

# **The Archaeology of the Suffolk Coast and Inter-tidal Zone**

A report for the National Mapping Programme



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Slaughden Martello tower, located on the shingle spit of Orfordness, to the south of Aldeburgh.

# **The Archaeology of the Suffolk Coast and Inter-tidal Zone**

A report for the  
National Mapping Programme

NMP Acceleration: Suffolk coast and inter-tidal zone (2912)

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1. Summary.....	1
2. Introduction .....	2
2.1 Background to the project .....	2
2.2 The project area .....	2
2.3 Summary of methodology .....	3
3. The character of the coast .....	5
3.1 Introduction .....	5
3.2 Geology and soils.....	5
3.3 Topography .....	6
3.4 Erosion .....	7
3.5 Accretion .....	8
3.6 Settlement patterns .....	10
3.7 Landscape modifications.....	11
3.8 Implications of land-use for archaeological survey .....	12
3.9 Summary.....	14
4. Factors affecting the results of the survey .....	15
4.1 The effects of the methodology on the survey results.....	15
4.1.1 NMP Methodology.....	15
4.1.2 The NMP methodology combined with the aerial reconnaissance .....	16
4.1.3 The NMP methodology combined with the field survey .....	17
4.2 Topographical characteristics affecting the survey results.....	18
5. Introduction to the prehistoric evidence .....	19
6. The Neolithic period: 4000 BC – 2350 BC .....	21
7. The Bronze Age: 2350 BC – 700 BC .....	27
8. The Iron Age and Romano-British period: 800 BC – AD 410.....	33

8.1 Problems with dating and interpretation.....	33
8.2 The evidence.....	34
8.2.1 Location.....	34
8.2.2 Settlement evidence.....	35
8.2.3 Associated field systems.....	37
8.3 Discussion.....	38
8.3.1 Uses of enclosures and field systems.....	38
8.3.2 Continuity in landscape.....	40
8.3.3 Relationships to earlier landscape features.....	41
8.3.4 Tribal boundaries.....	41
8.3.5 The Roman transition.....	42
9. The Roman period: AD 43 - 410.....	43
9.1 Problems with dating.....	43
9.2 The evidence.....	43
9.2.1 Fortifications.....	43
9.2.2 Communications.....	45
9.2.3 Settlement.....	48
Towns.....	48
Rural settlement pattern.....	49
Defining rural settlement.....	50
Small rural settlements.....	51
Villa settlements.....	51
9.2.4 Industry.....	55
10. The Anglo-Saxon period: AD 410 – 1066.....	60
10.1 Anglo-Saxon Suffolk.....	60
10.2 The evidence.....	61
10.2.1 Inter-tidal sites.....	61
Case study: Fishtrap in Holbrook Bay.....	61
10.2.2 Terrestrial sites.....	63
Case study: Burrow Hill 8 <sup>th</sup> century cemetery and settlement.....	63
Case study: the long hall at Freston.....	65
Case study: Covehithe settlement and cemetery.....	66
10.3 Problems of interpretation.....	70

10.4	Characterising the settlement pattern .....	72
10.5	Identifying agricultural landscapes .....	75
11.	The medieval and post-medieval periods: AD 1066 - 1900 .....	76
11.1	Introduction .....	76
11.2	Enclosure .....	76
11.3	Reclamation .....	78
	Case study: reclamation around Orford .....	81
11.3.1	The NMP evidence for reclamation .....	84
11.3.2	Reclamation: success, survival and dating .....	85
11.4	Water meadows .....	87
	Case study: Benacre Broad Water meadow, Covehithe .....	87
11.5	Parks and gardens .....	89
	Case study: Grimston Hall.....	89
	Case study: Erwarton Hall.....	90
11.6	Oyster beds.....	92
11.7	Warrens.....	100
	Case study: Sizewell warren, Leiston.....	101
	Case study: Warren, Stratton Hall parish .....	103
11.8	Fish traps .....	105
	Case study: Kiddles in the River Deben, Sutton parish.....	105
11.9	Medieval and post-medieval industry.....	106
11.9.1	Brickworks.....	107
11.9.2	The linen industry .....	110
	Case study: Retting ponds, Covehithe .....	110
11.10	Transport.....	112
11.10.1	Inter-tidal features .....	112
	Wrecks .....	112
	Inter-tidal structures.....	115
11.10.2	Terrestrial features .....	116
	Roads.....	116
11.11	Summary.....	121
12.	Twentieth century military remains on the Suffolk coast.....	122

12.1 Background .....	122
12.2 Early 20 <sup>th</sup> -century military sites: 1900 - 1939 .....	122
Case study: Orfordness Research Establishment.....	123
Case study: Crenellated trenches on Levington Heath. ....	124
12.3 Second World War military remains .....	125
12.3.1 Coastal anti-invasion defences .....	126
Case Study: Anti-invasion defences on Aldeburgh beach .....	127
12.3.2 Anti-aircraft defences .....	128
Case study: DIVER Strip sites around Orford .....	128
Case study: ‘Anti-glider’ ditches at Sutton Hoo .....	130
12.3.3 World War II temporary camps and training sites .....	131
Case study: Boyton AFV Range.....	131
12.3.4 Second World War activity on established military bases .....	132
Case study: Landguard Fort and Landguard Point, Felixstowe ....	133
12.3.5 Civil defence.....	135
12.4 The contribution of the NMP project to Second World War studies on the Suffolk coast.....	136
12.5 Cold War .....	138
13. Further work and research topics.....	139
13.1 Aerial photographic surveys .....	139
13.2 Aerial reconnaissance .....	141
13.3 Further work with the coastal survey data.....	142
14 Conclusions.....	144
15 BIBLIOGRAPHY .....	145
APPENDIX 1 Project staff and steering group members .....	154
APPENDIX 2 National Mapping Programme Methodology.....	155

*LIST OF FIGURES*

Figure 1. The Suffolk Coastal NMP project area .....	3
Figure 2. The soil regions of Suffolk .....	6
Figure 3. The major rivers of Suffolk.....	9
Figure 4. Reclaimed land on the Suffolk coast. ....	12
Figure 5. Potential prehistoric sites recorded by the NMP project. ....	20
Figure 6. The Neolithic causewayed enclosure at Freston.....	22
Figure 7. The post-built structure located in the north-eastern corner of the Freston causewayed enclosure.....	23
Figure 8. Two potentially Neolithic oval enclosures in Levington parish .....	24
Figure 9. A possible Late Neolithic or Early Bronze Age double concentric pit circle visible as a cropmark near Boyton Hall Farm in Boyton parish .....	25
Figure 10. A double concentric ring ditch visible as a cropmark in Shotley parish..	29
Figure 11. Probable barrow ring ditches located within a later prehistoric or Roman field system at Shotley .....	30
Figure 12. The probable Bronze Age barrow cemetery at Buckanay Farm, Alderton, located on land below the 5m contour. ....	31
Figure 13. A selection of possible Iron Age or Romano-British enclosures .....	36
Figure 14. Two phases of possible Iron Age or Romano-British landscape in Martlesham parish.....	37
Figure 15a. A selection of possible Iron Age or Romano-British field systems .....	39
Figure 15b. A selection of possible Iron Age or Romano-British field systems .....	40
Figure 16. Francis Grose's engraving of Walton Castle, 1766.....	45
Figure 17. Potential Roman road in Sutton parish.....	46
Figure 18. Possible Roman road identified in Covehithe parish.....	47
Figure 19. A small rectangular structure, potentially a Roman villa, identified in Sutton parish. ....	52
Figure 20. County wide distribution of villa sites as recorded on the Suffolk SMR.	53
Figure 21. Possible villa complex in Wherstead parish. ....	55
Figure 22. The first Red Hill to be recorded as part of the Suffolk NMP project, Trimley St Mary parish. ....	56
Figure 23. Distribution of Red Hills along the Suffolk coast.....	58
Figure 24. Map of the Holbrook Bay fishtrap. ....	61
Figure 25. Burrow Hill .....	64
Figure 26. Neolithic and Saxon surface finds in the area of Freston causewayed enclosure.....	67
Figure 27. Possible Saxon settlement and cemetery in the area of the church of St. Andrew, Covehithe.....	68
Figure 28. Saxon finds to the east of Covehithe.....	70



Figure 29. Area of a major fieldwalking survey in south-east Suffolk.....	73
Figure 30. Thematic map illustrating the topography in the area of Burrow Hill.....	74
Figure 31. Possible post-medieval field systems on Levington Heath. ....	78
Figure 32. The extent of sea walls in Suffolk’s coastal zone.....	79
Figure 33. Leiston Old Abbey; evidence for medieval reclamation? .....	80
Figure 34. Relict sea bank to the north of Orford. ....	82
Figure 35. Evidence for the construction of sea banks in relation to parish boundaries.....	83
Figure 36. Excerpt of Norden’s 1601 map.....	84
Figure 37. Progressive reclamation to the south of Orford.....	85
Figure 38. The irregular course of many sea banks may reflect episodes of breach and repair. ....	87
Figure 39. A failed water meadow at Benacre Broad? .....	88
Figure 40. Garden features at Grimston Hall.....	90
Figure 41. Garden features at Erwarton Hall.....	91
Figure 42. Garden features at the Old Rectory, Orford. ....	91
Figure 43. The range of oyster pits visible in the project area.....	92
Figure 44. Oyster pits in Lantern Marshes.....	93
Figure 45. Oyster pits between Lantern Marshes and King’s Marshes.....	94
Figure 46. Oyster beds of possible medieval origin.....	95
Figure 47. Embanked oyster beds on the Butley River. ....	96
Figure 48. Embanked group of large oyster beds at Orfordness. ....	97
Figure 49. Post-medieval commercial oyster pits on the west bank of the River Orwell .....	99
Figure 50. Probable 19 <sup>th</sup> -century commercial oyster pits on the east bank of the River Orwell.....	100
Figure 51. Sizewell warren. ....	102
Figure 52. Stratton Hall warren.....	104
Figure 53. Kiddles in the River Deben.....	106
Figure 54. Brickworks in Kirton parish. ....	108
Figure 55. Brickworks to the north of Aldeburgh. ....	109
Figure 56. Brickworks to the south of Lowestoft.....	110
Figure 57. Retting pits at Covehithe .....	111
Figure 58. A fragmentary wreck visible at low tide in the inter-tidal zone of the River Deben.....	113
Figure 59. The wreck of the trawler Iona. ....	114
Figure 60. Boat hards and quays as marked on late 19 <sup>th</sup> and early 20 <sup>th</sup> century Ordnance Survey maps .....	115
Figure 61. Medieval ferry quay in Sudbourne.....	116
Figure 62. Medieval trackway to the north of Levington Park. ....	117

Figure 63. Possible medieval trackway to the south of Erwarton village.....	118
Figure 64. Road of probable medieval date to the east of Butley Abbey. ....	119
Figure 65. Post-medieval road to the north-west of Boyton Hall Farm.....	120
Figure 66. The Orfordness Research Establishment .....	124
Figure 67. Crenellated trenches on Levington Heath. ....	125
Figure 68. Military sites recorded during the NMP survey.....	126
Figure 69. Anti-invasion defences at Aldeburgh in December 1941 .....	127
Figure 70. Typical layouts of A: a Heavy Anti-aircraft Artillery battery and B: a DIVER battery .....	128
Figure 71. The location of DIVER sites around Orford during the Second World War as recorded by the NMP survey and the documentary survey by Colin Dobinson. ....	129
Figure 72. Second World War ‘anti-glider’ ditches at Sutton Hoo .....	130
Figure 73. The AFV training ground at Boyton .....	132
Figure 74. Second World War activity on Landguard Point.....	134
Figure 75. A Second World War barrage balloon site at Pewitt Hill, Felixstowe ...	136
Figure 76. Erosion and the loss of Second World War remains at Covehithe. ....	137



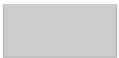

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## MAPPING CONVENTIONS

Convention	Layer	
	Ditch	Used for drawing all negative features seen as cropmarks and earthworks, e.g. ditches, hollow ways and pits
	Bank	Used when drawing upstanding earthworks or levelled features
	Structure	Used for structures e.g. a concrete pillbox or wooden posts
	Pits & Quarries	Used for extraction pits, bomb craters and other cut features

## 1. SUMMARY

The Suffolk Coastal NMP project involved the interpretation, mapping and recording of all archaeological features visible on aerial photographs in the coastal and estuarine areas of Suffolk. The survey, carried out between April 2001 and March 2004, was part of a wider project to assess the archaeology of the Norfolk and Suffolk coasts that also involved a field survey programme and documentary research. Changes to the Suffolk coast due to erosion or reclamation have had a dramatic affect on the nature of the archaeology recorded from the aerial photographs. On the erosional coast the majority of features surveyed relate to coastal anti-invasion defences from the Second World War, whilst in the areas of reclamation Roman salt production sites and features relating to post-medieval drainage have been found. In the inter-tidal zone of the estuaries, timber structures of varying dates have been recorded along with Post-medieval oyster pits and, on the higher ground above the estuaries, fragments of extensive prehistoric or Roman ditched field systems are visible as cropmarks. The results summarised in this report paint a picture of coastline with a complex topographical and archaeological history and with huge potential for further research.

## 2. INTRODUCTION

### 2.1 Background to the project

In 1997 English Heritage and the Royal Commission on the Historical Monuments of England published a survey entitled “England’s Coastal Heritage” (Fulford *et al* 1997) which identified the archaeology of the coastal zone as poorly understood. The survey noted that a better understanding of the coastal archaeological resource was necessary if the historic environment was to be effectively integrated into coastal management plans. As a response to this need the Norfolk/Suffolk Rapid Coastal Zone Assessment Survey (RCZAS) was set up, initially as a pilot project, and later extended to cover the entire length of the Norfolk and Suffolk coasts. The RCZAS aims to stimulate further research into, and conservation of, the coastal archaeological resource. See English Heritage (1999) for an overview of Rapid Coastal Zone Assessment Survey. Other rapid coastal surveys have taken place in Kent and in Essex (Wilkinson & Murphy 1995).

The Norfolk/Suffolk RCZAS comprised three aspects:

- 1) a survey using aerial photographs to National Mapping Programme (NMP) standards (Bewley 2001);
- 2) a documentary survey undertaken by Ivan Ringwood at the University of East Anglia (Ringwood, unpublished; unpublished a)
- 3) a field survey of the inter-tidal zone by county council staff from Norfolk and Suffolk (Loader unpublished).

The field survey and aerial photograph survey were funded by English Heritage but administered by Suffolk and Norfolk County Councils. With the commencement of an NMP survey of the whole county of Norfolk the two NMP surveys were separated, and in April 2001 the Suffolk Coastal NMP project commenced. The project continued to be closely involved with the other aspects of the Rapid Coastal Zone Assessment Survey including the biannual steering group (see Appendix 1 for members). The mapping and recording phase of the Suffolk Coastal NMP project was completed in March 2004.

### 2.2 The project area

The Suffolk Coastal NMP project covers an area of 313 square kilometres, which for practical reasons were divided into six blocks: Block 1 – The Upper Stour, Block 2 – The Orwell and Lower Stour, Block 3 – The Deben, Block 4 – Hollesley to Aldeburgh,

Block 5 – Aldeburgh to Walberswick and Block 6 – Southwold to Lowestoft (see Figure 1). This includes the two previously completed pilot areas of the Alde Estuary and the coast from Southwold to Kessingland (Miller 2000). The project area consists of a single kilometre wide strip along the coast, in all cases taking in the inter-tidal zone, and a wider area around the estuaries. This provides an archaeological context for the coastal sites recorded by both the NMP project, and by the field survey which, to date, has surveyed the inter-tidal zone only. The physical character of the Suffolk coastal zone is discussed in Section 3.

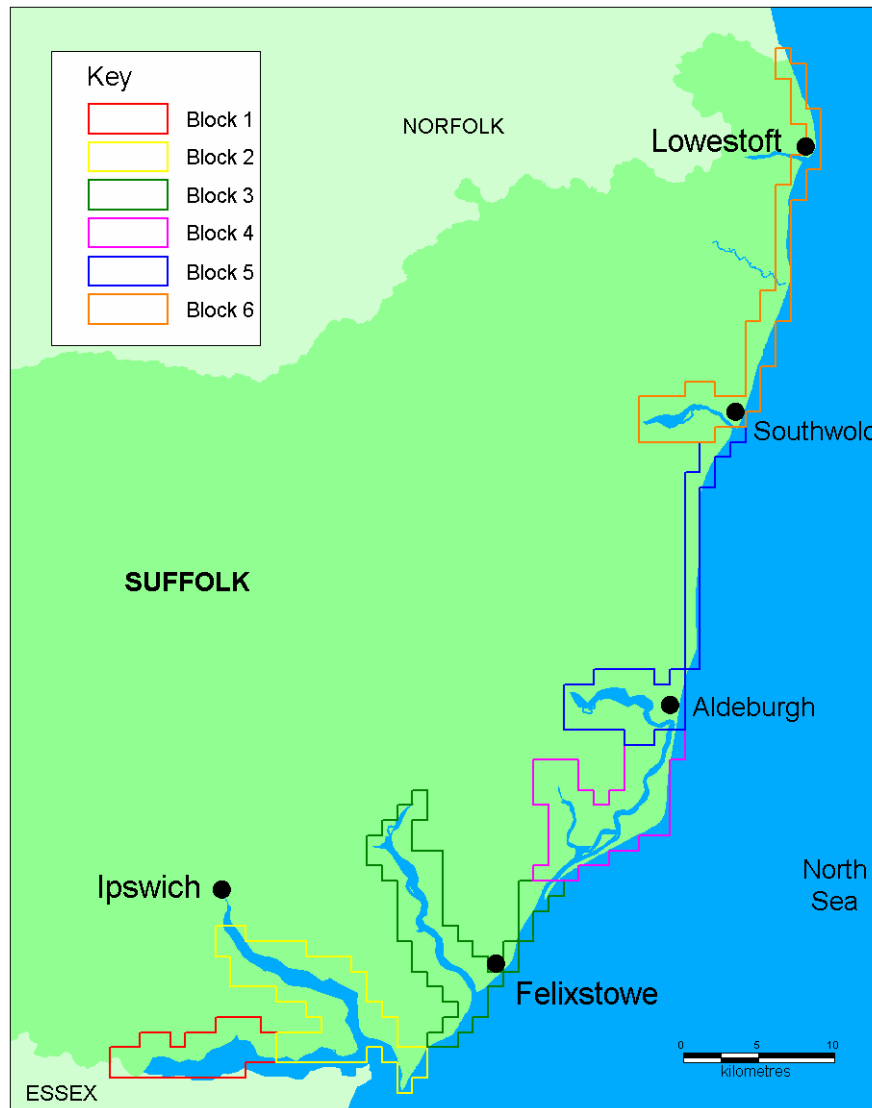


Figure 1. The Suffolk Coastal NMP project area

### 2.3 Summary of methodology

The NMP survey involved the interpretation, digital transcription, recording and synthesis of all archaeological features visible on aerial photographs in the project area, dating

from the Neolithic period to 1945. The project followed standard NMP methodology (see Appendix 2) and involved the systematic examination of vertical and oblique aerial photographs held in the National Monuments Record (NMR) and the Cambridge University Collection of Aerial Photographs (CUCAP). Oblique aerial photographs held by the Suffolk Sites and Monuments Record were also consulted, as well as Environment Agency vertical photographs from 1999 and 2000. The archaeological features were transcribed into a MapInfo-based GIS and recorded in a copy of the Suffolk Sites and Monuments Record database. See Section 4 for a critical overview of the project methodology.

A National Grid Reference and, where possible, a Suffolk Sites and Monuments Record number have been provided for all the sites mentioned in the main results section of the report that have been recorded during the project. See Appendices 2 and 3 for details of methodology and mapping conventions.



## 3. THE CHARACTER OF THE COAST

### 3.1 Introduction

Suffolk today is essentially a rural county, but the influence of the sea and rivers can be seen in many aspects of the development and organisation of the coastal zone landscape. This section will summarise the characteristics of the Suffolk coast and assess how, over time, they have combined to influence the physical and historical character of the coast.

### 3.2 Geology and soils

The character of the Suffolk coastal zone has been defined by its distinctive geological composition. The solid geology of the wider county is principally chalk, but towards the coast the chalk is overlain by two deposits laid down during the Pleistocene or Holocene periods. The southern third of the coastal zone chalk is overlain by London Clay and the northern two thirds by estuarine or marine shelly sand deposits known as Crag. The soils of the eastern fringe of the county are therefore composed of sands, gravel and local till, with surface pockets of the underlying Crag and clay. Much of this area of light soils is known collectively as the 'Sandlings'. The exception to this is the area around the Shotley and Felixstowe peninsulas in the south, which are covered by deep free-draining loams (see Figure 2). The character of the whole coastal area has been recognised by the Countryside Commission, and termed 'Suffolk Coast and Heaths' (Countryside Commission 1999).

This coastal area of free draining soils has historically been extensively settled and farmed, but the unconsolidated nature of the coastal geology means it is vulnerable to erosion, the implications of which are discussed in more detail below. Until recently, significant areas of the coastal zone were maintained as heathland and commons, probably exploited as part of a mixed pastoral and arable corn and sheep economy (Dymond 1999; cf. Williamson 1997). Developments in modern agricultural practice mean that increasing areas of these light soils are being converted to arable cultivation and consequently, much of the east and south-eastern part of the county is suited to cropland formation, potentially increasing the visibility of archaeological landscapes.

A limiting factor in this visibility is that the Suffolk coastline is punctuated by a number of river valleys. The soils of these estuaries are in the main composed of alluvium

deposited over many years. Although these deposits can potentially preserve archaeological deposits, particularly organic material, they can also mask subsurface features, previous ground surfaces and even subtle earthworks. These soils can therefore prevent cropmark formation and potentially limit the results of aerial survey.

