out but the field was not walked. On the 1:50,000 map are shown find spots of flint and pottery and the location of boreholes. In the boxes maps are shown giving the locations of the published sites within the Humber Wetlands Project volumes with their site names. These maps are at a scale of 1:25,000. The maps at 1:50,000 give an impression at the density and location of finds whereas the separate boxes link this data to the published examples.

POTENTIAL

The management unit is shown at a scale of 1:50,000 with areas highlighted as Important, Lack of study with high potential and Lack of study with low potential. These maps must be used in conjunction with the recommendations sections from each management unit.

Wrecks.dbf
Archaeol.dbf
HAP
LAS
LINCS
NELINCS
NLINCS
Palaeo.dbf
Airphoto.shp
Primary_region.shp
Secondary_region.shp

Scale 1:20,000

Scale 1:20,000

Map 1a
Management Unit 1
Spurn Head to Paull
Known archaeology

Scale 1:50,000

Map 1b
Management Unit 1 Spurn Head to Paull
Known Archaeology

Scale 1:50,000

Map 2a

Management Unit 1
Spurn Head to Paull
Humber Wetlands Project data

Scale 1:25,000

- Sediment2.dbf
- Pottery.shp
- Flint.shp

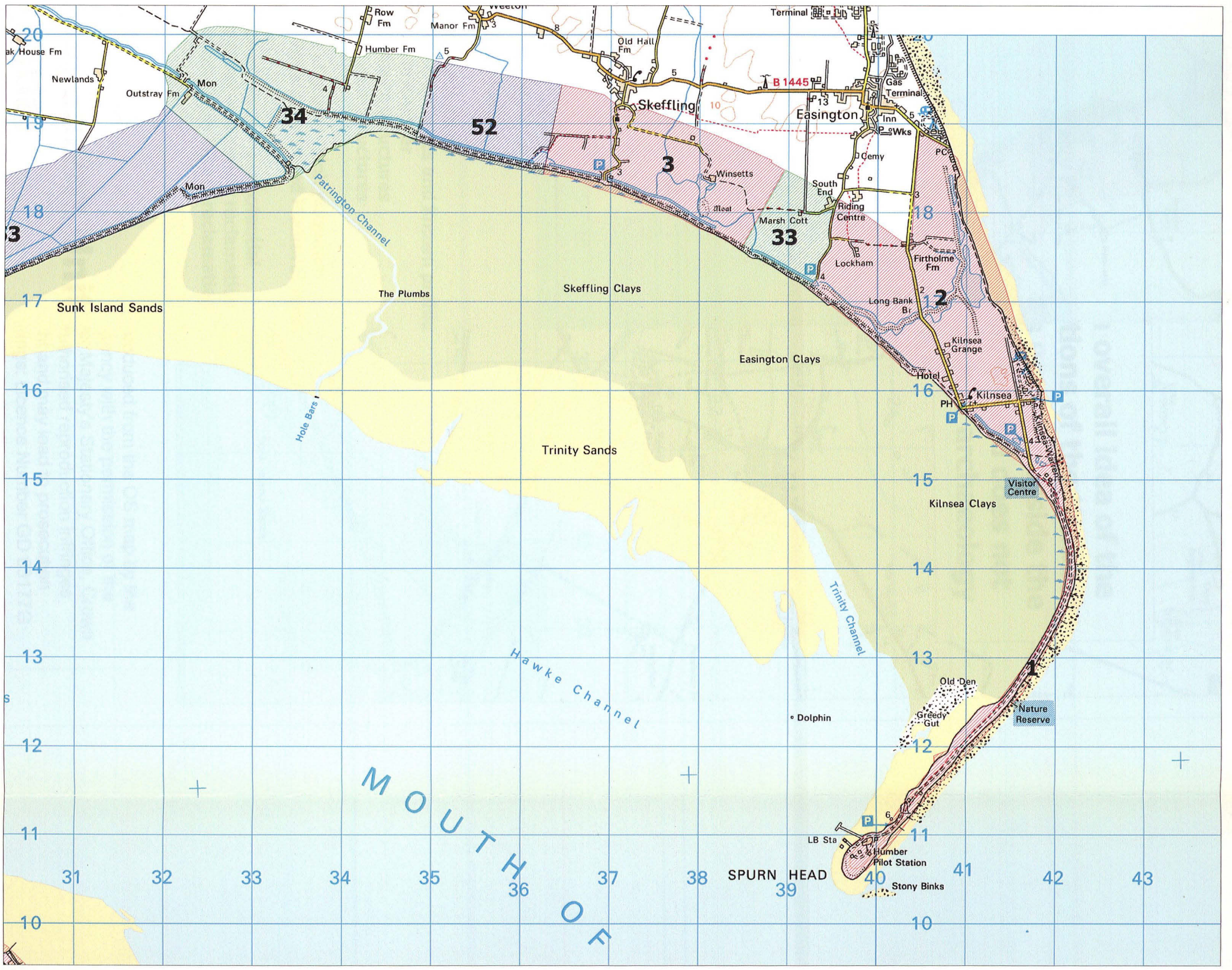
Fields.shp

- 1
- 2
- 3
- 4
- 5

- Primary_region.shp
- Secondary_region.shp

Map 2b
Management Unit 1 Spurn Head to Paull Humber Wetlands Project data

Scale 1:50,000



This map is provided to give an overall idea of the archaeological potential of sections of the Humber estuary. It is essential that it is used alongside the recommendations within the report and does not represent the presence or absence of archaeology

Key to areas

Important areas
1: Spurn defences
2: Defences and Bronze age landscape
3: Defences and Medieval settlement

Lack of study - high potential
33: Close to Medieval settlement and Roman pottery
34: Recorded Medieval settlement

Lack of study - low potential
52: Little known archaeology

Importance.shp
High.shp
Low.shp

Map 3a

Management Unit 1
Spurn Head to Paull
Potential

Scale 1:50,000

This map is provided to give an overall idea of the archaeological potential of sections of the Humber estuary. It is essential that it is used alongside the recommendations within the report and does not represent the presence or absence of archaeology

Importance.shp
High.shp
Low.shp

Key to areas

Important areas
7: Paull defences and known prehistoric finds
6: Little Humber
5: Defence structures
4: Defence structures

Lack of study - high potential
34: Area of recorded Medieval settlement

Lack of study - low potential
54: Relatively recent reclamation
53: Relatively recent reclamation

Map 3b
Management Unit 1 Spurn Head to Paull Potential

Scale 1:50,000

8. Management Unit 2: Paull to North Ferriby

8.1 Background

MU2 consists mostly of Secondary study areas, with just a small Primary area on the foreshore south of North Ferriby, and an area to the east near Paull. Within this survey region are the developed areas of Kingston upon Hull, Hessle and North Ferriby, plus the docklands and Salt End, which lie outside of the impact areas. Antiquarian reports during the construction works at Alexander Dock in 1884 recorded traces of a submerged forest (Reid 1885), and occasional Iron Age and Roman finds have been recovered from Hull (Evans 2000). These finds indicate the potential for the recovery of archaeological remains from the urban areas.

Within the area to the east of Kingston upon Hull, the earliest remains in the Primary study area date to the Post-Medieval period. The site of a brickyard represents Post-Medieval brick manufacture, and a broad range of drainage activities, are recorded from this time. The site of a barrage balloon represents Second World War defences.

To the west of Kingston upon Hull the distribution of archaeological sites is more varied. A possible Neolithic mound is recorded in the North Ferriby area, thus representing the earliest evidence for human activity in this area. The Bronze Age is extremely well attested through occasional finds; including a spearhead, and auroch skeleton and also by the Ferriby boats, which were discovered on the foreshore (Figure 26). Iron Age and Roman period pottery and metal work have both been found from the region. The find of a buckle and the remains of ponds represent Medieval activity, and brickworks, lime kilns, chalk quarry, shipyard and a steam mill all reflect activity during the Post-Medieval period.

8.2 Identified archaeology (MAP 4)

Within the Primary area of MU2 finds represent activity extending from the Neolithic period through to Second World War. To the east of Kingston upon Hull the study area is limited to the remains west of MU1. In this area Post-Medieval activity has been identified with the site of a brickyard (ARC122) and drains (ARC140). The site of a Second World War barrage balloon has also been identified from this area (ARC123).

To the west of Kingston upon Hull the earliest archaeological remains date to the Neolithic period, with the remains of a mound (ARC89). MU2 also contains the site of some of the most important archaeological discoveries in the region - the Ferriby boats (ARC94). In 1937 the first of the Ferriby boats, Ferriby-1, was discovered, being eventually recovered in 1946. The remains of a second boat, Ferriby-2, were identified in 1940 and recovered at the same time as Ferriby-1. The third boat, Ferriby-3, was discovered and excavated in 1963. Ferriby-4 was represented by a single plank which was found and retrieved in 1984 (Wright 1990, 1997, Fletcher *et al.* 1999). In 1989 a single fragment of a cleat, Ferriby-5, was identified by Valerie Fenwick (Fletcher *et*

Figure 26: Location on North Ferriby foreshore of the excavation of the Bronze Age boats.
© Humber Wetlands Project.

al. 1999). More recently a paddle of Bronze Age date has been found on the foreshore at North Ferriby by Peter Greenfield (Head *et al.* 1999). Also recovered from the area of the Ferriby boats has been the skeleton of an auroch which has been dated to 3575±40 BP (OxA-9864).

Ferriby-1 was constructed of oak and was of sewn construction using yew withies (Wright 1990, 1997). Radiocarbon dating produced a date of 1390-1130 cal BC (Switsur and Wright 1989). Ferriby-2 was also of oak and was constructed in a similar way to Ferriby-1 (Wright 1990, 1997). The dating of Ferriby-2 provided a range of 1440-1310 cal BC (Switsur and Wright 1989). Ferriby-3 was morphologically different to the previous discoveries, but displayed similar construction details indicating the same type of boat-building traditions. Ferriby-3 also displayed some evidence of boat repair (Wright 1990, 1997). A date of 1310-1060 cal BC was obtained from this third boat from North Ferriby (Switsur and Wright 1989). Ferriby-4 comprised only an alder plank of a sewn boat displaying evidence of similar sewn construction to the other boats (Wright 1990, 1997). This plank was dated to 775-700 cal BC or 530-375 cal BC (Switsur and Wright 1989) proving it to be the most recent of the Ferriby boats. Ferriby-5 consisted of a single cleat, detached from an oak plank, and was larger than those on the other Ferriby boats (Fletcher *et al.* 1999).

Other prehistoric finds from the foreshore at North Ferriby have included the remains of two paddles, the first constructed of ash, and a fragment of a possible capstan and other wooden items interpreted as relating to boat construction and repair. A bronze knife blade, late Neolithic and Bronze Age pottery, part of a baked clay sinker and flint have also been found from the North Ferriby foreshore (Fletcher *et al.* 1999).

Other Bronze Age material from the area of North Ferriby, in the Primary area of MU2, includes a spearhead (ARC93). Iron Age pottery (ARC96 and ARC99) and Roman pottery (ARC97 and ARC98) attest activity in the North Ferriby region during these periods. Medieval activity around North Ferriby has been identified from small finds including a buckle (ARC91) and from landscape features including ponds (ARC88). More recently, the North Ferriby area has contained the site of a brickworks (ARC92).

8.3 Humber Wetlands Project data (MAP 5)

During the survey of Holderness (1994-95) a single mapview was placed over the area of Paull, which partly falls within this management unit and partly in MU1. During the survey of the Vale of York (1997-98) a mapview was placed over the area of Melton and North Ferriby. This mapview falls partly within this management unit and partly within MU3. Also during the survey, the intertidal area was studied (see section 8.9)

8.4 Palaeoenvironmental data

Buckland *et al.* (1990) took samples for palaeoenvironmental study in association with the location of the Ferriby Boats. The sediments were

analysed for macrofossil, coleopteran and pollen content. No radiocarbon dates are available from the sequence, but it is suggested that the sediments span the greater part of the Bronze Age. The macofossil and coleopteran assemblages were a little thin, but they contained components strongly suggestive of estuarine conditions prevailing at the time of sediment deposition. For example, the seashore species of ground beetle *Bembidion normannum* is found in three of the four samples examined. Few seeds were recovered from the macrofossil samples although *Ranunculus scleranthus* (celery-leaved buttercup) and *Juncus* (rush) were represented. The pollen evidence shows that the inter-tidal mudflats were backed by estaurine vegetation including *Plantago maritima/coronopus* and reedswamp, with oak-alder carr fringing the dryland edges. The vegetation of the wider landscape included woodland in which *Tilia* (lime) was apparently a major component, with elm and perhaps pine forming part of the canopy. Slight reductions in tree and shrub pollen toward the top of the sequence along with increases in *Plantago lanceolata* and cereal-type may reflect anthropogenic impacts.

8.5 Potential

The potential of the archaeology and palaeoenvironmental deposits of MU2 lies mostly with the wet sediments. The evidence from the foreshore particularly has highlighted the potential for discovering features and finds of international archaeological importance, with the potential to investigate their environmental context, over successive years. It seems likely therefore that the biogenic and minerogenic deposits will reveal further archaeological finds, especially with the ongoing erosion of this resource.

The eastern area of MU2 has little proven archaeology, with the majority of the area now occupied by industry.

The area of the built-up zone in front of the city of Hull represents an area of unknown potential. The development of this area was started in an era when little attention was paid to the archaeology and hence little recorded information exists. There is a possibility that archaeology will be present in those areas that have escaped previous development so care should be taken in them.

8.6 Vulnerability

The foreshore deposits at North Ferriby have been demonstrated to be continually eroding, which has facilitated the discovery of archaeological remains. In this respect this environment is already vulnerable to the processes of the Humber, and it has been recommended that, other than complete excavation, either a systematic, or regular programme of monitoring be undertaken in this area. Any works that take place in this zone will no doubt reveal archaeology and as such this zone is of the highest level of vulnerability.

8.7 Importance (MAP 6)

Two areas of importance have been highlighted in this management unit – the area in front of Hull and the North Ferriby foreshore. The former is important due to the presence of Hull and the associated waterfronts. North Ferriby has an internationally important Bronze Age landscape. Areas of a lack of study and high potential are at Salt-End and the Humber Bridge. They have some reported finds but due to the lack of study it is not known the full potential of these areas. The industrial areas on wither side of Hull have been heavily developed with little archaeology found but there is still potential for finds from the areas.

8.8 Recommendations

These recommendations are based on the existing, available knowledge of archaeology for the region. Areas of high potential are those that already have a large collection of archaeological materials, where such remains are either still present *in situ* or where additional discoveries should be anticipated. Areas described as having a lack of knowledge and a low potential are those where little work has been carried-out, and where work has been undertaken has revealed few archaeological remains. The potential exists in these areas for significant discoveries of previously unknown sites. Areas described as having a lack of investigation but high potential are those where little work has been carried-out but the work which has been undertaken has indicated a high probability for the recovery of archaeological remains in the area. These recommendations are preliminary and further analysis should be undertaken on each area when management plans are produced.

The SMP selected strategy for this unit is to the hold the line, in particular in the area of the urban section of Hull. Any movement from this line may reveal archaeology, especially in the core centre of Hull. The main archaeology identified from this unit is in the area of North Ferriby. Any work undertaken in the area of North Ferriby should avoid the foreshore area, as this would entail detailed survey and excavation ahead of development. There is also a high potential that the dryland edge next to the foreshore could contain valuable settlement evidence associated with the activity on the foreshore.

8.9 Detailed list

Archaeology from the Primary survey area

No	Xcoord	Ycoord	Source	Site Type	Date
ARC88	498800	425300	SMR10218	PONDS	MED
ARC89	498680	425140	SMR10219	MOUND	NEO?
ARC91	498900	425200	SMR6606	FIND:BUCKLES	MED
ARC92	499000	425260	SMR11898	BRICKWORKS	PM
ARC93	499000	425300	SMR3673	FIND:SPEAR	BA
ARC94	499130	425240	SMR3674	BOATS	BA
ARC95	499200	425200	SMR16386	FIND:AUROCH	BA
ARC96	499360	425300	SMR3675	FIND:POT	IA

ARC97	499500	425400	SMR10230	FIND:POT	RO
ARC98	499800	425300	SMR19228	FIND:POT	RO
ARC99	499700	425400	SMR6604	FIND:POT	IA
ARC122	516600	426740	SMR11820	BRICKYARD	C18:C19
ARC123	516800	426760	SMR19129	BARRAGE BALLON SITE	C20
ARC140	516800	427600	SMR18467	DRAINS	PM

Aerial Photographs in the Primary Survey area

No additional sites were identified from the data sources studied (see section 3.1.5).

HWP survey data in the Primary and Secondary survey areas

No sites were located in the area studied by HWP in this management unit (see section 8.3).

Palaeoenvironmental data in the Primary survey area

No palaeoenvironmental data was located within the sources studied (see section 3.1.6).

KEY TO MAPS

KNOWN ARCHAEOLOGY

The known archaeology is displayed with shading showing the Primary and Secondary areas at a scale of 1:50,000. The records for all the points can be found in the Appendices (Volume 2). The data shown include the location of archaeology, palaeoenvironmental sampling sites, wreck sites and aerial photographs. Where there is a large cluster of points these areas are shown in separate boxes at a scale of 1:20,000.

HUMBER WETLANDS PROJECT DATA

The management unit is shown at a scale of 1:50,000 with shading showing the Primary and Secondary areas. Overlaying this, further shading shows the fields that were studied by the HWP. These are subdivided into 5 classes depending on the type of survey which was carried out. Only classes 1 to 3 are shown on the maps. Classes 4 and 5 are areas that were visited but couldn't be surveyed due to either the presence of pasture or industrial development.

Classes 1 and 3 are fields that were field walked. Class 2 reflects fields that were visited or were excavations were carried out but the field was not walked. On the 1:50,000 map are shown find spots of flint and pottery and the location of boreholes. In the boxes maps are shown giving the locations of the published sites within the Humber Wetlands Project volumes with their site names. These maps are at a scale of 1:25,000. The maps at 1:50,000 give an impression at the density and location of finds whereas the separate boxes link this data to the published examples.

POTENTIAL

The management unit is shown at a scale of 1:50,000 with areas highlighted as Important, Lack of study with high potential and Lack of study with low potential. These maps must be used in conjunction with the recommendations sections from each management unit.

- Wrecks.dbf

Archaeol.dbf

- HAP
- LAS
- LINCS
- NELINCS
- NLINCS
- Palaeo.dbf

Airphoto.shp

Secondary_region.shp

Primary_region.shp

KINGSTON UPON HULL

VEHICLE FERRY FROM KINGSTON UPON HULL TO
Rotterdam (Europoort) 14 hrs
Zeebrugge 14 hrs

Scale 1:20,000

Scale 1:20,000

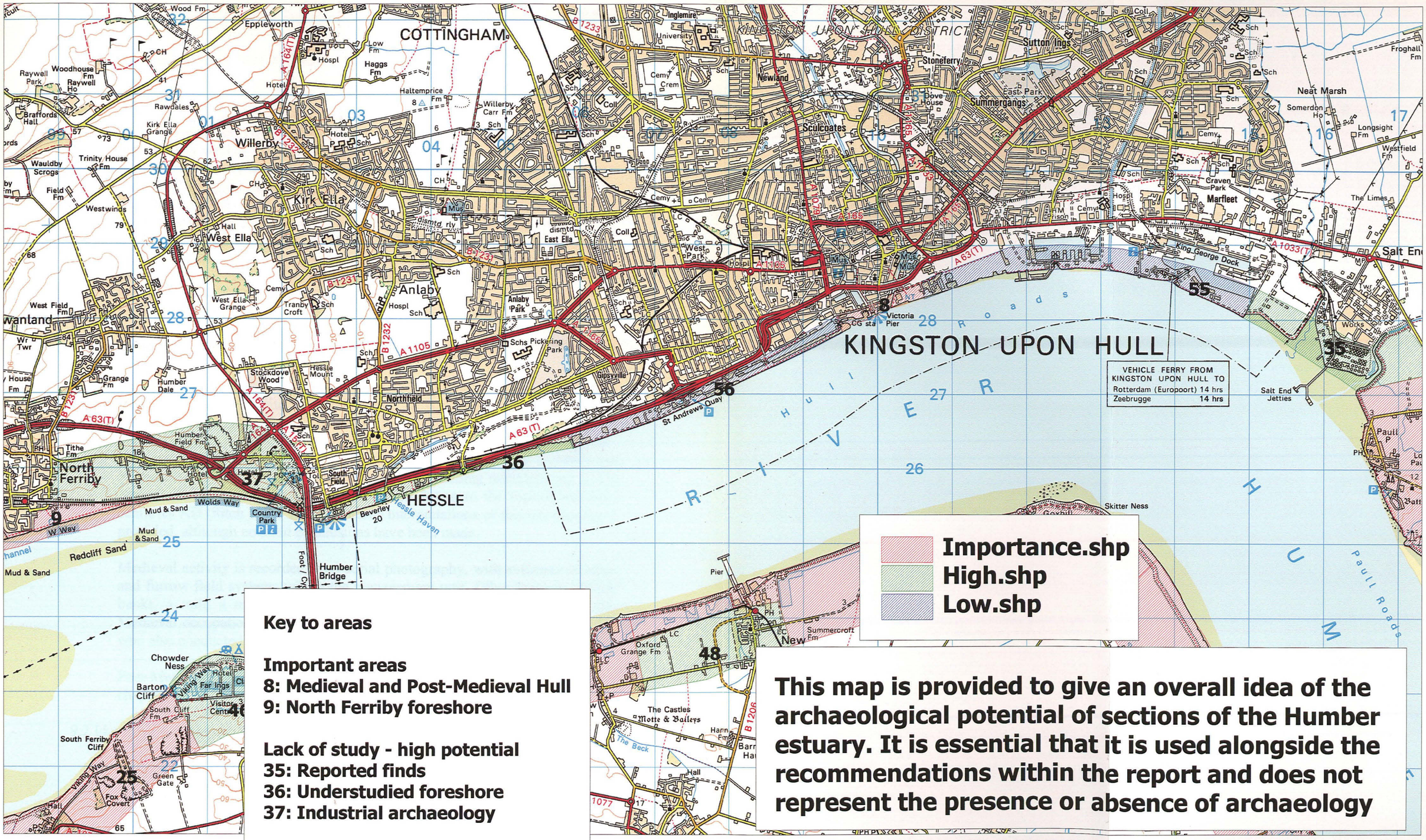
Scale 1:20,000

Map 4
Management Unit 2 Paull to North Ferriby
Known Archaeology

Scale 1:50,000

Map 5
Management Unit 2 Paull to North Ferriby
Humber Wetlands Project data

Scale 1:50,000



VEHICLE FERRY FROM KINGSTON UPON HULL TO

Rotterdam (Europoort)	14 hrs
Zeebrugge	14 hrs

Importance.shp
High.shp
Low.shp

Key to areas

Important areas
8: Medieval and Post-Medieval Hull
9: North Ferriby foreshore

Lack of study - high potential
35: Reported finds
36: Understudied foreshore
37: Industrial archaeology

Lack of study - low potential
55: Hull industrial zone
56: Hull industrial zone

This map is provided to give an overall idea of the archaeological potential of sections of the Humber estuary. It is essential that it is used alongside the recommendations within the report and does not represent the presence or absence of archaeology

Map 6
Management Unit 2 Paull to North Ferriby
Potential

Scale 1:50,000

9. Management Unit 3: North Ferriby to Trent Falls

9.1 Background

MU3 consists of two distinct Primary study areas. The first is located immediately west of North Ferriby, and the second is located between Crabley Farm (Broomfleet) and Trent Falls (Faxfleet). Prehistoric activity has been identified along this stretch of the Humber, with foreshore finds dating from the Bronze Age (and perhaps earlier) including stakes, fish traps and trackways (Figure 27 and 28). An undated ring ditch recorded by the SMR might also reflect activity during this period. The Iron Age is represented by a range of coin discoveries, and associated activity during this period is indicated by the earlier phases of the Romano-British site of Redcliff, which is located on the till cliff overlooking the foreshore, to the west of North Ferriby (Crowther *et al.* 1990). In addition, flint artefacts recovered from the area of Redcliff have been dated to the Late Mesolithic period onwards (Fletcher *et al.* 1999).