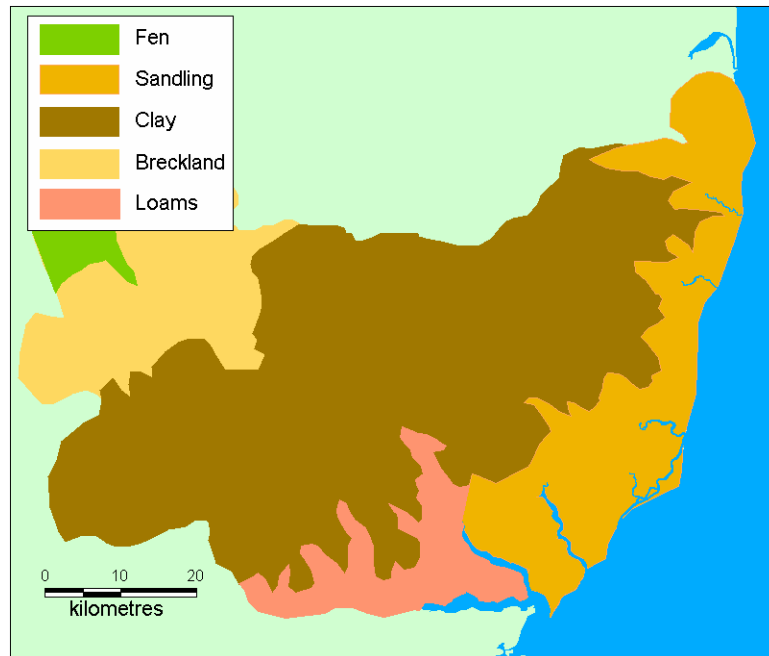


Figure 2. The soil regions of Suffolk.

### 3.3 Topography

Topographic features can also affect the visibility of archaeological features, both from the air and on the ground. The main topographical features of the project area can be summarised as:

- High ground rising to the west from the coastal areas and estuaries, to form gently rolling hills and spurs, often forming dry valleys with evidence of palaeochannels that previously fed into the tidal rivers. Within the project area these landforms reach heights of about 30m OD.
- Tidal estuaries and river valleys, usually cutting through the higher ground to the west of the coast. The rivers are now mostly embanked with relatively narrow tidal-ranges and the valley sides have moderately steep profiles.
- Erosional coastal cliffs. Geologically 'soft', the cliffs occasionally approach 20m in height, as at Kessingland, Sizewell and Dunwich.

- Low-lying coastland, including heathland but also drained, reclaimed and embanked saltmarsh and broads, separated from the sea by shingle beaches and spits. All generally below 5m OD.

These topographical zones have been shaped by a variety of natural and artificial process, and have characteristics that have implications for archaeological study and survey. These will be summarised below.

### 3.4 Erosion

Due to its relatively soft and unconsolidated nature, much of the coast suffers from severe and continuing erosion. This process has been well documented historically and has probably had a significant impact on the pattern and density of settlement on the coast (Martin 1999e). It has therefore subsequently affected archaeological studies of the coast. There are many historical sites and settlements on the coast that have suffered from erosion, but its impact and consequences can be best illustrated by examining the following examples:

- The Covehithe area, for instance, has lost approximately 250m of coastland to erosion since the 1940s. To illustrate the impact of this erosion on recent archaeological remains, the loss includes the former location of most of the World War Two anti-invasion defences for this area (see Figure 76).
- The town of Dunwich offers a historical example. From the 11<sup>th</sup> century Dunwich was an important town. During the medieval period it was more prosperous than Ipswich, largely due to its successful herring fishing fleet. This prosperity provided the impetus and means to build and maintain sea defences to protect the town's harbour from the effects of coastal erosion. A storm of 1328, however, caused a shift in the coastal shingle banks which blocked the mouth of the harbour. Following this event, trade and industry shifted to nearby Walberswick. The subsequent decline in the town's economy meant that the sea defences could no longer be maintained, with the result that effects of coastal erosion accelerated. In 1587 the town measured about 420 metres wide from east to west and 1.6km north to south. By 1977 erosion had reduced these dimensions to about 50m east to west and 480m north to south.

Some archaeological consequences of coastal erosion are therefore obvious: significant areas of historic coastline probably containing numerous archaeological sites have been lost to the sea. In some areas, as at Dunwich, the loss includes kilometres of coastal hinterland and any archaeological features that were located there. More are under imminent threat, such as the remains of Greyfriars Friary (English Heritage 2003, 13).

Some implications are less obvious. For example, many features now visible on, or near to the coast, were originally created some distance from their contemporary coastline. To put it simply, although potentially created within the coastal zone and part of an integrated coastal economy, they are not intrinsically 'coastal' in nature. These factors must be taken into account when considering the results of any coastal survey.

The estuaries within the project area include the River Stour, which forms the southern boundary of the county, the Orwell, the Deben, the Alde/Ore, the Butley River, the River Blyth at Southwold and the smaller Hundred River to the south of Kessingland (see Figure 3). Erosion also affects many of these tidal estuaries but is a complex process. In comparison with the wide and shallow estuaries of Essex, the river valleys in Suffolk, with the exception of the Stour, are relatively narrow with steep profiles. They are also largely embanked and partially canalised, which may have consequences for the effects of tidal erosion and scour, but these modifications will be discussed below. As a consequence of the narrow tidal ranges, the area within which inter-tidal archaeological features may be visible is limited. Estuarine erosion is a dynamic system with inter-related processes and consequences. The tide may destroy archaeological deposits and features in the inter-tidal zone, or it may obscure them through the deposition of alluvial silts. It may also reveal features that were previously obscured, whether through the removal of alluvial silt deposits or the erosion of the saltmarsh banks of the river, which may redeposit the eroded material elsewhere in the estuary. It may do any of these things overnight or over many years. It must also be considered that features eroding from the banks may only be visible in section, and may therefore not be visible to aerial survey. The implications of such processes for survey methodology are discussed in more detail in section 4.

### **3.5 Accretion**

The existence of much of the low-lying coastland is due, in part, to the complex process of coastal accretion. Areas of the coast such as the shingle spits at Landguard Point and Orfordness are experiencing ongoing accretion. The formation processes of these spits can have a direct effect on the survival and visibility of archaeological features.

The shingle forms a dynamic land surface that is subject to change through erosion and deposition, and can change dramatically with severe weather conditions in short spaces of time. Therefore the material remains of human activity or settlement can either be destroyed by tidal action or obscured by the deposition of shingle. Unusually severe weather, as was experienced by East Anglia in 1953 can remove surface sediments, potentially revealing previously obscured archaeological material. Alternatively it can completely destroy the shingle formation, and any archaeological deposits in it, as

happened in 1997 when, due to winter erosion, the sea defence bar between the coast and the River Ore at Slaughden was reduced in width from 13m to 1.5m.



Figure 3. The major rivers of Suffolk.

Coastal and estuarine accretion can also have more subtle effects on the composition of the historic coastal landscape. A simple example of this can be seen at Landguard Fort. To fulfil its defensive role, the fort was originally constructed on the tip of Landguard Point to guard the entrance to Harwich Haven. Due to coastal accretion it is now over 500m from the tip.

The effects of the growth of the Orfordness spit on settlement in the area can be illustrated through its historical relationship with Orford town. The early prosperity of the town was dependant upon its port, reflected in the construction by Henry II of the substantial castle to protect it. When the castle was built in the 12<sup>th</sup> century it would have held a commanding position over the port and inter-tidal area of the River Alde.

The safety of the port however, was dependant on the shelter provided by the shingle spit. From the medieval period onwards the continuing accretion of the spit and associated silting of the river created increasingly dangerous shipping conditions, which eventually resulted in the decline of the port, although it can still be seen to be an important mooring on a map of the late 16<sup>th</sup> century (Barker 2004). The town quay is now over 8km from the mouth of the river, and due to later reclamation of the accreted saltmarsh, the castle is 500m from the river bank.

Due to the lack of natural coastal harbours on the Suffolk coast, the prosperity of many coastal towns in Suffolk depended, like Orford, on river approaches to their quays. Many of the estuaries have been subject to the accumulation of alluvial silts which have at times made access difficult, and could have a dramatic impact on the fortunes of a town. Possibly because of this, most fishing fleets in Suffolk continued to launch small boats from the beach until the 19<sup>th</sup> century with the result that few large harbours have developed.

Despite the potential difficulties of access to the sea, Suffolk's shipping found great success in both the export of goods to the continent and in coastal transport in the post-medieval period, and Ipswich developed a successful shipbuilding industry. However, by the 19<sup>th</sup> century, larger vessels were becoming increasingly dominant. This meant that many of the smaller estuarine quays became commercially impractical and the larger fishing fleets and transport vessels focused on ports with good inland communications links (Malster 1999). An attempt to tap into this trend by creating a harbour for sea-going vessels at Lowestoft in the early 19<sup>th</sup> century failed commercially, but continued in use in the long term as a fishing port. Consequently only Ipswich and Felixstowe survived as commercial ports and consequently, with Lowestoft, developed into the only major urban and industrial settlements in the coastal zone.

### **3.6 Settlement patterns**

As the three main coastal towns grew, becoming increasingly suburbanised, the population of the rural coastal zone, as in the rest of the county, remained low. The commercial growth of the towns and the subsequent urban settlement pattern has had significant consequences for the survival of archaeological features in the coastal zone, both inter-tidal and terrestrial. The 19<sup>th</sup> and early 20<sup>th</sup> centuries were a period of dramatic rural population decline in Suffolk, with causes including emigration and a population shift to towns and industrial centres both in Suffolk and elsewhere in England. As the foci of some of this population movement, the new urban centres on the coast were an exception to the wider pattern of population decline. Rural industries declined and the down-turn in commercial river traffic meant the rivers largely remained undredged. The rivers and much of the countryside in the rural coastal zone therefore remained largely undeveloped until the second half of the 20<sup>th</sup> century, and the survival

of inter-tidal and terrestrial archaeological features should therefore generally be good, with a particular suitability to aerial survey. However, other factors that could affect this survival must now be considered.

### **3.7 Landscape modifications**

Approximately 30% of the coastal project area is composed of low lying land that has been modified, most commonly by drainage and embankment to reclaim coastal saltmarsh (see Figure 4). This process probably began in the medieval period, instigated by the wealthy land-owning classes to make a greater area of land available for grazing. The saltmarsh originally formed by natural processes of silt deposition during a phase of relative sea level rise at some time following the Roman period. This deposition obscured the earlier shoreline and inter-tidal zone, creating a new ground surface. This landscape zone was exploited in the post-Roman and medieval periods largely as commons and for sheep grazing and formed a significant element of the local subsistence economy (cf. Williamson 2000). However, the drainage of the marsh and the construction of flood defences to prevent subsequent inundation would have effectively consolidated this new land surface. This process accelerated in the post-medieval period as part of the enclosure movement, and marked the end of the previous subsistence economy based on the exploitation of common land. The reclamation process probably therefore had far-reaching social and economic consequences (Williamson 2000). It also trapped the now obscured previous shore and inter-tidal zone, and all associated coastal archaeological sites, behind the new flood defences. This process resulted in many of the estuaries being heavily embanked and their courses artificially regulated, creating anomalies in the coastal landscape, such as Orford Castle's location so far from the River Alde. In these areas the originally coastal archaeological sites may now be hundreds of metres inland. This process has potentially affected the survival and visibility of archaeological features in almost a third of the NMP project area and must be considered as important as erosion in all discussions of Suffolk's coastal archaeology.

Such landscape modifications are intrinsic to the modern coastal landscape. However, it is important that they are recognised as cultural modifications to the landscape in their own right. The implications and consequences of these processes are considered in more detail below, in the period based discussion of the project results.

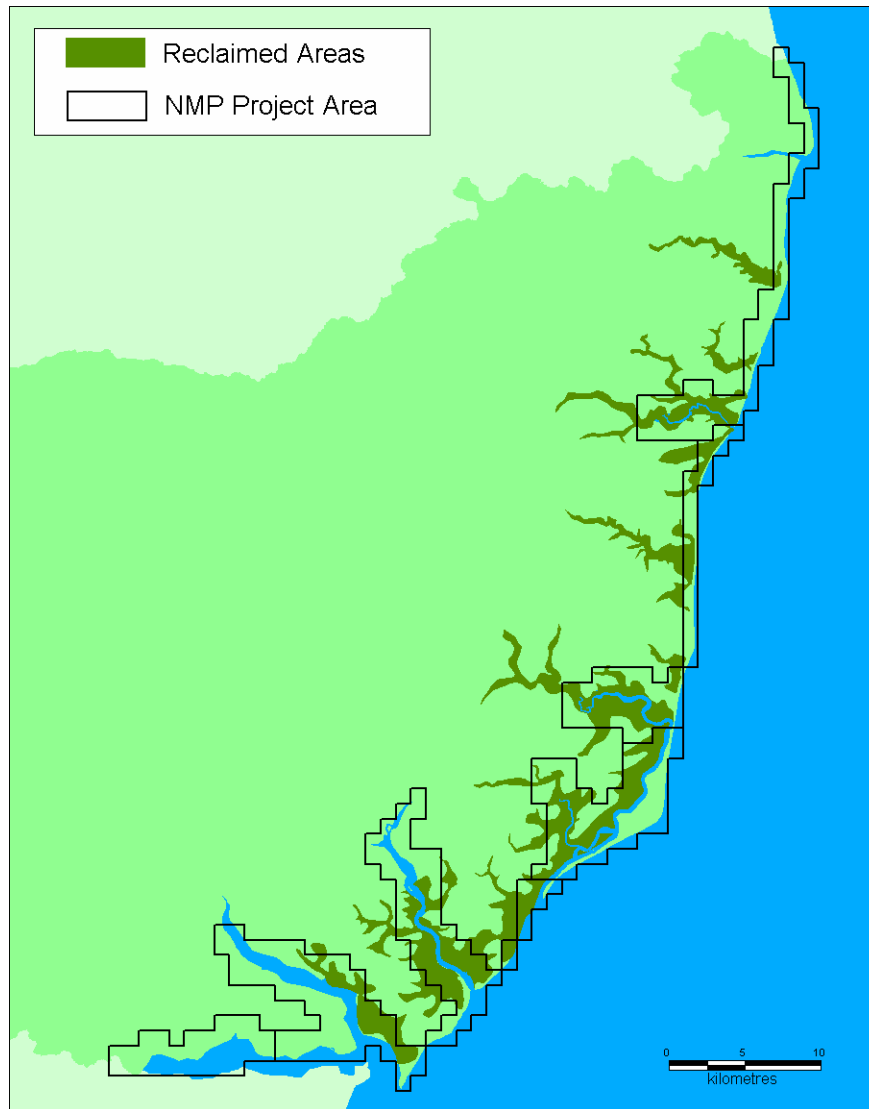


Figure 4. Reclaimed land on the Suffolk coast.

### 3.8 Implications of land-use for archaeological survey

A number of historic and modern land use issues affect the survival and visibility of archaeological features within the coastal zone.

Until the 1960s, industrial activity in Suffolk was largely confined to the urban centres, and the basis of the county's economy remained agricultural (Grace 1999). Historically the regime has been a mix of arable and pastoral agriculture. Central, or 'High' Suffolk was known for its dairying, with sheep farming more dominant on the coast. In these areas the common practice was what is known as a 'sheep-walk' or 'sheep-corn' economy, whereby sheep grazed common land in the day but were folded on the fields to manure the soil by night (Dymond 1999, 136; Williamson 2000). In the later post-medieval period, the agricultural preferences in High Suffolk moved from predominantly



pastoral to arable and changes in the organisation of agricultural holdings reflect this. However, the coastal heaths and reclaimed land were poorly suited to arable cultivation and this landscape zone therefore remained largely as pasture well into the second half of the 20<sup>th</sup> century. This complex subject is examined in section 11. This preserved many archaeological features as earthworks, some of which, such as relict sea banks that had been superseded by later reclamation, related to the reclamation process itself.

The development of modern agricultural practices and productivity demands following the Second World War resulted in increasing areas of reclaimed coastal lowland being converted to arable cultivation in the later 20<sup>th</sup> century. As a consequence, combined archaeological survey methods are now able to uncover increasing evidence for activity on the historic coastline.

In contrast, much of the higher, well drained ground in the project area appears to have been ploughed continuously for many years. Therefore archaeological features are more visible as cropmarks and better recorded in this area. Unfortunately, many sites mark the remains of earthworks that have been destroyed by the plough.

However, the visibility of archaeology from the air in this area is not uniform. Tree plantations cover large areas to the west of the project area. Areas of ancient woodland survive in Suffolk, but the majority of the woodland visible in the project area is the work of the Forestry Commission, dating from the 1920s onwards (Rackham 1999; 1998). The expansion and management of plantations can be clearly seen on photographs from the 1940s onwards, and must be assumed to have had a detrimental effect on the survival of archaeological features, as well as preventing aerial survey.

Agricultural activity will also have increased the down-slope movement of soil on the hills, spurs and valleys through colluvial action. Significant depths of top-soil can accumulate in this way, and it must also be assumed that archaeological features have been masked. Substantial archaeological features can remain obscured despite repeated fieldwalking and the build up of soil can seriously retard the formation of cropmarks (Going 2000).

The increasing importance of nature conservation is beginning to have implications for the survival of archaeology in Suffolk's coastal zone. Large areas of the coastal zone are of national and international significance, for example, most of the coast is an Area of Outstanding Natural Beauty (AONB), and all estuaries in the project area are Sites of Special Scientific Interest (SSSIs), (<http://www.suffolkcoastandheaths.org/map>, last viewed 7th October 2004). However, whereas nature conservation issues are seen to be a high priority in the region's Shoreline Management Plans (SMPs) archaeological remains are currently poorly represented. There is therefore potential for archaeological features to suffer damage during or following nature conservation works.

This process has already begun, for example, in the return of small parcels of reclaimed arable land to saltmarsh conditions as part of a managed retreat, which at Trimley Marshes involved the breach of a sea wall (Everett 2000). However, a new series of SMPs are in development which may take greater account of archaeological remains and, in the meantime, such works present the opportunity for field survey and excavation. Ongoing aerial survey can monitor the effect of tidal erosion on the inundated areas and assess its impact on any visible archaeological remains.

A final consideration for landuse is that the low lying nature of much of the Suffolk coastline has meant that it has often been perceived to be vulnerable to invasion or attack from the sea. Coastal defences and military activity in general have historically been common on the Suffolk coast. Due to coastal erosion, however, much evidence for coastal defences, including those from the 20<sup>th</sup> century, has been lost to the sea.

Modern military concerns have limited wider archaeological work. The use into the later 20<sup>th</sup> century of the military installations at Orfordness and the airfields at Woodbridge and Rendlesham has restricted the opportunities for aerial reconnaissance in these areas. Ongoing military restrictions at other potentially sensitive areas, such as Sizewell nuclear power station, have also resulted in restrictions to both aerial and ground based archaeological investigation.

### **3.9 Summary**

The Suffolk coast is complex and dynamic, deriving its physical and historical character from the inter-relationship of a number of equally complex influences. As has been described above, these are historic and modern, natural and man-made, social and economic, local, national and even international. Any one of these factors can directly influence the survival and visibility of archaeological remains in the Suffolk coastal zone.

## **4. FACTORS AFFECTING THE RESULTS OF THE SURVEY**

The topographic nature of the coast, the past and current land uses and the project methodology have all influenced the nature of the archaeology recorded during the NMP survey.

The Second World War coastal anti-invasion defence system, which originally stretched along almost the entire length of the county's coast, dominated the project results. In contrast, virtually no features of any date were recorded in the inter-tidal zone of these coastal areas. In the areas of reclaimed land a variety of post-medieval features were encountered including relict sea banks and a possible water meadow at Benacre Broad (TM 521825). The estuarine inter-tidal zone proved more fruitful than the coastal inter-tidal zone, though the results were largely dominated by post-medieval and modern wooden structures relating to fishing and transport, such as oyster pits and jetties. Inter-tidal sites of possible medieval or earlier dates, and therefore of greater archaeological significance, were particularly rare. On the higher ground, above the estuaries, fragments of extensive prehistoric landscapes, consisting of ditched field systems, enclosures and funerary monuments, are visible as cropmarks. Therefore, in general, when considered with the Second World War defences, much higher quantities of sites were recorded inland on the higher ground than in the inter-tidal zone.

Consequently there remains a paucity of sites in the inter-tidal zone despite the examination of both recent and historic photography, an inter-tidal field survey and a programme of targeted aerial reconnaissance. Results from the Norfolk NMP project appear to be following a similar pattern (Heppell & Massey forthcoming). This could be the result of a number of factors, relating both to the project methodology and to the physical characteristics of the Suffolk coast. These factors will be discussed in the following section.

### **4.1 The effects of the methodology on the survey results**

#### **4.1.1 NMP Methodology**

The NMP methodology proved valuable in a number of ways and resulted in a significant enhancement of the Suffolk Sites and Monuments Record. The systematic examination of all readily accessible oblique and vertical photographs led to the discovery of a number of sites which were visible on these photographs but which had remained unnoticed, including a small Roman villa in Sutton parish (see section 9.2.3). A series of wooden fish traps of probable medieval or later date visible in the Deben

estuary near Waldringfield (see section 11.8), were only visible on one set of vertical photographs taken in 1945, emphasizing the value of examining the historic vertical collections.

The importance of the systematic examination of the historic RAF and USAAF collections in recording the relatively short-lived Second World War anti-invasion defences has also been highlighted by the project. The photographs show the defensive system in incredible detail, including the temporary structures that were systematically removed at the end of the war, such as barbed wire and emergency batteries. Photographs taken at intervals throughout the 1940s also show developments in response to major wartime events, such as the build-up of troops and construction of embarkation hards (see section 12.3.4) at Landguard Fort, Felixstowe, in the run-up to the D-Day landings. The palimpsest of features from this period has been unravelled by the NMP survey using photographs taken at different stages of the war.

However the definition of the NMP survey area may have hampered our understanding of the patterns of prehistoric, Roman and early medieval archaeology that have emerged. A project area based on the modern coastline is not necessarily appropriate for surveying coastal activities of medieval or earlier date, as in some parts of the project area coastal erosion means that the historic coastal landscape has been lost to the sea. Other parts of the project area comprise swathes of drained and reclaimed land, as opposed to areas that are likely to have been subject to settlement or other semi-permanent activities in the less recent past. These areas may be located inland and therefore are potentially available for study in other projects (see section 3 for further details).

Additionally, in any mapping project a one or two kilometre wide strip of landscape revealed only through small windows of cropmarks is inadequate to characterise the nature of historic settlement and land use. In the Deben and Orwell estuaries the field systems and settlement complexes seen as cropmarks on the higher ground cannot provide a context for the inter-tidal 'landscape' due to the relative low density of features recorded in the inter-tidal zone. This suggests that a much larger area of the coastal hinterland needs to be mapped before we can analyse changes in settlement and land use relating specifically to the coast.

#### 4.1.2 The NMP methodology combined with the aerial reconnaissance

The programme of aerial reconnaissance that ran alongside the NMP survey was still successful in adding new detail to sites visible as cropmarks in the coastal zone, despite a long history of reconnaissance in the area. The most important new discoveries were of eight potential Iron Age or Roman salt making sites, or Red Hills,

five of which have subsequently been confirmed during field visits. The discovery of these sites has begun to change perceptions of the late Iron Age and Roman salt industry in Suffolk (see section 9.2.4).

However, despite expectations raised by reconnaissance in Essex (Strachan 1995), the programme of aerial reconnaissance in the inter-tidal zone was less productive. Few new sites were discovered even when the reconnaissance was specifically timed to coincide with optimum conditions for photography in this zone. One of the few archaeologically significant structures, a large wooden, possibly Anglo-Saxon, fish trap located in Holbrook Bay in the River Stour (see section 10.4.1), was only accurately recorded for the first time however, through the combined efforts of the English Heritage reconnaissance team and Suffolk County Council field survey team, though the structure had been photographed by Davy Strachan of Essex County Council in 1995 (Strachan 1997).

As with the NMP survey, the success of aerial reconnaissance in the Suffolk coastal zone has been affected by our understanding of the position of the historic inter-tidal zone in relation to the modern coastline. High levels of erosion and reclamation on certain stretches of the Suffolk coast mean that the historic inter-tidal zone has either been drained, and is 'trapped' behind relatively modern seabanks, or has been lost to the sea. This could mean that archaeological sites, such as the Iron Age and or Roman salt production sites, are potentially located a significant distance inland and therefore reconnaissance of the modern inter-tidal zone in reclamation areas will only discover relatively modern features.

#### 4.1.3 The NMP methodology combined with the field survey

The field survey of the inter-tidal zone recorded nearly 500 sites, many related to features of post-medieval date (Loader unpublished). The field survey generally complemented the NMP survey, with the field team discovering and recording features in the inter-tidal zone that were unlikely to be seen on aerial photographs, such as fragments of wattle, possibly of Anglo-Saxon date, in the Deben estuary near Sutton Hoo. The time-frame over which the areas were examined also differs greatly between the two survey methods. The ground survey involved a single snapshot of the inter-tidal area and the aerial survey looked at many snapshots of the same area over a period of 60 years. Though only 10% of all features recorded in the inter-tidal zone by the field survey were also recorded by the NMP survey, both surveys noted a lack of significant medieval or earlier sites. This suggests that factors other than the project methodology or survey techniques are affecting the results and these are examined in more detail in the next section.

## 4.2 Topographical characteristics affecting the survey results

In light of the results of the integrated coastal survey doubts have been expressed as to whether the estuaries of Suffolk will ever yield the results seen in the Essex estuaries such as the Blackwater (Wallis 1994), even with a programme of repeated aerial and ground reconnaissance. Though patterns and rates of saltmarsh erosion may change revealing new sites, the lack of significant inter-tidal features discovered during 60 years of aerial photography and the recent ground survey would appear to support the suggestion of a genuine lack of archaeological features in the Suffolk inter-tidal zone.

Although the modern position of the historic inter-tidal zone has undoubtedly played a part in the pattern of results, large parts of the Stour, Deben and Orwell estuary have not changed position dramatically. However, only the northern, Suffolk, side of the Stour has yielded significant results, whilst the inter-tidal zones of the Orwell and Deben estuaries remain relatively blank. It is possible that the topographic nature of these two fairly steep estuaries, with a narrow inter-tidal range, may have affected the survival or visibility of archaeological features in the inter-tidal zone or may have influenced how these estuaries were exploited in the past. In contrast the wider estuary of the Stour, with its extensive mud flats, may have proved a more stable environment for the survival of archaeological remains and more attractive for a range of historic coastal activities. This is exemplified by the fish trap in Holbrook Bay. A geographically determined explanation of the lack of inter-tidal archaeology on the majority of the Suffolk coast is reinforced when one notes that the topographic nature of the Stour is more typical of the Essex estuaries and atypical for Suffolk.

It will be important in the future to compare the results and methodology of the Suffolk coastal survey to the survey, being undertaken at the time of writing, on the Norfolk coast, which also consists of a ground survey, NMP survey and reconnaissance. A more detailed discussion of the methodology used in the Suffolk coastal survey project is now available (Newsome & Hegarty 2004).

## 5. INTRODUCTION TO THE PREHISTORIC EVIDENCE

Virtually all the monuments potentially dating to the prehistoric period on the Suffolk coast have been plough-levelled due to intensive agriculture in the area over many years. Therefore the ditches defining prehistoric monuments are only visible on the aerial photographs in the form of cropmarks, or occasionally soilmarks, generally located on the higher ground above the estuaries. Funerary and ritual monuments, dating from the Neolithic and Bronze Age periods, have been identified as well as a large number of field system fragments and enclosures which could potentially date from the Bronze Age through to the Roman period. The dating and interpretation of this cropmark evidence has proved problematic as very few sites in the project area have been subject to excavation.

Plough-levelled prehistoric sites visible as cropmarks or soilmarks are often interpreted and dated purely on their morphology. This approach can prove problematic as our assumptions are often too simplistic, the realities of monument use and date being far more complex than can be gleaned from enclosure size and shape. Scatters of datable finds recovered in the vicinity of cropmarks cannot be assumed to relate to the phase of activity visible on the aerial photographs or may only represent the most durable forms of material culture, for example Roman pottery, within a long period of continuous settlement.

The earliest features of the archaeological landscape visible on aerial photographs generally belong to the Neolithic period as it is at this time that the first substantial monuments and permanent structures were built. The palimpsest of features visible as cropmarks in the Suffolk coastal zone contains elements that potentially stretch in date from this period into the Roman era and beyond. Consequently periods of change, such as the Roman transition, are difficult to identify from the evidence available on the aerial photographs.

The aerial photographic evidence also gives a skewed impression of the patterns of prehistoric settlement and activity as it is biased towards activities that leave a signature that could be visible from the air, such as enclosed settlement, whilst in reality much evidence for prehistoric activity comes in the form of pits and find scatters that are unlikely to be identified on aerial photographs. Finally, cropmark formation and discovery is dependant on many factors, as discussed in Section 3, and these also need to be taken into account, though these mean that there is always potential for more cropmark evidence to be discovered. All these issues must be considered when analysing the cropmark evidence.

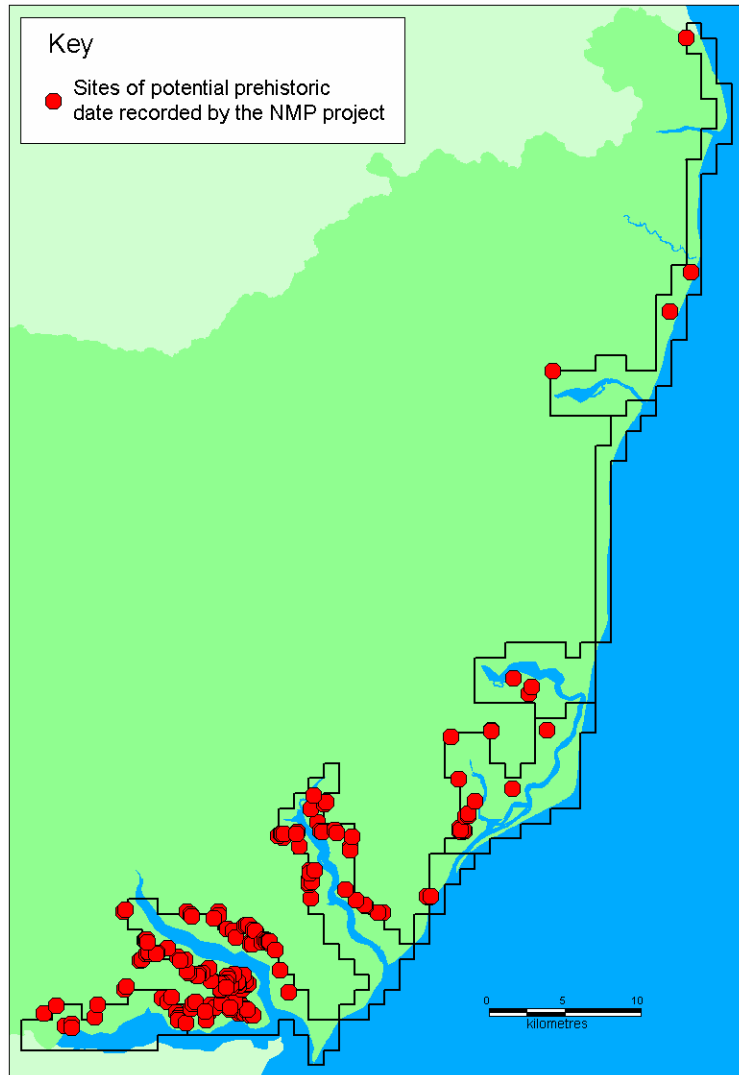


Figure 5. Potential prehistoric sites recorded by the NMP project.



## 6. THE NEOLITHIC PERIOD: 4000 BC – 2350 BC

Though changes in land use and settlement throughout prehistory would have been gradual, and prehistoric populations had no perception of the period of time we define as the Neolithic and Bronze Age, it is necessary for this report to group the data. The problems with identifying a clear transition between the Neolithic and Bronze Age (Ashwin 1996, 47) are acknowledged by the authors even though the two periods are considered separately in this report.

The Suffolk Coastal NMP survey did not identify any new sites that can be described with certainty as Neolithic. Only two new sites, an oval enclosure in Levington parish and a pit circle in Boyton, were identified as potentially Neolithic, based on their morphology and comparisons to regional and national site types.

The Neolithic causewayed enclosure at Freston (TM 168379, FRT 005) was transcribed by Carolyn Dyer in 1995 as part of the “Industry and enclosure in the Neolithic” project (Dyer 1995; Oswald *et al.*, 2001). The transcription has been included in the Suffolk Coastal NMP project as it is located just on the edge of the project area, at a height of 30m OD, between the Orwell and Stour valleys. It is defined by two circuits of interrupted concentric ditches, visible as cropmarks on aerial photographs, with a narrow palisade trench running in between (see Figure 6). Its topographical location has been described thus, “...the enclosure surrounds the head of a shallow dry valley. This holds a spring now barely sufficient to feed an agricultural pond, though it may once have fed a nearby tributary of the River Stour” (Oswald *et al* 2001, 97). The association of causewayed enclosures with watercourses appears to be common across the country (Oswald *et al* 2001, 97). There has been no excavation or intensive field walking of the site and consequently the activities that may have been taking place there remain unclear.

Comparison of causewayed enclosures across the British Isles has shown that if regional patterns in form exist they do so only at a very small scale (Oswald *et al* 2001, 109). The enclosure at Freston differs from the other causewayed enclosures known in Suffolk (located at Kedington, Fornham All Saints and possibly Bentley, see Oswald *et al* 2001). The palisade trench and close proximity of the two circuits of ditches suggest similarities with the excavated enclosure at Orsett in Essex (Oswald *et al* 2001, 43;47) but causewayed enclosures in Norfolk appear to be small and more circular (S. Tremlett, pers comm).

Within the enclosure the possible remains of a contemporary Neolithic long house or Anglo-Saxon hall (TM 169380, FRT 023) are visible as cropmarks of post-holes (see Figure 7). Either interpretation of the structure, which lies within the scheduled area of

the causewayed enclosure, would reinforce its status as a nationally important site (see section 10.4.2). Causewayed enclosure sites with long house structures within them are known from mainland Europe (Oswald *et al* 2001, 83) but if the Freston post-hole feature was found to have a Neolithic date its location within a causewayed enclosure would make it unique within Britain (M. Barber, pers comm).

Despite the importance of this site no further investigation of this structure has been discussed and this report provides an opportunity to highlight the importance of further work on the site, perhaps small scale excavation, especially as 30 years of deep ploughing may have already destroyed the feature (see section 13.3 for further discussions). Existing evidence for this period is very sparse and, without mapping the remainder of the Shotley peninsula not included within the project area, it is very difficult to place the Freston enclosure within its contemporary landscape. Nearby ring ditches attest, however, to the continuing use of the area for funerary, and presumably ritual, purposes into the later Neolithic and Bronze Age.



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*Figure 6. The Neolithic causewayed enclosure at Freston*

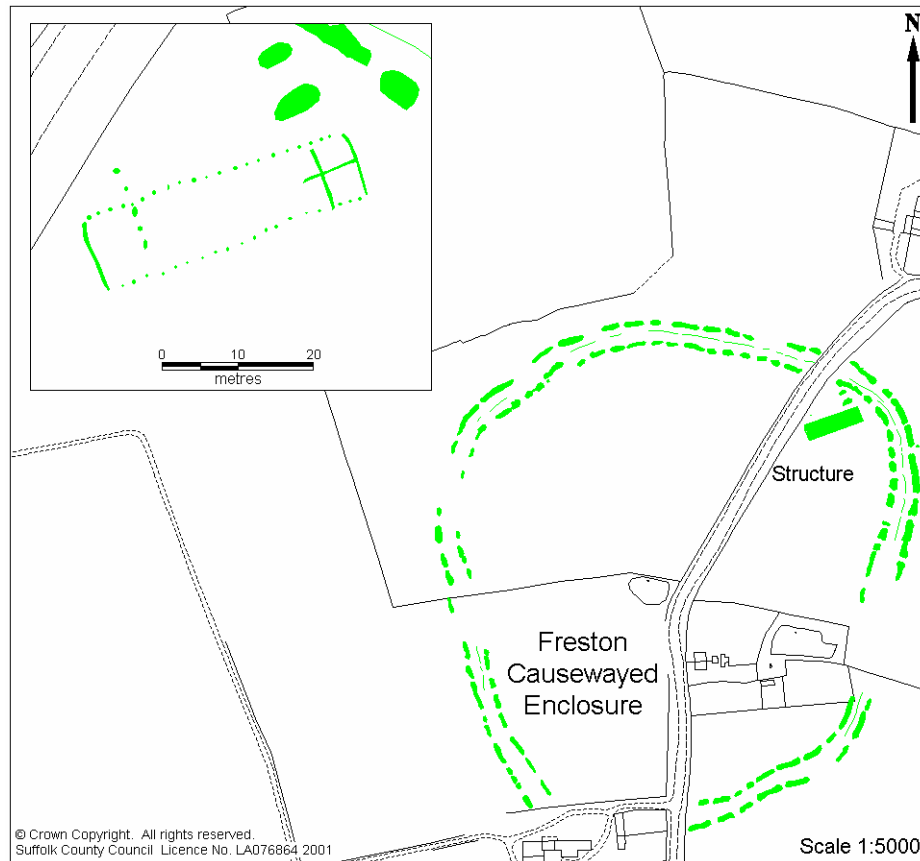


Figure 7. The post-built structure located in the north-eastern corner of the Freston causewayed enclosure (after Dyer 1995).

Funerary and ritual monuments such as long barrows, oval barrows and mortuary enclosures, typical of the Neolithic period in Britain (Thomas 1999, 131-151), are relatively sparse in the county, with the known possible Neolithic barrow sites in 1981 consisting of one dubious long barrow, two oval barrows and 12 oval enclosures, that is enclosures with a continuous ditch (Lawson *et al* 1981, 21). These oval enclosures appear to be part of an East Anglian monument tradition and date to the Neolithic period though, as the excavated site at Rivenhall, Essex, demonstrates, their precise function as mortuary enclosures or burial mounds remains unclear (Buckley *et al* 1988, 90). The lack of monuments from this period in the neighbouring county of Norfolk has also been noted (Ashwin 1996) though this will need to be reassessed in light of the inevitable revision of the record that the Norfolk NMP project will bring (Massey *et al* 2003). In Suffolk, the pattern of enclosures thought, on a morphological basis, to be Neolithic does not appear to have changed in over 20 years, but a proper reassessment of all ovoid enclosures recorded on the SMR would be necessary to confirm this.

The only two possible Neolithic oval enclosures that have been recorded by the project are only 1.4km apart, located on the northern side of the River Orwell above Levington. The larger enclosure (TM 241392, LVT 014) is visible in the form of an elongated oval

ditch enclosing an area of at least 30m in length and 20m in diameter. The second, smaller enclosure, measuring 22m by 14m, (TM 229399, LVT 055) may be a small mortuary enclosure and is new to the Sites and Monuments Record (see Figure 8). They both share similar orientations and geographical locations, sitting around the 25m contour above shallow valleys formed by tributaries running into the River Orwell. Both enclosures appear isolated, from the aerial photographic evidence alone. It appears that the sites may have been inter-visible but this would depend on factors such as tree cover. Their similar locations and potential inter-visibility may suggest they are part of a local tradition, that the people who constructed them were influenced by the same things. Though the coastal NMP project has not altered the distribution of Neolithic sites in the county, the discovery of one new potential oval barrow site or mortuary enclosure in an area where Neolithic monuments are rare suggests that a wider aerial survey of the whole county could significantly increase their potential distribution.

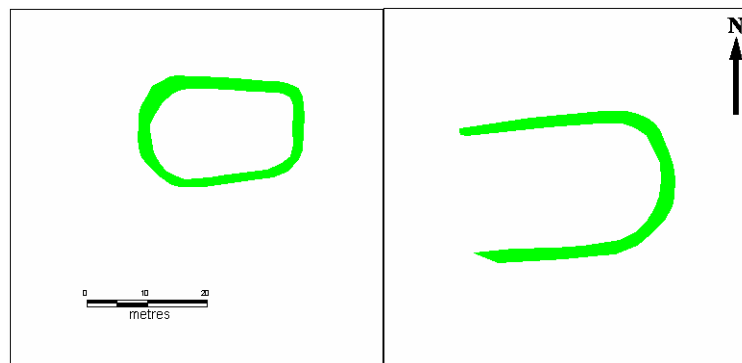
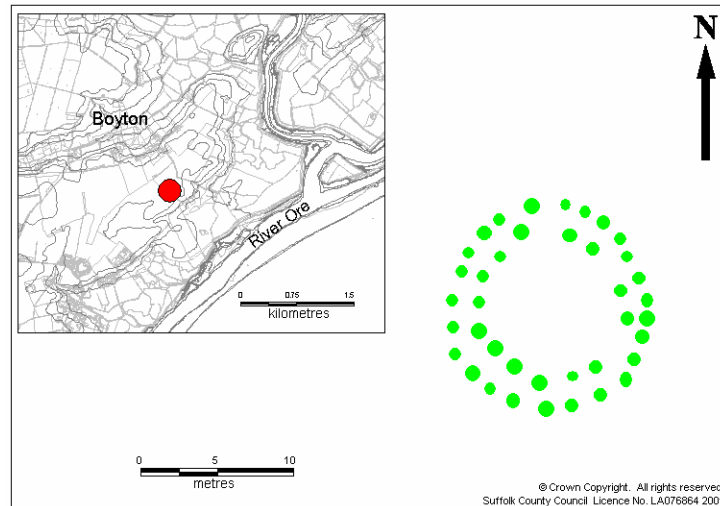


Figure 8. Two potentially Neolithic oval enclosures in Levington parish(1:1250)

Another site, potentially Later Neolithic or Early Bronze Age in date, which is new to the Suffolk SMR consists of two concentric circles, one 10m and one 14m in diameter, defined by pits located in Boyton parish (TM 379465, BOY 068). The pits are visible as cropmarks and may represent the past location of large timber posts (see Figure 9). The pit circles could be the structural remains of a round barrow or round house though no features of similar design have been recorded by the project. Excavation is the only way to discover the date of this feature but its unusual nature suggests that it could be a ritual timber circle of Late Neolithic or Bronze Age date. A similar site excavated at Flixton, Suffolk, was thought to be a non-domestic enclosure of Late Neolithic date (Boulter 1997, 96) and excavated sites with similar morphology at Oddendale in Cumbria and on Ogden Down in Wiltshire and have also been found to be of this date (Gibson 1998, 137-138). The initial construction phase of other circular enclosures, recorded as Bronze Age barrows, may have been similar to the pit circle but the construction of a later barrow means that this is unlikely to be visible on the aerial photographs. The site at Boyton is located on a low spur of land which would have had, prior to later post-medieval reclamation of the saltmarsh, a coastal location. In the historical atlas of Suffolk edited by Dymond and Martin (1999) there does appear to be

a concentration of Neolithic finds evidence near the three major river estuaries in the south-east (Martin 1999a, 37) but the whole county would need to be surveyed to assess how the sites recorded during the NMP project relate to this concentration of Neolithic activity.