Roman activity in MU3 is attested by two Roman sites that have been identified at Faxfleet (Sitch 1990). Faxfleet 'A' is situated on the foreshore, to the south of Weighton Lock, and amongst the finds recovered at this site are pottery, wooden objects and brooches. To the north of the lock is Faxfleet 'B'. This site was discovered during the excavation of a borrow pit in 1967, and excavations revealed large quantities of pottery, building materials and a lead ingot, with the principal phase of occupation dating to the second and third centuries AD (Sitch 1989, 1990). Various interpretations of this site have been provided, although no solid conclusions have been made.

Medieval activity is recorded from aerial photography, with evidence of ridge and furrow field systems within the management unit. Other features include banks, a mill, a moated site and a Medieval settlement at Faxfleet. This Medieval occupation is associated with a preceptory of the Knights Templar, who also conducted drainage activities in the area.

Post-Medieval activity is also identified from a series of buildings, including a chapel, a bridge and through burial evidence.

9.2 Identified archaeology (MAP 7)

Within the Primary areas of MU3 the known archaeological remains are dated from between the Neolithic period and the Post-Medieval period, with all intermediary periods represented. The western section, from Faxfleet to Crabley Farm, has produced evidence that focuses on the Iron Age and Roman periods and later, although the evidence of a ring ditch from near Faxfleet Grange (ARC56) might indicate earlier, Bronze Age activity. Settlements within this western section of MU3 have been identified as dating to the Roman period, with occasional evidence of earlier, Iron Age activity (ARC58, ARC59, ARC64 and ARC14). This evidence demonstrates the high potential for finds of Roman date from this region. The work of the *Humber Wetlands Project* has further reflected this with the site of Faxfleet-3. Medieval activity

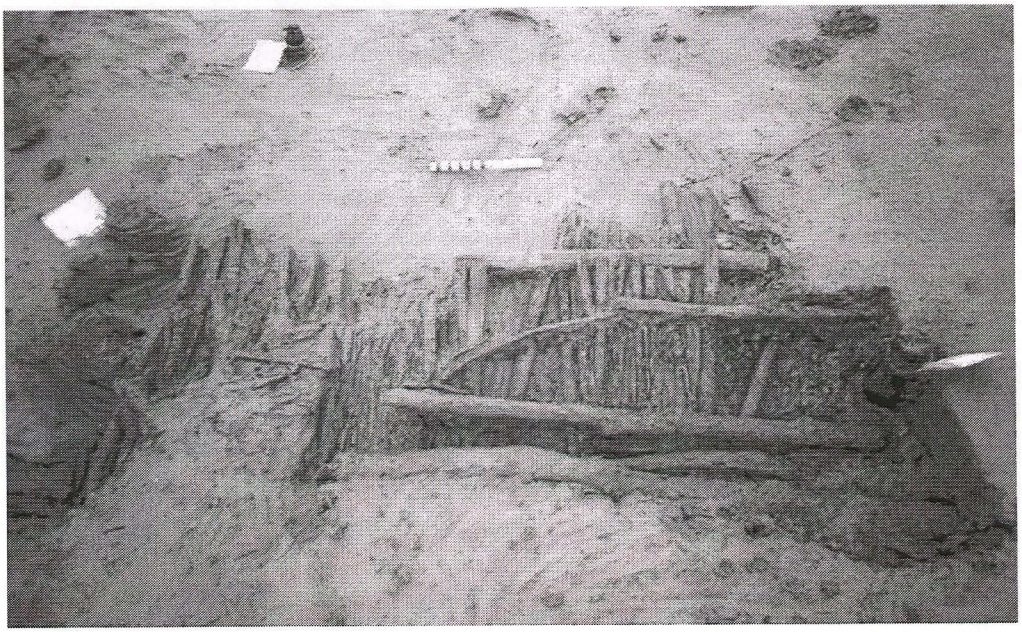


Figure 27: Partially excavated section of one of the Bronze Age trackways at Melton. © Humber Wetlands Project.

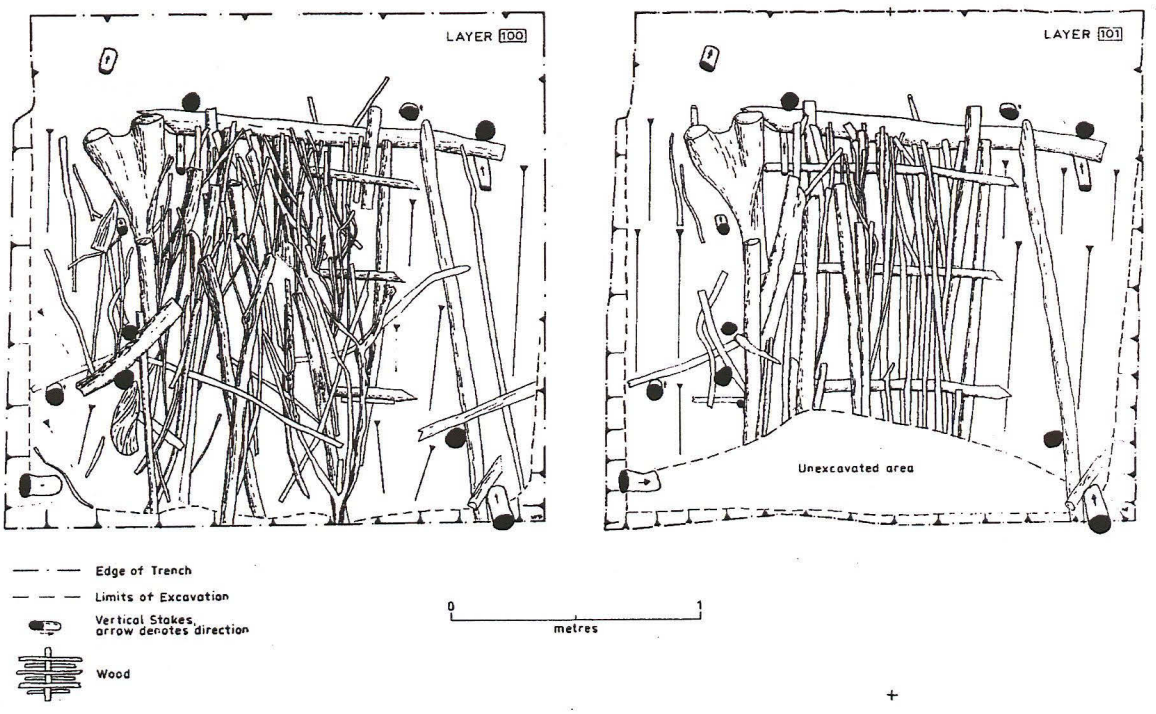


Figure 28: Excavation plans on one of the Bronze Age trackways from Melton. The pictures show the uppermost layer to the left and the trackway after the removal of this first layer of wood to the right. © Humber Wetlands Project.

has also been identified from this area with the discoveries of two moated sites, at various levels of preservation (ARC47, AP8 and AP44) and by the remains of ridge and furrow agriculture (AP12 and AP22). Other Medieval finds include the settlement at Faxfleet (ARC40), dams (ARC45 and ARC51), banks (ARC65, ARC67, ARC70 and ARC71), a mill (ARC46), a fishery (ARC63) and pottery finds (Faxfleet-1). Post-Medieval activity is also represented within the western part of the Primary area of MU3 with various buildings (ARC42, ARC43, ARC60 and ARC545), a chapel (ARC41), a school (ARC544), a hall (ARC57), a lock (ARC62), a bridge (ARC66) and a bank (ARC65), the latter perhaps being constructed at an earlier date.

The Primary area to the east of MU3 has previously revealed evidence relating to activity beginning in possibly the Neolithic and Bronze Age periods (see the foreshore section below). One of the more significant prehistoric finds from the eastern part of MU3 is the pair of trackways located on the foreshore south of Melton (ARC102, Melton-25 and Melton-26), with a possible extension of one of them at Melton-27. The Iron Age is represented by finds of coins (ARC81, ARC82, ARC83 and ARC101) and a brooch (ARC87). Other prehistoric finds include a worked piece of flint of uncertain date (ARC86). Pottery dating to the later Iron Age or Roman period has also been found from the region (ARC84). In addition to this pottery find, the Roman period is represented by another brooch (ARC85). Activity during the Medieval and Post-Medieval periods in the eastern section of MU3 has also been identified from pottery finds (ARC90). Finds on the foreshore may also date to these later periods, with some exceptional remains including the large, Post-Medieval V-shaped fish weir from the Melton region (Melton-2).

9.3 Humber Wetlands Project data (MAP 8)

During the survey of the Vale of York (1997-98) three mapviews were placed within this management unit, Melton, Brough and Faxfleet. The Melton mapview is partly in this management unit and partly within MU2. The Faxfleet mapview is partially within this unit and partly in MU4a (see section 9.9).

9.4 Palaeoenvironmental data

General

Coring transects have been carried out at several locations within this management unit. They include Brough, East Clough and Faxfleet. The coring at Brough revealed up to 7.15 m of river deposits with little potential for information regarding the environment. The other coring locations all provided information that can be used to reconstruction the vegetation and environment in the past, and the work at Faxfleet also contained information relative to sea-level changes in the past.

Brough (Ellerker Sands)

Lillie (1999) excavated a transect of 10 boreholes for 1.57 km across the area known as Ellerker and Brantingham Sands, between SE917273 and SE923284. The depositional sequences consisted of clay-silt alluvium, with

finely laminated sands and clay-silts and sands occurring towards the base of the boreholes. Compact clays, and in places thixotropic sands, form the lowermost deposits excavated at a maximum depth of 7.15 m. No organic remains suitable for pollen analysis were encountered and as such no relative chronology could be established.

Melton

Samples for pollen analysis were taken from the intertidal peat exposure on the foreshore at Melton (Lillie 1999). The base of the sequence suggested patchy oak-alder-hazel woodland with areas of open water with aquatics including pondweed present on the sampling site. The sample from the middle of the sequence suggested closed oak-alder woodland in which lime was dominant, whilst the sample from the top of the deposit suggested a reduced extent of tree cover with some limited open grassland, with possible evidence for anthropogenic disturbance in the form of *Plantago lanceolata*. It is suggested that this deposit was forming sometime in PZVIIb (4000-2000 cal BC) or later.

East Clough (SE97402475)

Long *et al.* (1998) studied this intertidal peat exposure as part of an assessment of Holocene sea-level changes. The stratigraphy consists of peat 0.32 m thick, above basal sands and clays capped by blue-grey silt clay. Pollen from the base of the sequence suggests the presence of saltmarsh communities near to the site with the development of the peat at this site being attributed to waterlogging prior to a rise in relative sea-level. An increase in the representation of tree and shrub pollen midway through the sequence is followed by evidence for encroachment of saltmarsh with diatoms from the clay overlying the peat including species confirming local saltmarsh conditions. The base of the peat is dated to 3770±45 BP (SRR-4748) and the top to 3640±45 BP (SRR-4749).

Faxfleet (SE875257)

Hulme and Beckett (1973) investigated a borehole sequence from Faxfleet, which consisted of two *Phragmites* peat horizons intercalated with blue-grey clay alluvium. Pollen analysis of the lowermost 0.7 m thick peat (5.7 m depth) indicated the presence of fen carr environments with hazel, pine and some open areas with grass. The pollen spectra from the uppermost 0.5 m thick peat (3.8 m depth) portray a shift towards more open grassland communities with the occurrence of *Artemisia*-type interpreted as evidence for local agricultural activity. It is suggested that the peats were forming in PZVIIb.

Lillie (1999) excavated eight boreholes for a distance of 1.7 km from Faxfleet at SE864242 to SE861256. The southernmost borehole in this transect is *c.* 1.8 km southwest of Hulme and Beckett's (1973) study. The boreholes consist of clay-silt alluvial deposits with lenses of sand. A moderately humified *Phragmites* peat is evident at around 4.5-4.8 m depth, beneath which is a layer of clay-silt alluvium over another *Phragmites* peat between 5.7-6 m depth. A basal alluvium overlies fluvially re-worked lacustrine sands at a maximum depth of 9.0 m. The macrofossil content of the peat deposits show a

progression northwards from reedswamp through to alder dominated fen carr and some localised evidence for acid *Sphagnum* rich communities.

Pollen samples from the peat horizons indicate local alder and open grassland/reedswamp with oak-hazel woodland probably established in the wider landscape. Samples from the upper peat horizons indicate a decline in tree cover with heather communities growing on the mire surface. The pollen spectra suggest the peats were forming sometime in PZVIIb and later.

The evidence from Lillie (1999) and Hulme and Beckett (1973) establishes two periods of peat growth occurring during periods of regressive sea-level tendency, intercalated with alluvuial sediments representing transgressive sea-level episodes. One of the two peat horizons is equivalent to that at East Clough studied by Long *et al.* (1998) the formation of which between 2320-2030 cal BC and 2100-1880 cal BC.

9.5 Potential

The high quality and number of finds from the area of MU3 have demonstrated exceptional value, particularly for Roman period archaeology in the western part of the region, and for prehistoric archaeology in the eastern part. Evidence of extensive Roman activity in this region suggests that more sites are yet to be discovered along this foreshore reach in this part of the region.

The survey undertaken by the *Humber Wetlands Project* revealed over 30 new sites on the foreshore at Melton. This survey was dependent on weather and tidal conditions and the potential remains for yet more sites to be discovered.

9.6 Vulnerability

The area of the foreshore at East Clough is currently being eroded at an alarming rate. This area is one of the most vulnerable in the region. The area in front of the defences has extensive archaeology, and that to the rear of the defences has the potential to hold information pertaining to this. The area on either side of Weighton Lock has produced archaeology from both sides of the current sea defences. Any works close to the defences in this zone will have a direct impact on the archaeological resource.

9.7 Importance (MAP 9)

Three areas of importance have been recorded within this zone. They are the continuation of the foreshore zone from North Ferriby, the area around Brough and the area around Weighton Lock. The importance of the foreshore zone has been highlighted above from its nationally important finds. The area around Brough includes the possible naval port for the Roman town. At Weighton Lock extensive Roman settlement evidence has already been located, and it also includes an important Medieval landscape of the Templar Preceptory. These two areas have regionally importance.

The areas between these zones have a lack of work but have high potential to reveal archaeology in relation to the areas of importance. The area of Broomfleet is also the area Walling Fen and where the River Foulness enters the Humber, and the high concentration of finds further inland show the potential of this area to be high.

9.8 Recommendations

These recommendations are based on the existing, available knowledge of archaeology for the region. Areas of high potential are those that already have a large collection of archaeological materials, where such remains are either still present *in situ* or where additional discoveries should be anticipated. Areas described as having a lack of knowledge and a low potential are those where little work has been carried-out, and where work has been undertaken has revealed few archaeological remains. The potential exists in these areas for significant discoveries of previously unknown sites. Areas described as having a lack of investigation but high potential are those where little work has been carried-out but the work which has been undertaken has indicated a high probability for the recovery of archaeological remains in the area. These recommendations are preliminary and further analysis should be undertaken on each area when management plans are produced.

The SMP selected strategy for this unit involves possible areas in which defences will be setback and in other areas to hold the line. The areas of importance should be avoided for setback, as any associated work would no doubt reveal archaeology. These areas would be best served by holding the line with any work on the foreshore zone to be avoided. The areas of lack of work but high potential would have to be evaluated on a case by case basis to assess the areas most suitable if setback was to be considered.

9.9 Detailed list

Archaeology from the Primary survey area

No	Xcoord	Ycoord	Source	Site Type	Date
ARC40	486300	424100	SMR2929	SETTLEMENT	MED
ARC41	486410	424160	SMR14511	CHAPEL	PM
ARC42	486550	424300	SMR14510	BUILDING	PM
ARC43	486480	424760	SMR14513	BUILDING	PM
ARC45	485430	428420	SMR2912	DAM	MED
ARC46	486500	424300	SMR12634	BUILDING:MILL	MED
ARC47	486350	424950	SMR721	MOAT	MED
ARC51	481800	432700	SMR9002	DAM	MED
ARC56	486900	425800	SMR2918	AP:RING DITCH	PU
ARC57	486700	425200	SMR12620	BUILDING:HALL	PM
ARC58	487300	425400	SMR2931	SETTLEMENT	IA:RO
ARC59	487200	425600	SMR2936	AP:SETTLEMENT	IA:RO
ARC60	487390	425580	SMR14506	BUILDINGS	PM
ARC61	487400	425600	SMR15553	BURIAL:INHUMATION	PM
ARC62	487450	425660	SMR798	LOCK	PM

ARC63	487500	425700	SMR149	FISHERY	MED
ARC64	487500	425800	SMR158	SETTLEMENT	RO
ARC65	487500	425680	SMR173	BANK	MED:PM
ARC66	488060	426530	SMR151	BRIDGE	PM
ARC67	487500	425680	SMR175	BANK	MED
ARC69	489000	426800	SMR161	AP:ENCLOSURE	PU
ARC70	487500	425650	SMR7629	BANK	MED
ARC71	488780	426350	SMR7639	BANK	MED
ARC80	498200	425020	SMR960	SETTLEMENT	RO
ARC81	498100	425000	SMR17694	FIND:COINS	IA
ARC82	497900	424900	SMR17695	FIND:COINS	IA
ARC83	498100	425000	SMR17696	FIND:COINS	IA
ARC84	498300	425000	SMR10226	FIND:POT	IA:RO
ARC85	498400	425100	SMR10225	FIND:BROOCH	RO
ARC86	498400	425100	SMR10231	FIND:FLINT	PRE
ARC87	498600	425100	SMR3678	FIND:BROOCH	IA
ARC90	498570	425350	SMR13600	FIND:POT	MED:PM
ARC101	497100	424700	SMR1XX	FIND:COIN	IA
ARC102	497500	424800	SMR16383	TRACKWAY	BA
ARC103	497900	424900	SMR17695	FIND:COIN	IA
ARC544	486380	424140	SMR14512	BUILDING:SCHOOL	PM
ARC545	487220	425870	SMR14507	BUILDINGS	PM

Aerial Photographs in the Primary Survey area

No	Xcoord	Ycoord	Source	Site Type	Date
AP12	488000	426800	OBL	SM:R&F	MED
AP14	489000	426700	OBL	CM:DOUBLE DITCH	?LPRE:RO
AP22	496300	425300	OBL	CM:FIELD:R&F	MED:?RO
AP44	486500	424900	OBL	EWKS:MOAT	MED
AP8	486300	424900	OBL	CM:MOAT	MED

HWP survey data in the Primary survey area (see section 9.3).

Faxfleet-1: Field walking finds. Collection of 12 sherds of Medieval pottery (Fletcher *et al.* 1999: 209, 212).

Faxfleet-3: Field walking finds. Collection of 68 Roman pottery sherds probably associated with the settlements of Faxfleet-A and Faxfleet-B (Fletcher *et al.* 1999: 212).

Secondary survey area

Melton-29: Field walking finds and loan of artefacts from the area of the archaeological site known as Redcliff. During field walking eight pieces of flint were recovered by HWP. Previously five pieces of flint had been recovered from the same area and were deposited at the Hull and East Riding Museum (KINCM:116.63). These were also analysed as part of HWP. Dates from Mesolithic to Bronze Age (Fletcher *et al.* 1999: 238-239).

Foreshore zone

During the survey the intertidal area of the foreshore was studied and numerous features recorded. Although outside the area of study they are listed here for context.

Melton-2: Over 800 stakes hammered into the alluvium in a V shape. Large fish weir of Post-Medieval date (Fletcher *et al.* 1999: 221).

Melton-3: Six vertical timbers probably remains of a fish or eel trap of Post-Medieval date (Fletcher *et al.* 1999: 221-222).

Melton-4: Line of double stakes, possibly part of fish trap of Post-Medieval date (Fletcher *et al.* 1999: 222).

Melton-5: A single stake with axe-marks suggesting Bronze Age date (Fletcher *et al.* 1999: 222).

Melton-6: Two stakes dated to 1512-1316 cal BC (middle Bronze Age) (Fletcher *et al.* 1999: 222).

Melton-7: 15 stakes in intertidal peat. Axe-marks suggest Bronze Age but could possibly be Iron Age (Fletcher *et al.* 1999: 222-223).

Melton-8: 6 small stakes in the alluvial deposits at an angle of 45°. Possibly Bronze Age (Fletcher *et al.* 1999: 223).

Melton-9: Three parallel, horizontal timbers, not dated (Fletcher *et al.* 1999: 224).

Melton-10: Collection of small stakes, one with Bronze Age axe-marks (Fletcher *et al.* 1999: 224).

Melton-11: Patch of roundwood pieces. Not dated (Fletcher *et al.* 1999: 224).

Melton-12: Large wooden stakes in clustered pairs or groups with evidence for woodworking. Possibly elaborate fish trap, Bronze Age in date (Fletcher *et al.* 1999: 224-226).

Melton-13: Nine wooden stakes, two dated to late Bronze Age, early Iron Age (Fletcher *et al.* 1999: 226-227).

Melton-14: Ten timbers close to Melton-13. Bronze Age date (Fletcher *et al.* 1999: 227).

Melton-15: Five upright timbers with Bronze Age marks (Fletcher *et al.* 1999: 227-228).

Melton-16: Chips and woodworking debris, not dated (Fletcher *et al.* 1999: 228).

Melton-17: Alignment of paired stakes, Post-Medieval in date (Fletcher *et al.* 1999: 228).

Melton-18: Cluster of small roundwood pieces, date unknown (Fletcher *et al.* 1999: 228).

Melton-19: Cluster of wood, date unknown (Fletcher *et al.* 1999: 228).

Melton-20: Four stakes possibly Bronze Age in date (Fletcher *et al.* 1999: 228-229).

Melton-21: 15 small roundwood stakes in a cluster dated to the Bronze Age (Fletcher *et al.* 1999: 229).

Melton-22: Single piece of worked wood of Bronze Age date (Fletcher *et al.* 1999: 229).

Melton-23: Six wood piles, date unknown (Fletcher *et al.* 1999: 229).

Melton-24: Ten small roundwood pieces dated to Bronze Age (Fletcher *et al.* 1999: 229-230).

Melton-25: Bronze Age trackway excavated by HWP (Fletcher *et al.* 1999: 230-234).

Melton-26: Second Bronze Age trackway excavated by HWP (Fletcher *et al.* 1999: 234-237).

Melton-27: Possible extension of the trackway Melton-25 (Fletcher *et al.* 1999: 238).

Melton-28: Six large timbers undated but possibly associated with the trackways (Fletcher *et al.* 1999: 238).

Melton-30: A single timber with evidence for coppicing, Bronze Age in date (Fletcher *et al.* 1999: 239-240).

Melton-31: Discarded wood and off-cuts, Bronze Age in date (Fletcher *et al.* 1999: 240).

Melton-32: Single timber, date unknown (Fletcher *et al.* 1999: 240-241).

Melton-33: Woodworking debris, date unknown (Fletcher *et al.* 1999: 241).

Palaeoenvironmental data in the Primary survey area

NO	XCOORD	YCOORD	SOURCE	SITE_TYPE	DEPTH
PAL3	487500	425700	PAPER	CORE	6.00
PAL10	497700	424800	PAPER	EXPOSURE	0.00
PAL26	486779	425253	BGS	BOREHOLE	61.00
PAL29	495441	424750	BGS	BOREHOLE	32.70
PAL30	496251	424668	BGS	BOREHOLE	24.60
PAL31	497567	424881	BGS	BOREHOLE	75.60
PAL32	498610	425438	BGS	BOREHOLE	10.60
PAL33	497902	424945	BGS	BOREHOLE	36.80
PAL34	497511	424861	BGS	BOREHOLE	3.00

KEY TO MAPS

KNOWN ARCHAEOLOGY

The known archaeology is displayed with shading showing the Primary and Secondary areas at a scale of 1:50,000. The records for all the points can be found in the Appendices (Volume 2). The data shown include the location of archaeology, palaeoenvironmental sampling sites, wreck sites and aerial photographs. Where there is a large cluster of points these areas are shown in separate boxes at a scale of 1:20,000.

HUMBER WETLANDS PROJECT DATA

The management unit is shown at a scale of 1:50,000 with shading showing the Primary and Secondary areas. Overlaying this, further shading shows the fields that were studied by the HWP. These are subdivided into 5 classes depending on the type of survey which was carried out. Only classes 1 to 3 are shown on the maps. Classes 4 and 5 are areas that were visited but couldn't be surveyed due to either the presence of pasture or industrial development.