*Figure 9. A possible Late Neolithic or Early Bronze Age double concentric pit circle visible as a cropmark near Boyton Hall Farm in Boyton parish*

The coastal and estuarine situations of the Neolithic monuments that have been mapped are unsurprising considering the concentration of the settlements at this time on the light soils such as the Sandlings, within a mile of a watercourse (Martin 1999a). Though these settlement sites cannot be identified from the air, because they consist of pits and find scatters that are not visible on aerial photographs, one might expect to find a few more ritual monuments belonging to the Neolithic population, especially when one considers the concentration of oval enclosures of potential Neolithic date along the River Stour (Martin 1999a, 36).

Factors affecting the lack of Neolithic sites in the coastal zone may include the problem of identifying a monument tradition which is distinctly different to that of, for example, the Wessex chalk, and is not easily distinguished from later features on aerial photographs. It is even possible that parts of the Neolithic landscape have been submerged due to a rise in sea level in the Late Neolithic to Early Bronze Age period (Brown & Murphy 1997, 12; Holgate 1996, 15). Timber circles, discovered by the Suffolk County Council field team, are eroding out of the saltmarsh in Holbrook Bay, Stutton (TM 166340, STU 068). Though these features are not thought to be of Neolithic or Bronze Age date (P. Murphy, pers comm) it highlights the possibility of Neolithic sites being discovered in these inter-tidal areas (see Brown & Murphy 1997, 12).

The identification of Neolithic settlement is rare in any type of archaeological survey, especially in aerial photographic surveys and the project did not prove to be an exception to this rule. The identification of field systems associated with Neolithic activity is even more unlikely. The field system visible on aerial photographs running across Sutton Common adjacent to the Anglo-Saxon barrow cemetery at Sutton Hoo (see Figure 15 'H') appears, in light of recent work in the area of the Sutton Hoo Visitor Centre, to be of Roman date (Topham-Smith 2001, 87-88; J Plouviez, pers comm). This is despite the assertion of an unlikely Late Neolithic or Early Bronze Age date (Carver 1998, 96-97; M. Barber, pers comm) in the interim excavation report on the prehistoric settlement (Hummler 1993, 21). No excavated evidence could be found in the published material to support to this claim (Longworth & Kinnes 1980).

The low numbers of potential Neolithic sites recorded by the NMP survey reflects a countywide sparsity for monuments of this period. The river valleys would have been the most heavily settled and exploited parts of the county in the Neolithic period (Martin 1999a) and the presence of the large ceremonial enclosure at Freston suggests that a reasonably sized population inhabited this coastal zone. The NMP survey has highlighted the potential for discovering new monuments dating to this period, despite the difficulty of recognising these monuments on aerial photographs and the fact that cropmark formation is unlikely due to the nature of some parts of the survey area (see Section 3). The newly recorded possible oval enclosure or barrow in Levington parish and the pit circle at Boyton may be part of a regional and a national monument tradition respectively.

## 7. THE BRONZE AGE: 2350 BC – 700 BC

Evidence for the Bronze Age in Suffolk comes in the form of funerary monuments and their remains, find scatters and palaeoenvironmental evidence (Brown & Murphy 1997). Evidence for settlement from the county is rare and this reflects a general trend across much of northern East Anglia (Brown & Murphy 1997, 16). Although there was probably less Bronze Age occupation on the heavy soils of the claylands, artefactual evidence suggests widespread activity across the county in the Bronze Age (Martin 1999b, 39). Inter-tidal features of Bronze Age date have been found in the Essex river estuaries (Brown & Murphy 1997, 18). Settlement was concentrated on the river valleys of Suffolk and evidence for Bronze Age funerary monuments is concentrated on the coastal Sandlings (Martin 1999b, 38) suggesting that there was high potential for recording Bronze Age activity in the project area. Identifying cropmarks of enclosed settlement and field systems from this period on aerial photographs is difficult without other evidence, such as finds from field walking or excavation, partly due a significant proportion of open settlement at this time.

The plough-levelled remains of probable burial mounds dominate the NMP survey evidence for the Bronze Age as they are highly visible within the cropmark landscapes, in the form of ring ditches. Large numbers of ring ditches have been mapped and recorded during the project and a significant number are new to Suffolk's archaeological record. Settlement evidence for this period is more difficult to identify on the aerial photographs, not least because a significant proportion would have been unenclosed (Brown & Murphy 1997, 18; Parker-Pearson 1993, 103) but elements of the Bronze Age landscape may be visible within the palimpsest of prehistoric enclosures, boundaries and trackways that can be seen as cropmarks in the Suffolk coastal zone.

Sixty-one new ring ditches were mapped as part of the project, in addition to the 104 ring ditches previously recorded on the Suffolk SMR. Just over half of all the ring ditches in the project area were interpreted as possible ploughed-out Bronze Age round barrows. The difficulties in interpreting circular cropmarks have been well documented (Wilson 2000); smaller ring ditches can represent the remains of prehistoric round houses, larger ones prehistoric settlement enclosures. Recent excavations in Essex have highlighted some of the perils of interpreting hengiform features visible on aerial photographs as prehistoric monuments; two features revealed themselves to be the sites of post-mills (Brown, Knopp & Strachan 2000, 7).

It must also be noted that the ring ditches could, in some cases, belong to round barrows of the Iron Age, Roman or Anglo-Saxon periods. Though round barrows of these dates are much less common than Bronze Age barrows, the presence in the region of round barrows from these periods (Lawson *et al* 1981, 21-26), notably at

Sutton Hoo, highlights the problems involved in trying to interpret and date ring ditches known from cropmark evidence alone. The ring ditches of the flat Bronze Age cremation cemetery at Ardleigh, Essex, with diameters varying from 3 to 9m (Brown 1999, 36), further complicate matters, as does evidence from the Anglo-Saxon cemetery at Snape, where two small ring ditches are definitely Anglo-Saxon in date but the others, lacking in dating evidence, could be Bronze Age (Filmer-Sankey and Pestell 2001, 236). Despite these problems, most of the larger ring ditches mapped during the project have been interpreted as the plough-levelled remains of Bronze Age round barrows, particularly if found in association with other possible barrow ring ditches, suggesting a cemetery. The context or setting of a ring ditch, when actually visible on the aerial photographs, is more relevant than its size when forming an interpretation on the basis of cropmark evidence alone.

The possible barrow-related ring ditches enclose areas that range in size from 7m to 36m in diameter, the vast majority of which fall into the 15m to 25m range. The widths of the ditches themselves vary from 0.5m to 5m, a factor which may have some bearing on the original form of the barrow, for example whether or not it had a small mound, especially when considered alongside the ring ditch diameter (Strachan 2001, 14-15). The diameter of the ring ditches suggests that the barrows in the Suffolk coastal zone are comparable in size with those in the Stour Valley on the Suffolk-Essex border (Strachan 2001, 14), but it is beyond the scope of this report to attempt to collate comparative data for other parts of the country. Again comparisons of ring ditch size must always allow for the misinterpretation of ring ditch function and the inclusion of ring ditches which do not represent Bronze Age funerary sites. The only excavated example of a plough-levelled Bronze Age round barrow in the project area (TM 254392, TYN 029) was found to date to the Early Bronze Age and had an internal diameter of 24.5m enclosed by a ditch 1.5m wide. Consequently there is no clear evidence on which to base a correlation between the diameter of a ring ditch and its interpretation as the remains of a burial mound.

The majority of potential barrow ring ditches appear, on the basis of the NMP survey at least, to be either isolated or located in pairs, rather than in large cemeteries. Large barrow cemeteries do occur in Suffolk (Lawson *et al* 1981, 82) but are less common than small clusters or even isolated ring ditches. There are however a few examples of small cemeteries (e.g. TM 206370, TM 359421), though these only appear to contain three or four ring ditches. One much larger, dispersed barrow cemetery, visible on Levington Heath (TM 2440; Lawson *et al* 1981, 84), was only partly mapped as it extends well beyond the project area. Again this highlights the problems created by the use of an arbitrary boundary to the project area as opposed to one based on relevant areas of landscape such as the whole of the heath.

A number of double-concentric ring ditches were mapped and recorded during the project, including two sites located 400m apart at Shotley (TM 229352, SLY 039 and



TM 233253, SLY 049, see Figure 10) and one site in Levington parish that is new to the county SMR (TM 231394, LVT 043). The double concentric ring ditches may represent the ploughed-out remains of more complex round barrow forms or two phases of construction and use. In Essex, a concentration of the double-concentric ring ditch monuments has been noted around the Stour valley in the north of the county (Strachan 2001, 18). The coastal NMP project results appear to reflect a similar concentration of these types of sites around the Stour estuary and the next major river to the north, the Orwell. This pattern may imply some type of local monument tradition related to a particular population group or may be a reflection, as discussed previously (see sections 3 and 4), of the light soils in and around these major river valleys allowing more and better cropmark formation than the soil in other areas. This could also mean that multiple phases, such as the concentric ring ditches, are more easily visible.



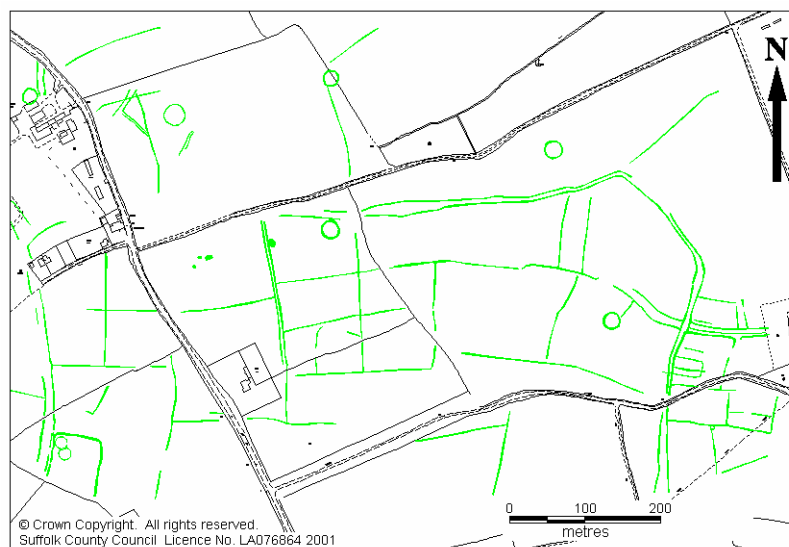
*Figure 10. A double concentric ring ditch visible as a cropmark in Shotley parish*

The close relationship between the lighter soils and the Bronze Age barrows of Suffolk has previously been highlighted (Martin 1999b, 38). It was noted that this may be related, in part, to the coastal Sandlings area being more conducive to the formation of cropmarks due to high soil moisture deficit levels (Martin 1981, 77). Although there was probably more occupation on the light soils and in the river valleys, as is suggested by the barrow distribution, artefactual evidence suggests widespread activity across the county in the Bronze Age (Martin 1999b, 39) including in the clay areas not conducive to cropmark formation. Only intensive and systematic aerial reconnaissance of all areas, including the claylands, will clarify whether the Bronze Age barrow distribution is due to a bias in the available aerial photographic evidence. Only 15% of the evidence for Bronze Age barrows in the county comes from upstanding mounds (Martin 1981, 65), which suggests that the varying potential for cropmark formation on different soils could be having a significant effect on the distribution pattern.

Within the NMP survey area the vast majority of the soils are light and well draining so no clear preferences of the Bronze Age populations for particular soil types can be

identified within the project area itself. In addition, the narrow strip of higher, sloping ground adjacent to the estuaries which the project area covers has inevitably produced a skewed picture of the topographical distribution of ring ditches because it is not wide enough to include a variety of topographical zones for comparison. It appears that some of the possible barrow sites are located on slight slopes orientated towards the estuaries, but as the majority of the project area covers these slopes rather than the higher, level plateau areas it is not clear whether this observation is valid. Additionally, in the coastal zone, the distribution of possible Bronze Age barrow ring ditches cannot be related to a later pattern of Bronze Age cremation burials.

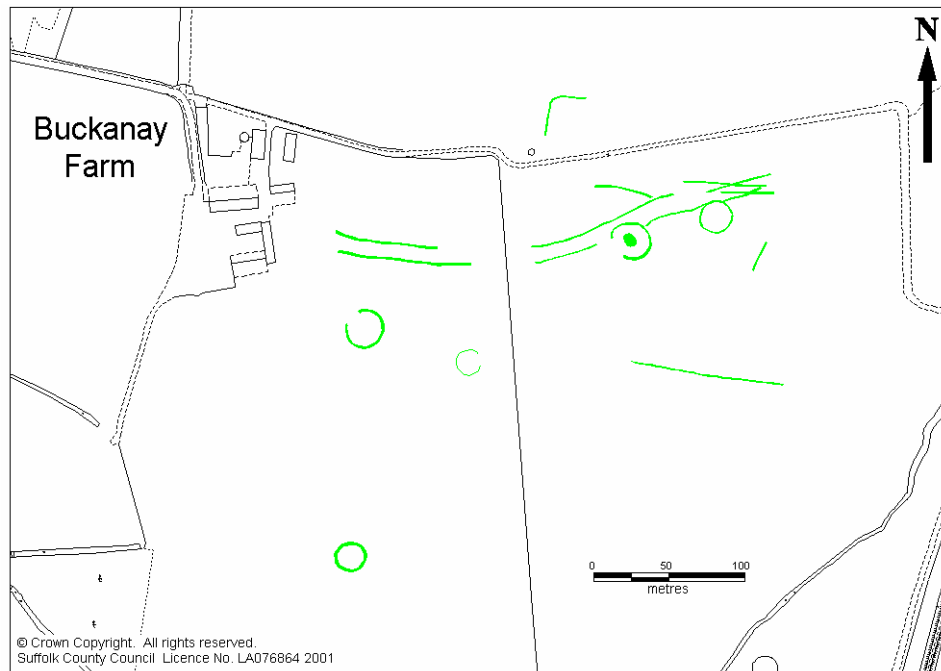
If conclusions can be drawn from the Suffolk Coastal NMP project results, it is that there was wide variation in the locations that the Early Bronze Age people of Suffolk chose to bury their dead, rather than a preference for particular topographic locations. A general preference for the location of Bronze Age barrows within areas of permanent settlement has been noted in the county as a whole by Martin (1981, 82). A number of large, isolated ring ditches, probably the remains of Bronze Age barrows are visible interspersed within a ditch-defined field system in Shotley parish of Iron Age or Romano-British date (see Figure 11). This field system is located on the level plateau area of the Shotley peninsula above the Stour and Orwell estuaries and though the field system is likely to be later than the barrows, it may represent the formalisation of an earlier agricultural or pastoral landscape suggesting that the barrows were not built in a marginal area.



*Figure 11. Probable barrow ring ditches located within a later prehistoric or Roman field system at Shotley (scale 1:10000)*

In contrast, a possible Bronze Age barrow cemetery at Buckanay Farm, Alderton (TM 360422) is located on very low-lying ground below the 5m contour (see Figure 12). The area around the slight knoll where the ring ditches are located is now drained and embanked but may have been saltmarsh and presumably would have periodically

flooded during the Bronze Age. This suggests a very different environment and landscape for burying the dead compared to that described above on the Shotley peninsula. The significance of watercourses in the location of Neolithic and Bronze Age ritual and funerary monuments has been widely noted (Strachan 2002; J. Mills pers comm) and the sea, or a coastal location, may have held a significance beyond that of transport and subsistence in the siting of these barrows. This also adds to the importance of being able to define the position of the prehistoric coast when studying coastal landscapes of this nature.



*Figure 12. The probable Bronze Age barrow cemetery at Buckanay Farm, Alderton, located on land below the 5m contour (scale 1:5000).*

In general settlement evidence from the Middle and Late Bronze Age in Suffolk is scarce (Brown & Murphy 1997, 16-18) and therefore it is hard to relate the evidence for Bronze Age activity, potentially visible as ring ditches, to the general pattern of settlement. There are also problems inherent in identifying cropmarks of Bronze Age enclosed settlement and field systems on aerial photographs without other evidence, such as finds from field walking or excavation, especially as a certain amount of the settlement is likely to have been unenclosed. This is compounded by the probability that many of the enclosed settlement sites visible on aerial photographs are probably of Iron Age or Romano-British date, but with earlier Bronze Age phases that cannot be clearly identified in the palimpsest of cropmarks. At Ardleigh in Essex, for example, trackways with only Roman datable material in the ditches were based on the framework of the Bronze Age landscape, perhaps even suggesting earlier, Bronze Age, origins for the routes (Brown 2000, 178). The enclosure defining the ring ditch complex at Lawford can also either be seen as contemporary with the round barrows or as being

the later manifestation of Bronze Age land division based on the barrows (Brown *et al* 2002 , 23-25). Late Bronze Age circular settlement enclosures, such as the one excavated at Springfield Lyons in Essex (Buckley & Hedges 1987), have not been identified in the coastal zone from the cropmark evidence.

The NMP survey has interpreted, mapped and recorded a large body of evidence for Bronze Age burial in the Suffolk coastal zone, though this is primarily related to mound burial rather than more ephemeral sites such as flat cremation cemeteries. However, a number of problems have been identified with the positive interpretation of the date and original function of ring ditches. Settlement has proved more difficult to identify, though it has potentially been mapped and recorded within the general pattern of prehistoric enclosure and land use. Important evidence relating to Suffolk's coastal Bronze Age landscapes undoubtedly remains to be interpreted and mapped from aerial photographs, as the NMP project area did not target areas of prehistoric activity or to areas of modern land use conducive to aerial photographic survey.

## **8. THE IRON AGE AND ROMANO-BRITISH PERIOD: 800 BC – AD 410**

### **8.1 Problems with dating and interpretation**

In contrast to the Neolithic, and to some extent the Bronze Age, sites and landscapes potentially relating to the Iron Age and Romano-British periods are highly visible as cropmarks on aerial photographs of the project area. The dating, interpretation and analysis of the enclosures and field systems that make up these landscapes are problematic and have to be done on the basis of morphology, in a general absence of supporting evidence from excavation in the project area. There exists a general assumption in the morphological analysis of cropmarks that rectilinear regular enclosures are later in date than curvilinear forms. However, there are numerous examples of enclosures which on excavation have been found not to follow this pattern and the assumption must be used with caution. As already discussed in the Neolithic and Bronze Age sections, sites that appear morphologically to be Iron Age or Roman often turn out on excavation to have earlier origins, but these origins can be masked by the later form of the site as is visible on the aerial photographs. Even when enclosures are confirmed as being of Iron Age or Roman date, the bias towards the identification of enclosed rather than open settlement on aerial photographs means the resulting patterns of field systems and settlements must also be analysed with caution.

It is now generally accepted that the arrival of the Romans in 43AD may have had a less dramatic impact on the Iron Age peoples of Britain than had been traditionally thought, at least in terms of rural settlement patterns. Romanisation would have involved the slow adoption of new types of material culture and ideas, both prior to and after the invasion, and a change in the elite but not necessarily a wholesale reorganisation of the rural landscape. The Iron Age and Romano-British periods are therefore discussed together in this section, based on the strong possibility that there would have been no immediate shifts in settlement patterns between these two periods and on the fact that the general lack of evidence for Roman roads and villas sites in coastal zone suggest a degree of continuity between the periods in the project area (Plouviez 1999, 42; section 9.2.2) Distinguishing between these periods on the basis of cropmark morphology is also problematic and the enclosures and field systems visible on the aerial photographs are likely to have had Iron Age origins even if they continued in use into the Roman period.

## 8.2 The evidence

Acknowledging the problems with dating discussed above, and in contrast to the lack of evidence from the preceding periods, a wealth of sites of probable Iron Age or Romano-British date were recorded by the project. In total 136 sites were recorded as potentially having Iron Age or Roman elements (700 BC – 409 AD). Approximately 25% of those sites were new to the Suffolk SMR, though new details were added to many sites that had been recorded in the database prior to the NMP survey. In general these sites consist of fragments of extensive ditch-defined field systems, possible enclosures of settlement, or other functions, and trackways. The long history of arable cultivation on the light coastal Sandlings soils means that virtually no evidence of earthwork sites from this period is visible within the project area, even on the 1940s RAF photography, and the vast majority of the evidence discussed below was only visible as cropmarks.

### 8.2.1 Location

The Iron Age and Romano-British sites and landscapes are generally located on the higher, level ground above the estuaries on the free-draining sandy soils of the Sandlings and the loams of the Felixstowe and Shotley peninsulas (see section 3.2). The sites and landscapes of this date appear to be slightly more prevalent on the loamy soils, though this may be reflecting greater amounts of arable agriculture and aerial photography on the Felixstowe and Shotley peninsulas. The cropmark complexes do not appear to extend down the valley slope towards the estuaries themselves possibly because these slopes were not exploited in a way that would leave a trace visible on aerial photographs, being perhaps too steep for settlements or field systems. Alternatively they may not be conducive to cropmark formation due to reclamation, silt deposits or particular land use (see section 3) which may be masking the archaeology.

The densest areas of cropmarks relating to these probable Iron Age or Romano-British landscapes are located alongside the major estuaries of the Stour, Deben and Orwell. Areas of particularly dense cropmarks include the Shotley peninsula, both sides of the Orwell river and the northern half of the Deben estuary. To the north, occasional trackways and enclosures are visible, in particular on the slightly higher ground above the Butley River, but in general the narrowness of the one kilometre strip mapped in this area, and the large amount of drainage and erosion along the coast proper, has meant that few cropmarks sites have been recorded.