Classes 1 and 3 are fields that were field walked. Class 2 reflects fields that were visited or were excavations were carried out but the field was not walked. On the 1:50,000 map are shown find spots of flint and pottery and the location of boreholes. In the boxes maps are shown giving the locations of the published sites within the Humber Wetlands Project volumes with their site names. These maps are at a scale of 1:25,000. The maps at 1:50,000 give an impression at the density and location of finds whereas the separate boxes link this data to the published examples.

POTENTIAL

The management unit is shown at a scale of 1:50,000 with areas highlighted as Important, Lack of study with high potential and Lack of study with low potential. These maps must be used in conjunction with the recommendations sections from each management unit.

- Wrecks.dbf

Archaeol.dbf

- HAP
- LAS
- LINCS
- NELINCS
- NLINCS

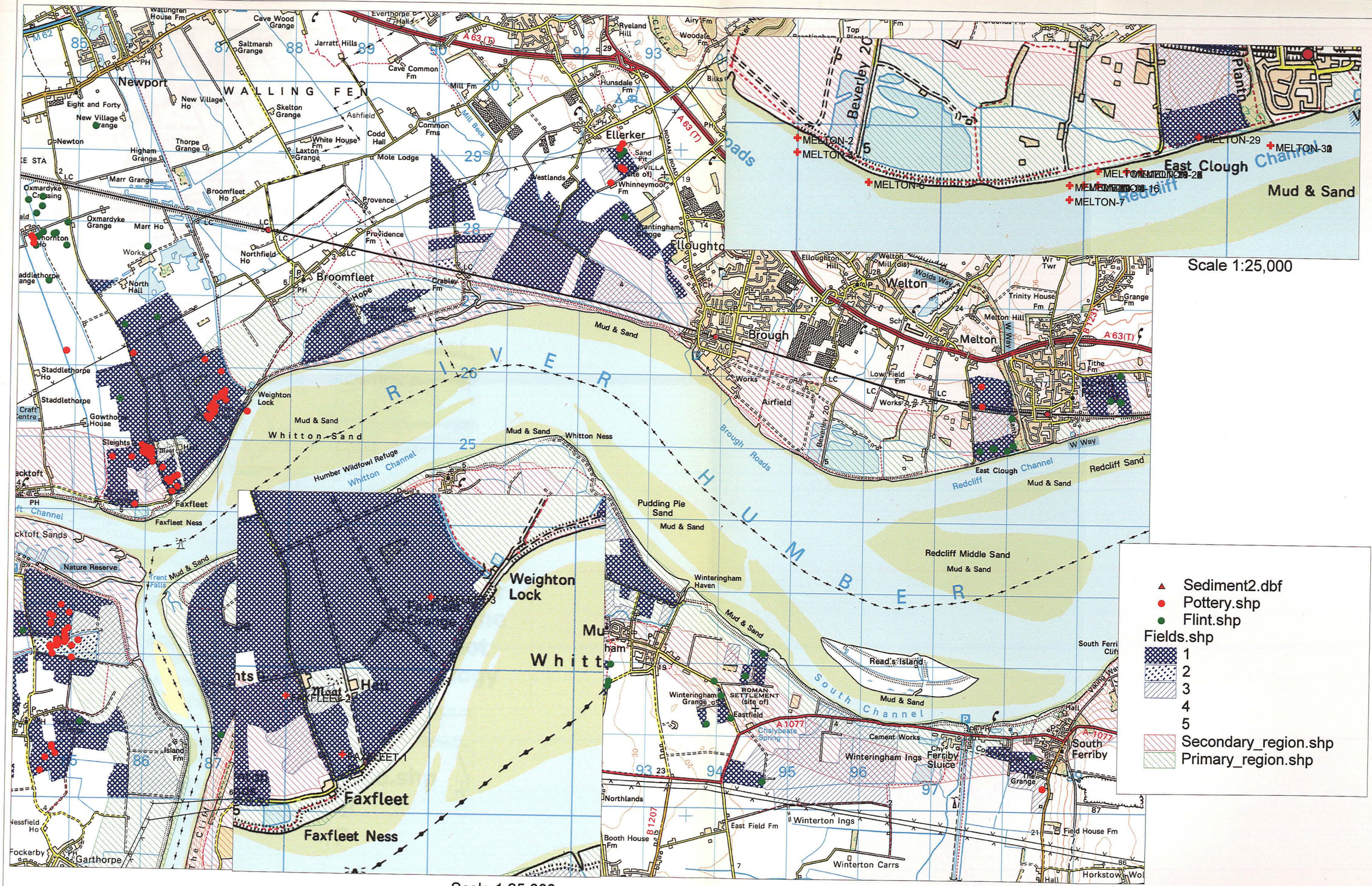
- Palaeo.dbf
- Airphoto.shp
- Primary_region.shp
- Secondary_region.shp

Scale 1:20,000

Scale 1:20,000

Map 7
Management Unit 3 North Ferriby to Trent Falls
Known Archaeology

Scale 1:50,000

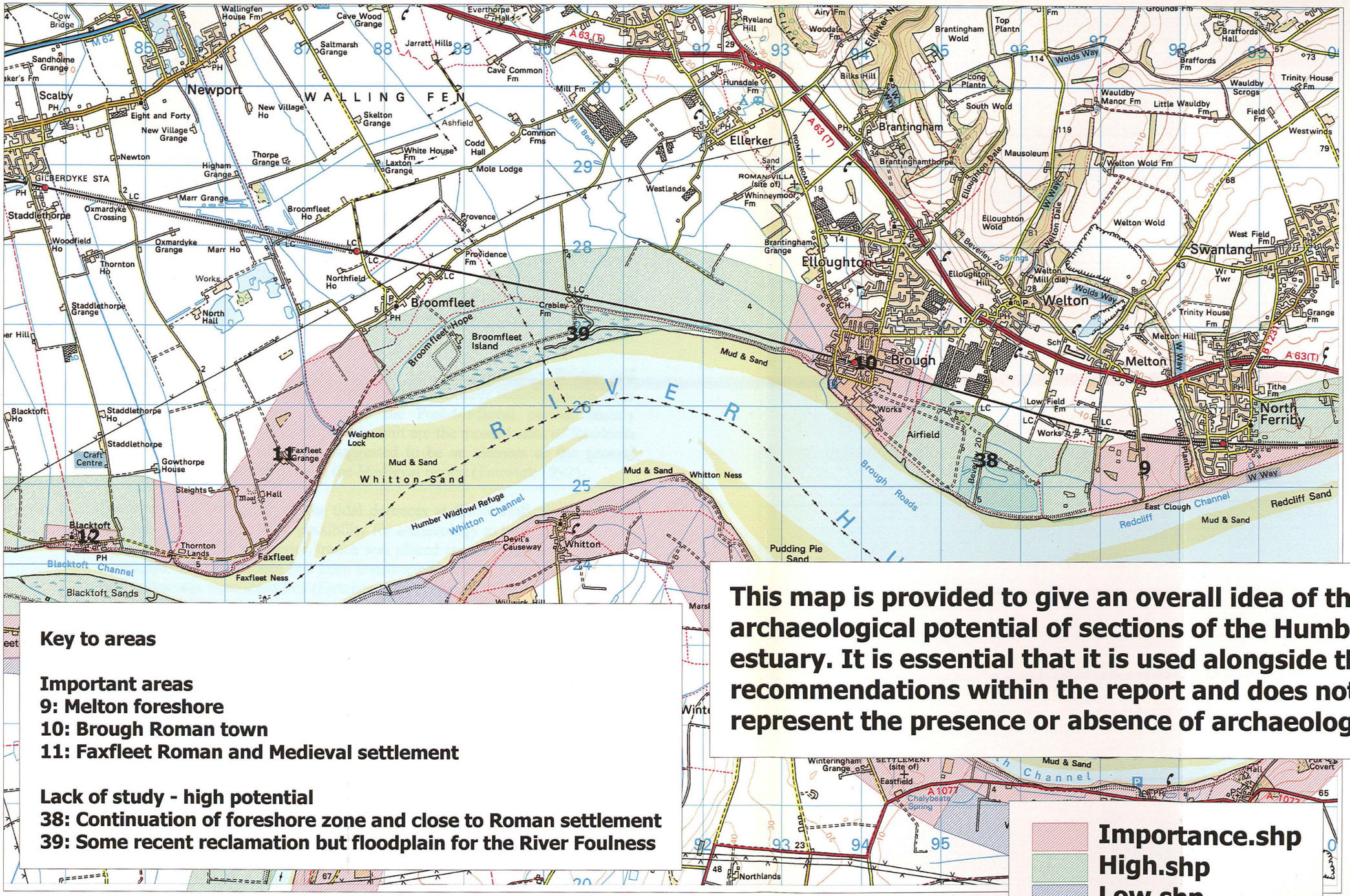


Scale 1:25,000

Scale 1:25,000

Map 8
Management Unit 3 North Ferriby to Trent Falls
Humber Wetlands Project data

Scale 1:50,000



Key to areas

Important areas
9: Melton foreshore
10: Brough Roman town
11: Faxfleet Roman and Medieval settlement

Lack of study - high potential
38: Continuation of foreshore zone and close to Roman settlement
39: Some recent reclamation but floodplain for the River Foulness

This map is provided to give an overall idea of the archaeological potential of sections of the Humber estuary. It is essential that it is used alongside the recommendations within the report and does not represent the presence or absence of archaeology

Importance.shp
High.shp
Low.shp

Map 9
Management Unit 3 North Ferriby to Trent Falls
Potential

Scale 1:50,000

10. Management Unit 4a & 4b: Trent Falls to Boothferry Bridge and Boothferry Bridge to Whitgift

10.1 Background

On the northern side of the River Ouse between Boothferry Bridge and Trent Falls (MU4a) the earliest known remains date to the Roman period, with a pottery scatter (Faxfleet-2) and a quern (ARC78). The Medieval period is more thoroughly represented with moated sites, deserted settlements and field systems. Further earthworks associated with the preceptory of the Knights Templar, located in MU3, are also present in this management unit. Post-Medieval features include buildings, wrecks, bridges, chapels, lodges and other structures. Within this unit are three estates – Yokefleet Hall, Saltmarsh Hall and Sand Hall. All of these have associated out-buildings and enclosed grounds.

On the southern side of the River Ouse between Boothferry Bridge and Whitgrift (MU4b) there are fewer archaeological features recorded, with these being dominated by sites dating to the Post-Medieval period; mainly upstanding buildings. Present within the unit are the moated sites of Reedness and Ousefleet which have been suggested to be an element of the general colonisation of the wetter areas in the Medieval period (Fenwick 1997).

During works undertaken on the tidal defences at Goole Hall, an evaluation was carried out to assess the possibility for archaeology to be buried under the present defence. An evaluation trench was placed across the defences but this concluded that the defence had been constructed sometime after 1950 and no earlier deposits were identified (Fletcher, Gearey *et al.* 1999).

10.2 Identified archaeology (MAP 10)

Within the Primary study area of MU4a the earliest archaeology represented dates from the Medieval period. Features include moated sites near Saltmarsh (ARC24 and ARC25), a deserted settlement near Yokefleet (ARC27), a settlement on the western edge of the study area (ARC34) and evidence of field systems near Kilpin (ARC549). Post-Medieval activity is well represented within MU4a with a range of site types. Features include buildings (ARC6, ARC26, ARC28, ARC29 and ARC36), lodges (ARC540 and ARC542), chapels (ARC37 and ARC49) and bridges (ARC21 and ARC22). Other features include wrecks incorporated into the river defences near Sand Hall (ARC7), a lane near Saltmarsh (ARC20), a mill (ARC23), a ford (ARC35), a boathouse (ARC74), a park (ARC529) and a kennels (ARC541). No Second World War features are recorded from this region.

Within the Primary study area of MU4b, on the southern side of the Humber, are a number of Post-Medieval remains. These include a windmill (ARC30), buildings near Reedness (ARC31 and ARC33) and a lighthouse near Ousefleet (ARC73).

10.3 Humber Wetlands Project data (MAP 11)

During the survey of the Vale of York (1997-8), two mapviews were placed in this management unit – Faxfleet and Airmyn. Faxfleet is partly in this unit and partly in MU3. Airmyn is situated at the far end of the unit, next to Boothferry Bridge (see section 10.10).

10.4 Palaeoenvironmental data

A palaeoenvironmental assessment of deposits at Goole Hall (SE753220) revealed a sequence of over 5.5 m of laminated clayey silt and silt with sand lenses over a 1.08 m thick band of peat with frequent clay and silt bands with a basal unit of 0.50 m brown organic mud. Analysis of pollen and diatoms from the top, middle and base of the organic horizon indicated the presence of oak-alder-hazel woodland in the lowermost sample. The upper samples indicated reductions in tree pollen and increased representation of taxa indicative of acidic conditions, namely *Calluna* and *Sphagnum*, suggests a transition from eutrophic (nutrient rich) to ombrotrophic (nutrient poor) conditions at the site. It is suggested that the sequence is likely to date to the post-Elm Decline period (PZVIIb). The palaeoenvironmental potential of the organic deposits compromised by the presence of inorganic lenses in the peat, representing the interruption of sediment accumulation by occasional tidal inundation. The upper silts, clays and sands are interpreted as reflecting higher energy subtidal and intertidal deposits following the submergence of the site due to a rise in relative sea-level.

This work has highlighted the potential for deposits with preserved evidence of past environments and vegetation and the possibility of investigating sea-level change.

10.5 Walk-over survey

During the walk-over survey four locations were visited within this management unit. They highlighted the narrow intertidal zone and the close proximity of settlement to the sea defences.

Blacktoft SE842242: Saltmarsh in front of defences with little intertidal zone. Large concrete defences.

Saltmarsh SE790241: Small intertidal zone but many remains of previous concrete sea defences cover most of this area.

Sand Hall SE765242: Unfortunately time limits constrained access to the land within the bend of the river at this point. The area around Sand Hall is still pasture and parkland and therefore has high potential for previously unknown archaeology to be buried and undisturbed within this area. The intertidal zone is very limited next to the defences.

Skelton SE767254: At this location there are some saltmarsh grasses on the intertidal zone resulting in a limited chance to see any archaeology. The linear village of Skelton lies directly behind the defences.

10.6 Potential

The potential of these units lies in the understanding of the Medieval and Post-Medieval landuse of the region. The intertidal area in front of the defences is small and heavily vegetated. This has hindered any archaeological discoveries in the past but any works in these areas may reveal archaeology. Settlement in the area has developed in close proximity to the current defences and as such the Medieval occupational evidence is also close to the defences. One area of potential is that of Sand Hall where areas of pasture may hold previously unknown, buried archaeology.

10.7 Vulnerability

The Medieval settlement evidence is vulnerable in this region due to its close proximity to the defences. It is assumed that during the Medieval period sea defences would have been constructed and there is the potential that these are on the same alignment as the present day defences. Any work to the current defences may therefore disturb earlier defences. This has been shown not to be the case in the area of Goole Hall, but any works on different sections of the defence will need to consider this factor.

10.8 Importance (MAP 12)

Areas of importance have been defined as a continuation of the Medieval landscape at Faxfleet and the areas of villages and estates located within the area. These hold the potential for revealing important information concerning the settlement of the region. Areas between these are identified as having a lack of study but high potential as they are part of this Medieval landscape and it is highly likely that earlier settlement may be located in this area. The one area of low potential is that at the rear of Swinefleet. Here the practise of warping has effectively heightened the ground level. Any archaeology in this area is likely to be buried and would only be revealed with excavations at depth.

10.9 Recommendations

These recommendations are based on the existing, available knowledge of archaeology for the region. Areas of high potential are those that already have a large collection of archaeological materials, where such remains are either still present *in situ* or where additional discoveries should be anticipated. Areas described as having a lack of knowledge and a low potential are those where little work has been carried-out, and where work has been undertaken has revealed few archaeological remains. The potential exists in these areas for significant discoveries of previously unknown sites. Areas described as having a lack of investigation but high potential are those where little work has been carried-out but the work

which has been undertaken has indicated a high probability for the recovery of archaeological remains in the area. These recommendations are preliminary and further analysis should be undertaken on each area when management plans are produced.

The SMP selected strategy for this unit is investigation into setback and to hold the line until the need for repair or improvement. The setback should avoid the areas of settlement as these have the highest archaeological potential. Areas adjacent to the settlements would need to be assessed on a case by case basis and any deep excavation work may reveal archaeology. If the areas of defences in front of the settlement are to be move, then investigation will be required as to whether they are covering earlier defences. The areas of warped land may have archaeology, but buried at a greater depth. Any intrusion into these areas would need to be proceeded by an investigation into the depth of this burial.

10.8 Detailed list

Archaeology from the Primary survey area Management Unit 4a

No	Xcoord	Ycoord	Source	Site Type	Date
ARC6	476290	423800	SMR6428	BUILDING	PM:1777
ARC7	476400	424100	SMR19544	WRECK	PM
ARC20	479400	424400	SMR14452	LANE	PM
ARC21	479620	424820	SMR14452	BRIDGE	PM
ARC22	479700	424100	SMR14478	BRIDGE	PM
ARC23	479390	424090	SMR2823	MILL	PM
ARC24	479950	424460	SMR2816	MOAT	MED
ARC25	479870	424100	SMR2817	MOAT	MED
ARC26	479870	424120	SMR3491	BUILDING	PM
ARC27	480000	424000	SMR2820	DMV	MED
ARC28	477100	427100	SMR12412	BUILDINGS	PM
ARC29	477020	427200	SMR12396	BUILDING	PM
ARC34	476600	425700	SMR10031	SETTLEMENT	MED:PM
ARC35	477140	426640	SMR14345	FORD	PM
ARC36	477260	426660	SMR14344	BUILDING	PM
ARC37	477230	426660	SMR14340	CHAPEL	PM
ARC49	484530	424240	SMR9857	CHAPEL	PM
ARC74	482510	423930	SMR14490	BUILDING:BOAT HOUSE	PM
ARC539	476290	423800	SMR9223	PARK	PM
ARC540	476700	423600	SMR14469	BUILDING:LODGE	PM
ARC541	476700	423500	SMR14470	BUILDING:KENNELS	PM
ARC542	476500	424100	SMR14468	BUILDING:LODGE	PM
ARC549	476700	426400	SMR MAP	AP:FIELD SYSTEM	MED

Archaeology from the Primary survey area Management Unit 4b

No	Xcoord	Ycoord	Source	Site Type	Date
ARC30	477980	422750	SMR9418	BUILDING:WINDMILL	PM
ARC31	479320	423370	SMR6443	BUILDING	PM
ARC33	479150	423250	SMR9382	BUILDING	PM
ARC73	482130	423200	SMR10654	LIGHTHOUSE	C19

Aerial Photographs in the Primary Survey area

No additional sites were identified from the sources studied (see section 3.1.5).

HWP survey data in the Primary survey area

No sites were located within the Primary area surveyed by HWP (see section 10.3).

Secondary survey area

Faxfleet-2: Field walking finds. A collection of 51 sherds of pottery was recovered from an area of the ploughed-out earthworks. Three sherds were Roman in date and the remaining were Medieval and Post-Medieval (Fletcher *et al.* 1999: 212).

Palaeoenvironmental data in the Primary survey area Management Unit 4a

NO	XCOORD	YCOORD	SOURCE	FORM	SITE_TYPE	DEPTH
PAL14	475370	426900	BGS	BH1	BOREHOLE	15.00
PAL15	475360	426930	BGS		BOREHOLE	15.00
PAL16	475370	426960	BGS		BOREHOLE	15.00
PAL17	475400	426970	BGS		BOREHOLE	15.00
PAL18	476254	423829	BGS		BOREHOLE	61.00
PAL21	475932	423215	BGS		BOREHOLE	63.00
PAL24	483701	424206	BGS		BOREHOLE	6.70

Palaeoenvironmental data in the Primary survey area Management Unit 4b

NO	XCOORD	YCOORD	SOURCE	FORM	SITE_TYPE	DEPTH
PAL7	482250	423150	PAPER	HMB20	CORE	0.00
PAL19	479138	423285	BGS		BOREHOLE	313.00

KEY TO MAPS

KNOWN ARCHAEOLOGY

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HUMBER WETLANDS PROJECT DATA

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Classes 1 and 3 are fields that were field walked. Class 2 reflects fields that were visited or were excavations were carried out but the field was not walked. On the 1:50,000 map are shown find spots of flint and pottery and the location of boreholes. In the boxes maps are shown giving the locations of the published sites within the Humber Wetlands Project volumes with their site names. These maps are at a scale of 1:25,000. The maps at 1:50,000 give an impression at the density and location of finds whereas the separate boxes link this data to the published examples.

POTENTIAL

The management unit is shown at a scale of 1:50,000 with areas highlighted as Important, Lack of study with high potential and Lack of study with low potential. These maps must be used in conjunction with the recommendations sections from each management unit.

Scale 1:20,000

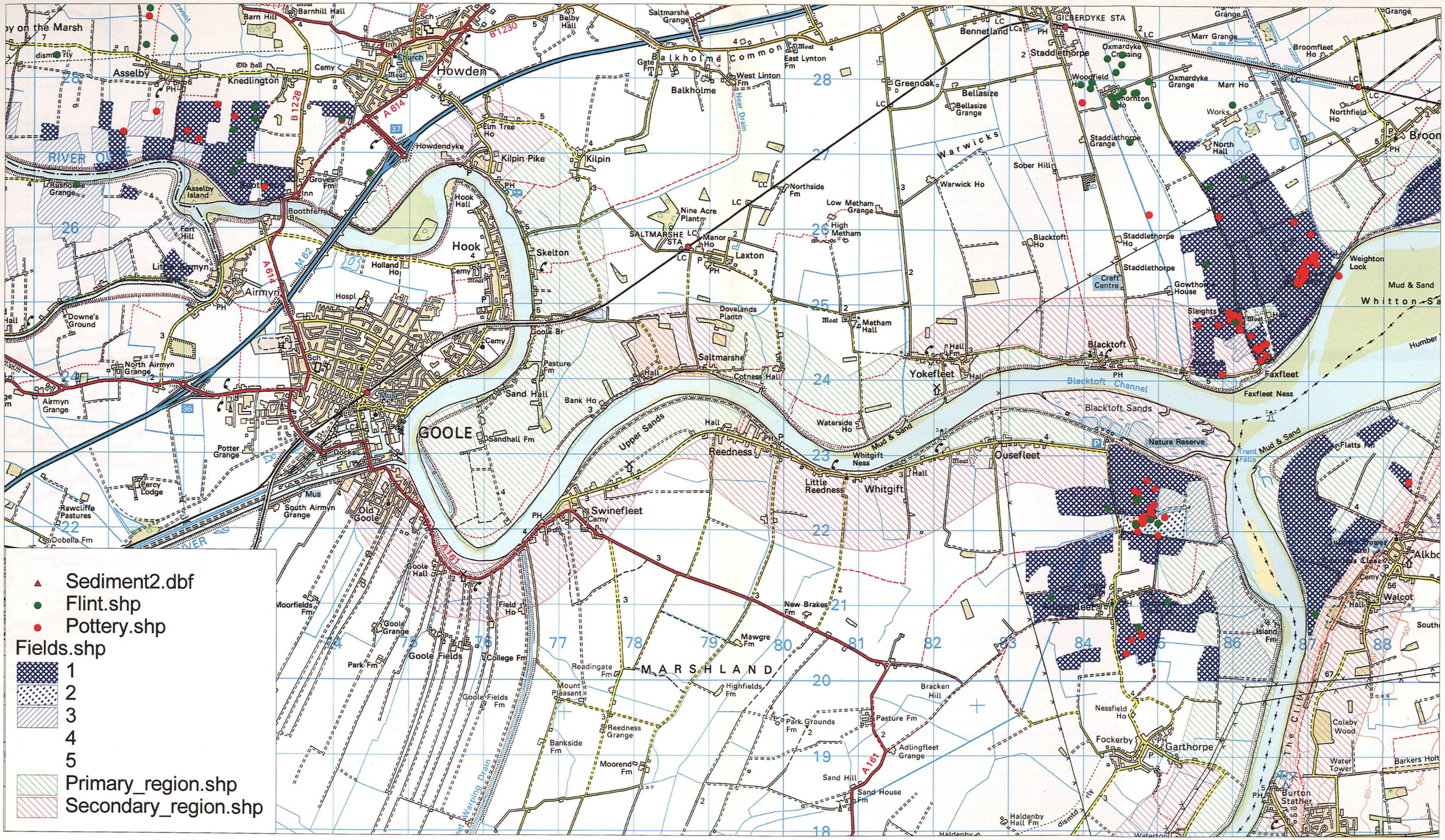
- Wrecks.dbf

Archaeol.dbf

- HAP
- LAS
- LINCS
- NELINCS
- NLINCS
- Palaeo.dbf
- Airphoto.shp
- Primary_region.shp
- Secondary_region.shp

Map 10
Management Units 4a & 4b
Trent Falls to Boothferry Bridge
Known Archaeology

Scale 1:50,000



Map 11
Management Units 4a & 4b
Trent Falls to Boothferry Bridge
Humber Wetlands Project data

Scale 1:50,000

Key to areas

Important areas
11: Continuation of Medieval landscape
12: Blacktoft settlement
13: Yokefleet settlement and Hall
14: Saltmarshe
15: Sand Hall
16: Skelton
17: Ousefleet and Whitgift

Lack of study - high potential
40: Medieval landscape
41: Further Medieval landscape with possibility of buried deposits
42: Old Goole settlement and Swinefleet

Lack of study - low potential
57: Deeply buried deposits

Importance.shp
High.shp
Low.shp

This map is provided to give an overall idea of the archaeological potential of sections of the Humber estuary. It is essential that it is used alongside the recommendations within the report and does not represent the presence or absence of archaeology

Map 12

Management Units 4a & 4b
Trent Falls to Boothferry Bridge
Potential

Scale 1:50,000

11. Management Unit 4c & 4d: Trent Falls to Keadby Bridge and Keadby Bridge to Whitton

11.1 Background

The third and fourth sections of MU4 lie to the south of the Humber, and are themselves divided by the River Trent, with MU4c to the west, and lining the southern bank of the River Ouse, and MU4d to the east, extending as far as Whitton.