The shape of the project area has also made it difficult to assess the significance of the topographic location of the field systems and enclosures in any detail as only the edges

of the higher Sandlings areas that are conducive to cropmark formation have been surveyed. The Iron Age and Romano-British landscapes continue beyond the project area resulting in only a portion of the landscapes available for study being interpreted, mapped and recorded. This has proved a disadvantage in the analysis of these landscapes, partly as the most convincing Iron Age or Romano-British enclosures appear to be located above the 20m contour, as do most sections of cohesive field system. A few of the enclosures appear to sit on very low spurs which would have jutted out into saltmarsh in the Iron Age and Roman period (for example the enclosure at Sutton parish, TM 287465, SUT 063, Figure 13 'G'). This might suggest that the people who constructed them were using the saltmarsh as a natural form of defence or that the sites were located in order to exploit coastal resources.

### 8.2.2 Settlement evidence

The project interpreted, mapped and recorded a number of possible enclosed settlements which vary widely in size and form, some of which appear isolated and some apparently associated with field systems and trackways ( see Figure 13). The identification of settlement enclosures as opposed to enclosures of other functions is problematic from the aerial photographic evidence alone. Ring ditches within enclosures may suggest round houses but that does not necessarily imply a domestic function (Figure 13 'F' and 'G'). The nature of the soils in the project area produce a background mottled pattern in the crops and therefore man-made pits that might suggest domestic activity are also difficult to identify. Patterns which might reflect particular communities or tribal groups cannot be identified in the morphology of the enclosures within the project area, though this is unsurprising as the shape and size of the project area means that it is unlikely to encompass whole territories or landscapes that had significance for the Iron Age or Romano-British populations.

There do appear to be a number of regular rectilinear enclosures of similar dimensions in the Deben Estuary area which may suggest a very late Iron Age or Roman date (for example TM 317416, TM 310419, TM 281421 and TM 275453, Figure 13 'C','H','I' and 'J'), though the excavation of a rectangular enclosure at Foxhall has suggested a Middle Iron Age date (Martin 1999d, 62). As discussed above these sites are difficult to date morphologically but occasionally a relationship can be suggested, such as at Martlesham parish (TM 275453, MRM 026). Here a rectilinear, possibly double-ditched enclosure has been interpreted morphologically as being of later Iron Age or Roman date, as it is apparently overlying an earlier, but still probably Iron Age, phase of prehistoric field systems and enclosures (see Figure 14).

There are no large hillforts or major defended settlements within the project area. This reflects a general sparseness of hillforts across the region as a whole (Bryant 1997, 29) and may suggest that the development of an alternative to the traditional concept of the

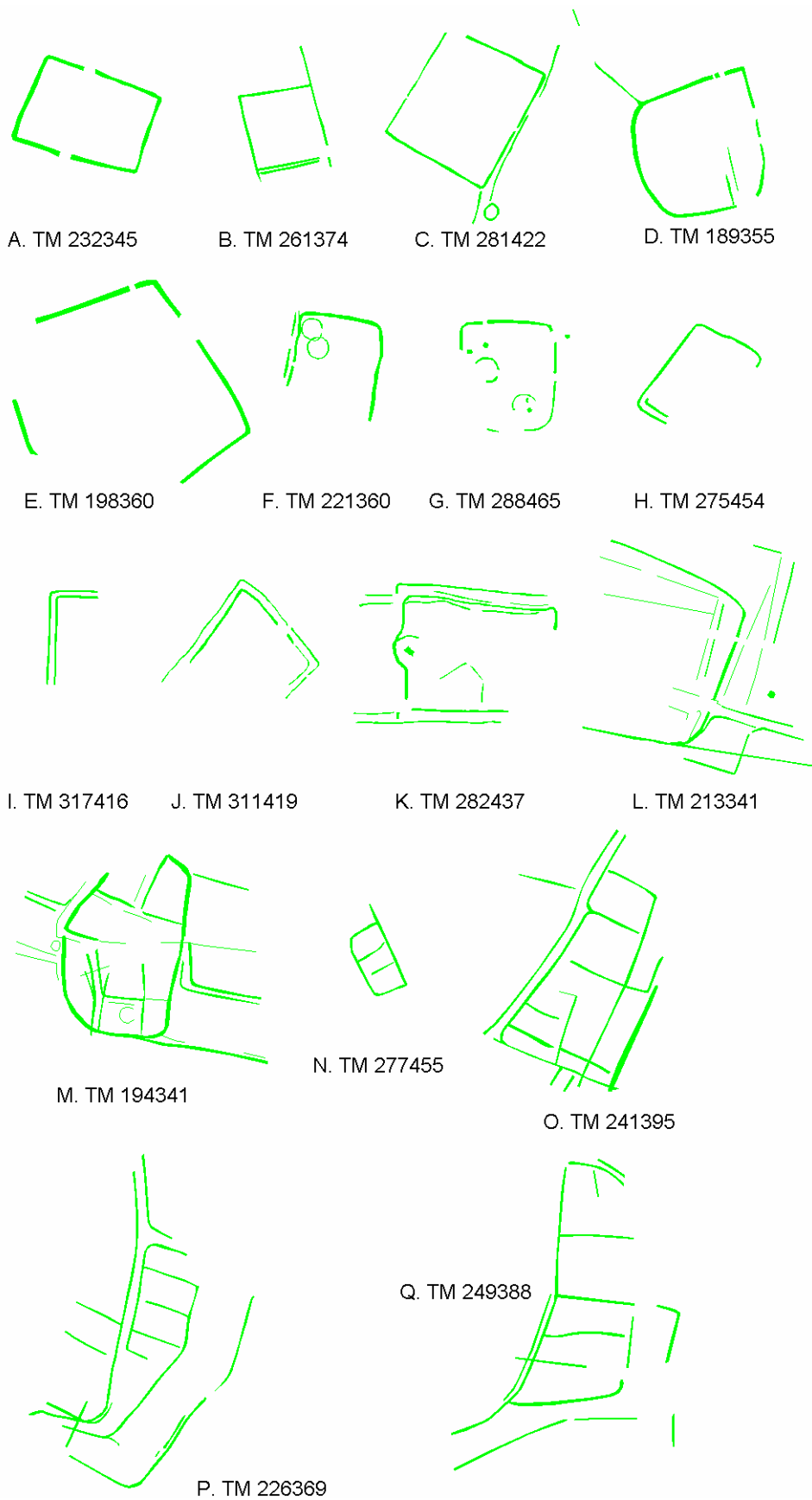


Figure 13. A selection of possible Iron Age or Romano-British enclosures (scale 1:5000)



'Wessex' hillfort is appropriate for the region. Some of the enclosures recorded during the project may have been defended in some fashion but evidence of banks has not been recorded. Enclosures appearing to have particularly large ditches suggesting large banks, like the one excavated at Barnham (Martin 1992, 1), have not been recorded in the coastal zone. The only site recorded that shows evidence of a palisade trench is the D-shaped enclosure at Harkstead (TM 194341, HRK 007, Figure 13 'M') but it is unclear whether this was related to defence.



Figure 14. Two phases of possible Iron Age or Romano-British landscape in Martlesham parish (scale 1:10000)

### 8.2.3 Associated field systems

A number of the enclosures and possible settlements described above are linked into ditched field systems and trackways. The field systems comprise conjoined rectilinear enclosures, the layouts of which suggest varying degrees of preplanning in their development (see Figure 15). There is no evidence of extensive coaxial field systems, similar to those suggested by Williamson on the claylands of north Suffolk and Norfolk (1987;1998). The orientation and nature of the field systems in the coastal zone suggest a greater variety of smaller individual field systems reflecting local topography, rather than an extensive planned landscape. This is perhaps unsurprising as the nature of the landscape dissected by a number of major river estuaries makes an extensive coherent field system impossible. There is no dominant orientation of field systems within the project area, though an area in the northern half of the Deben estuary at Martlesham does show some coherence over a few kilometres, with elements on roughly north-south and east-west alignments as shown in Figure 14 and Figure 15 'E'.

Often the rectilinear fields have stretches of trackway defined by parallel ditches integrated within them (Figure 15 'B','E','F' and 'I'). These trackways form substantial elements of the Iron Age and Romano-British landscapes, extending over greater distances than the field systems, though in general they cannot be traced for more than a kilometre due to the fragmentary nature of the cropmark evidence and the narrow shape of the project area.

Some of the field systems appear, morphologically, to be of probable Iron Age or Romano-British date, due to their small fields, inter-linked with enclosures and trackways (cf. Winton 1998; Hingley, 1989a). These fields are much smaller in size than the modern field, on average around 135m by 105m (see Figure 15 'B','C','D','E','H' and 'I'). Other field systems that have been interpreted, mapped and recorded by the project appear to be more regular and could represent subsequent phases of reorganisation of the landscape dating from the Iron Age right through to the post-medieval period (see Figure 15 'G','J','M' and 'N'). Though the coastal areas such as the Felixstowe and Shotley peninsulas have been subject to much more landscape reorganisation than the High Suffolk clays, a similar continuity of land use from the prehistoric into the medieval period (Williamson 1987) is visible despite a greater likelihood of landscape reorganisation. This means that field systems with elements that are orientated in a similar way to the surviving post-medieval enclosure patterns could potentially still be prehistoric in origin and therefore the phasing of the field systems based on orientation is problematic (see discussion below).

### **8.3 Discussion**

#### **8.3.1 Uses of enclosures and field systems**

As discussed in the previous section it is difficult to identify the functions of enclosures from aerial photographs alone, although the presence of ring ditches within some enclosures could be taken to represent round houses related to domestic settlement (Martin 1999d, 63). There are no overall patterns in the form of enclosures within the project area and the variety in the enclosures could represent differences in function, date or local traditions. Certain enclosures have features which may suggest some sort of stock management, such as the D-shaped enclosure in Harkstead parish near the Stour estuary (TM 194341, HRK 007, Figure 13 'M'), with its internal divisions and an in-turned funnel entrance. Also a large circular enclosure at Trimley St Martin (TM 257386, TYN 053) has a short funnel annex, the entrance of which appears to point down a shallow valley. The orientation of the funnel may suggest that the enclosure relates to the movement of stock from the higher ground to the saltmarsh for grazing. The needs of stock are thought to have been particularly important in the locating of

settlements (Martin 1999c, 40) during the Iron Age and Romano-British periods. There also exists the strong possibility of unenclosed settlement existing outside, but near, non-domestic enclosures (Winton 1998, 47) or scattered within the field systems.

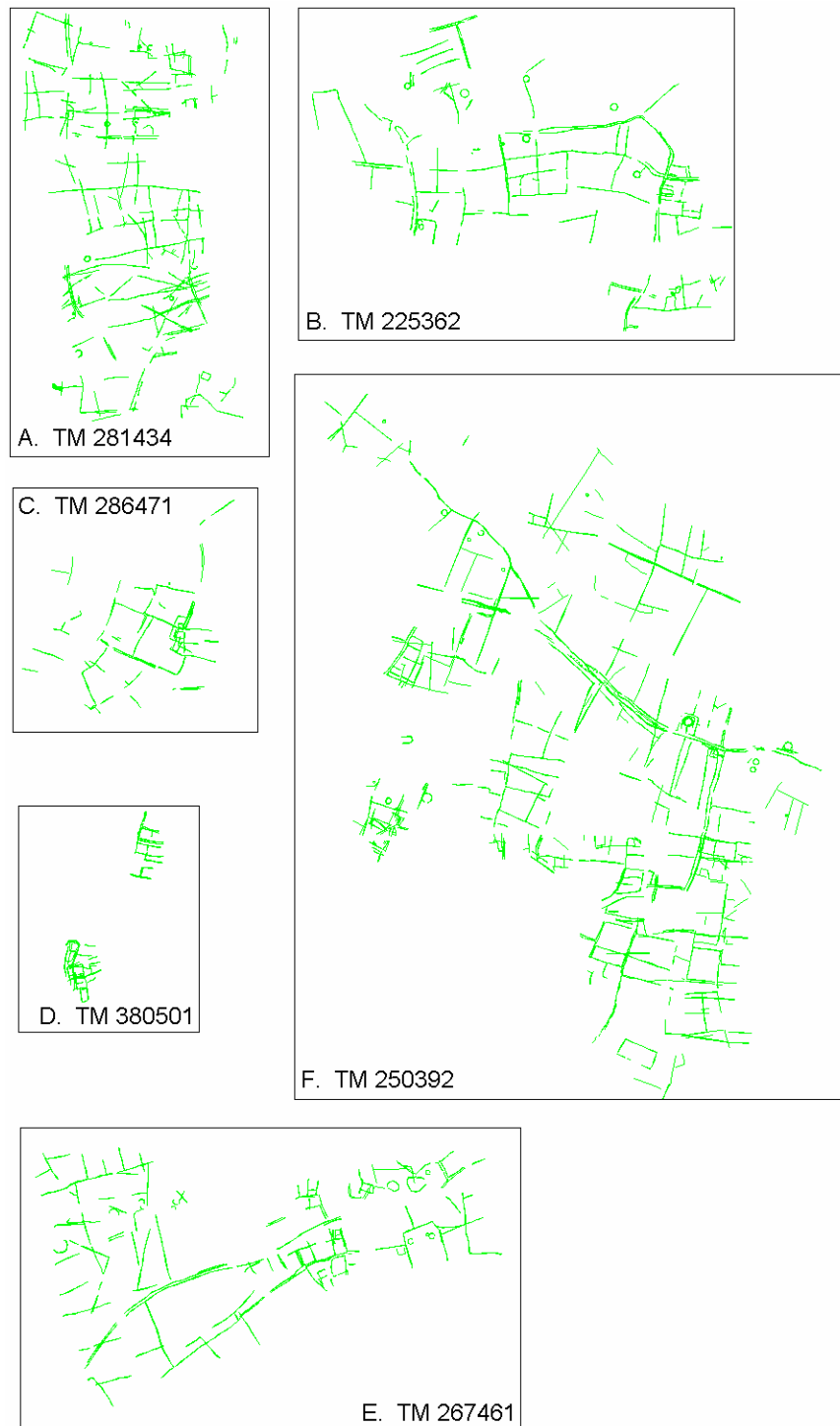
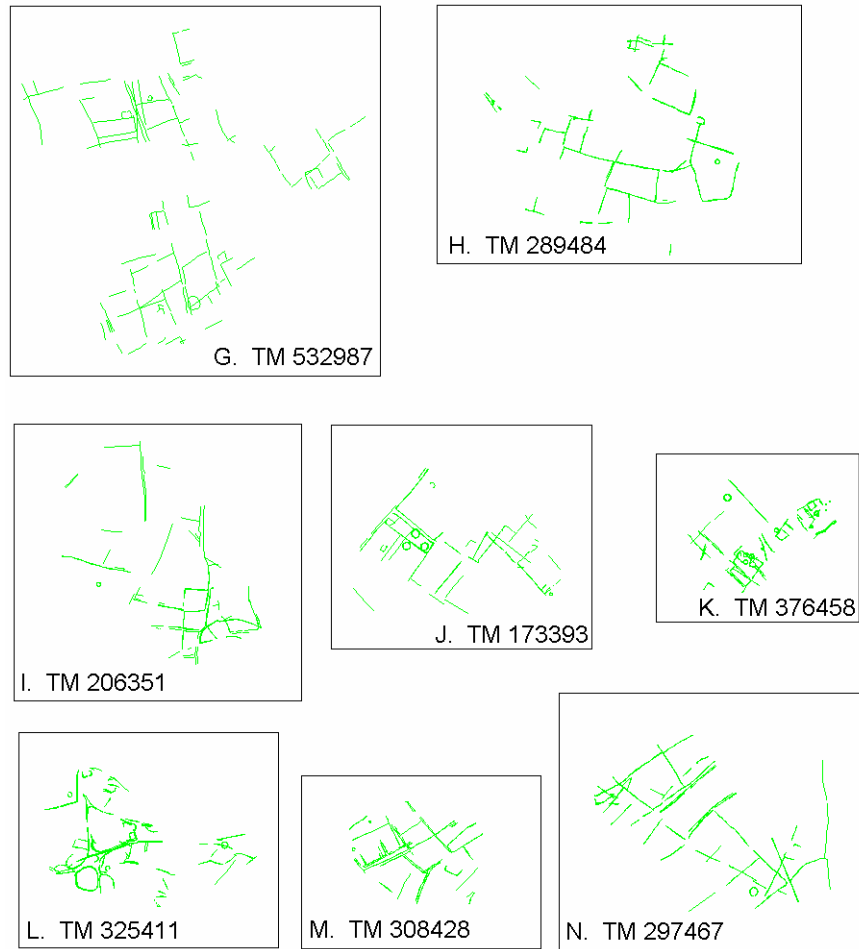


Figure 15a. A selection of possible Iron Age or Romano-British field systems (scale 1:25000)



*Figure 15b. A selection of possible Iron Age or Romano-British field systems (scale 1:25000)*

The Iron Age population of Suffolk had a mixed economy with arable cultivation and stock raising (Martin 1999c, 40). It is not entirely clear to what part of the agricultural regime the systems of fields and trackways relate but it has been suggested that the dry soils of the Sandlings were more suited to cattle and sheep than to arable cultivation (Martin 1999c, 40). In that case the fields and trackways visible in the project area may relate to the sorting, management and movement of stock.

### 8.3.2 Continuity in landscape

As briefly mentioned above, Williamson (1987;1993) has suggested that, on the claylands of East Anglia, areas of extensive co-axial pre-Roman field patterns are fossilised within the modern pattern of field boundaries and roads. This is thought to reflect a high level of continuity of land use over thousands of years. Though the Sandlings have been more intensively settled, farmed and consequently reorganised, there is potential for continuity within the landscape and this can compound some of the difficulties with dating these cropmark landscapes as already discussed.

Two trackways in particular highlight the potential for modern elements of the landscape to have ancient origins. The first is located in Martlesham parish where a modern field boundary closely follows the line of a Prehistoric or Roman trackway, visible as cropmarks, leading to an enclosure where Roman pottery had been recovered (TM 266462, MRM 026, Figure 15 'E'). This illustrates the possible influences of Roman or even prehistoric populations on modern patterns of land use. The second example is of a trackway on Levington Heath, just to the north of Felixstowe (TM 248394, SNH 005, Figure 15 'F'). Here the parish boundary, as marked on 19<sup>th</sup>-century maps, and a field boundary marked on an 18<sup>th</sup>-century map follow the line of an ancient trackway, visible as cropmarks, which has been re-cut many times and links to a series of small, probably Iron Age or Roman fields. The evidence seems to suggest that this route way retained its significance over a thousand years. This relationship becomes even more important when we consider that the trackways may be the earliest and most fundamental parts of the field systems that are visible on the aerial photographs (Martin 1999d, 56) suggesting that they could represent the route ways of pre-Iron Age landscapes.

### 8.3.3 Relationships to earlier landscape features

The NMP project has provided some evidence of the relationship of the Iron Age and Romano-British landscapes to earlier monuments. Many of the prehistoric and Romano-British enclosures and field systems appear to be located in the same areas as the funerary and ritual monuments discussed in the Neolithic and Bronze Age sections. This could suggest that the Iron Age and Romano-British agricultural landscapes had much earlier precursors. In an area of cropmarks near Waldringfield (TM 281437, WLD 017, Figure 13 'K' and Figure 15 'A') a probable Iron Age or Romano-British enclosure appears to kink around the location of a ploughed-out barrow probably, of Bronze Age date, which suggests that there was some perceived benefit of taking the barrow into the enclosure, perhaps related to the power of the ancestors.

### 8.3.4 Tribal boundaries

The size and shape of the project area makes analysis of the cropmark evidence for the Iron Age and Romano-British periods difficult. The boundary between the Iron Age tribes of the Iceni and Trinovantes is thought to be located on a line between the Fens and the Alde estuary, mainly on the basis of finds evidence (Martin 1999c, 41). The NMP survey shows less cropmark evidence for potential settlement to the north, in Iceni territory, but this is probably more a reflection of disparity between the north and south of the project area in terms of geographical extent and cropmark forming soils rather than any visible tribal division. Consequently there is not enough aerial photographic

evidence for the northern half of the coastal area to be able to make any comparisons between the tribal territories based on the morphology of enclosures or field systems. The Roman salt production sites discussed in Section 9.2.4 also demonstrate a similar pattern, with only a few sites in Icenic territory, but whether this is a true reflection of late Iron Age or Romano-British activity in the area is unclear.

### 8.3.5 The Roman transition

Although sites that can be confidently dated to the Roman period are discussed in the next section, it is certainly possible that some of the enclosures and field systems recorded by the NMP survey originated in the Roman period. The problems involved in the dating of cropmark evidence have been discussed at length in this report and settlement continuity into the Roman period makes the transition difficult to spot in the cropmark evidence. In some areas ditched field systems are visible laid out over, and on a different alignment to, field systems which are thought to have prehistoric origins. These may represent reorganisations of the landscape after the Roman invasion but they could equally relate to later periods, including post-medieval enclosure. As described above, a rectangular ditched enclosure at Martlesham is visible as a cropmark overlying a probable Iron Age ditched field system. The enclosure appears to be unrelated to the later post-medieval landscape layout and may represent the superimposition of a Roman enclosure on the earlier field system.

## 9. THE ROMAN PERIOD: AD 43 - 410

*“...a programme which explores the air photographic evidence would greatly augment our knowledge of the (Roman road) network and would also reveal additional settlement sites, some of substantial importance.” Going (1997, 39)*

### 9.1 Problems with dating

It is recognised that the period of transition from the Iron Age to the Roman period is highly complex and that there can be difficulties in interpretation when examining evidence from this period. Therefore the features discussed below must be assessed in the light of the morphological considerations raised in the preceding section on the identification and analysis of Iron Age settlement enclosures and field systems. Unless otherwise stated, therefore, this section will consider only those features which as far as is possible, can be confidently identified as dating from the Roman period.