Within the area to the west, MU4c, the earliest archaeological evidence dates from the Roman period. Discoveries by the *Humber Wetlands Project* include several scatters of Roman pottery, and the results of excavation and geophysical survey have identified a sizeable multi-phased site at Adlingfleet (Figure 29). Roman period activity has also been attested from the western side of the Trent in the Amcotts area where scatters of Roman pottery were also found during the *Humber Wetlands Project*. The Medieval period is represented by the deserted settlements of Marae and Waterton, settlement evidence at Amcotts and a number of features including a font. Post-Medieval activity is also represented by a number of buildings recorded by the SMR.

In the area to the east, MU4d, the earliest archaeological evidence is from worked lithic material of an undifferentiated prehistoric date and Neolithic flint from the higher ground at Alkborough and Burton upon Stather. Bronze Age pottery and flint have been recovered from the Flixborough area. Roman pottery has also been found from the region. The Early Medieval (middle to late Saxon) period is recognised from the internationally important site of Flixborough discovered during quarrying and excavated between 1989 and 1991 (Loveluck 1998). Removed Post-Medieval field boundaries have been recognised on aerial photographs of the region.

11.2 Identified archaeology (MAP 13)

Within MU4c the earliest recorded archaeological remains date to the Roman period. Surrounding the area of Adlingfleet, near Trent Falls (Adlingfleet-2, Adlingfleet-3, Adlingfleet-4, Adlingfleet-5 and Adlingfleet-6), and the area opposite Flixborough on the Trent (Flixborough-2 and Flixborough-3), a number of pottery scatters have been found during the *Humber Wetlands Project*. Of these the most significant was in the area to the northeast of the village of Adlingfleet (Adlingfleet-2). Here the evidence from field walking was augmented by geophysical survey and small-scale excavation aimed at understanding the nature of the archaeology and assessing both its preservation and the conditions for its continued preservation *in situ*. Together the results of this work have demonstrated the high-status of the area during the Roman period, the complexity of settlement (between periods of flooding and consequent sediment accumulation) and the potential for the discovery of remains relating to industrial activity such as salt-production.

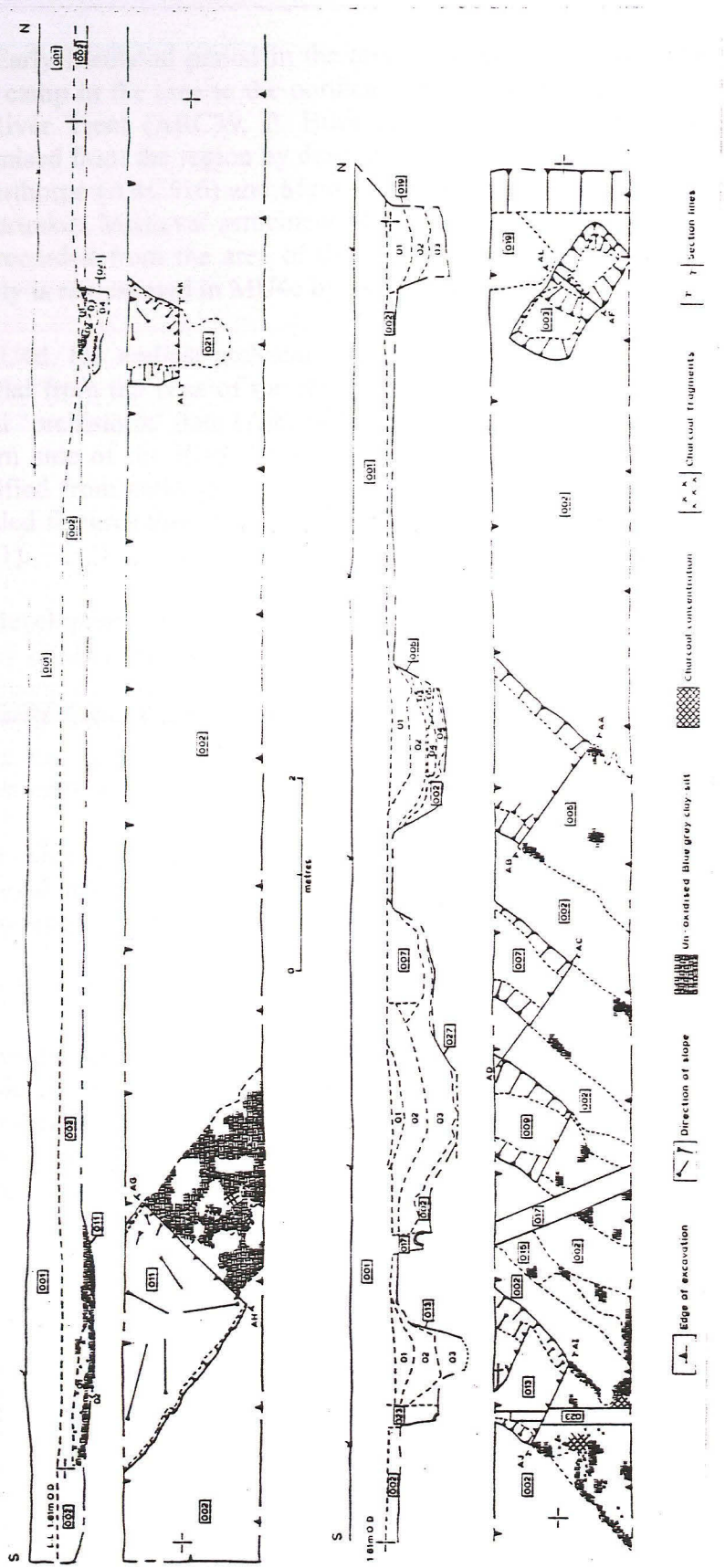


Figure 29: Plan of one of the excavation trenches from the Roman site at Adlingfleet. The main features are several parallel ditches running across the trench diagonally. © Humber Wetlands Project.

The Early Medieval period in the area is alluded to by the supposed Viking army camp in the area to the northeast of Adlingfleet on the western edge of the River Trent (ARC39, P. Buckland pers. comm.). Medieval activity is recognised from the region by deserted settlements with Waterton to the south of Garthorpe (ARC516) and Marae to the east of Luddington (ARC521), and the shrunken Medieval settlement of Amcotts (ARC527). A Medieval font is also recorded from the area of the Waterton Hall (ARC518). Post-Medieval activity is represented in MU4c by two buildings (ARC517 and ARC528).

In MU4d, the earliest archaeological evidence is from worked lithics. This material from the base of the slope west of Walcot has only been ascribed a global 'prehistoric' date (ARC509). Roman period activity is attested on the eastern side of the River Trent as well as the west (ARC509). Crop marks identified from aerial photography to the north, near Whitton Channel, have revealed features that probably relate to the later prehistoric or Roman period (AP11).

The development of settlement within the region has been investigated at the site of Flixborough on the eastern side of the River Trent. At this location settlement evidence dating from the Roman period through to the high Medieval period has been identified, although the principal occupation occurs during the seventh to tenth centuries – the middle to late Saxon period – consisting of at least thirty buildings (see Figure 8) (Loveluck 1998).

Other Medieval finds are known from the region (ARC506) and Post-Medieval activity is attested by removed field boundaries identified on aerial photographs (AP10).

11.3 Humber Wetlands Project data (MAP 14)

During the survey of the Ancholme and Lower Trent valleys (1996-97), two mapviews were placed in this management unit – Adlingfleet and Flixborough. The Adlingfleet mapview covers an area on either side of the River Trent at Trent Falls. The Flixborough mapview covers an area from Flixborough Stather to Gunness and both sides of the Trent (see section 11.9).

11.4 Palaeoenvironmental data

General

The palaeochannel of the River Trent attains its greatest width of 2.7 km at Trent Falls. This deeply incised (-20 m OD) alluvial channel runs north from Gunness being joined northeast of Garthorpe by a channel associated with the pre-Vermuyden River Don (Gaunt 1987, Gaunt *et al.* 1992).

The landscape development of the lower Trent has been outlined by Gaunt (1976, 1994). Extensive areas of alluvial deposits are mapped by the BGS with only limited exposures of floodplain peats, blown sands or first terrace deposits. Peat deposits tend to be less than 1 m thick in the Trent valley generally, although they do attain a thickness of 1.5 m south of Owston Ferry (Gaunt 1994). East of the Trent thicker peat has been identified in hollows and

channels on the first Terrace Deposits and these may attain up to *c.* 6 m in places (Gaunt *et al.* 1992).

The great depth of the alluvium close to the river channel means that archaeology of the earlier periods is likely to be deeply buried. This was thought to be the case at Adlingfleet until coring revealed an island within this landscape that contained a large Roman settlement. It is these higher areas that need to be identified as they may contain settlement evidence. Analysis of the samples from the cores outlined below has highlighted their potential to hold valuable information on the environmental and vegetation development of the region.

Specific

The BGS recorded two boreholes at SE84461258, north of Gunness and at SE83310734 near West Butterwick. The former revealed peaty clay and sand with basal gravels resting on the bedrock of Mercia mudstone at -16.1 m OD.

Amcotts

Lillie (1998b) excavated 24 boreholes over a distance of 5010 m east across the present course of the River Trent. This transect demonstrates the existence of two palaeochannels near to the village of Amcotts. These channels and the floodplain margins produced depositional sequences overlying Devensian deposits. Analysis of pollen and diatoms from sediments at -8.83 m in the westernmost of the palaeochannel features (SE846137) produced pollen and diatom assemblages indicating the presence of alder carr woodland with freshwater and brackish influences from PZVIIa. A pollen sample from the upper peats at 1.96 m indicates mixed woodland with evidence for open heathland communities suggesting a later Holocene date. A maximum depth of 11.10 m of deposits was established but it is likely that earlier Holocene deposits underlie the excavated sequences. The westernmost channel was infilled by human intervention in the nineteenth century when the rivers course was diverted into the eastern channel. The borehole transect from SE827140 to SE829139 excavated sediments containing remains characteristic of acidic mire communities, with *Sphagnum* and *Eriophorum* dominated peat. This suggests the development of raised mire on the margins of the Trent floodplain in the later Holocene period, thus marking the far eastern limits of the ombrotrophic peatlands of Thorne Moors.

Adlingfleet (Trent Falls)

Gaunt (1994) has demonstrated that the base of the Holocene deposits in this area dip sharply west-east from 0 m OD to -20 m OD at Trent Falls. BGS boreholes from the vicinity of Trent Falls have recorded Holocene sediment sequences to 17.18 m depth at Garthorpe. The laminated clay silts and fine sand sediments with peaty laminae below 5.4 m depth contain diatoms indicating the presence of both brackish and marine environments. Below 6 m laminated silts with organics including wood fragments were evident. A shift to predominantly freshwater conditions is apparent in the diatom assemblages below 13.67 m depth. A basal peat between 14.67 and 14.88 m depth contains a pollen spectrum indicating formation during PZVIIa (5900-3800 cal BC).

Lillie (1998b) excavated a borehole transect consisting of 24 boreholes to a maximum depth of -9.43 m for a distance of 4460 m east across the Trent floodplain from SE833221 to SE878220. The boreholes established up to 12 m of sediment, most of which were laminated clay silts and fine sands representing deposition in high energy environments present between SE856222 to SE878220. Adjacent to the deeply incised channel, peats were developing into the Sub-Boreal period from *c.* 4000 cal BC (5200 BP) onwards. Towards the western end of the coring transect, peat formation was taking place in a later period, after around 2000 cal BC (1650 BP). Another palaeochannel feature identified between SE835222 and SE841220 was also flanked by floodplain reedswamp peats with pollen spectra indicative of peat formation later in the Holocene (post-Roman period).

11.5 Potential

The large number of Roman period sites and finds in the region has been established by the work of the *Humber Wetlands Project*, and has added a new temporal dimension. The area surrounding Adlingfleet has demonstrated the potential for a high-status Roman site and the possibility of industrial activity (e.g. salt-production). The limited excavations in these areas have revealed a sequence alluvial sediments and archaeology with conditions that are conducive for the preservation of organic archaeological and palaeoenvironmental material. The possibility remains of other sites existing beneath these deposits. The proximity to the Rivers Trent, Ouse and Humber and the role of these for contemporary communication links, serve to highlight the potential of this area for future archaeological discoveries from this period.

The site at Adlingfleet was discovered on an island within the alluvium of the area. On both sides of Trent Falls at Blacktoft Sands and Alkborough Flats it is anticipated from the palaeoenvironmental evidence that these areas have a deep alluvial sequence and therefore any archaeology would be deeply buried.

The potential for further finds of Early Medieval date in the region may also be understood in the context of the site of Flixborough. While this site lies within the area of a quarry, and has been excavated, it may be expected that associated features still exist in the area surrounding it.

11.6 Vulnerability

The area around Adlingfleet has been highlighted as of great potential and the area closest to the defences will probably contain the highest possibility of waterlogged deposits associated with the Roman settlement. The large area of finds recovered by the field walking finds suggests a very extensive site. The majority of the archaeology from the rest of the management unit has been recovered from the higher ground, away from the effects of potential works. There are other nationally important sites such as Flixborough whose activity may have extended into the lower areas and these areas would be vulnerable from any proposed works.

11.7 Importance (MAP 15)

There are several areas identified as important within these management units. The area at Adlingfleet contains extensive Roman evidence, in an area that was previously considered to have been too wet to inhabit. The site is located at a strategic point at the confluence of the Ouse and Humber. To the south is an important Medieval landscape that includes settlement evidence from the Deserted Medieval Village of Marae Dyke and Waterton. At Amcotts there is extensive Medieval occupation evidence from the village and field walking has revealed Roman pottery to the west suggesting Roman settlement in the near vicinity. On the opposite side of the Trent is the nationally important site of Flixborough and further to the north along the Lincoln Edge there is extensive evidence of occupation from prehistoric times onwards.

The areas which have been identified as having a lack of work but high potential are those which link these areas of importance and may hold a continuation of activity; it is a lack of data which makes it difficult to draw any firm conclusions. The two areas of low potential are areas where previous fieldwork has shown a deep sequence of deposits and little archaeology. The potential exists for these areas to contain archaeology which is either deeply buried or exists on islands within the alluvium.

11.8 Recommendations

These recommendations are based on the existing, available knowledge of archaeology for the region. Areas of high potential are those that already have a large collection of archaeological materials, where such remains are either still present *in situ* or where additional discoveries should be anticipated. Areas described as having a lack of knowledge and a low potential are those where little work has been carried-out, and where work has been undertaken has revealed few archaeological remains. The potential exists in these areas for significant discoveries of previously unknown sites. Areas described as having a lack of investigation but high potential are those where little work has been carried-out but the work which has been undertaken has indicated a high probability for the recovery of archaeological remains in the area. These recommendations are preliminary and further analysis should be undertaken on each area when management plans are produced.

The SMP selected strategy for this unit is to investigate the possibility of setback and in other areas to hold the line until repair or improvement is required. Any setback in the area of Adlingfleet may involve excavation into the deposits of the Roman settlement and should be avoided. The line of defences should be held on its present line with any work on either side requiring evaluation of the impact on the archaeology. Holding the line of the defences will have the least effect for the majority of the unit. The possibility of setback at Alkborough Flats could be investigated with further work recording the depth of the deposits in the area.

11.9 Detailed list

Archaeology from the Primary survey area Management Unit 4c

No	Xcoord	Ycoord	Source	Site Type	Date
ARC39	485500	422500	SMR13186	CAMP	EMED
ARC52	485250	421810	SMR15503	AP	PU
ARC53	484800	422400	SMR10811	AP	PU
ARC510	486060	421700	SMR9488	WATERCOURSE	
ARC516	485300	418000	SMR1640	DMV	MED
ARC517	485200	417900	SMR10500	BUILDING:FARM	PM
ARC518	485300	417900	SMR10507	FONT	MED
ARC520	484999	416586	SMR19585	WATERCOURSE	
ARC521	485000	416600	SMR70	DMV	MED
ARC527	485500	414100	SMR9529	SETTLEMENT	MED
ARC528	485590	414130	SMR6952	BUILDING	C19:1862

Archaeology from the Primary survey area Management Unit 4d

No	Xcoord	Ycoord	Source	Site Type	Date
ARC506	489900	424500	SMR2133	FIND	MED
ARC508	489300	424200	SMR2134	RIVER CROSSING	
ARC509	488340	422660	SMR19358	FIND:POT	RO
ARC511	487100	420900	SMR19357	FIND:FLINT	PRE

Aerial Photographs in the Primary Survey area Management Unit 4d

No	Xcoord	Ycoord	Source	Site Type	Date
AP10	487100	421600	OBL	CM:BOUNDARIES	PM
AP11	488800	423800	OBL	CM:DOUBLE DITCH	LPRE:RO:PM

HWP survey data in the Primary survey area

Adlingfleet-2: Geophysical survey and excavation. Roman activity has been identified across a large area to the south of Blacktoft sands. Over 1000 sherds of pottery were recovered during the excavation of three trenches which revealed a variety of pit, ditch and gully features (Fenwick *et al.* 1998: 168-182).

Adlingfleet-4: Field walking finds. A collection of 32 sherds of Roman pottery recovered to the north of Adlingfleet-2 (Fenwick *et al.* 1998: 183).

Adlingfleet-5: Field walking finds. A collection of 27 sherds of Roman pottery recovered to the northwest of Adlingfleet-2 (Fenwick *et al.* 1998: 183).

Adlingfleet-6: Field walking finds. A collection of six sherds of Roman pottery recovered to the north of Adlingfleet-2 (Fenwick *et al.* 1998: 183).

Secondary survey area

Flixborough-2: Field walking finds. Five sherds of Roman pottery probably associated with Flixborough-3 (Fenwick *et al.* 1998: 158).

Flixborough-3: Field walking finds. 44 sherds of Roman pottery were recovered from the west of Amcotts (Fenwick et al. 1998: 158-9).

Palaeoenvironmental data in the Primary survey area Management Unit 4c

NO	XCOORD	YCOORD	SOURCE	FORM	SITE_TYPE	DEPTH
PAL155	484730	415770	BGS		BOREHOLE	18.90
PAL156	485100	416650	BGS		BOREHOLE	19.40
PAL160	485394	413598	BGS		BOREHOLE	531.00

Palaeoenvironmental data in the Primary survey area Management Unit 4d

NO	XCOORD	YCOORD	SOURCE	FORM	SITE_TYPE	DEPTH
PAL25	488345	422644	BGS		BOREHOLE	999.00
PAL157	486070	417090	BGS		BOREHOLE	14.00
PAL158	485870	415920	BGS		BOREHOLE	18.50
PAL161	484450	412400	BGS		BOREHOLE	91.00
PAL162	484140	412700	BGS		BOREHOLE	23.00
PAL163	484470	412580	BGS		BOREHOLE	19.40
PAL164	483920	412240	BGS	PYLON 6	BOREHOLE	7.50
PAL165	484220	412220	BGS	PYLON 7	BOREHOLE	8.70
PAL166	484550	412220	BGS	PYLON 8	BOREHOLE	6.50
PAL167	484520	412250	BGS	57	BOREHOLE	20.30
PAL168	483980	412350	BGS	59	BOREHOLE	19.30

KEY TO MAPS

KNOWN ARCHAEOLOGY

The known archaeology is displayed with shading showing the Primary and Secondary areas at a scale of 1:50,000. The records for all the points can be found in the Appendices (Volume 2). The data shown include the location of archaeology, palaeoenvironmental sampling sites, wreck sites and aerial photographs. Where there is a large cluster of points these areas are shown in separate boxes at a scale of 1:20,000.

HUMBER WETLANDS PROJECT DATA

The management unit is shown at a scale of 1:50,000 with shading showing the Primary and Secondary areas. Overlaying this, further shading shows the fields that were studied by the HWP. These are subdivided into 5 classes depending on the type of survey which was carried out. Only classes 1 to 3 are shown on the maps. Classes 4 and 5 are areas that were visited but couldn't be surveyed due to either the presence of pasture or industrial development.

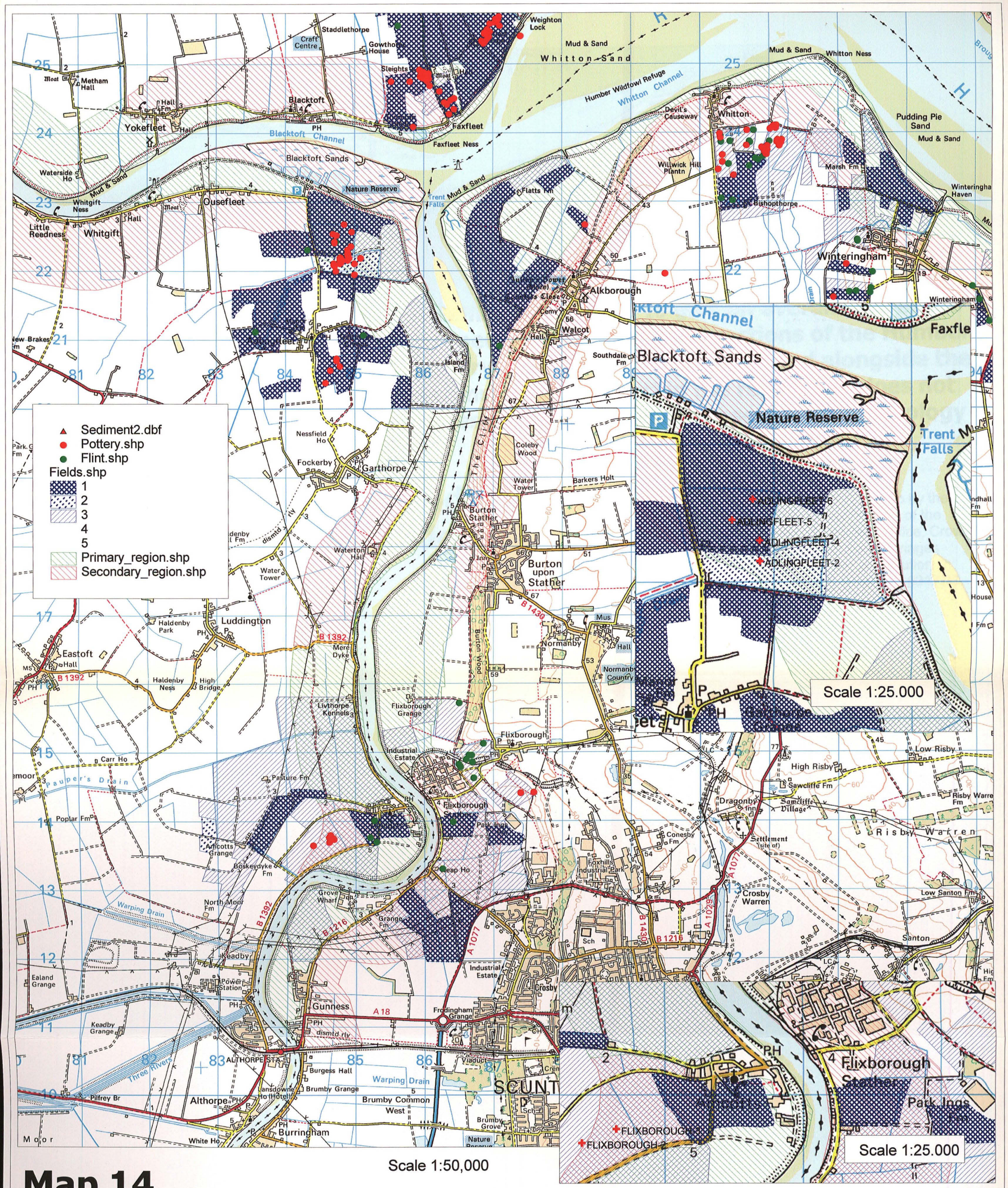
Classes 1 and 3 are fields that were field walked. Class 2 reflects fields that were visited or were excavations were carried out but the field was not walked. On the 1:50,000 map are shown find spots of flint and pottery and the location of boreholes. In the boxes maps are shown giving the locations of the published sites within the Humber Wetlands Project volumes with their site names. These maps are at a scale of 1:25,000. The maps at 1:50,000 give an impression at the density and location of finds whereas the separate boxes link this data to the published examples.

POTENTIAL

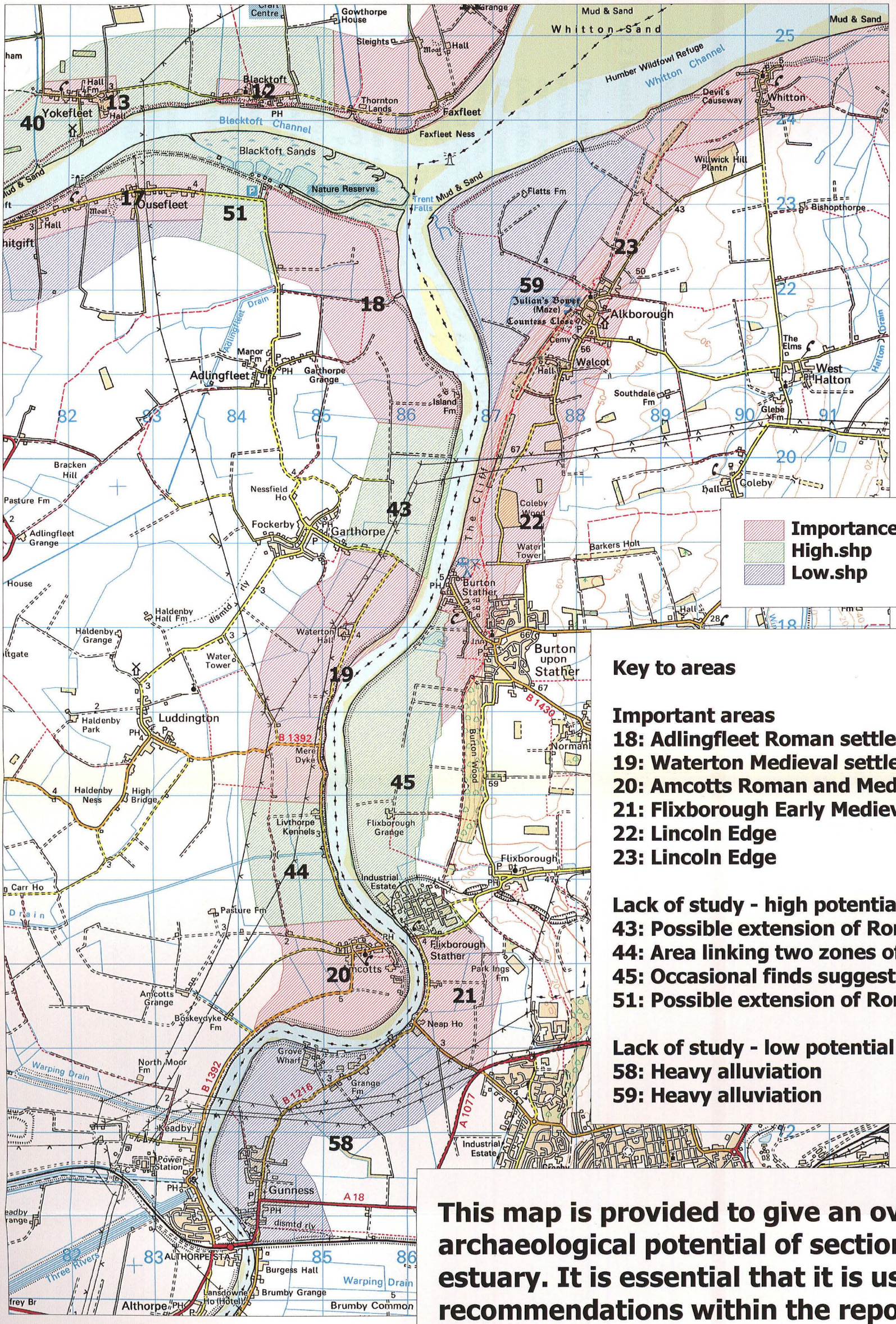
The management unit is shown at a scale of 1:50,000 with areas highlighted as Important, Lack of study with high potential and Lack of study with low potential. These maps must be used in conjunction with the recommendations sections from each management unit.

Map 13
Management Units 4c & 4d
Trent Falls to Keadby Bridge
Known archaeology

Scale 1:50,000



Map 14
Management Units 4c & 4d
Trent Falls to Keadby Bridge
Humber Wetlands Project data



Key to areas

Important areas
18: Adlingfleet Roman settlement
19: Waterton Medieval settlement
20: Amcotts Roman and Medieval settlement
21: Flixborough Early Medieval settlement
22: Lincoln Edge
23: Lincoln Edge

Lack of study - high potential
43: Possible extension of Roman settlement
44: Area linking two zones of Medieval settlement
45: Occasional finds suggest activity
51: Possible extension of Roman settlement

Lack of study - low potential
58: Heavy alluviation
59: Heavy alluviation

This map is provided to give an overall idea of the archaeological potential of sections of the Humber estuary. It is essential that it is used alongside the recommendations within the report and does not represent the presence or absence of archaeology

Map 15

Management Units 4c & 4d
Trent Falls to Keadby Bridge
Potential

Scale 1:50,000

12. Management Unit 5: Whitton to South Ferriby cliff

12.1 Background

MU5 extends between Whitton to the west and South Ferriby Sluice to the east. Previous archaeological research and finds in this area have identified activity dating from the Iron Age and later, particularly from the Roman and Post-Medieval periods, although earlier evidence comes from the submerged forest on the foreshore near Whitton. The earliest archaeological evidence comes from finds near Winteringham of Iron Age pottery, but in association with Roman material. Roman activity is well-known from the area with the site of the Roman settlement of Winteringham and the stretches of Roman roads, both mostly contained within the Secondary research area (see Figure 7). Extensive evidence for Roman activity has also been located at Whitton with several pottery scatters recovered by the *Humber Wetlands Project*. Early Medieval activity is represented by the find of an Anglo-Saxon pin from the Winteringham area. Post-Medieval activity is well represented within MU5 with several buildings including a mill, the various remains from maritime activities including sluices, a harbour and shipyard, and industrial remains including a brickyard. A twentieth century beacon is also recorded at Whitton Ness.

12.2 Identified archaeology (MAP 16)

The submerged forest (ARC350) on the foreshore near Whitton probably provides the earliest remains in MU5 (Figure 30). Archaeologically, the earliest remains within the Primary study area relate to Iron Age pottery (ARC486), although this find is associated with later material dating to the Roman and Medieval periods. The Roman period is well represented within this region, with scatters of pottery (ARC500 and ARC501) and the remains of a road (ARC482 and ARC484). An extension of this road has also been identified on the foreshore to the northwest of South Ferriby (ARC354 and ARC355). The remains of this road exposed on the foreshore were investigated by the *Humber Wetlands Project* (Figure 31) (South Ferriby-2 – Chapman *et al.* 1998). The Early Medieval period is represented by the discovery of an Anglo-Saxon pin (ARC491). The most thoroughly represented is the Post-Medieval period with evidence for buildings (ARC475 and ARC503), a mill (ARC480), a harbour (ARC400), a shipyard (ARC496) and two sluices (ARC477 and ARC481). The South Ferriby Sluice is a Scheduled Ancient Monument. Other recorded features include a brick platform near Whitton Ness (ARC348), a sundial at South Ferriby (ARC476) and a brickworks near Winteringham (ARC495). A twentieth century beacon is also recorded from Whitton Ness (ARC346).

A number of features are recorded by the SMR extending between a number of different periods within this region, including pottery (ARC486 and ARC501) and a ferry (ARC497).

Figure 30: The buried forest at Whitton Ness. © WAERC.

Figure 31: Excavation of the Roman road at South Ferriby. © Humber Wetlands Project.

12.3 Humber Wetlands Project data (MAP 17)

During the survey of the Ancholme and lower Trent valleys (1996-97), two mapviews were placed in this management unit – Whitton and South Ferriby. The Whitton mapview is centred on Whitton Ness and follows the estuary southwards towards Winteringham. The South Ferriby mapview is centred on South Ferriby sluice and the River Ancholme (see section 12.10).

12.4 Palaeoenvironmental data

General

Two areas of this unit have been studied. The area of Winteringham Grange, close to Winteringham, and the area to either side of South Ferriby Sluice. Winteringham Grange provided good palaeoenvironmental material with two peat horizons. South Ferriby produced deposits with a layer of woody peat. These sites provide data associated with the past vegetation of the area and for sea-level fluctuations from the Mesolithic onwards.

Winteringham Grange

Gaunt *et al.* (1992) identified up to 1.5 m of surficial peats infilling palaeochannel features at Winterton Beck, with more than 2 m present at greater depths locally. A sequence of Holocene deposits was also recorded at the northern end of Booth Nooking Lane (Whitton Ness: SE92302434). This comprised laminated clay-silts and fine sands over brownish-black peat with wood macrofossils between 5.68 and 6.26 m depth. Basal deposits consisted of laminated silts into clay silt and finally chalk above till at 10.0 m (-6.19 m OD).

Lillie (1998b) carried out coring transects in the same area, running east-north-east for c. 150 m from SE912223 and north for *c.* 80 m from SE9232324. These transects demonstrate Holocene floodplain deposits consisting of silt-clay alluvium over two peat horizons. The upper peats tend to be woody fen-carr peats, whilst the lower organics contain *Phragmites* remains suggesting reedswamp formation. The base of the lowermost organics descends to 7.5 m (-4.75 m OD) below the modern floodplain. The north-south transect revealed a similar sequence of oxidised silt-clay alluvium over peat above unoxidised alluvium, with a lower peat unit above Lake Humber silts. The deepest borehole reached a maximum depth of 6.5 m below the floodplain. Analysis of pollen from organics on the ENE transect at a depth of 7.44 m indicate local fen carr with mixed woodland present nearby, indicating the deposits were forming at some point in the mid-Holocene (6300-5200 BP). A pollen sample from closer to the edge of the floodplain indicated later (2600 BP or later) peat formation.

South Ferriby

Neumann (1998) carried out a coring transect at South Ferriby near to the confluence with the Humber. The transect ran east-north-east some 250 m across the floodplain at the neck of the Ancholme valley from SE969211. This revealed silt-clay alluvium overlying a layer of woody peat between -2.5 to -3.5 m OD merging into a peat with *Phragmites* remains. On the eastern side of

the floodplain the depth of boreholes becomes progressively shallower as the lower peat rises from a depth of -2 m to 2 m OD. A grey clay layer 2.5-3 m thick with herbaceous macrofossils underlies this unit across the valley. Deeper channel deposits were encountered in the central area of the floodplain with inorganic fine sandy silt and clay extending to *c.* 7 m below the surface. Sandy loam and glacio-lacustrine clay in turn underlie the Holocene valley fill.

Samples for radiocarbon dating were taken from the basal peats and show the development of these organic units over four millennia (4900-900 BC; OxA-7057 and 7067). The infill of the main tidal channel was complete by the mid-Holocene and wetland formation continued from 3800 BC to reach their maximum extent at the Bronze Age-Iron Age transition (1000-790 cal BC, 2690±70 BP; OxA-7067). Pollen samples from the organics show the presence of dense lime-oak-elm woodland on the drier areas with alder-hazel carr on the floodplain. Evidence for human activity in the form of high percentages of Poaceae and *Plantago lanceolata* is apparent in the pollen sample from the peat dated to 3890±60 BP (2470-2290 cal BC).

The sedimentary sequences from Winteringham and South Ferriby reflect the formation of different deposits in relation to changes in relative sea-level due to the low-lying relief and openness to the Humber estuary. The development of the lower peat probably resulted from a rise in base-levels and the establishment of alder carr following paludification of the valley bottom, dated from around 5200 BP by Neumann (1998). Continuing rise in sea-level led eventually to marine encroachment and the deposition of clastic sediments over the peat within a saltmarsh environment. The transgressive episode may have occurred during the middle Bronze Age (*c.* 3600 BP), with evidence for another fluctuation toward drier conditions during the Roman period (1900-1500 BP).

12.5 Walk-over survey

During the walk-over survey, three areas were visited within this management unit. These visits highlighted several areas of high potential.

South Ferriby TA968212: Small intertidal zone. Only visible archaeology is the previously investigated Roman Road. Land behind the defences is mainly industrial and arable.

Wintringham Haven SE935229: Large expanse of saltmarsh deposits in front of the sea defences. Land to the rear of defences consists of a mixture of arable and pasture.

Wintringham Marsh Farm SE923243: Area to the south is a large area of saltmarsh. At SE921248 the Halton Drain outfalls into the Humber and has associated modern structural timbers. To the north the area around Whitton Ness (SE918252) has high potential for archaeology. This zone has a visible buried forest at low tide and the area has less alluvial deposition than the previous areas studied. This area has parallels with the areas of the Melton and North Ferriby foreshores and any work that will impact on the archaeology

should be preceded by a full survey of the area affected. Area behind the defences is arable land.

12.6 Potential

The archaeological potential of this management unit has been shown with the discovery of the Roman Road at South Ferriby and the extensive evidence for Roman activity at Winteringham. The postulated harbour at Winteringham, providing the landing place for the ferry across the Humber has yet to be firmly identified and any work in this stretch of the defences may reveal this information. The area of the Roman Road at South Ferriby has the potential to reveal further sections of this road but recent attempts to locate this structure ahead of work on the defences has failed to locate the inland extension (Lindsey Archaeological Services 1999).

The foreshore area at Whitton Ness has visible evidence of a buried forest in the peat bed and the potential remains for extensive archaeology to be preserved in this area as has been seen at North Ferriby and Melton on the north bank. Observations made during the walk-over survey have highlighted this potential and this indicates that a full foreshore survey should be conducted of this area.

12.7 Vulnerability

Active erosion is occurring throughout the management unit. The Roman road at South Ferriby is eroding. A large portion of the land around Winteringham Haven has extensive saltmarsh in front of the defences and hence archaeology has been hard to locate previously in these areas. Any works may therefore encounter unknown finds. The area of Whitton Ness has been shown to hold very high potential and any works in this area may affect the peat bed in front of the defences.

12.8 Importance (MAP 18)

This area contains a complex and extensive Roman landscape. Evidence has been recovered from Whitton to South Ferriby Cliff with the Roman settlement at Winteringham being of particular importance. The possible associated port still to be identified. The presence of the Roman road on the foreshore at South Ferriby Sluice further highlights the potential of this unit. This unit also consists of an area of foreshore at Whitton Ness which has been understudied and which on initial assessment may hold equivalent deposits to the foreshore in the area of North Ferriby and Melton. The area to the rear of the foreshore, along the floodplain of the Ancholme has deep deposits and little recovered archaeology.

12.9 Recommendations

These recommendations are based on the existing, available knowledge of archaeology for the region. Areas of high potential are those that already have a large collection of archaeological materials, where such remains

are either still present *in situ* or where additional discoveries should be anticipated. Areas described as having a lack of knowledge and a low potential are those where little work has been carried-out, and where work has been undertaken has revealed few archaeological remains. The potential exists in these areas for significant discoveries of previously unknown sites. Areas described as having a lack of investigation but high potential are those where little work has been carried-out but the work which has been undertaken has indicated a high probability for the recovery of archaeological remains in the area. These recommendations are preliminary and further analysis should be undertaken on each area when management plans are produced.

The SMP selected strategy for the unit is to investigate the potential for setback and to hold the line until the need for repair or improvement. The high importance and potential of this unit would mean that any movement from the present line or setback would have to be carefully evaluated. Further investigations in the region of Whitton Ness and Winteringham Haven may be needed to establish the exact of potential of these zones.

12.10 Detailed list

Archaeology from the Primary survey area

No	Xcoord	Ycoord	Source	Site Type	Date
ARC344	491830	425100	UW4A	POST ALIGNMENT	PU
ARC345	491940	425030	UW4B	POSTS	PU
ARC346	492000	424980	UW4C	BEACON	C20
ARC347	492020	424960	UW4D	EXPOSURE	PU
ARC348	492110	424870	UW4E	PLATFORM:BRICK	PM
ARC349	492120	424850	UW4F	TIMBER	PU
ARC350	491730	425270	UW4G	BURIED FOREST	PRE
ARC351	495570	421520	UW5A	TIMBER	PU
ARC352	497070	421250	UW6A	POSTS	PU
ARC353	497630	421210	UW6B	POSTS	PU
ARC354	497110	421250	UW6C	ROAD	RO
ARC355	497150	421250	UW6D	ROAD	RO
ARC400	497650	420900	SMR	HARBOUR	PM
ARC404	495280	421390	SMR	WATCHING BRIEF	PU
ARC406	497330	421140	SMR	WATCHING BRIEF	PU
ARC475	498840	421360	SMR5144	BUILDING:HOUSE	C19:1805
ARC476	497600	421100	SMR7149	SUNDIAL	PM
ARC477	497500	421070	SMR1666	SLUICE	C19
ARC478	497520	421040	SMR9482	WATERCOURSE	
ARC479	497630	420890	SMR3824	FIND:POTTERY	RO
ARC480	497280	420850	SMR7787	MILL:SITE	C19:1824
ARC481	497500	420900	SMR17656	SLUICE:SITE	C17
ARC482	497200	421200	SMR16777	ROAD	RO
ARC484	495000	421500	SMR100	ROAD	RO
ARC485	494800	421600	SMR2067	HARBOUR	RO
ARC486	494700	422200	SMR2058	FIND:POTTERY:BURIAL	IA:RO:MED
ARC487	494640	422150	SMR19388	FIND:FLINT	PM
ARC491	494300	422200	SMR18569	FIND:PIN	AS

ARC495	493100	422700	SMR17663	BRICKWORKS	C19
ARC496	493550	422890	SMR17665	SHIPYARD	PM
ARC497	493600	423000	SMR12652	FERRY	RO:MED:PM
ARC500	492410	424010	SMR2144	FIND:POT	RO
ARC502	490400	424600	SMR2143	FIND:POT	RO:MED
ARC503	490280	424600	SMR8510	BUILDING	C18:C19

Aerial Photographs in the Primary Survey area

No	Xcoord	Ycoord	Source	Site Type	Date
AP15	490500	424900	OBL	CM:FIELD	PM
AP19	493700	422700	OBL	CM:CIRCLES	PU
AP46	493700	422800	OBL	CM:CIRCLES	PU

HWP survey data in the Primary survey area

South Ferriby-2: Excavation of small stretch of the Roman Road mentioned above (ARC482,484) (Chapman *et al.* 1998. 242-244).

Secondary survey area

No sites were identified in the areas studied by HWP in the Secondary survey area (see section 12.3).

Palaeoenvironmental data in the Primary survey area

NO	XCOORD	YCOORD	SOURCE	FORM	SITE_TYPE	DEPTH
PAL1	497400	420900	PAPER		CLAY PIT	20.00
PAL27	492300	424340	BGS		BOREHOLE	37.90
PAL28	493530	423030	BGS		BOREHOLE	30.60
PAL35	496200	421200	BGS		BOREHOLE	18.30
PAL36	496500	421200	BGS		BOREHOLE	18.30
PAL37	496700	421200	BGS		BOREHOLE	27.70
PAL38	495958	421272	BGS		BOREHOLE	46.50
PAL39	497610	421043	BGS		BOREHOLE	93.50
PAL40	495355	421160	BGS		BOREHOLE	37.50
PAL41	495140	421315	BGS		BOREHOLE	41.10
PAL44	496850	421130	BGS	HMB3	BOREHOLE	9.00