While discussing the study of Roman roads in the eastern counties in 1997, Chris Going made the statement that the subject “remains more poorly known than one might wish” (Going 1997, 39). This statement is largely true for all Roman site types in the coastal zone and the project has found few features that can confidently be ascribed a Roman date. Possible explanations for this trend will be raised below, for particular classes of site.

Generally speaking, it is possible that many of the traditional archaeological indicators of the Roman period, such as military sites, roads and urban settlements may have had their focus to the west of the tidal estuaries and therefore remain beyond the project area. Certain further classes of site, such as those related to industrial process such as metalwork and pottery production are also difficult to identify from aerial photographs. In addition, it is probable that many sites located on the Roman coastline have been lost due to the changing position of the coastline caused by coastal erosion.

### 9.2 The evidence

#### 9.2.1 Fortifications

The NMP project did not find any convincing new evidence for permanent military sites of the Roman period within the project area. However, when assessing the potential extent of the archaeological evidence it is necessary to consider a number of factors. As described in the preceding section, Suffolk is thought to sit astride the borders of two

tribal territories, those of the Iceni to the north (into Norfolk) and the Trinovantes' to the south. It is possible that during the early post-conquest period the Icenian territories required only a minimal military presence and associated fortifications, unlike the legionary fortress that was located at Camulodunum (Colchester) in the territory of the Trinovantes to the south. Few first century military sites are known in Suffolk, the exceptions being forts at Coddendam and Pakenham (Moore and Plouviez 1988). As such, few early Roman military sites may be expected in the project area. The NMP survey did locate a possible marching camp in Covehithe parish, but the date and function of this feature is uncertain (see Figure 18). The evidence for this site is discussed below in the communications section, as it may be associated with a length of possible Roman road.

The Boudican revolt (AD60-61) originated in the territories of the Iceni and the period immediately following the quelling of the revolt is thought to initially have seen a Roman military backlash (Warner 1996). However, the aftermath of the revolt probably did not result in the large scale construction of fortifications in the region and probably concentrated more on the pacification of native sites. In the longer term, post-Boudican Roman policies are thought to have moved away from military subordination to more subtle policies of romanisation. Only two probable military sites that may date to this period have been previously identified in Suffolk, the two overlapping forts at Coddendam and a triple ditched fort at Pakenham, both visible as cropmarks on aerial photographs, outside the NMP project area. The NMP aerial survey however revealed no new evidence for fortifications of this period within the project area. Excavation at Pakenham suggested that the operational period of the fort may have been short-lived (Plouviez 1995). It is therefore possible that any similar sites that would potentially have been visible from the air could now be obscured by later settlements (Plouviez 1988; 1995).

Probably the most visible Roman remains in East Anglia are the late Roman Saxon Shore forts. However, in Suffolk only fragments of the probable fort at Felixstowe, Walton Castle (TM 322358, FEX 030) can be seen on aerial photographs from July 1974. This site is known to have been destroyed by coastal erosion by 1766 and can now only be seen as possible masonry remains approximately 125m from the shore at extreme low tide. Walton Castle is thought to be most comparable in plan to the Saxon Shore fort in Norfolk at Burgh Castle (Gariannonum).



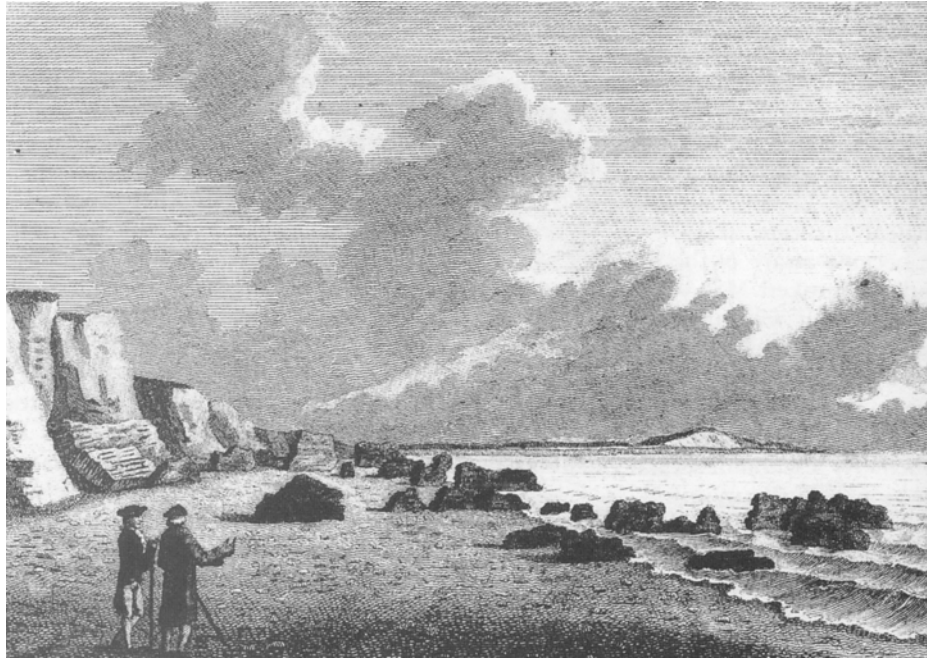


Figure 16. Francis Grose's engraving of Walton Castle, 1766 (from Fairclough and Plunkett 1998).

#### 9.2.2 Communications

A fragmentary network of Roman main roads is known for inland Suffolk, which would have provided access to the main towns to the north, south and west (Margary 1973; Moore *et al* 1988). The construction of the network is undated, but Roman roads in Britain were often established to ensure communication routes between military sites and so the roads in Suffolk may originate in the first century AD. Towards the coast however, the evidence for Roman roads becomes increasingly fragmentary. Aerial survey is acknowledged to be one of the most effective ways of identifying the remains of Roman roads in both arable and pastoral areas, but the NMP survey has found little evidence for major Roman roads in the project area.

This may be because the main axis of the road network was placed inland of the large estuaries, which effectively presented barriers to road transport whilst also providing an alternative and probably preferable means of transport to and from the interior of the county (Jones and Mattingly 1990). It is probable that any Roman roads in this estuarine area would have been part of a smaller local network (*diverticula*) of a secondary and more irregular nature and of less durable construction.

Two possible examples of minor Roman roads have been identified within the project. The first has been identified in Sutton parish (TM 306456, SUT 022; see Figure 17 below). The road or track forms part of a wider, possibly late prehistoric to Roman field system and is visible approximately 200m to the north-east of the only probable villa

site to be identified in the project area. Although this association could be seen to support its interpretation as a route of Roman date, Moore *et al* (1988) state that a direct association between Roman roads and the location of villa sites is not known in Suffolk, so any possible association must be treated with caution. The interpretation as a Roman road is largely based upon the morphology of the feature, particularly the identification of a possible agger or compacted surface approximately 10m wide. Most of the visible feature is flanked by ditches, but a third ditch cut into the road surface suggests that the feature may have been recut a number of times. This may reflect the maintenance of the road over a lengthy period of occupation on the neighbouring settlement.

An alternative possibility must also be considered for this feature. It possibly coincides with a field boundary shown on the Haiward map of Sutton, dated 1629, and could therefore be interpreted as dating from the medieval or post-medieval period. However, although this feature may have been utilised as a boundary in the medieval and post-medieval periods, the apparent association of the linear ditches to the probable trackways to the south would indicate an earlier date of origin.



Figure 17. Potential Roman road in Sutton parish (scale 1:5000).

The second possible Roman road is visible in Covehithe parish (TM 522820, COV 084; see Figure 18). Although at about 5m wide it is not as substantial as the above example, this possible road is straighter and has very well defined ditches and the road surface or possible agger is clearly visible as a cropmark. Dating evidence in the immediate area of the road is scarce, but a number of pottery scatters of Roman date

are recorded on the SMR approximately 700m to the east of route of the road, in areas now lost to coastal erosion. Approximately 60m to the north-east of the visible feature, a rectangular enclosure about 35m by 30m in size is visible as a cropmark. The enclosure has rounded corners, seen by some to be typical of Roman period sites (Wilson 2000, 117). If the route of the possible road is projected eastwards, this enclosure would lie approximately 10m to the north of the road. It may therefore represent a marching camp or small roadside settlement of Roman date. However, no finds evidence suggestive of a Roman settlement associated with this road has been identified.



Figure 18. Possible Roman road identified in Covehithe parish (scale 1:2500).

As Going states, it is probable that aerial survey could greatly enhance the knowledge of the Roman road network in Suffolk (Going 1997, 37). However, the constraints of the NMP project area were such that only narrow contextual areas could be examined around the estuaries and coast, providing little opportunity to identify continuous lengths of road network. In addition, the secondary road network that probably covered the coastal zone may have largely been a continuation of the preceding Iron Age routes and therefore difficult to positively identify. The main focus of the primary Roman road network probably lies to the west of the NMP project area and future reconnaissance and NMP projects should target this area to enhance the incomplete body of data for Suffolk.

### 9.2.3 Settlement

Just as the location of the river valleys probably had consequences for the layout of the major Roman road network in Suffolk, the subsequent arrangement of the major roads would have had consequences for the development of urban or semi-urban centres and rural settlements in the coastal zone. Plouviez (1995, 69) states that Roman Suffolk would have included a 'normal complex range of Roman settlement types' with a number of small towns at the top of the hierarchy. This range would include rural settlements that have been described as 'villages', villa estates and farmsteads of varying degrees of affluence (Jones and Mattingly 1990; Plouviez 1995; Hingley 1989b).

#### *Towns*

There is no evidence for formal, planned Roman towns in Suffolk. However, Plouviez (1995) argues that eight known Roman settlements in Suffolk could be described as 'small towns', filling some roles as economic or administrative centres. These are, from west to east, Wixoe, Icklingham, Long Melford, Pakenham (also called Ixworth in some texts), Coddendam, Felixstowe, Hacheston and Wenhaston (Plouviez 1995, 69). Other than Felixstowe, which is presumed to have also been a port, none of these 'small town' sites are located within the project area.

The NMP survey has not identified any new urban or suburban settlements within the project area and it is thought that this negative evidence, or 'hole in the distribution map' as the title of a paper by Plouviez (1995) calls it, may reflect the actual distribution of urban or proto-urban Roman settlements in the immediate coastal zone. This could support the argument that economic or administrative centres developed on or close to the road network, which is thought to have been located largely to the west of the larger estuaries and therefore outside the NMP project area.

Plouviez has notionally defined areas for which the eight small towns could have acted as market 'centres' and although the towns themselves fall outside of the project area, the catchment areas of these towns include the coastal zone and could have implications for other types of settlement found in the NMP project area (Plouviez 1995). Felixstowe is the only 'small town' site within the project area, but two Roman settlements, Wenhaston and Hacheston, are towards the east of the county. This raises the possibility that these small towns may have acted as 'centres' for the northern parts of the coastal zone, placing the economic focus for the immediate area, and arguably the mechanism for economic growth for smaller settlements, outside the NMP project area. This will be discussed below.

Felixstowe is the only known Roman port on the Suffolk coast and one of the few coastal Roman sites with any evidence for an approach via a Roman road (Plouviez 1995). Its role as a major port in the Roman period may have led to its developed road communications and a role as a 'central place'. This role is supported by the number of Roman sites and finds located on the ground, but NMP has not been able to add to the landscape evidence in this promising area. This is largely due to the form of the project area which covers the inter-tidal zone and a 1km terrestrial contextual area around the coast and the Rivers Orwell, Deben and Stour, but leaves a 3 to 4 km corridor between the two rivers on the higher arable ground to the north of Felixstowe unsurveyed. It is anticipated that this area would be productive in terms of cropmark formation and should be prioritised as an area for future work for aerial survey (see section 14).

The Dunwich promontory has been suggested as a possible location for a second coastal Roman site and port, but neither the field evidence nor that from aerial survey provides any support for this theory (Plouviez 1988; Warner 1996). However, it must be borne in mind that, as with at Walton Castle, the action of coastal erosion has drastically altered the profile of the north Suffolk coast and any Roman coastal settlement site would now be up to a couple of miles out to sea.

The implications for aerial survey may be that Roman semi-urban development in Suffolk, roadside settlements in particular, was largely confined to areas inland, to locations close to concurrences of river and road communications, and it is therefore suggested that future reconnaissance continue to monitor these areas. It can be concluded that it is unsurprising that no significant semi-urban settlements have been identified in the immediate coastal zone, which with the possible exception of Felixstowe, appears to be dominated by agricultural landscapes, as discussed below.

#### *Rural settlement pattern*

The state of knowledge for rural settlement in the Roman period in East Anglia in general and Suffolk in particular can only be described as patchy (Going 1997). As in much of the country, research in the past has largely focused on high-status settlements, villas and their outbuildings, and often has not extended very far beyond them. Consequently, there have been few attempts to examine the physical extent and organisation of the associated holdings of these sites, and their economic relationship with smaller rural settlements. Therefore the character of the areas between the few recorded sites remains largely unknown and knowledge of the distribution of Roman rural sites is therefore limited.

Current interpretations would suggest that the distribution of rural settlements does not follow that of the small towns, towards roadside locations, but may follow the Iron Age

preference for river valleys, with some expansion onto the claylands of central Suffolk (Plouviez 1988). A concentration of villa sites has been noted around some 'small town' sites, suggesting an economic advantage for this distribution, though this pattern may not extend into the east of the county. Because of the 20<sup>th</sup>-century expansion in intensive arable cultivation on the Sandlings, however, significant areas of Roman field systems could potentially become visible as cropmarks (see section 8).

### *Defining rural settlement*

For aerial survey there are difficulties in interpreting Roman rural settlements. As has been noted above in the section discussing the Iron Age to Roman transition, for large sections of society Romanisation would not necessarily have involved a reorganisation of the rural landscape or even necessarily an obvious change in settlement form or construction. Round houses and 'celtic fields' were not necessarily replaced by rectangular structures, and narrow strip fields were unlikely to be superseded by centuriation. This presents a number of challenges for the identification and morphological interpretation of rural sites of this period visible on aerial photographs. It is also notoriously difficult even to define a classification system for Roman rural settlements, from the application of the term 'villa' down the social scale (Going 1997; Plouviez 1995; Jones and Mattingly 1990). Hingley (1989b) describes a possible division of rural settlements into two main groups; villas and non-villa settlements, on what is often called a 'native' or pre-Roman Iron Age model.

In archaeological terms, the label 'villa' is applied to a form of domestic building that expresses the investment of surplus wealth in a form of construction that is distinctly 'Roman' (Hingley 1989b, 21). This is most archaeologically recognisable in the use of stone building materials and a move to a rectangular form, although evidence for other indicators of surplus wealth is usually required, for classification as a villa. In Suffolk, sites have been classified as villas from surface scatters if the scatters include such indicators of surplus wealth as tesserae or painted wall plaster (Plouviez pers comm).

Difficulties in identifying non-villa settlements arise from the fact that they have often been considered in negative terms, i.e. as places where villa settlements do not occur (Hingley 1989b, 23). However, nationally they demonstrate a wide variety in form, from settlements of individual roundhouses, very often within a simple enclosure, to groups of structures that may indicate nucleated communities. It is probable that such settlements also varied in social and economic status, from the homes of villa estate slaves to relatively affluent farming communities (Hingley 1989b, 24).

### *Small rural settlements*

In Suffolk, few smaller rural sites have been investigated and modern excavated evidence is scarce. Therefore, there is little comparative evidence on which to base regional site types.

Extensive but fragmentary cropmark complexes have been identified throughout the coastal project area, and the probable prehistoric date of many of these has been discussed in detail in section 8. It is probable, however, that many of these sites continued in use during the Roman period but very few settlement sites have been identified during the project that can be confidently ascribed a Roman date and associated with field systems.

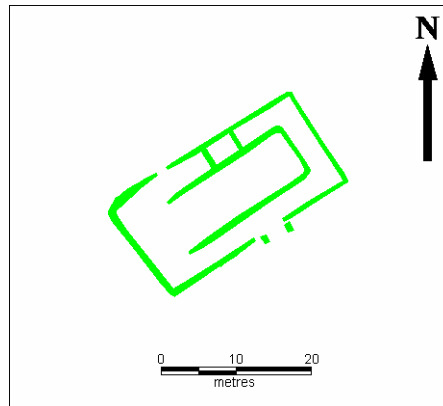
Those areas that are perceived to be unsuitable for cropmark formation, such as some valley sides and reclaimed areas may provide good preservation for features under colluvial or alluvial deposits, and may be suitable for investigation in future integrated surveys. This may be supported by a dramatic increase in evidence for all types of Roman rural settlement, recently revealed by systematic fieldwalking surveys in previously little studied areas, such as the Waveney valley (Plouviez 1995).

### *Villa settlements*

A previously unrecorded probable villa settlement has been identified in Sutton parish (TM 305453, SUT 149; see Figure 19). The site is visible as cropmarks forming over the robbed out walls or foundations of a probably stone built or founded rectangular structure, which measures approximately 28m by 14m in plan. A probable entrance is visible as a roughly 3m wide gap halfway along the south-eastern side of the building plan. This is flanked by two small external ditches which may mark the location of a porch. Inside this outer wall, a second rectangle can be seen roughly 18m by 7m in size. This could be interpreted as an inner courtyard, but is more likely to represent a central hall surrounded by an external corridor or terrace. This places this structure in Hingley's (1989b) class of 'corridor houses', and the ground plan suggests it may be similar in form to that shown in the reconstruction drawing for the corridor house at Wymbush, Buckinghamshire (Mynard 1987).

Hingley (1989b) states that the addition of a corridor to a structure indicates the development of 'new standards of privacy' in family life, a change possibly indicated here by a small room visible on the north-western side of the structure, directly opposite the entrance. It is also apparent from the cropmark plan that the structure has undergone some remodelling: the south-western end of the structure can be seen to lay on a slightly different orientation to the main body of the structure and has unbalanced what was probably originally a symmetrical facade. This has been interpreted as an

indication that the building was renovated or reoccupied after a period of decline or possibly disuse.



*Figure 19. A small rectangular structure, potentially a Roman villa, identified in Sutton parish (scale 1:1000).*

Hingley (1989b) also argues that the construction of a corridor does not necessarily indicate that the building has achieved villa status, unless further indicators of wealth and status are present. In this instance, one possible indicator of status may be seen in the location of the structure: it is on prime agricultural land on the southern end of a low promontory overlooking the River Deben about 1200m to the east, with the small valley of a spring fed tributary to the south and west that probably fed Shortisham Creek. Further indicators of a high status structure can be seen in the surface finds of pottery, including Samian ware, and building material such as brick and tile recorded on the SMR in the immediate area. In addition, two coin hoards and a variety of metal objects including brooches have been discovered in the same area. The dates of the surface finds and the coin hoards also suggest two periods of high status occupation in this area, dating from the first and fourth centuries AD, but also support the interpretation that there was an element of discontinuity in the settlement of this area.

The surface finds come largely from an area immediately to the east of the structure, within which multi-phase cropmarks are visible defining a number of enclosures and possible field systems. The cropmarks define both curvilinear enclosures and fragments of more regularly shaped, possibly rectilinear enclosures, some of which are on a similar alignment to the rectangular building plan. Ring ditches, varying in diameter from 6m to 15m are also visible. Although it is not possible to definitely identify a direct relationship between the enclosures, villa structure and coin hoards, the similar alignment to the building plan of some of the more regular enclosures makes this seem likely. Although they cannot be dated, the complex nature of the cropmarks hints at several phases of occupation on this site. It is accepted that in some areas circular structures continued in use into the Roman period, and some features of this type may be contemporary with the rectangular villa structure. However, the large



curvilinear enclosure and a number of smaller ring ditch features appear to be overlain by more regular and probably later trackways and boundaries suggesting a later reorganisation. This, in combination with the fact that the first century coin hoard was excavated from a ditch feature that also produced Iron Age sherds, would suggest that this was a high status site in occupation continuously from the Iron Age into the Roman period.

It is not possible to date the construction of the villa but it seems probable that its construction was a significant event and provided a deliberate change of settlement focus and possibly a stimulus for major reorganisation of the associated land holdings. The deposition of the 4<sup>th</sup> - century hoard and obvious later remodelling of the villa also suggests the strong possibility that the area of the villa, if not the villa structure itself, was occupied continuously into the 4<sup>th</sup> century.

The identification of this site is significant in that it extends the distribution of recorded villa sites in the eastern part of the county. The distribution of all sites recorded as a 'villa' on the Suffolk SMR prior to the NMP project is illustrated in Figure 20. These 30 sites include a number of complex multi-roomed villas, such as Lidgate, Stanton Chair and Castle Hill, Ipswich, but also include many more sites identified from surface finds. The paucity of good evidence for villa structures in the eastern third of the county is clear.

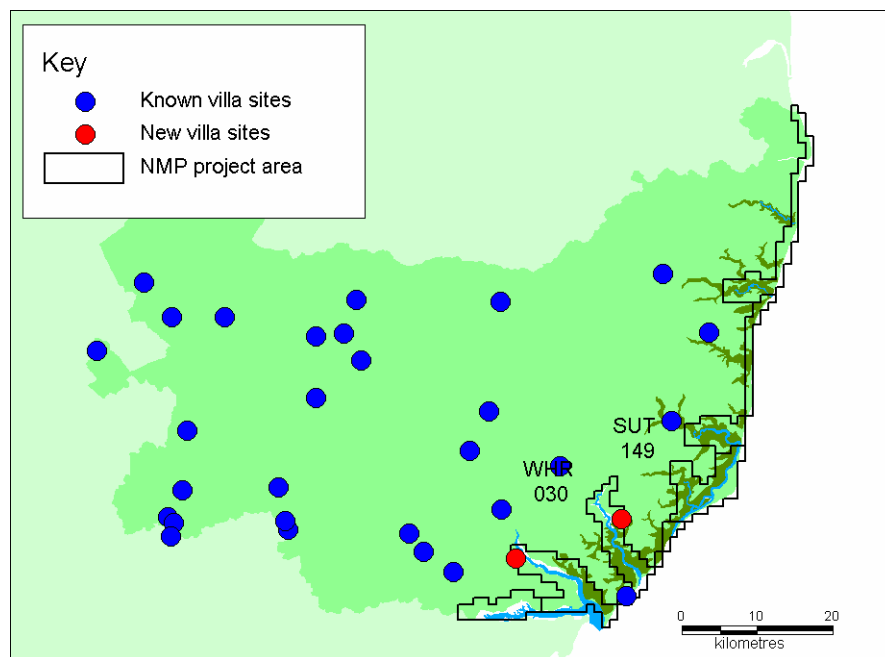


Figure 20. County wide distribution of villa sites as recorded on the Suffolk SMR (scale 1cm to 10 km).

Although complex, the field system on the Sutton site contains elements similar to those of a number of fragmentary cropmark systems located in the project area which

are thought to be of Roman or pre-Roman date. The NMP project has been able to illustrate that these field systems do, as was expected, follow the preceding Iron Age pattern and exploit the fertile major estuaries. However, the evidence available to the survey suggests that the cropmarks extend beyond the area of the river valleys covered in the project area. The apparent continuation of cropmarks of this type beyond the narrow project area that covers the northern coastal zone, also illustrates the presence of an active agricultural economy in areas well to the east of the known road network and probable market centres in the northern part of the county. Roman rural settlement in this area is particularly poorly understood and more aerial survey work is required in this area to assess the extent of the cropmarks.

A second possible high status Roman site has been identified by the NMP project in Wherstead parish, at the head of a small promontory overlooking the River Orwell (TM 166401, WHR 030; see Figure 21). The site is visible as cropmarks defining a large square or rectangular enclosure that may measure up to 250m by 160m. Within this outer enclosure a smaller enclosure is visible, roughly 80m square, on the same alignment as the outer boundary. An entrance is visible on the eastern side of the inner enclosure, and further fragmentary linear cropmarks may indicate additional subdivisions within both the inner and outer areas. The location of two possible structures is visible as a series of postholes. The first structure is visible as two parallel rows of pits, about 6.5m apart and 17m in length. The plan of the other feature located 5m to the west, is less clear and is visible as a right-angled arrangement of pits. This may represent one corner of a structure or enclosure that may have abutted the outer boundary. It is not possible to date the features but the regular form of the enclosures and structures would strongly suggest a Roman date. This interpretation is again supported by datable finds evidence. A 3<sup>rd</sup> - century coin hoard is recorded on the SMR as scattered across this site (TM 168402, WHR 030) and the concentration of Roman period surface finds from this area would suggest a high status settlement is located in the immediate area. The function of this site is less clear. Unlike the Sutton example, there are not any field systems obviously associated with the site.

The form of the two probable structures within the compound has parallels from other known Roman sites, and may fall into the category of aisled houses, interpreted variously as homes to villa owning families or villa estate agricultural workers (Hingley 1989b), or as barns associated with a villa estate (Hanley 2000). It is thought that aisled houses often predate or develop into more complex villa forms, such as at Exning: it is possible therefore that the aisled structure could represent an early villa phase that predated the larger complex now surrounding it (Hingley 1989b). However, the alignment of the various structural elements suggests that they are probably contemporary in date, or represent a continuous development.



Figure 21. Possible villa complex in Wherstead parish.

A second interpretation is tentatively proposed for this site. The rectangular form of the concentric enclosures is similar to that of sites interpreted as temples, and although there is currently no evidence for a central structure, or *cella*, within the central compound or temenos, there are similarities to examples from Britain, the best known probably being that at Hayling Island, Hampshire (Downe, King & Soffe 1978) and regionally, Gosbecks Farm, Colchester (Crummy 1980).

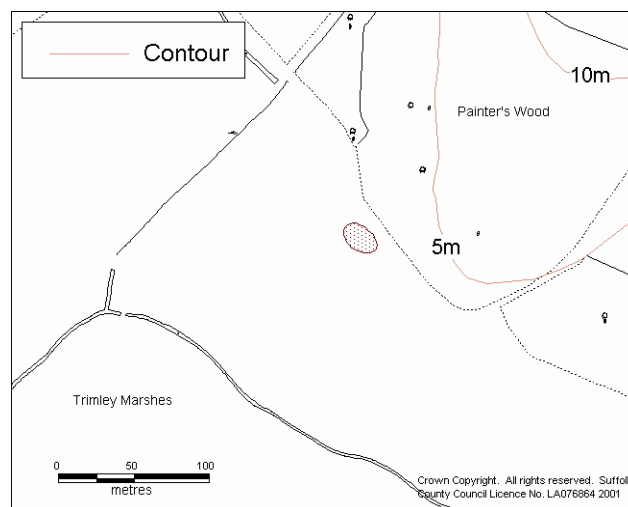
#### 9.2.4 Industry

Excavation and fieldwalking evidence has demonstrated that Romanised manufacturing industries, such as the production of pottery vessels, ceramic building materials and metal working, developed and thrived at various locations in Suffolk in the Roman period (Plouviez 1988). Unfortunately, the physical remains of many of these industrial processes are not easily identifiable by aerial survey. However our knowledge of one, specifically coastal industrial site type has been much enhanced by the integration of the NMP survey with recent English Heritage aerial reconnaissance and field survey from Suffolk County Council's field archaeology services.

These sites are earthworks known collectively as 'Red Hills', found almost exclusively in or on the edge of areas that are, or were in the Roman period, inter-tidal. They were originally identified in Essex in the 19<sup>th</sup> century, and have long been identified as the remains of the industrial production of salt from marine brine. The practice of marine salt production is probably late Bronze Age or Iron Age in origin, but the industry and much of the related technology probably developed during the early Roman period as the scale of production was developed and the industry expanded (de Brisay, 1975).

Approximately 400 Red Hill sites have now been identified in Essex (H. Saunders, pers comm). Due to this exceptional preservation, much of the interpretation of the site function, the identification of the technological components and the dating evidence for this industry is based largely on comparison with excavated Essex sites (de Brisay 1975; Fawn 1990). The large number of sites also means that Essex has dominated regional and national studies of the Roman marine salt industry (Jones and Mattingly 1990, 224, map 6:43).

The Suffolk coastal zone does not contain as large an area of reclaimed saltmarsh as the Essex coast, which may partially account for the relatively poor site preservation in Suffolk and the identification of only relatively few sites through field survey. The first recorded fieldwork to investigate a possible Red Hill in Suffolk dates from circa 1922, and, from this date until the start of the NMP project, fieldwork had identified 18 Red Hills. Of this number, it is probable that two are not in fact salt production sites and were recorded due to the misidentification of Romano-British loom weights as briquetage. The comparative wealth of data from Essex has resulted in the impression that salt production was at best a marginal industry in Suffolk in the Roman period (Going 1997; Going and Plouviez 2000). For these reasons the identification of Red Hills was not one of the main initial expectations of the NMP project.



*Figure 22. The first Red Hill to be recorded as part of the Suffolk NMP project, Trimley St Mary parish.*

However, the continuing recognition of this site type from the air in Suffolk is a direct result of the aerial reconnaissance carried out by Damian Grady for English Heritage. The first site to be identified from the air was photographed in August 2002 and can be seen in Figure 22. The site (TM 266358, TYY 044) is located in Trimley St Mary parish, on reclaimed land below the 5m contour, but in an area where the land is beginning to rise from the former saltmarsh. Four previously identified possible Red Hills are located

in this area. This supports the current interpretations of the probable operation of Red Hills which suggests that they would have been located just above the reach of maximum high spring tide (de Brisay, 1975; Fawn 1990).

Suffolk County Council Archaeological Services field team carried out a walkover survey of the Trimley site in November 2002 which collected and positively identified diagnostic briquetage and datable pottery, confirming the interpretation and Romano-British date of the site. Following this initial identification, eight previously unknown Red Hill sites have now been identified through reconnaissance (see Figure 23). The sites are distributed over 25km of coast and estuary, from Trimley St Mary on the northern bank of the River Stour to Iken parish on the southern bank of the River Ore, and are all located below the 5m contour.

The Suffolk County Council field survey team has, to date, confirmed the interpretation of five of the Red Hills through fieldwalking. The sites have been interpreted as analogous to the Essex sites and are therefore thought to originate in the later Iron Age, though the continued operation of the industry from the Iron Age and probable expansion into the Roman period is attested to by finds of datable ceramics (Tester 2004).

A possible pattern can be seen in the distribution of the Red Hills. They appear to be more numerous to the south of the county, roughly up to the line of the River Alde. The apparent concentration of the sites to the south of the Alde in Suffolk could be a reflection of their actual distribution. The possible mid-county location for the boundary between the Iron Age tribal territories of the Iceni and Trinovantes may be significant as the density of the Red Hills increases towards the southern, and potentially Trinovantian, half of the county. If the density of Red Hills in Essex reflects a highly Romanised salt industry, focusing on the Roman town of Colchester that is grounded in Trinovantes tribal traditions, the relatively low number of Red Hill sites in the northern half of the county may reflect the cultural preferences of the Iceni, for other less archaeologically visible coastal industries.

However, a number of additional factors must be considered that may have biased both the distribution and the identification of the Red Hills through aerial survey.

The first factor is the location of the sites on low lying reclaimed land. A rise in relative sea level from the Roman period resulted in the preservation of many of the sites under deposits of marine alluvium that subsequently formed the coastal saltmarsh landscape (P. Murphy, pers comm). From the medieval period onwards large areas of the saltmarsh have been drained and reclaimed, fossilising the areas of Roman coast behind the sea walls in the process, particularly in the south of the county. Until relatively recently, much of this land has remained as marginal pasture and therefore has been largely uncultivated. However, developments in agricultural techniques and

technology from the 1950s onwards have made possible an increase in the scale of arable cultivation in these areas. This has resulted in an increasing number of these sites suffering plough damage and therefore becoming visible from the air.

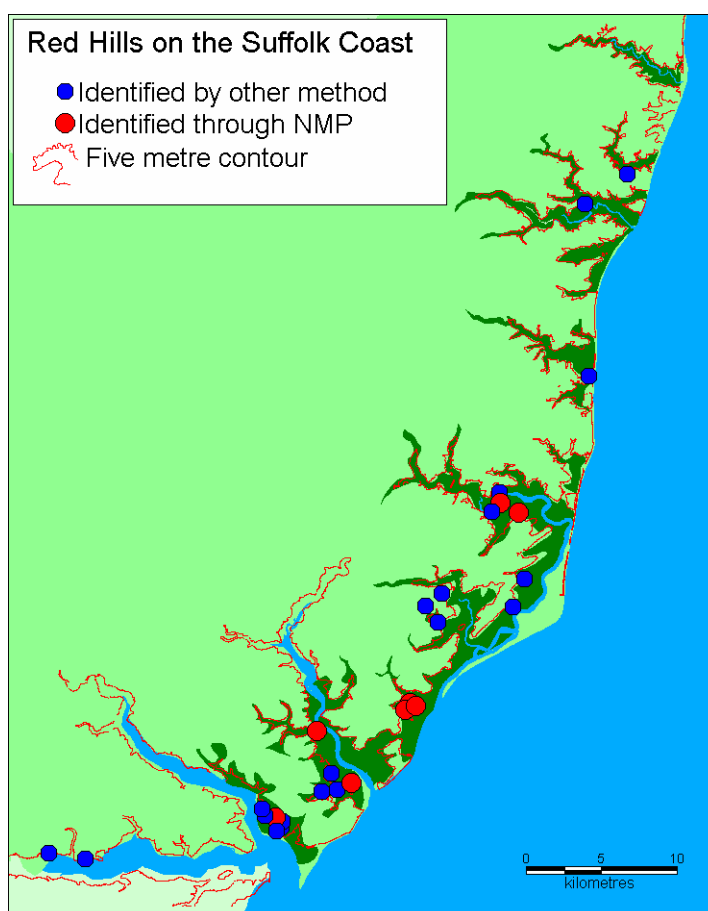


Figure 23. Distribution of Red Hills along the Suffolk coast (scale 1cm to 5km).

It is probable that a number of Red Hills were located in the inter-tidal zone of low-lying areas of the northern coast and have now been lost to erosion. Conversely, as described in section 3 significant areas of the northern coastline are composed of erosional cliffs. Such a landscape would not have been a suitable location for the salt industry, a factor which must also be considered in any examination of the distribution of these sites.

The importance of the introduction, by ongoing reconnaissance, of good quality colour photography to the distribution of Red Hills in Suffolk cannot be over-emphasised. It is important to bear in mind that the majority of the aerial photographic cover for the coastal project area is composed of monochromatic historic vertical photographs; Suffolk does not enjoy the same history of specialist colour oblique photography as either Essex or Norfolk. The recognition of this site type by the photographer and interpreter, and the introduction of regular reconnaissance flights and colour

photographs that can register the distinctive red coloured soils of these sites are all factors that increase the likelihood of their discovery.

The number of identified Red Hill sites has also recently been increased through recent fieldwork, both amateur and in advance of development, in areas that have not previously been subject to ploughing (Everett 2000; J. Plouviez, pers comm). It can be presumed that further Red Hill sites survive in the remaining uncultivated coastal areas.

It is anticipated that the developing body of data on Suffolk's Roman salt industry gained from the integration of results from both ground based and aerial techniques, will prove valuable to future research work examining the distribution of other Roman coastal industries, such as the production of oysters or ceramic building material, and their possible seasonal relationships. Additionally, the relationship of Red Hills to possible secondary salt processing sites or settlements could also be an area with potential for further study. This could begin by examining any evidence for the association of briquetage with inland cropmark settlement evidence. This would, however, require further aerial survey work on the lighter soils of the Sandlings not covered by the NMP project, to enhance the cropmark record sufficiently to provide a viable study area for this potentially very informative topic.

## 10. THE ANGLO-SAXON PERIOD: AD 410 – 1066

### 10.1 Anglo-Saxon Suffolk

The archaeological evidence for Anglo-Saxon settlement in Britain is relatively poorly known and suffers a number of biases, including low visibility in comparison with the monumental sites of the Bronze Age, Iron Age and Roman periods (Rahtz 1976; Hamerow 1992). However, the movement of at least some peoples from north Germany and south Scandinavia into Britain in the 5<sup>th</sup> century is now generally accepted, although it is possible that Saxon cultural practices may, initially, have diffused into post-Roman Britain from a relatively small number of settlers. However, the precise mechanisms of settlement, i.e. the 'date, duration and processes of settlement' are not clear, and probably vary from region to region (Scull 1992).

Suffolk has a long history of Anglo-Saxon study, which is unsurprising when one considers some of the country's best known and most thoroughly studied Anglo-Saxon sites are situated in the county, such as the cemeteries of Snape and Sutton Hoo, and the settlement site of West Stow. However, in Suffolk, as elsewhere, the mechanisms of Saxon settlement and its development in the post-Roman landscape remain poorly understood (West 1999; Newman 1992).

There is some limited evidence for Saxon activity on Roman sites in Suffolk, most noticeably the larger sites, such as the 'small towns' discussed in section 9.2.3 (Scull 1992,12; Newman 1992). However, there is no indication of continuous occupation of settlement, or site type continuity, from the Roman period into the post-Roman and early Saxon period. Brooks (1986) reviews the evidence for continuity of settlement in towns and finds the evidence points to a hiatus in occupation. Evidence from the high status villa sites at Castle Hill in Ipswich and Stanton Chare, suggest that post-Roman occupation on rural sites may have been on an opportunistic 'squatter' basis (Moore, Plouviez and West 1988; Scull 1992).

There is little excavation evidence for early Anglo-Saxon sites in Suffolk coinciding with Romano-British settlement sites (West 1985; Scull 1992). The establishment of the early Saxon settlement at Spong Hill adjacent to the site of the Romano-British farmstead, and the establishment of West Stow on a site unsettled since the pre-Roman Iron Age, may suggest a contiguity of settlement but this does not necessarily imply a continuity of community (Fowler 1976; Hamerow 1992).

The Anglo-Saxon archaeology of Suffolk's coastal zone, as visible on aerial photographs is summarised below, and is discussed in the light of the evidence for other periods and the biases that may have affected the results of the NMP survey.



## 10.2 The evidence

The NMP survey has not identified any sites that can be confidently dated to the Anglo-Saxon period, but four sites of *possible* Anglo-Saxon date have been identified. The evidence for these is summarised below.

### 10.2.1 Inter-tidal sites

*Case study: Fishtrap in Holbrook Bay*  
(TM 170336, STU 067).

This feature is visible on aerial photographs as a structure on the mud flats of the inter-tidal zone of the River Stour at Holbrook Bay, approximately 500m from the northern bank, and has been interpreted as a fish trap, or weir. It consists of two linear features that form a 'V' shape pointing eastwards to the main channel of the estuary (see Figure 24). The southern arm is almost 310m in length and is defined by rows of parallel posts that would have probably supported a wattle fence. The northern arm is almost 180m long, and resembles a low earthwork. This is probably due to the accumulation of silts over an arrangement of more eroded posts that may originally have been of a similar length to the southern arm. A roughly circular arrangement of smaller or more eroded posts can be seen at the point, or 'eye' of the feature.

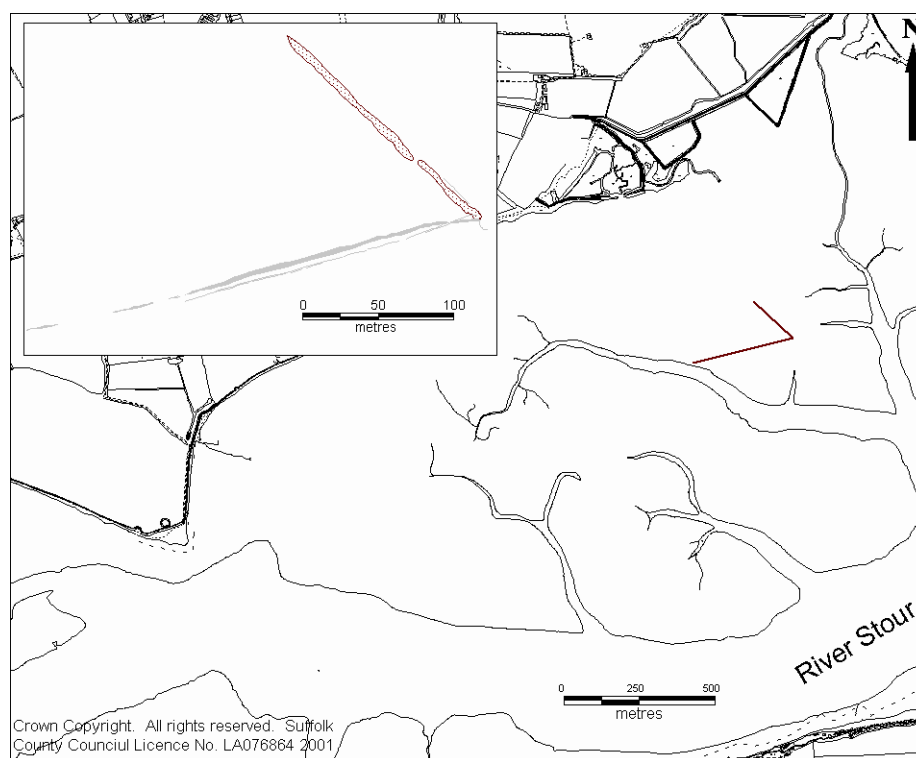


Figure 24. Map of the Holbrook Bay fishtrap (at 1:25000 scale, inset 1:5000).

The fishtrap would have been at least partially submerged by the flood of the incoming tide and as the tide ebbed, fish would have been caught up in the 'V' and trapped in the circular feature at the eye, probably a pound constructed of basketry or wattle.

Similar fishtraps are known from Essex, their distribution concentrated in the nearby Blackwater Estuary, and Strachan (1997) identifies the Holbrook Bay fishtrap as the only known example in the region, outside of the Blackwater Estuary Management Plan area.

The Holbrook Bay fishtrap was first photographed by David Strachan in 1995, but was not known to the Suffolk SMR until the posts of the southern arm were identified on the ground by the Suffolk County Council (SCC) Rapid Coastal Zone Assessment Survey (RCZAS) in 2003 (Suffolk County Council 2003). Following liaison with the SCC RCZAS field team, the feature was photographed from the air when its 'V' shape was identified and it was interpreted as a fishtrap. Due to its location on featureless mud-flats, transcription of the feature from the 1995 photographs was not possible. Further liaison with the SCC field team allowed aerial reconnaissance to be carried out with geo-referenced control-points in place around the feature. This allowed the site to be accurately mapped and recorded for the first time as part of the NMP project.

The Holbrook Bay fishtrap has not yet been dated, but a number of the similar Essex examples were constructed from the 7<sup>th</sup> to 10<sup>th</sup> century (Strachan 1997). A Saxo-Norman fishtrap, also with a circular pound or basket at the eye, has been recorded at Binstead on the Isle of Wight (Isle of Wight Council, 1997; 2004). On the basis of local and national parallels such as these, a similar date is suggested for the Holbrook Bay fishtrap. The numerous rows of parallel posts that make up the southern arm of the trap suggest a number of phases of repair or re-use and the trap may therefore have been in use for a lengthy period of time.