KEY TO MAPS

KNOWN ARCHAEOLOGY

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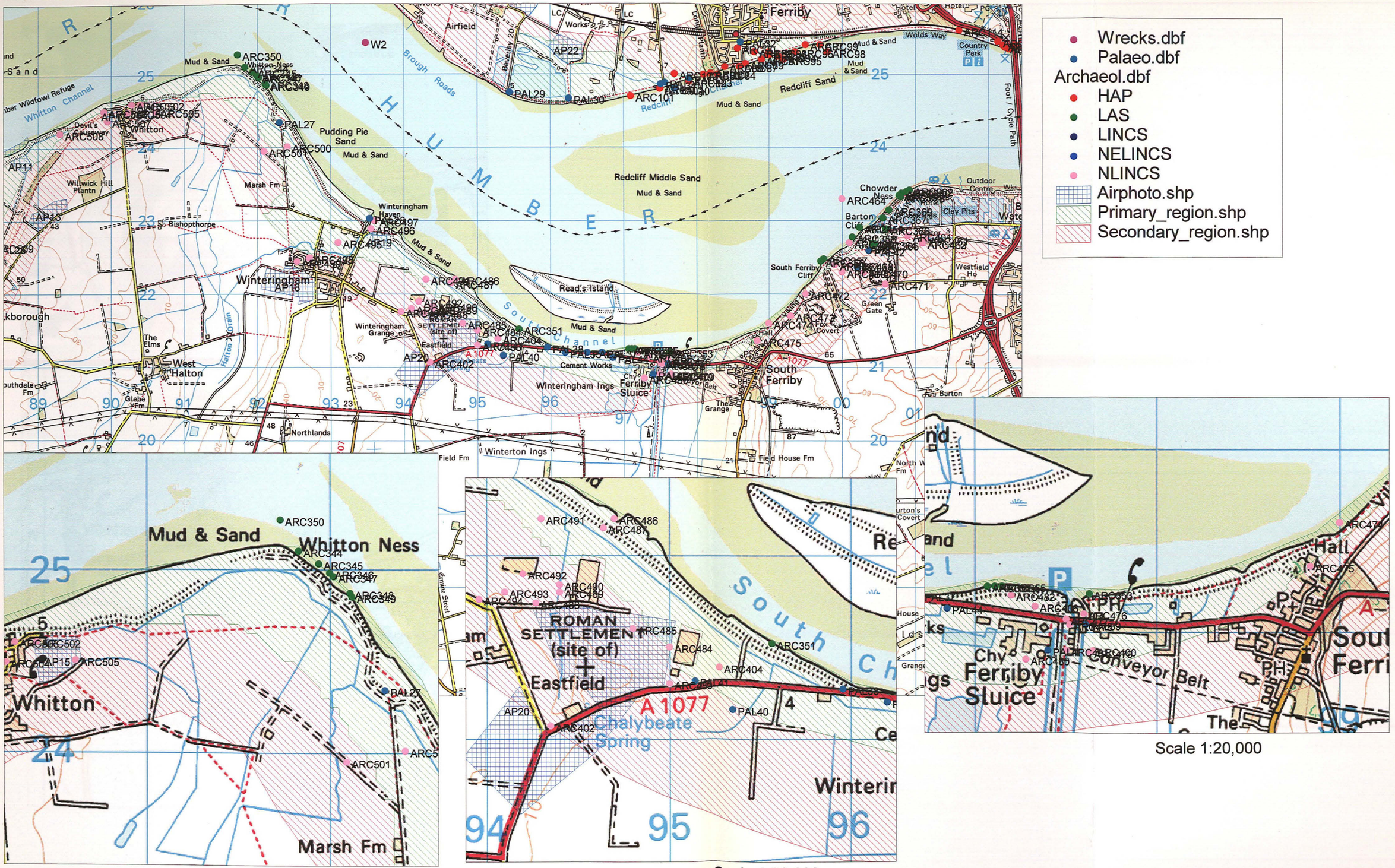
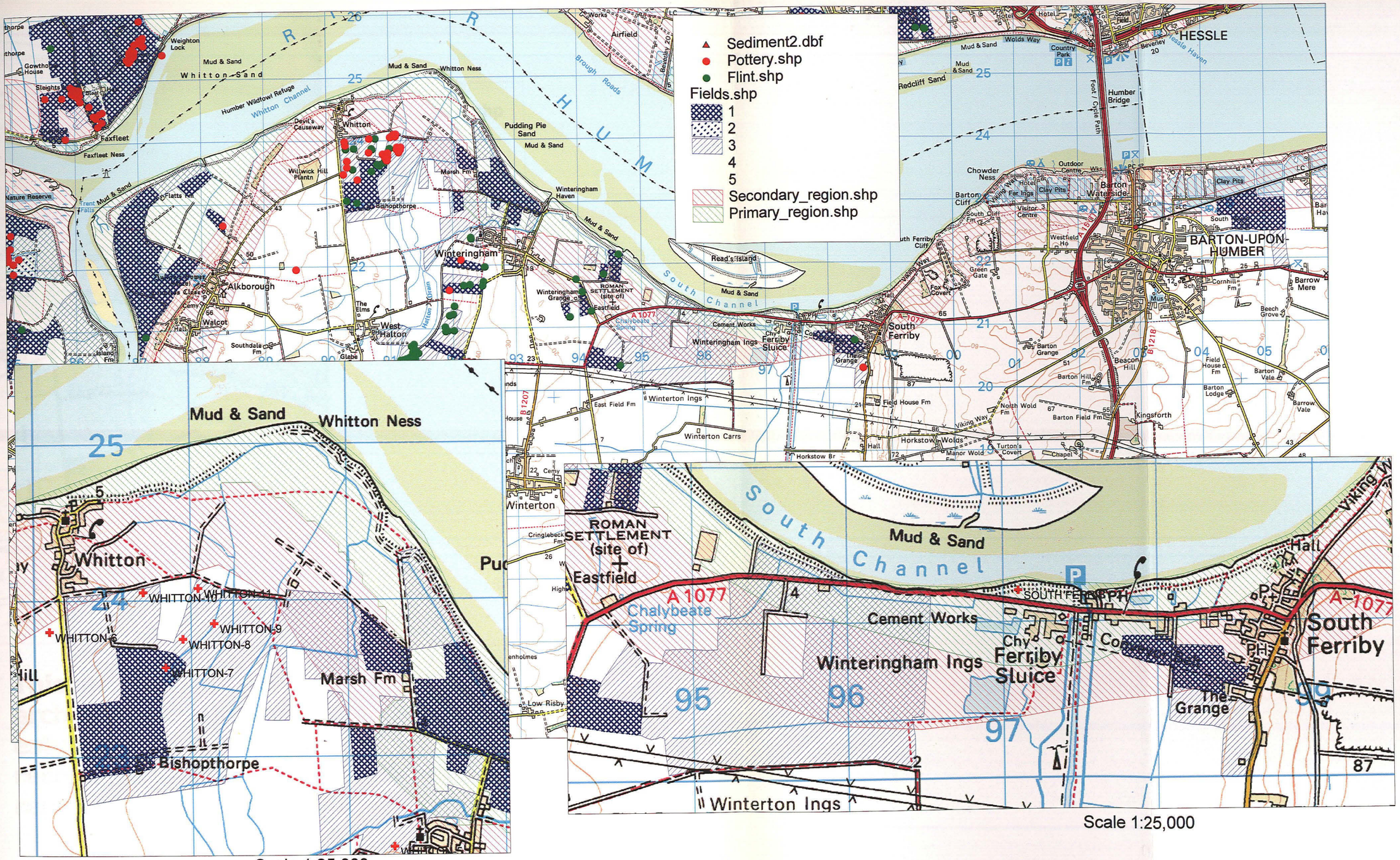
POTENTIAL

The management unit is shown at a scale of 1:50,000 with areas highlighted as Important, Lack of study with high potential and Lack of study with low potential. These maps must be used in conjunction with the recommendations sections from each management unit.



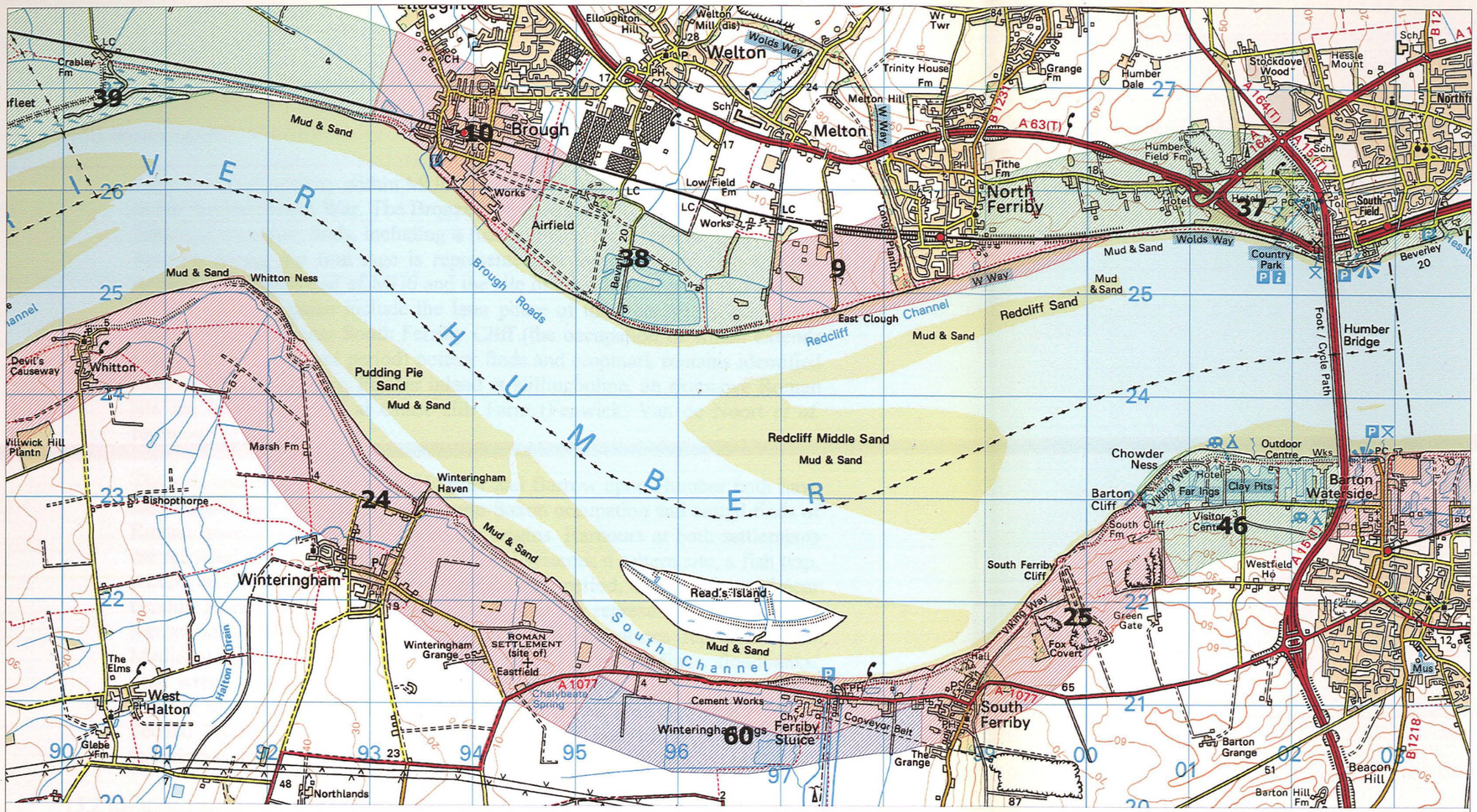
Map 16
Management Unit 5 Whitton to South Ferriby Cliff
Known archaeology

Scale 1:50,000



Map 17
Management Unit 5 Whitton to South Ferriby Cliff
Humber Wetlands Project data

Scale 1:50,000



This map is provided to give an overall idea of the archaeological potential of sections of the Humber estuary. It is essential that it is used alongside the recommendations within the report and does not represent the presence or absence of archaeology

Key to areas

Important areas
24: Whitton and Winteringhm Roman settlements
25: South Ferriby Roman road and settlement

Lack of study - low potential
60: Deep alluviation

Map 18
Management Unit 5 Whitton to South Ferriby Cliff
Potential

Scale 1:50,000

13. Management Unit 6: South Ferriby Cliff to North Killingholme

13.1 Background

Archaeological activity within MU6 is evidenced from the Bronze Age period to the Second World War. The Bronze Age is represented by a series of small finds and foreshore finds, including a fish trap near New Holland (Figure 32). Activity during the Iron Age is represented by the discovery of a figurine towards the eastern end of MU6 and the site of a settlement near East Halton. Roman period remains include the later phase of the Iron Age settlement, a second settlement near South Ferriby Cliff (the occupation of which extends into the Early Medieval period) pottery finds and cropmark remains identified from aerial photography. Further inland at Killingholme, an extensive Roman site has been excavated at Chase Hill Farm (Fenwick, Van de Noort *et al.* forthcoming).

The settlements at Barton-upon-Humber and Barrow upon Humber both have early beginnings with evidence of Anglo-Saxon occupation and casual finds of Roman material suggesting even earlier origins. Harbours at both settlements are recorded as being equally as early. Field systems, a saltern site, a fish trap, pottery and a moated site represent the Medieval period, the latter located near Goxhill Haven, and the earlier part of this period is represented by an Anglo-Saxon burial. However, the majority of recorded features represent Post-Medieval ventures. These include jetties, waste heaps, buildings, floodbanks, pits, wrecks, brickyards, kilns, a railway station and a gas works, plus a number of individual finds. The later jetty constructions and a number of Second World War features including a decoy and battery site represent the twentieth century.

13.2 Identified archaeology (MAP 19)

The area of the foreshore at Barton-upon-Humber, just in to the east of the Humber Bridge has extensive evidence for a buried forest. Bronze Age activity in the Primary study area of MU6 is evidenced from finds including a fish trap on the foreshore at New Holland (Barrow-8), an axe (ARC466) and pottery (ARC467) from Barton Cliff and a flint scatter from the Goxhill area (Goxhill-3). The Iron Age is represented by the earlier phases of a settlement near East Halton (ARC405) and a figurine discovered from the same general area (ARC431). Roman period evidence includes the later phase of the settlement near East Halton (ARC405), crop marks and field system remains (ARC428, ARC436 and ARC551) and scatters of pottery (ARC430, ARC432, ARC437, ARC443, ARC444 and ARC449). The earlier phase of a second settlement, near New Holland, also has evidence for Roman period activity (ARC473).

The Early Medieval period is visible from a number of finds. The later phase of the Roman settlement near New Holland contains Anglo-Saxon evidence (ARC473) and burial remains also reflect this period (ARC474). Field systems in various conditions of preservation (ARC423 and ARC551), a saltern (ARC424), a fish trap (ARC429), pottery finds (ARC430, ARC432 and

Figure 32: Bronze Age fish trap on the foreshore at New Holland. © Humber Wetlands Project.

ARC443) and a moated site near Goxhill Haven (ARC438) reflect activities during the Medieval period.

Post-Medieval period remains are the most commonly recorded features within MU6. These include waste heaps (ARC356 and ARC364), jetties (ARC357, ARC371, ARC374 and ARC445), buildings (ARC378, ARC379, ARC391 and ARC393), pits (ARC380, ARC383, ARC394 and ARC395), floodbanks and defences (ARC382, ARC390, ARC396 and ARC446) and brickyards (ARC419 and ARC427). A tidal dock (ARC447) and a railway station (ARC448) at New Holland, a kiln near Goxhill Haven (ARC439) and a gas works at New Holland (ARC450) are also known. A series of wrecks (ARC387 and AP28) and hulks (ARC370) are known from below the intertidal zone. Finally, removed Post-Medieval field systems have been identified from the region (AP29), a shaft is known from the Skitter Ness region (ARC388), a mace (ARC440) and finds of pottery (ARC432 and ARC443) have been also discovered.

Recorded remains from the twentieth century include jetties (ARC392 and ARC445) and buildings (e.g. ARC378). Second World War sites in MU6 include a battery site (ARC414) and a decoy (ARC426).

Two sites which have just been added to the SMR and were not included when the data was original searched are an early twentieth cement works which is eroding from the edge at TA011234 and a stone causeway which can be seen at low tide at TA02852355. This structure includes architectural fragments that possibly came from Thornton Abbey and possibly dates from the late sixteenth century (A. Williams pers. comm..

13.3 Humber Wetlands Project data MAP 20

During the survey of the Lincolnshire Marsh (1999-2000), two mapviews were placed over the area of this management unit – Barrow and Goxhill. The Barrow mapview incorporates the area of Barrow Haven to New Holland and the Goxhill mapview incorporates the area of Goxhill Haven and East Halton Skitter (see section 13.10).

13.4 Palaeoenvironmental data

General

Coring has been carried out at two locations in this management unit – Barrow Haven and East Halton Skitter. At Barrow Haven the deposits hold good potential to help date fluctuations in sea-level. At East Halton Skitter deep channel infill sequences were recovered with up to 7.7 m of deposits. Dateable deposits from this location show ages that are pre-Elm Decline (pre-4000 cal BC).

Specific data

Long *et al.* (1998) investigated a sequence from a small tidal inlet near to Barrow Haven. Pollen, diatom and radiocarbon analyses of a 2.24 m thick sedimentary unit consisting of two peats intercalated within grey clays with a

basal deposit of white sand were carried out. The lowermost of the peats (+1.44 and +1.49 m OD) was dated to 2325±60 BP, whilst the regressive (+1.79 m OD) and transgressive (+2.07 m OD) contacts of the thicker upper peat are dated to 2040±40 and 1080±40 BP respectively. The pollen data show that saltmarsh was present at both the beginning and end of peat accumulation, with reed swamp and freshwater sedge fen present in the intervening period.

Lillie and Gearey (forthcoming) excavated a 250 m long transect across a small drain that flows into the Haven at TA063229. The transect was excavated between TA0642283.01 and TA065230.02, following a north-south alignment. The evidence from TA064228.03 in this transect fully conforms to the uppermost limits of peat development as identified by Long *et al.* (1998), and would confirm a post-Roman (PZVIII) age for the upper stages of peat formation. The similarities in sedimentary sequences identified along this transect would suggest that peat formation intercalated with marine transgressive deposits occurs from a PZVIIb age of *c.* 800-200 BC through to the more recent historical period at AD 890-1030 at Barrow Haven.

A second transect was excavated in a north-south direction for a distance of 230 m, across the Beck and Butforth Drains between TA074218.02 and TA075223.01 (Lillie and Gearey forthcoming). The boreholes reached a maximum depth of 2.4 m through Holocene sediments. Organic horizons intercalated with alluvium at this location have shown that in the thin organics at the base of the alluvial unit the presence of *P. maritima* may well attest the onset of marine conditions close to the sampling site. This is likely to correlate to the transition from lower peat to alluvium as identified by Long *et al.* (1998).

The limited presence of woodland taxa is likely to reflect a mixed hazel-oak-alder woodland on and around the sampling site. The higher ground to either side of the site would certainly be expected to support such communities. The PZVIIb to PZVIII age inferred from the palynology again conforms to the chronological outline obtained by Long *et al.* (1998) further west in the Haven. Between the base and top of the peat sequence in TA075220.01 a shift is recorded from a mixed wooded and open landscape towards one where reedswamp-type and open grassland communities dominated. These latter environments mirror those found further west at Barrow Haven, where a date of AD cal 890-1030 (1080±40 BP SRR-1373) has been obtained for the top of the sequence. The relative absence of an upper alluvial unit at this current sampling location probably reflects reduced marine influences due to the greater height of the catchment away from the Haven.

To the east of the Barrow Haven, at the East Halton Skitter, further excavation of a transect across the palaeochannel between TA129229.01 and TA136225.02, have revealed in excess of 7.7 m of channel infill sequences (Lillie and Gearey forthcoming). Palynological analyses of a basal wood peat horizon occurring between 6.36 and 7.26 m indicates that at the base of borehole TA136225.01, high values for *Alnus* (38%) suggest the close proximity of alder, probably forming carr communities on the damper soils of the adjacent floodplain. Mixed woodland with lime, oak, elm and some hazel

is attested, probably on the higher areas of till to the northwest and southeast, is also inferred. A woodland habitat with ivy, holly and honeysuckle is indicated, suggesting the canopy was not completely closed. This impression is reinforced by the representation of Poaceae at 10%, indicating some open grassy areas, with other herbs of Cardueae/Asteroideae, *Galium*-type, Apiaceae and Chenopodiaceae all present at 1% or less. This pollen assemblage must belong to a pre-Elm Decline context in PZVIIa (pre-4000 cal BC) (Lillie and Gearey forthcoming).

On the northwestern side of the floodplain at TA131228.02 at a depth of 3.15 m, oak is well represented, with other tree and shrub pollen including alder, lime and hazel also present. Oak-dominated woodland is inferred, in which lime would also have been a significant component, bearing in mind its poor representation in the pollen record (see Lillie and Gearey 2000 for discussion of the status of lime woodland in East Yorkshire). The percentages of elm indicate that it quite probably dates to a pre-Elm Decline, PZVIIa context.

13.5 Walk-over survey

During the walk-over survey a single area was visited within this management unit.

Barton Cliff TA004229: Silty foreshore. To the west at TA00252285 there are numerous stakes running parallel to the foreshore representing earlier sea defences. Land to the rear is arable.

13.6 Potential

This area has high potential to preserve archaeology within the foreshore zone as has been shown with the discoveries of the buried forest and the Bronze Age fish trap. With discoveries in this area also indicating extensive early settlement in the region then there is potential to discover further wet preserved deposits close to the current line of the defences. The area of Barrow Haven, an early harbour, has revealed casual finds of pottery on the foreshore and it should be anticipated that this area will hold the potential for further discoveries.

Recent work at East Halton has expanded the areas of known settlement with an extensive Roman settlement uncovered with the potential for associated salt-working and trade on the Humber. Previous finds from the East Halton Skitter region also suggest that this was an important trade area.

13.7 Vulnerability

The settlement at South Ferriby Cliff has gradually been eroded away by the Humber but there is possibility that some archaeology may remain in this highly erosive zone. Erosion in other areas of the foreshore also threatens archaeology as at the same time revealing new sites such as the fish trap at New Holland.

13.8 Importance (MAP 21)

The majority of the foreshore zone has been classed as important. This is due to the large amount of evidence that has already been recovered. This includes a buried forest at Barton, a Bronze Age fish trap at New Holland, Barton and Barrow Havens and numerous isolated finds of Roman and Medieval pottery. This area has the potential for continued recovery of archaeology and can provide valuable information on the use of the river through a long period of time. The buried forest also has the potential in helping to understand environmental change in the region. Areas that have been described as lacking study but with high potential are those that have been affected from clay extraction and where previous work has revealed little archaeology.

13.9 Recommendations

These recommendations are based on the existing, available knowledge of archaeology for the region. Areas of high potential are those that already have a large collection of archaeological materials, where such remains are either still present *in situ* or where additional discoveries should be anticipated. Areas described as having a lack of knowledge and a low potential are those where little work has been carried-out, and where work has been undertaken has revealed few archaeological remains. The potential exists in these areas for significant discoveries of previously unknown sites. Areas described as having a lack of investigation but high potential are those where little work has been carried-out but the work which has been undertaken has indicated a high probability for the recovery of archaeological remains in the area. These recommendations are preliminary and further analysis should be undertaken on each area when management plans are produced.

The SMP selected strategy for this unit is possible compensation for inter-tidal loss and to hold the line. If any areas are selected for possible setback then the foreshore would need to be thoroughly surveyed before work as the effects could cause erosion to this important resource. The recovery of isolated finds of Roman pottery may indicate that further riverside settlements such as the one recently discovered at East Halton Skitter, may exist at further locations along this management unit. Therefore any work close to the defences may reveal archaeology.

13.10 Detailed list

Archaeology from the Primary survey area

No	Xcoord	Ycoord	Source	Site Type	Date
ARC356	499710	422450	UW7A	WASTE HEAP	PM
ARC357	499750	422480	UW7B	JETTY	PM
ARC358	500140	422780	UW7C	POSTS	PU
ARC359	500240	422910	UW7D	?JETTY	PU
ARC364	500420	422690	UW7I	WASTE	PM
ARC365	500450	422680	UW7J	BUILDING	PM
ARC370	508550	424730	UW9A	HULKS	PM

ARC371	508680	424670	UW9B	JETTY	PM
ARC372	508960	424750	UW9C	EXPSOURE	PU
ARC373	509320	424880	UW9D	POSTS	PU
ARC374	509950	425080	UW9E	?JETTY	PM
ARC375	510070	425130	UW9F	POSTS	PU
ARC376	510300	425120	UW9G	POST ALIGNMENT	PU
ARC377	510670	425190	UW9H	EXPOSURE	PU
ARC378	508600	424600	UW9I	BUILDINGS	C19:C20
ARC379	508730	424560	UW9J	BUILDINGS:SITE	C19:C20
ARC380	508880	424620	UW9K	PITS	PM
ARC381	509830	424770	UW9L	DEPRESSIONS	PU
ARC382	510030	425070	UW9M	SM:FLOOD BANK	PM
ARC383	510380	425110	UW9N	PITS	PM
ARC384	511880	425460	UW10A	POSTS	PU
ARC385	512300	425560	UW10B	POST ALIGNMENT	PU
ARC386	512800	425500	UW10C	POST ALIGNMENT	PU
ARC387	513030	425430	UW10D	WRECKS	PM
ARC388	513040	425370	UW10E	SHAFT	PM
ARC389	513100	425380	UW10F	TIMBERS	PU
ARC390	512010	425450	UW10G	FLOOD BANK	PM
ARC391	512050	425470	UW10H	BUILDING:SITE	PM
ARC392	516180	420850	UW12A	JETTY	C20
ARC393	515620	421420	UW12B	BUILDING	PM
ARC394	515580	421380	UW12C	PIT	PM
ARC395	515850	421080	UW12D	PIT	PM
ARC396	514850	422870	UW12E	SEA BANK	PM
ARC397	514720	423000	UW12F	EXPOSURE	PU
ARC405	514200	422500	SMR	SETTLEMENT	IA:RB
ARC414	516000	420700	SMR18476	BATTERY:SITE	C20
ARC418	515100	421000	SMR17472	AP:DITCH	PU
ARC419	515660	421280	SMR9761	BRICKYARD	PM
ARC422	514200	422610	SMR768	AP	PU
ARC423	514500	422800	SMR1056	AP:FIELD SYSTEM	MED
ARC424	514000	422800	SMR8784	SALTERN	MED
ARC425	514100	422900	SMR17451	AP:CROPMARK	PU
ARC426	513700	422900	SMR18450	DECOY	C20
ARC427	514200	423100	SMR8770	BRICK YARD	PM
ARC428	513900	423300	SMR8777	AP:CROPMARK	RO
ARC429	514600	423100	SMR8774	FISHTRAP	MED
ARC430	514700	423100	SMR1589	FIND:POTTERY	RO:MED
ARC431	514700	423300	SMR17785	FIND:FIGURINE	IA
ARC432	514700	423500	SMR1591	FIND:POTTERY	RO:MED:PM
ARC433	514200	423490	SMR881	AP	PU
ARC434	514300	423600	SMR768	AP	PU
ARC435	514200	424200	SMR768	AP	PU
ARC436	513300	424100	SMR9898	AP:CROPMARK	RO?
ARC437	513800	424400	SMR1592	FIND:POT	RO
ARC438	511900	424800	SMR1583	MOAT	MED
ARC439	511900	425300	SMR18478	KILN	PM
ARC440	511900	425400	SMR7741	FIND:MACE	PM
ARC443	510500	425400	SMR1588	FIND:POT	RO:MED:PM
ARC444	509600	423900	SMR17868	FIND:POT	RO
ARC445	507900	424300	SMR16499	JETTY	C19:C20

ARC446	508000	424500	SMR411	FLOOD BANKS	C18
ARC447	508240	424400	SMR17280	TIDAL DOCK	C19:1848
ARC448	508150	424350	SMR17281	RAILWAY STATION	C19:1848
ARC449	508200	424300	SMR393	FIND:POTTERY	RO?
ARC450	508400	424100	SMR18481	GAS WORKS	PM
ARC465	500100	422700	SMR4672	FIND:BROOCH	PU
ARC466	500100	422700	SMR425	FIND:AXE	BA
ARC467	499900	422400	SMR1668	FIND:POTTERY	BA
ARC473	499300	421700	SMR1661	OCCUPATION	RO:AS
ARC474	499000	421600	SMR17552	BURIAL:INHUMATION	AS
ARC551	514000	423000	SMR MAP	AP:FIELD SYSTEM	RO:MED

Aerial Photographs in the Primary Survey area

No	Xcoord	Ycoord	Source	Site Type	Date
AP23	500500	422600	OBL	CM	PU
AP24	500200	422600	OBL	CM:CHANNEL	PU
AP28	510900	425200	OBL	WRECKS	PM
AP29	514800	420600	OBL	CM:FIELD	PM
AP30	514500	421500	OBL	CM:FEATURES	PU

HWP survey data in the Primary survey area

Barrow-8: Foreshore find. Bronze Age fish trap that has been flattened, originally conical in shape (Fenwick *et al.* forthcoming)

Goxhill-3: Field walking finds. 12 pieces of worked flint possibly dating to Bronze Age (Fenwick *et al.* forthcoming).

Secondary survey area

No sites were identified within the areas surveyed by the HWP in the secondary survey area (see section 13.3).

Palaeoenvironmental data in the Primary survey area

NO	XCOORD	YCOORD	SOURCE	FORM	SITE_TYPE	DEPTH
PAL42	500366	422596	BGS		BOREHOLE	5.50
PAL43	500210	422366	BGS		BOREHOLE	22.50
PAL45	509685	424116	BGS		BOREHOLE	17.40
PAL46	508668	424366	BGS		BOREHOLE	22.20
PAL47	510170	425010	BGS		BOREHOLE	15.20
PAL48	511200	425200	BGS		BOREHOLE	24.40
PAL49	512650	424910	BGS		BOREHOLE	21.00
PAL50	514500	422820	BGS		BOREHOLE	19.00
PAL51	514730	422460	BGS		BOREHOLE	20.00
PAL52	514420	423060	BGS		BOREHOLE	23.00
PAL53	513470	424360	BGS		BOREHOLE	18.00
PAL54	514530	423040	BGS		BOREHOLE	18.00
PAL55	514300	423700	BGS		BOREHOLE	13.00
PAL57	522200	414679	BGS		BOREHOLE	37.00
PAL58	522740	413880	BGS		BOREHOLE	2.00
PAL59	523520	413610	BGS		BOREHOLE	73.00
PAL60	522900	413400	BGS	HMB5	BOREHOLE	9.00

KEY TO MAPS

KNOWN ARCHAEOLOGY

The known archaeology is displayed with shading showing the Primary and Secondary areas at a scale of 1:50,000. The records for all the points can be found in the Appendices (Volume 2). The data shown include the location of archaeology, palaeoenvironmental sampling sites, wreck sites and aerial photographs. Where there is a large cluster of points these areas are shown in separate boxes at a scale of 1:20,000.

HUMBER WETLANDS PROJECT DATA

The management unit is shown at a scale of 1:50,000 with shading showing the Primary and Secondary areas. Overlaying this, further shading shows the fields that were studied by the HWP. These are subdivided into 5 classes depending on the type of survey which was carried out. Only classes 1 to 3 are shown on the maps. Classes 4 and 5 are areas that were visited but couldn't be surveyed due to either the presence of pasture or industrial development.

Classes 1 and 3 are fields that were field walked. Class 2 reflects fields that were visited or were excavations were carried out but the field was not walked. On the 1:50,000 map are shown find spots of flint and pottery and the location of boreholes. In the boxes maps are shown giving the locations of the published sites within the Humber Wetlands Project volumes with their site names. These maps are at a scale of 1:25,000. The maps at 1:50,000 give an impression at the density and location of finds whereas the separate boxes link this data to the published examples.

POTENTIAL

The management unit is shown at a scale of 1:50,000 with areas highlighted as Important, Lack of study with high potential and Lack of study with low potential. These maps must be used in conjunction with the recommendations sections from each management unit.

Scale 1:20,000

Scale 1:20,000

Scale 1:20,000

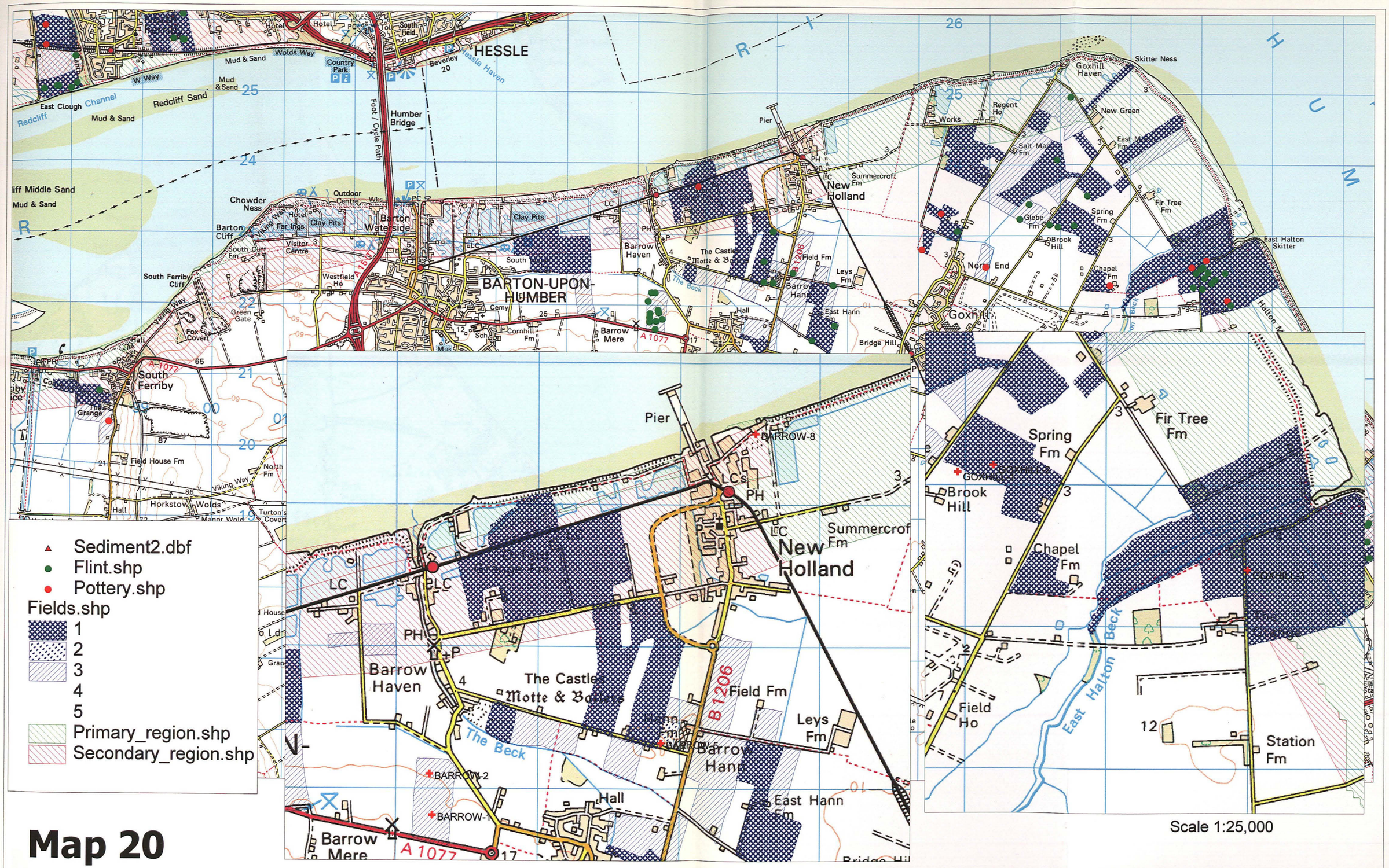
- Wrecks.dbf

Archaeol.dbf

- HAP
- LAS
- LINCS
- NELINCS
- NLINCS
- Palaeo.dbf
- Airphoto.shp
- Primary_region.shp
- Secondary_region.shp

Map 19
Management Unit 6
South Ferriby Cliff to North Killingholme
Known archaeology

Scale 1:50,000



- Sediment2.dbf
- Flint.shp
- Pottery.shp

Fields.shp

- 1
- 2
- 3
- 4
- 5

- Primary_region.shp
- Secondary_region.shp

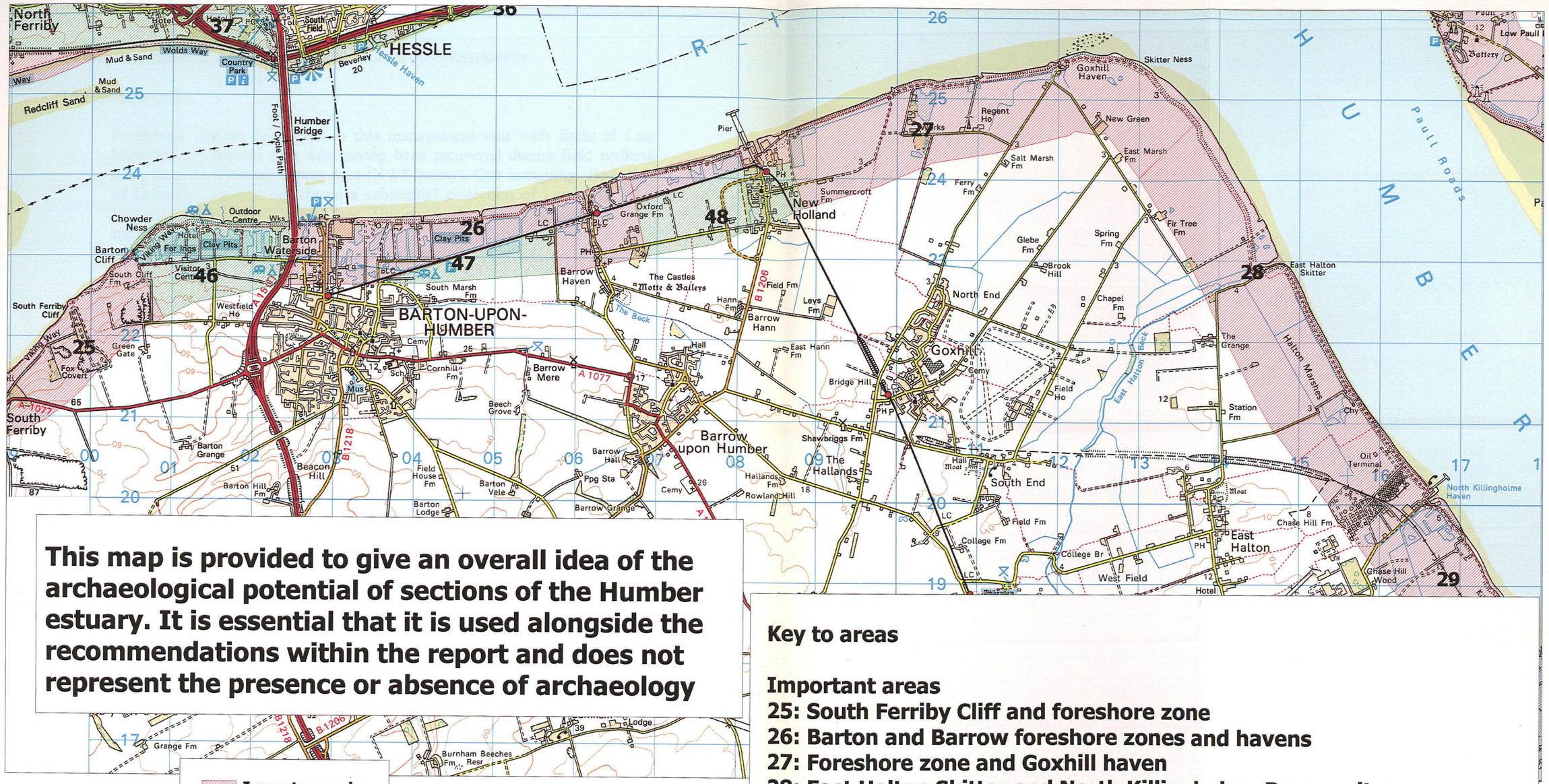
Map 20

Management Unit 6
South Ferriby Cliff to North Killingholme
Humber Wetlands Project data

Scale 1:25,000

Scale 1:50,000

Scale 1:25,000



This map is provided to give an overall idea of the archaeological potential of sections of the Humber estuary. It is essential that it is used alongside the recommendations within the report and does not represent the presence or absence of archaeology

Key to areas

Important areas
25: South Ferriby Cliff and foreshore zone
26: Barton and Barrow foreshore zones and havens
27: Foreshore zone and Goxhill haven
28: East Halton Skitter and North Killingholme Roman sites

Lack of study - high potential
46: Barton Cliff foreshore zone
47: Possible extensions of Early Medieval and Medieval settlement areas
48: Possible extension of Early Medieval settlement

Map 21
Management Unit 6
South Ferriby Cliff to North Killingholme
Potential

Scale 1:50,000

14. Management Unit 7: North Killingholme to Cleethorpes

14.1 Background

Prehistoric activity is present in this management unit with finds of Late Mesolithic to Bronze Age date having been recovered during field walking away from the Primary survey area (HWP below). One intriguing site is that of Grimsby-2 that has produced a substantial collection of Late Mesolithic flint along with finds of a later date. This site is situated on the saltmarsh and intertidal zone in front of Pyewipe works at the outfall of the River Freshney and suggests activity at either this site or a site close by.

Prehistoric finds have also been recovered from the area of Cleethorpes Beach including a flint adze, ground stone axe and a polished stone axe (Loughlin and Miller 1979). This evidence, along with that from Grimsby highlights the potential of the intertidal zone of this management unit to reveal early archaeological finds.

Grimsby has produced a range of evidence for Iron Age activity. This comes in the form of Iron Age coins but also the settlement at Weelsby Avenue (Wise 1990, Fenwick, Van de Noort *et al.* forthcoming) which suggests intensive activity.

Recent work and past finds from the area of North Killingholme suggest the potential for Iron Age and Roman occupation in the northern reaches of the management unit. Recent excavations to the west of Roper Road have revealed evidence for Iron Age and Roman structures and settlement (ARC403).

Medieval activity is highlighted in this area with evidence for the deserted Medieval village of Houflet, mentioned in the Domesday book which reportedly lies between the two Primary survey areas (ARC598, Beresford and Hurst 1971).

In the area of TA220150, now occupied by an industrial works, was located Stallingborough Battery. Originating as a battery of 24-pounders at the time of the Napoleonic Wars in the early 1800's (Dorman 1990), this site was later re-fortified in 1858 but was ruinous by 1887 and it was only the impetus of war in 1914 that caused a new structure to be built. This structure included concrete towers, magazines, accommodation and ancillary buildings, all surrounded by a defensive ditch (Dorman 1990). The site was abandoned at the end of the Second World War but parts of the structure still remain.

14.2 Identified archaeology (MAP 22)

The archaeology identified in the Primary survey area was all dated to the Post-Medieval period or later. Post-Medieval occupation is recorded on the SMR at Woad Farm (ARC599). Once again the importance of the Humber Defences was highlighted with evidence of two pillboxes (ARC575, ARC593) and an air raid shelter (ARC574) associated with Stallingborough Battery.

Two enclosures have been identified from aerial photographs but there is no dating evidence to accompany these sites (ARC594, ARC595). Soil colour variations were recorded by the LAS and may relate to archaeology but no verification of this has been made (ARC576).

14.3 Humber Wetlands Project data (MAP 23)

During the survey of the Lincolnshire Marsh (1999-2000), two mapviews were located within this management unit – Killingholme and Grimsby. The Killingholme mapview covers the area from North Killingholme to Immingham and the Grimsby mapview covers the area around Pyewipe (see section 14.7).

14.4 Palaeoenvironmental data

General

Coring carried out at Grimsby has shown deep deposits up to 13 m thick with peat horizons that provide data for dating sea-level change. Further coring at Healing revealed peat at a depth of 4 m+ with the potential for providing information on vegetation change.

Specific

Long *et al.* (1998) report that Core U4 at Union Dock, Grimsby revealed a 13 m thick sediment sequence consisting of a basal peat resting on stiff sandy grey clay with gravel overlain by thick clay. A second thin peat towards the base of this clay unit has a conformable lower contact but a possibly erosive upper contact. The lower contact of the basal peat (-8.87 m OD) is dated to 8170±45 BP and the upper contact (–8.79 m OD) to 6645±45 BP. No diatoms were present but the high percentages of tree pollen suggest a well-wooded landscape above direct marine influence. Pollen and diatom from the thin peat indicates it formed under saltmarsh conditions ensuing from a negative sea-level tendency at 5900±45 BP (-7.78 m OD) prior to inundation by rising sea levels at 5665±45 BP (-7.68 m OD) and deposition of conditions under a tidal regime.

Palaeoenvironmental survey at Cress Cottage, Healing has mapped a freshwater alluvium grading into estuarine-marine alluvium on the edge of the Lincolnshire Marsh between TA223123.01 and TA221119.01. Palynological analyses on intercalated peat deposits in boreholes TA220119.01 and TA220119.03 has been undertaken (Lillie and Gearey forthcoming). These analyses have shown that at the top of peat location in TA220119.01, at 4.50 m depth, the sample was dominated by tree and shrub pollen, with alder being the best represented of the arboreal taxa. This indicates the presence of alder nearby, perhaps forming carr woodland. Oak, lime and hazel were present in quantities sufficient to indicate limited areas of mixed oak-lime-hazel woodland in the vicinity, or more extensive tree cover at a greater distance from the sampling site, probably in the higher areas of till to the southwest.

Herb taxa are also well represented, with Poaceae and Cyperaceae at sufficient levels to demonstrate grass and sedge around the sampling site. *Galium*-type

percentages are also abundant enough to infer the presence of members of the bedstraw family very close to, and probably on, the site. The presence of Cardueae/Asteroideae alongside trace levels of Lactuceae undiff. and *Filipendula* suggest the presence of other herb communities, including thistles/daisies and meadowsweet. The overall impression is of a mosaic of patchy woodland and open grassland communities in the vicinity of the sampling site. Dating the assemblage is problematic as the elm percentages of 2% are equivocal, but it may be of a pre-Elm Decline age, and a PZVIIa date is tentatively suggested for this deposit.

At a distance of *c.* 180 m to the northwest, the lower part of the peats in TA220119.03, at 4.46 m depth, have an assemblage that is strongly indicative of a saltmarsh community. Cyperaceae dominates, with Chenopodiaceae at sufficient levels to indicate that sedge and members of the fat hen family were prevalent on and around the sampling site. The only other pollen types recorded in the sample are pine and Poaceae. The pine percentages probably represent long-distance transport, whilst some grass might have been growing nearby. Assigning a date to this assemblage is problematic given its probable sedimentary context, and it may equally date to a pre- or post-Elm Decline phase. Unfortunately, the palynology of the upper part of the profile, at 3.60 m depth, failed to produce any pollen from which a greater degree of accuracy could be obtained.

14.5 Potential

The potential of this unit has been highlighted with the site at Pyewipe producing finds dating from Mesolithic to Post-Medieval periods. The unit also has potential in the form of the Second World War monuments that are still present defending the south bank of the Humber in partnership with those at Paull and Spurn on the north side. At present it appears that any palaeoenvironmental potential lies within the deeply stratified and intercalated organic deposits occurring throughout the regions saltmarsh sequences.

14.6 Vulnerability

The foreshore zone in front of the defences is at risk from erosion. This zone includes finds from the area of Pyewipe that are being eroded. In other areas the archaeology is only vulnerable from development either from industry or further work to the defences.

14.7 Importance (MAP 24)

Two areas have been highlighted as important. These are the area of Stallingborough Battery which has been partially destroyed by development but associated features still survive and that of the Pyewipe site that includes finds from the Mesolithic period onwards. An area between these two has been highlighted as having a lack of study but high potential to reveal archaeology. This includes areas of recorded Medieval settlement. Further to this the remaining areas have been deemed as having low potential due to the lack of finds recovered in the past and the high amount of developed land.

14.8 Recommendations

These recommendations are based on the existing, available knowledge of archaeology for the region. Areas of high potential are those that already have a large collection of archaeological materials, where such remains are either still present *in situ* or where additional discoveries should be anticipated. Areas described as having a lack of knowledge and a low potential are those where little work has been carried-out, and where work has been undertaken has revealed few archaeological remains. The potential exists in these areas for significant discoveries of previously unknown sites. Areas described as having a lack of investigation but high potential are those where little work has been carried-out but the work which has been undertaken has indicated a high probability for the recovery of archaeological remains in the area. These recommendations are preliminary and further analysis should be undertaken on each area when management plans are produced.

The SMP selected strategy for this unit is to hold the line for the complete unit. Possible realignment may be necessary between Killingholme and Grimsby in the future. A buffer zone is to be left between the current defence and any new industrial development. Holding the line will entail the least impact on the archaeology. Any works in the two areas of importance should take care to avoid the archaeology. At Pyewipe, the whole area in front of the defences has revealed archaeology and this should be avoided. At Stallingborough, the area of any of the features of the Battery should be avoided. In the other regions any movement of the defences will have to be monitored, since little information is available regarding the nature of the archaeology due to the early industrial development of much of the unit.

14.9 Detailed list

Archaeology from the Primary survey area

No	Xcoord	Ycoord	Source	Site Type	Date
ARC574	522310	414740	UW15E	AIR RAID SHELTER	C20
ARC575	522350	414700	UW15F	PILLBOX	C20
ARC576	522500	414200	UW15G	SM	PU
ARC593	523200	413700	SMR9951	PILLBOX	C20
ARC594	522500	413500	LAS152	ENCLOSURE	PU
ARC595	522400	413500	SMR2396	CM:ENCLOSURE	PU
ARC599	524330	412280	SMR11318	SETTLEMENT	PM

Aerial Photographs in the Primary Survey area

No additional sites were identified from the sources inspected during this project (see section 3.1.5).

HWP survey data in the Primary survey area

No sites were identified by in the areas surveyed by HWP in the Primary survey area (see section 14.3).

Secondary survey area

Killingholme-2: Field walking finds: Four pieces of worked flint with both flint of Late Mesolithic date and Bronze Age date present (Fenwick *et al.* forthcoming).

Killingholme-3: Field walking finds: 13 pieces of worked flint dating from the Neolithic and later (Fenwick *et al.* forthcoming).

Grimsby-2: Site visit and loan of finds: This area of Pyewipe has produced a large collection of finds over the last few years with over 600 pieces of flint dating from late Mesolithic to Neolithic and a collection of pottery including Roman, Early Medieval and Medieval fabrics. Interpretation of the site remains problematic (Fenwick *et al.* forthcoming).

Palaeoenvironmental data in the Primary survey area

No palaeoenvironmental data was located within the sources studied (see section 3.1.6).

KEY TO MAPS

KNOWN ARCHAEOLOGY

The known archaeology is displayed with shading showing the Primary and Secondary areas at a scale of 1:50,000. The records for all the points can be found in the Appendices (Volume 2). The data shown include the location of archaeology, palaeoenvironmental sampling sites, wreck sites and aerial photographs. Where there is a large cluster of points these areas are shown in separate boxes at a scale of 1:20,000.

HUMBER WETLANDS PROJECT DATA

The management unit is shown at a scale of 1:50,000 with shading showing the Primary and Secondary areas. Overlaying this, further shading shows the fields that were studied by the HWP. These are subdivided into 5 classes depending on the type of survey which was carried out. Only classes 1 to 3 are shown on the maps. Classes 4 and 5 are areas that were visited but couldn't be surveyed due to either the presence of pasture or industrial development.

Classes 1 and 3 are fields that were field walked. Class 2 reflects fields that were visited or were excavations were carried out but the field was not walked. On the 1:50,000 map are shown find spots of flint and pottery and the location of boreholes. In the boxes maps are shown giving the locations of the published sites within the Humber Wetlands Project volumes with their site names. These maps are at a scale of 1:25,000. The maps at 1:50,000 give an impression at the density and location of finds whereas the separate boxes link this data to the published examples.

POTENTIAL

The management unit is shown at a scale of 1:50,000 with areas highlighted as Important, Lack of study with high potential and Lack of study with low potential. These maps must be used in conjunction with the recommendations sections from each management unit.

Wrecks.dbf
Archaeol.dbf
HAP
LAS
LINCS
NELINCS
NLINCS
Palaeo.dbf
Airphoto.shp
Primary_region.shp
Secondary_region.shp

Scale 1:20,000

Scale 1:20,000

Scale 1:20,000

Scale 1:20,000

Map 22
Management Unit 7 North Killingholme to Cleethorpes
Known archaeology

Scale 1:50,000

Map 23

Management Unit 7 North Killingholme to Cleethorpes Humber Wetlands Project data

1:50,000

This map is provided to give an overall idea of the archaeological potential of sections of the Humber estuary. It is essential that it is used alongside the recommendations within the report and does not represent the presence or absence of archaeology

Importance.shp
High.shp
Low.shp

Key to areas

Important areas
29: North Killingholme Roman sites
30: Stallingborough Battery
31: Pyewipe Multi-period site
32: Cleethorpes beach

Lack of study - high potential
49: Area with recorded Medieval settlement

Lack of study - low potential
61: Heavy industrial development
62: Heavy development
63: Heavy development

Map 24
Management Unit 7 North killingholme to Cleethorpes Potential

Scale 1:50,000

15. Management Unit 8: Cleethorpes to Donna Nook

15.1 Background

This unit includes the urban centre of Cleethorpes and the land to the south down to Donna Nook. The land immediately to the south of Cleethorpes is utilised as holiday and recreational landuse down to Humberston Fitties. From here the land is primarily agricultural land with the disused airfield at North Cotes and the military practice range at Donna Nook being the exceptions.

The recorded archaeology within this unit is scarce. Prehistoric activity is known from the Cleethorpes area with finds from the beach (see MU7). A stone axe has been recovered from Humberston (ARC631). Further to this the only other finds come from outside the immediate area of study with the Late Bronze Age salt-working site at Tetney (Palmer Brown 1993). This highlights the importance of this region for the salt-making industry that is discussed below.

The major form of archaeological evidence for this mapview comes in the form of Medieval saltern mounds. These mounds are the result of the salt-making process known as sand-washing which resulted in large quantities of waste sand and silt which was disposed of and produced these mounds. In this way much of the land to the east of the main road to the sea was reclaimed from the saltmarsh (Grady 1998, Fenwick forthcoming). This method of land reclamation is illustrated in a map of 1595 of the parishes of Fulstow and Marshchapel which shows isolated mounds in the saltmarsh as well as land which had already been reclaimed and was then agricultural land (Fenwick forthcoming).

15.2 Identified archaeology (MAP 25)

Further to this, the only archaeology from the Primary survey area are a Post-Medieval grange (ARC585) and several pill boxes (ARC582, 586-588), noted on the coast.

15.3 Humber Wetlands Project data (MAP 26)

During the survey of the Lincolnshire Marsh undertaken in 1999-2000, one mapview within this management unit was studied – Tetney Lock. Tetney Lock includes the land to the north of the lock northwards to Humberston. During the field walking in this area only residual finds were recovered. The one site from this mapview was that of a Medieval saltern mound (Tetney Lock-1) which was recorded by coring and topographical survey (see section 15.9).

15.4 Palaeoenvironmental data

General

Cores taken in the location of Low Farm, Tetney have revealed deep deposits overlain by saltern mounds that effectively are masking earlier landsurfaces. The saltern mounds are the result of Medieval salt-working which produced a large amount of waste slit and sand which was dumped in mounds. This has artificially heightened the ground level in much of this management unit. Peat recovered from below the saltern mounds has revealed evidence for the dating of sea-level changes.

Specific

Recent research by Long *et al.* (1998) at TA33200325, has dated an upper peat contact to 1220-830 cal BC (RCD-1598, 2840±60 BP) at a height of +0.96 m OD. The contact between the peat and overlying alluvium at this location attests a period of positive sea-level tendency (Long *et al.* 1998).

Borehole survey by Lillie (Lillie and Gearey forthcoming) has shown that in excess of 4.15 m of Holocene alluvial sedimentation occurs beneath a saltern mound between TA337037.01 to TA337037.02. While the upper alluvial sequences reflect intertidal deposition, palynological analysis of the basal peats has shown that at 3.86 m depth the sample is dominated by ivy pollen (Lillie and Gearey forthcoming). The large percentage representation of this species suggests the incorporation of an anther into the peat matrix. The presence of alder and lime indicates alder, presumably on damper soils, with lime-dominated woodland on the drier areas. Lower values for hazel suggest some hazel cover locally.

There is also some evidence for restricted areas of open herb communities locally, or more extensive areas at a greater distance from the sampling site, with Poaceae, Cyperaceae, Lactuceae undiff., Chenopodiaceae and Caryophyllaceae all present alongside slightly greater representations of Cardueae/Asteroideae. These taxa suggest a range of herb communities typical of both dry land and damper grassland habitats. The presence of Pteropsida (monolete) indet. points to the presence of some ferns, which, like ivy, are common in shady, woodland contexts. The absence of elm suggests a PZVIIb or later date, but considering the unusual composition of this sample, this may not be an wholly reliable age estimation (Lillie and Gearey forthcoming).

At the top of the peat, at a depth of 3.76 m, high quantities of Chenopodiaceae alongside Poaceae, Cyperaceae and *Artemisia*-type suggest the close proximity of saltmarsh communities, which might very well have been growing on the sampling site itself. Low values for total tree and shrub pollen reinforce this impression, with woodland apparently absent locally but probably present at some distance from the site. *Pteridium* is also well represented suggesting that bracken was present on better-drained soils, possibly on the dryland fringes of the saltmarsh. Assigning a date is difficult, but bearing in mind the previous statement concerning the likely absence of woodland from the close proximity

of the sampling site, the presence of elm at 2% might suggest a pre-Elm Decline PZVIIa date for the assemblage.

Given the 1220-830 cal BC age obtained by Long *et al.* (1998) from a site 700 m inland and at 0.96 m OD, on stratigraphic grounds the inferred age for the top of peat sampling location would not be too unrealistic. However, the absence of elm from the lower sample is confusing and would contradict the evidence from the upper sampling location. The thin nature of the sampled deposit makes the obtaining of absolute dates problematic in this context (Lillie and Gearey forthcoming).

15.5 Potential

In essence, due to the masking of any earlier deposits in this region by the saltern mounds, deposits of earlier periods may well exist at depth in the area under consideration.

15.6 Vulnerability

The majority of the land next to the defences in this unit is of a more recent date with reclamation by the salt industry. These deposits may though be masking earlier deposits and any works that will be excavating to a depth will potentially encounter earlier deposits. The area to the north at Cleethorpes beach that has in the past revealed prehistoric and later evidence is vulnerable from coastal processes which include masking and erosion.

15.7 Importance (MAP 27)

Evidence from the northern section of the management unit at Cleethorpes and Humberston suggests prehistoric activity in the area with several finds being reported from Cleethorpes beach. This area should be avoided where at all possible. The area with a lack of study but high potential is that around Low Farm. To the west of the area a Bronze Age salt-working site was discovered. The area currently under consideration constitutes an area covered by saltern mounds that could be masking earlier landsurfaces. The southernmost area is also recently reclaimed land (from the fifteenth century onwards) and there may be some potential in the area of Grainthorpe Haven but little work has been conducted in this area. Medieval settlements that are associated with this zone are located away from the area under consideration.

15.8 Recommendations

These recommendations are based on the existing, available knowledge of archaeology for the region. Areas of high potential are those that already have a large collection of archaeological materials, where such remains are either still present *in situ* or where additional discoveries should be anticipated. Areas described as having a lack of knowledge and a low potential are those where little work has been carried-out, and where work has been undertaken has revealed few archaeological remains. The potential exists in these areas for significant discoveries of previously

unknown sites. Areas described as having a lack of investigation but high potential are those where little work has been carried-out but the work which has been undertaken has indicated a high probability for the recovery of archaeological remains in the area. These recommendations are preliminary and further analysis should be undertaken on each area when management plans are produced.

The SMP selected strategy for this unit involves the possible compensation for inter-tidal loss and to hold the line at Cleethorpes. Possible realignment elsewhere will be judged on a case by case basis. The masking affect of the saltern deposits in the majority of this unit may serve to protect the archaeology. Any works at depth may therefore disturb unknown sites. The depth of deposits in the area next to the current defences has not been tested in recent years and it would be a valuable exercise to establish this when selecting any areas for compensation or realignment.

15.9 Detailed List

Archaeology from the Primary survey area

No	Xcoord	Ycoord	Source	Site Type	Date
ARC582	542200	399810	SMR43380	PILLBOX:SITE	C20
ARC585	541850	398800	SMR41291	GRANGE	PM
ARC586	535400	403000	SMR43251	PILLBOX	C20
ARC587	535200	403100	SMR43250	PILLBOX	C20
ARC588	538100	401900	SMR43252	PILLBOX	C20

Aerial Photographs in the Primary Survey area

No	Xcoord	Ycoord	Source	Site Type	Date
AP41	533700	403600	OBL	CM:SALTERN:SEA BANK	MED

HWP survey data in the Primary survey area

Tetney Lock-1: Topographical survey and coring programme. A survey was undertaken of one of the saltern mounds. Coring showed the artificial nature of the mound (Lillie and Gearey forthcoming, Fenwick *et al.* forthcoming, Fenwick forthcoming).

Palaeoenvironmental data in the Primary survey area

NO	XCOORD	YCOORD	SOURCE	SITE_TYPE	DEPTH
PAL61	539370	400290	BGS	BOREHOLE	39.60
PAL62	542600	399250	BGS	BOREHOLE	42.70
PAL63	542800	399700	BGS	BOREHOLE	53.00
PAL64	542740	398840	BGS	BOREHOLE	53.00

KEY TO MAPS

KNOWN ARCHAEOLOGY

The known archaeology is displayed with shading showing the Primary and Secondary areas at a scale of 1:50,000. The records for all the points can be found in the Appendices (Volume 2). The data shown include the location of archaeology, palaeoenvironmental sampling sites, wreck sites and aerial photographs. Where there is a large cluster of points these areas are shown in separate boxes at a scale of 1:20,000.

HUMBER WETLANDS PROJECT DATA

The management unit is shown at a scale of 1:50,000 with shading showing the Primary and Secondary areas. Overlaying this, further shading shows the fields that were studied by the HWP. These are subdivided into 5 classes depending on the type of survey which was carried out. Only classes 1 to 3 are shown on the maps. Classes 4 and 5 are areas that were visited but couldn't be surveyed due to either the presence of pasture or industrial development.

Classes 1 and 3 are fields that were field walked. Class 2 reflects fields that were visited or were excavations were carried out but the field was not walked. On the 1:50,000 map are shown find spots of flint and pottery and the location of boreholes. In the boxes maps are shown giving the locations of the published sites within the Humber Wetlands Project volumes with their site names. These maps are at a scale of 1:25,000. The maps at 1:50,000 give an impression at the density and location of finds whereas the separate boxes link this data to the published examples.

POTENTIAL

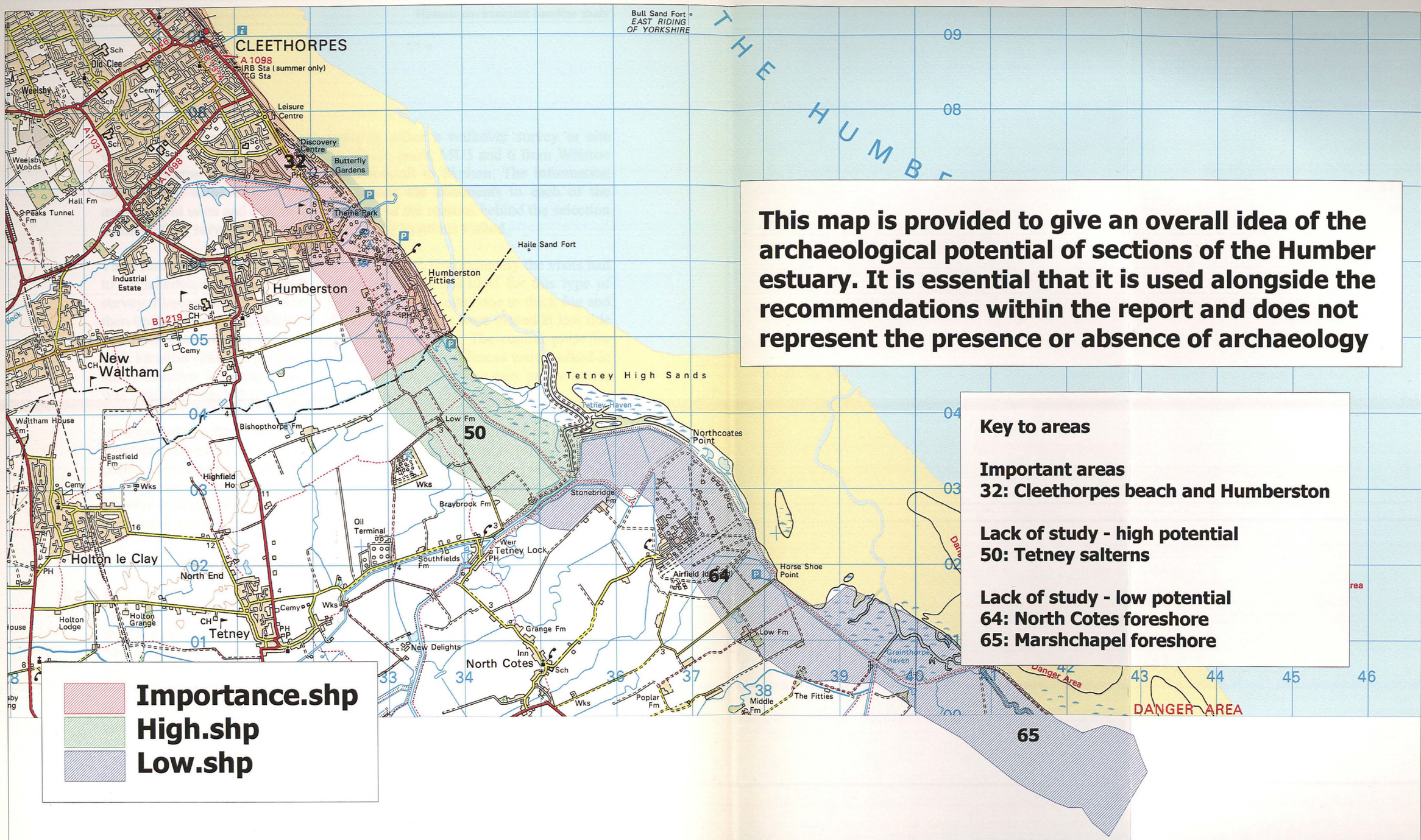
The management unit is shown at a scale of 1:50,000 with areas highlighted as Important, Lack of study with high potential and Lack of study with low potential. These maps must be used in conjunction with the recommendations sections from each management unit.

Map 25
Management Unit 8 Cleethorpes to Donna Nook
Known archaeology

Scale 1:50,000

Map 26
Management Unit 8 Cleethorpes to Donna Nook
Humber Wetlands Project data

Scale 1:50,000



This map is provided to give an overall idea of the archaeological potential of sections of the Humber estuary. It is essential that it is used alongside the recommendations within the report and does not represent the presence or absence of archaeology

Key to areas

Important areas
32: Cleethorpes beach and Humberston

Lack of study - high potential
50: Tetney salterns

Lack of study - low potential
64: North Cotes foreshore
65: Marshchapel foreshore

Importance.shp
High.shp
Low.shp

Map 27
Management Unit 8 Cleethorpes to Donna Nook
Potential

Scale 1:50,000

16. WALK-OVER SURVEY

16.1 Background

Three areas were considered as requiring either a walkover survey or site visits. These were MU1 from Paull to Spurn point, MU5 and 6 from Whitton Ness to Barton clay pits, and MU4a, Blacktoft to Skelton. The information gained from these visits has helped inform the comments in each of the management units and below is a summary of the reasons behind the selection of each of the survey areas, methods used and locations visited.

The visits were made between 3rd and 8th January. Unfortunately the visits had to be scheduled for the winter months which are not ideal for this type of survey. Planned survey dates in December were cancelled due to thick fog and then heavy snow cover. Where at all possible the areas were visited at low tide and most observations were made from the shoreline. The central point for each location visited is given a grid reference and the defences were walked in either direction from this point. These areas were chosen as easy public assess was available which due to the time constraints was imperative.

In areas which have been highlighted as having high potential a proper intertidal survey is recommended with the use of a Rigid Inflatable Boat (RIB), GPS equipment and full health and safety considerations which apply in the Humber estuary zone. These techniques have been developed by the *Humber Wetlands Project* over the past six years providing the safest and most productive and accurate method of recording and investigating such areas.

16.2 Management Unit 1: Paull to Spurn Head

16.2.1 Background

Selected parts of this management unit had been visited during the Lindsey Archaeology Services survey in 1996 (Field *et al.* 1997). The area had also been studied during the *Humber Wetlands Project* but as this was the first region to be studied in 1994, the observations were slightly outdated. During the HWP survey the intertidal section was visited and attempts made to walk this zone. The conclusion drawn from these attempts was that it was beyond the scope of traditional survey techniques such as walking from the shoreline, as the alluvial clays were too wet and deep making any foray into this area too treacherous.

The visits carried out during the current survey confirmed this observation and any area along this management unit that may be affected by works should be subjected to a full survey as outlined above.

16.2.2 Areas visited

Paull Hedon Haven TA166266: Deep alluvial foreshore with shale and shingle next to sea defences. Large silt build-up from haven. Three ship hulks used as water breaks next to shipyard. Land behind defences arable or settlement.

Thorngumbald Clough TA171251: Deep alluvial foreshore. No remains visible. Pillbox to north in the sea defences (TA17072508). Two lighthouses. Land to rear of defences all arable. Very undulating land surface with high potential for finds (Paull-2 to Paull-5 HWP survey).

Stone Creek TA235188: Large saltmarsh area in front of defences (*c.* 100 m). After saltmarsh there is again deep alluvial intertidal zone. No remains visible in this foreshore area. Within the creek itself there are areas of saltmarsh and alluvial deposits and these could contain archaeological deposits relating to crossings of this creek or of boats moored along side. On the southern side of the creek are the remains of an army camp with several upstanding structures. The one nearest the sea defences has some damage. Land behind defences mainly arable.

Skeffling Clough TA369183: Large area of saltmarsh in front of defences, followed by a wide flat expanse of intertidal alluvial deposits. Only a single stake visible in intertidal zone. Land behind the defences is mainly arable.

Easington Clough TA393172: Large expanse of saltmarsh then intertidal deposits. Anti-Tank blocks to the rear of defences and a sea defence at right angles to the shore, also concrete blocks. Land behind defences mainly arable.

Kilnsea TA409158: Large expanse of intertidal deposits that can be surveyed with care. Visible remains include a pillbox incorporated into sea defences and some timber sea defences parallel to the coast stretching for *c.* 200 m to the south. The section to the north of this point may reveal archaeology. Land behind defences settlement and pasture.

Spurn Point TA402112: Many war-time defences. This area is outside of the current plans.

16.3 Management Units 5 and 6: Whitton Ness to Barton clay pits

16.3.1 Background

Selected parts of this area had been previously surveyed by Lindsey Archaeological Services but had not been studied during the *Humber Wetlands Project*. The area has a high potential with the Roman road at South Ferriby indicating the quality of preservation in this stretch of the coastline.

16.3.2 Areas visited

Barton Cliff TA004229: Silty foreshore. To the west at TA00252285 there are numerous stakes running parallel to the foreshore representing earlier sea defences. Land to the rear arable.

South Ferriby TA968212: Small intertidal zone. Only visible archaeology is the previously investigated Roman Road. Land behind the defences mainly industrial and arable.

Wintringham Haven SE935229: Large expanse of saltmarsh deposits in front of sea defences. Land to the rear of defences a mixture of arable and pasture.

Wintringham Marsh Farm SE923243: Area to the south is a large area of saltmarsh. At SE921248 the Halton Drain outfalls into the Humber and has associated modern structural timbers. To the north the area around Whitton Ness (SE918252) has high potential for archaeology. This zone has a visible buried forest at low tide and the area has less alluvial deposition than the previous areas studied. This area has parallels with the areas of the Melton and North Ferriby foreshores and any work that will impact on the archaeology should be preceded by a full survey of the area affected. Area behind the defences is arable land.

16.4 Management Unit 4a: Blacktoft to Skelton

16.4.1 Background

This area was partly surveyed by boat during the *Humber Wetlands Project* of the Vale of York. The intertidal zone in this area of the River Ouse is very limited so the potential to locate archaeological remains is limited without excavation. Many of the settlements along this area are located on the river edge themselves indicating the importance placed on this major transport and trade route.

16.4.2 Areas visited

Blacktoft SE842242: Saltmarsh in front of defences with little intertidal zone. Large concrete defences.

Saltmarsh SE790241: Small intertidal zone but many remains of previous concrete sea defences cover most of this area.

Sand Hall SE765242: Unfortunately time limits constrained getting access to the land within the bend of the river at this point. The area around Sand Hall is still pasture and parkland and therefore has high potential for previously unknown archaeology to be buried undisturbed within this area. The intertidal zone is very limited next to the defences.

Skelton SE767254: At this location there are some riverine grasses on the intertidal zone but limited chance to see any archaeology. The linear village of Skelton lies directly behind the defences.

16.5 Discussion of results of the walkover survey

The areas of MU1 will need a case specific survey conducted from the waterside, as access from the land is too dangerous. The large amount of alluival deposition in the area may be masking archaeology to a great depth. Areas with large quantities of saltmarsh in front of the defences are hard to assess under the current survey. It will only be when any intrusive work is carried out that the potential of these areas can be evaluated.

The area that has the highest potential for archaeology is that of the intertidal zone at Whitton Ness which has parallels with the area of the Melton and North Ferriby foreshore.

17. CONCLUSIONS

This report has highlighted the uneven spread of previous archaeological work across the region. Some areas have suffered from little or no fieldwork in recent years and even the *Humber Wetlands Project's* approach to the survey of the Humber was undertaken on a selective sampling basis. The lack of archaeology recorded in some areas has therefore been shown to be more of a reflection of a lack of study and investigation in these specific areas rather than an actual, proven absence of archaeology.

Certain landscapes have been highlighted as having high importance throughout this report. These are outlined for each management unit, but several key research themes relating to our understanding of the Humber region as a whole can be listed as follows:

- Sea-level change and environmental response
- Bronze-Age human eco-dynamics
- Roman settlement and infrastructure
- Medieval reclamation and settlement development
- First and Second war defensive landscapes

The 'important areas' have been defined using a selection of criteria within the framework of current knowledge of the region and by consideration of their regional, national and international importance. These areas should be avoided if at all possible. Many of the important areas are the foreshore zones on the Humber. These areas have revealed a high concentration of archaeology from all periods and due to the nature of the deposits in this area, have excellent preservation.

The areas that have been highlighted as those that lack previous archaeological investigation have been divided in two groups – those with high potential to reveal archaeology and those with low potential. It must be emphasised at this point that all areas under consideration have the potential to reveal previously unknown archaeology. The areas which are classed as having high potential are those which have had a limited amount of previous research conducted or where documentary evidence suggests the possibility of archaeological sites in the immediate area. They may also be areas close to other known sites, but which have not been studied in any detail. The close position of these areas to the known archaeology may mean that an extension/continuation of these sites could be found in these areas.

Areas of low potential are where there has previously been little recorded archaeology, and where either extensive development or deep naturally derived deposits mean that there is a low potential for revealing archaeology, or that the archaeology will be deeply buried and only works at depth will disturb it.

The recommendations that have been given for each unit are preliminary. They need to be considered alongside the primary statement as given in the recommendation sections. Once any mitigation plans have been drawn up for specific units or specific areas of defences then further evaluation will need to be carried out on a case by case basis. Foreshore areas will need to be surveyed within Health & Safety requirements

and techniques have been developed for rapid, efficient and safe surveys of such areas.

Finally this report acts as the paper supplement to information which is held digitally in a GIS. The GIS is the more effective and informative method of using these data and should be the preferred method. Data can be interrogated and manipulated with this report as a guide.

The historic environment of the Humber is rich and diverse and has given the region the distinctive character that can be seen today. This report will hopefully enable the considered planning of any work in the Humber in order to ensure that such works have a minimal impact on this rich archaeological and palaeoenvironmental resource.

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