Nonetheless, a degree of caution must be maintained: stationary inter-tidal fishtraps are known from a number of countries and from most archaeological periods. Fischer (1995) describes evidence dating to the Mesolithic in Denmark, possible Neolithic and Bronze Age traps have been identified on the Isle of Wight (R. Loader, pers comm), whilst Gobold and Turner (1992) describe similar traps in use into the 20<sup>th</sup> century in the Severn Estuary.

In this instance we must be particularly cautious as large fishtraps are known, from documentary evidence, to have operated in the Orwell and on the Felixstowe side of Harwich Haven in the medieval period (Bailey 1990). These are areas in which dredging and recent development has probably resulted in poor survival of inter-tidal features. In addition, the NMP survey has identified smaller fishtraps known as kiddles (TM 290451, SUT 127) in the Deben Estuary, that are thought to be relatively recent in date (see section 11.8). It is possible therefore that the Holbrook Bay fishtrap may

represent a survival from a later industry. Radiocarbon or dendro-chronological dating may be the only way to resolve this issue.

Strachan (1997) has stated that the concentration of similar fishtraps in the Blackwater Estuary in Essex may be a bias created by frequent low-tide reconnaissance focused on this area. However, subsequent repeated reconnaissance over Suffolk's coastal and estuarine inter-tidal zone by Damian Grady for English Heritage has not identified any further such fishtraps in other Suffolk estuaries. One interpretation of this pattern is that such fishtraps were not suited to the narrower estuaries of Suffolk and the Stour is the only estuary in Suffolk suited to this technique. The kiddles in the River Deben are of comparative length but are differently configured and may support the suggestion that an alternative technology was required in the narrower estuaries.

The possible implications of the relatively steep profile and embanked course of many of Suffolk's narrower estuaries, for the survival and visibility of inter-tidal features has been discussed in section 4.2. The generally low number of inter-tidal estuarine features identified in Suffolk might therefore suggest that these processes have obscured or destroyed most features of any significant age in the estuarine inter-tidal zone. This is illustrated by the fact that the kiddles in the inter-tidal zone of the Deben Estuary have possibly now been destroyed as they are faintly visible on only one run of aerial photographs from 1945. For the majority of Suffolk's tidal estuaries, it is therefore probable that any features of Anglo-Saxon date originally within the inter-tidal zone have been lost to erosion.

It must also be considered that smaller sites or structures of Anglo-Saxon date could have been located in the tidal creeks that dissected the saltmarsh areas prior to medieval and post-medieval reclamation. The courses of many tidal creeks would have been filled in during the process of drainage and reclamation, and the remains of any inter-tidal features within them could now potentially be located behind the sea walls, obscured by silt and not easily visible to either ground or aerial survey techniques.

#### 10.2.2 Terrestrial sites

##### *Case study: Burrow Hill 8<sup>th</sup> century cemetery and settlement*

(TM 389484, BUT 001)

Burrow Hill is situated on the western bank of the Butley River. The hill reaches circa 15m OD in height and has been incorporated into the flood defences on the bank of the Butley River. During the Anglo-Saxon period the hill would have formed an island within the saltmarsh of the river's inter-tidal zone. Areas of the hill have been subject to small-scale modern gravel extraction, with the remainder under permanent pasture.

Cropmarks therefore form only under relatively extreme conditions of moisture stress (Wilson 2000).

Prompted by the discovery of a cauldron chain during gravel extraction, excavations took place on Burrow Hill from 1978-81 (Fenwick 1984). The excavations identified, amongst other features, an extensive inhumation cemetery of 8<sup>th</sup> century date and some limited evidence for settlement of the same period. The all-male composition of the burials led Fenwick to propose an interpretation for the site as an early monastic community.

The NMP survey has identified three enclosures as cropmarks around the summit of the hill, which can be seen on Figure 25. Due to the schematic nature of the available excavation site plan, it is not possible to directly relate the excavated areas to the NMP mapping. However, the gravel extraction and consequent archaeological excavation is situated in the area between the enclosures identified by aerial survey. It is therefore possible that the cropmark enclosures relate to the proposed monastic settlement.

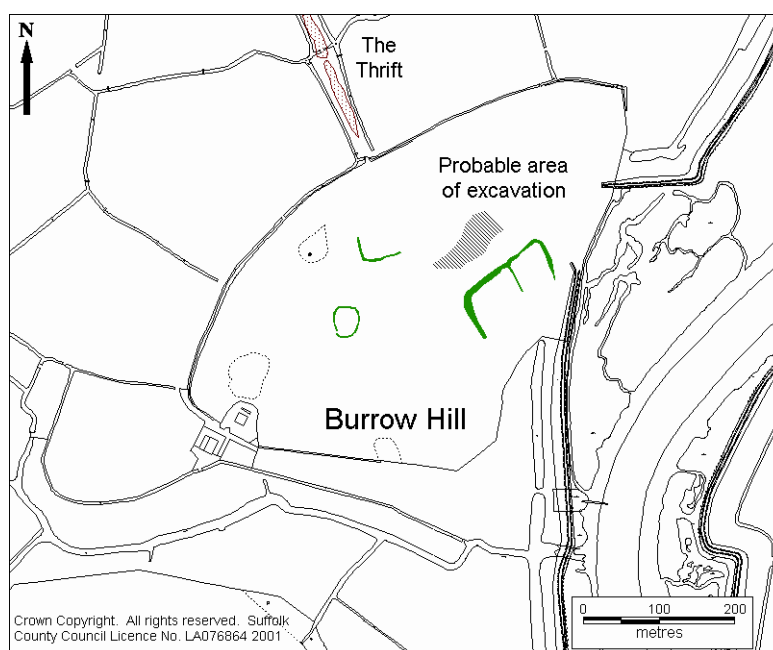


Figure 25. Burrow Hill (scale 1:10000).

An earthwork causeway known as The Thrift (BUT 018), approaches the hill from the north-west. It is similar in form to a causeway identified at the middle Saxon site of Brandon (Carr, Tester and Murphy 1988). The construction of the causeway would logically pre-date the drainage and reclamation of the surrounding saltmarsh, and may also be related to the Anglo-Saxon phase of settlement on Burrow Hill.

The excavations also proved that the hill was occupied in prehistory, and it must be considered that some of the enclosure features identified from aerial photographs may date from this period.

*Case study: the long hall at Freston (TM 169380, FRT 023)*

The interpretation of this site as a possible Neolithic longhouse has been discussed in section 6, and illustrated in Figure 7. An alternative interpretation as an Anglo-Saxon 'long hall' is summarised here.

This feature is located within the boundary of Freston Neolithic causewayed enclosure, situated about 7m from the north-eastern end of the enclosure. It sits just above the 30m contour, placing it on a plateau overlooking the River Orwell to the north-east, Shotley peninsular to the east and a narrow dry valley system to the south, within which a spring fed stream once fed into the Stour.

The possible long hall is visible on aerial photographs as a rectangular feature approximately 37m long and 9m wide, defined on its longer edges by postholes at intervals of between 1.5 to 2.5m. On the shorter ends it appears to be defined by narrow ditches.

Long halls of this period are known from a number of sites in England, including, in Suffolk, West Stow. The origins, techniques and social significance of this building tradition have been covered in detail elsewhere (James, Marshall and Millet 1999; Rahtz 1976) and will not be discussed here. However, the main characteristics of this class of site can be summarised as follows. The main feature is the rectangular form, which from the known examples varies from short and broad to long and narrow. The Freston example would sit at the larger end of the scale, but is similar in proportion to sites at Cheddar, Somerset (James *et al* 1999, fig. 4.14) and Chalton, Hampshire (Rahtz 1976, fig. 2.15). Many Saxon halls have paired doors in the centre of their longer sides, visible upon excavation as gaps in foundation slots and possibly on aerial photographs as a wider space between larger than normal post holes. Such doors are not apparent at Freston. However, the hall does appear to be partitioned at both ends, a typical internal arrangement James *et al.* (1999) describe as known from a number of Saxon halls.

Saxon halls are also often located within palisaded enclosures, often on the top of ridges. This position is possibly matched by the hall's situation on a promontory of land overlooking a tributary of the Stour.

However, other than that thought to be associated with the causewayed enclosure, there is no evidence for a palisade directly associated with the hall. It is possible though that the site of the causewayed enclosure survived as earthworks into the

Anglo-Saxon period, and may have been re-occupied. The size of the possible hall may be indicative of a high status settlement (Wilson 2000, 128), and it is possible, if not probable, that the palisade apparently associated with the causewayed enclosure actually dates from an Anglo-Saxon period of reoccupation.

When examples of the other well known Saxon building tradition, Sunken Featured Buildings (SFBs), are associated with halls, they are frequently arranged in a position parallel to the hall. Two round-cornered roughly rectangular pits are visible at Freston, aligned roughly parallel to the north-eastern end of the possible hall. These may be the remains of SFBs, although their size, roughly 6.5 by 3m and 4.5 by 2.5m would place them towards the larger end of the size range. However, these features are also in close proximity to the ditches of the causewayed enclosure, to which they are similar in form. A Neolithic date for these features is therefore possible

However, the low number of possible SFBs and absence of additional aerial photograph evidence for settlement activity on the site does not support an interpretation of the site as a sizeable settlement. It is possible, nevertheless, that subtle features towards the interior of the site have been damaged by agricultural activity or that due to the topography of the site they have been obscured by the resulting soil movement or by the moisture from the spring.

Circumstantial dating evidence is also inconclusive for this site, as both Neolithic and Anglo-Saxon surface finds are relatively poorly represented on the SMR for this area (see Figure 26). Cautionary examples, such as that of a site at Balbridie in Scotland must also be considered. At Balbridie a Saxon longhouse was identified from aerial photographs, but upon excavation the feature was dated to the Neolithic period (Current Archaeology 1980, 326-8; Hope-Taylor 1980, 18-19; Barclay 1996). Without excavation it is therefore not possible to be sure of the date or function of the Freston site.

*Case study: Covehithe settlement and cemetery (TM 522818, COV 086)*

A possible Anglo-Saxon settlement and cemetery are visible as cropmarks in the immediate area of the 13<sup>th</sup> - century church of St Andrew, Covehithe (see Figure 27). The village of Covehithe has been almost completely lost to coastal erosion, St Andrew's church now standing in an isolated position on the edge of a low knoll between Covehithe Board and Benacre Broad, about 400m from the coastal cliffs. The church itself faces destruction from erosion probably within 70 years (Loader unpublished).

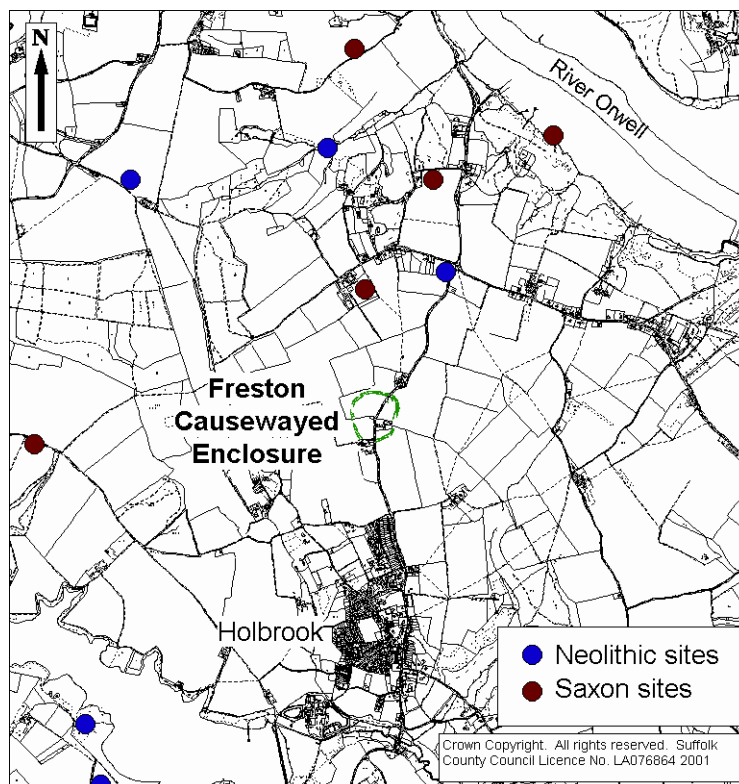


Figure 26. Neolithic and Saxon surface finds in the area of Freston causewayed enclosure (Scale 1:50000).

Fowler (1976) describes how such isolated churches are relatively common in East Anglia. A number of explanations have been suggested to explain the occurrence of such churches in the landscape. Fowler has suggested that they may be representative of a widespread settlement shift in the early to middle Saxon period (1976, 42). Cropmark evidence for a settlement may be apparent immediately to the north of the possible cemetery. This is visible on the aerial photographs as cropmarks forming over a number of roughly square or rectangular pits which vary in size from about 2m square to about 7m by 6m (see Figure 27 'C'). These pits have been interpreted as forming over the remains of early-Saxon structures known as Sunken Feature Buildings (SFBs). The form and function of such structures, and the role of the rectangular pits within them, probably varied within each settlement. Evidence from West Stow has demonstrated that they may have had occupational, workshop or storage use (Rahtz 1976, 70-81; West 1985). SFBs are detectable on aerial photographs due to their distinctive shape and the fact that they often occur in groups. For this reason they have been described as 'being datable from their plan alone' (Wilson 2000, 127), although in some contexts the remains of certain recent agricultural or industrial practices can be confused with SFBs (Wilson 2000). Some of the larger pits appear to be aligned on the eastern boundary of St Andrew's churchyard, a boundary presumably of medieval date, and it must be considered that they might result from such processes.



Figure 27. Possible Saxon settlement and cemetery in the area of the church of St. Andrew, Covehithe (Scale 1:2500).

The dimensions of the pits near the church boundary would place them at the larger end of the scale for SFBs (Wilson 2000, 127), but the majority are within the range typically visible on aerial photographs and known from sites in Suffolk, such as West Stow (West 1985). A site with comparative possible SFBs has also recently been identified at East Ruston, Norfolk, by the Norfolk NMP project (Albone, Massey and Tremlett *forthcoming*). A number of pits to the north of St Andrew's church are less regular in plan, and may result from a number of phases of construction.

A level of mobility is a recognised feature of early Saxon settlements, and it is possible therefore that the SFBs at Covehithe are the remains of an early Saxon settlement that shifted, probably at some point between the 5<sup>th</sup> and 7<sup>th</sup> century, to a different location (Hamerow 2002). At Covehithe the settlement may have shifted eastwards to form the basis of the medieval coastal village. However, the presence of the isolated medieval church cannot be explained by the shifting of a possible early Saxon settlement. A further explanation may involve a late Saxon hall and church complex. Martin (1999e) describes the pairing of isolated medieval parish churches and manorial halls as being a characteristic feature of Suffolk's medieval landscape. This settlement pattern was based probably on the late Saxon pattern of 'thegnly halls with dependant churches' (Martin 1999e, 88). The shifting of the hall would therefore leave the church standing alone. At Ixworth Thorpe the location of the original hall is thought to be marked by a Saxo-Norman pottery scatter near the Norman church, the hall having moved about 750m to the north to a new moated site (Martin 1999e, 88). At Covehithe, if such a late



Saxon hall shifted eastwards, potentially towards the coastal village, it would undoubtedly now be lost to the sea.

Possible burial activity can be seen on aerial photographs as cropmarks to the west and east of the current churchyard. In the field to the west, immediately adjacent to the churchyard, the crop has a mottled, irregular appearance. This is in contrast to the even growth in the main body of the field. These features are visible within an area of about 0.3ha, defined by a rectangular cropmark (see Figure 27 'A'). This is interpreted as the result of cumulative ground disturbance, as might be caused by the digging of graves over many years, rather than a geological feature. A number of small cropmark features approximately 2m in length may mark the location of individual burials. Only the most clearly defined of such features have been mapped and are visible on figure 27, but more diffuse features are present. It is possible that these features relate to agricultural activity, but the absence of similar features in the remainder of the field makes this unlikely. The rectangular enclosure boundary is not marked on the historic or 19<sup>th</sup> century maps available to the survey. However, the church of St Andrew was reduced in scale in 1672 (Munro-Cautley 1954, 247) and if the grounds of the church were also reduced, this enclosure may mark the original extent of the cemetery. Many of the possible burials in this area may therefore date from the pre-reduction period of the medieval churchyard, and potentially into the late Saxon period.

The second possible area of burial activity is located immediately to the east of the current churchyard (see Figure 27 'B'). The appearance of the crop in this area resembles that described above, but the disturbed ground extends beyond the area of St Andrew's churchyard and does not appear to be defined by an enclosure boundary. This is interpreted as potentially representing a phase of burial activity associated with an earlier, potentially late Saxon church on this site. If the 13<sup>th</sup> century church and burial ground did replace an earlier timber church, potentially dating from the late Anglo-Saxon period, this cropmark evidence may represent a continuity of use of this site from the Anglo-Saxon period into the medieval period.

It is possible therefore that the SFBs and cemetery are the remains of discreet phases of Anglo-Saxon settlement. The early Saxon settlement may have at some point shifted its focus, possibly to form the basis of the medieval coastal village of Covehithe to the east. This may be supported by a number of mid to late Saxon finds recorded on the SMR to the east of St Andrew's church, that have been discovered as they have eroded from the coastal cliff or, as in the case of an 8<sup>th</sup> or 9<sup>th</sup> century dug-out canoe, have been recovered at sea after probably eroding from nearby coastal peats (P. Murphy in Loader, forthcoming; see Figure 28). This settlement shift may have been followed in the late Saxon period by the relocation of a manorial hall.

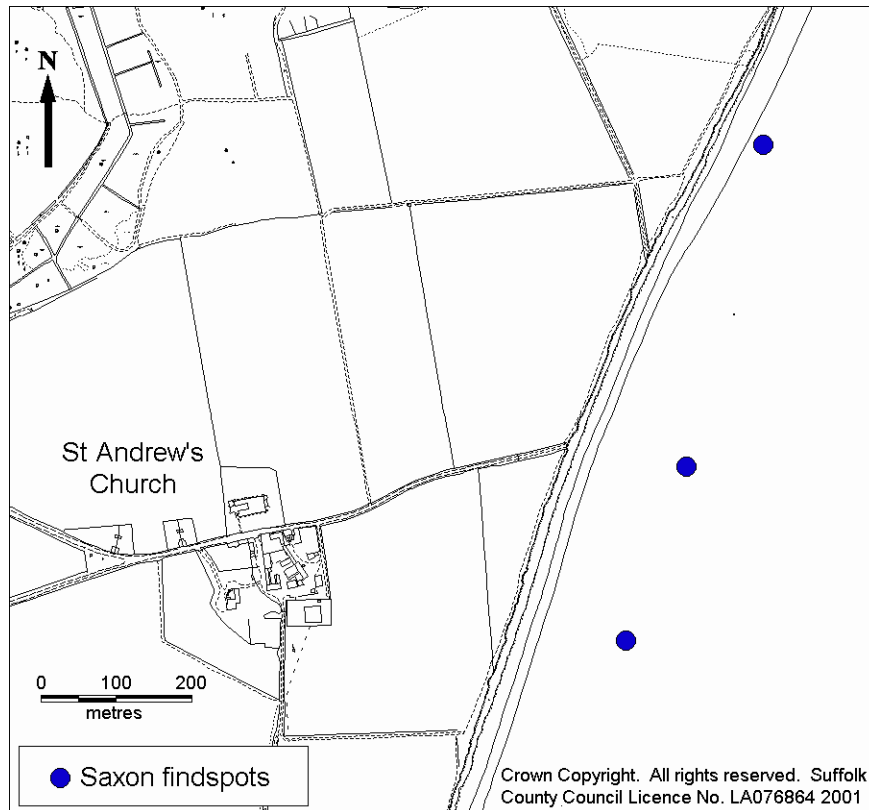


Figure 28. Saxon finds to the east of Covehithe (scale 1:10000).

Unfortunately the destruction of medieval Covehithe by coastal erosion has made the confirmation or disproval of such a sequence of events impossible. However, it is likely that many Saxon settlements have been lost to the sea, and that the distribution of surviving Anglo-Saxon sites in the coastal zone bears little relation to the actual Saxon coastal settlement pattern.

### Terrestrial sites; discussion

As described above, the study of the Anglo-Saxon period has a long history in Suffolk. Although the state of knowledge can be described as relatively good, the data is in fact 'patchy' (Newman 1992, 25). A number of factors have probably affected the archaeological survival of Anglo-Saxon sites and landscape features within the NMP project area and its coastal hinterland. The reasons for this and the implications for aerial survey are summarised here in light of the NMP survey results.

### 10.3 Problems of interpretation

The evidence for Anglo-Saxon structures from excavated settlements, both nationally and regionally, supports the established view that most structures of this period were constructed of timber, either, as discussed above for Freston in the form of framed halls

or as suggested for Covehithe, in the form of superstructures built over sunken features (Rahtz 1976; James 1999). Therefore, even substantial Anglo-Saxon structures leave relatively slight remains in the archaeological record and consequently are often difficult to confidently identify from aerial photographs (Wilson 2000). As many settlements of this period are unenclosed by boundary ditches, unless settlement structures are grouped in significant numbers they are difficult to identify on morphological grounds (Wilson 2000). This is particularly relevant to the Suffolk NMP area in relation to the possibility that early Saxon settlements may be smaller and more dispersed than has previously been thought (Newman 1992; cf. West 1985).

Due to the inherently uneven nature of cropmark formation, it is also possible that the visible extent of such settlements may be incomplete, with a possible bias to the more visible and distinctive early Saxon SFBs (Wilson 2000), with potential implications for the interpretation of the site's date and function.

Wilson also cautions that the identification of SFBs can be confused by the remains of certain industrial or extractive processes, most typically rectangular pits formed by the extraction of gravels, often within a single strip on large open fields (Wilson 2000, 217). Although the development of 'open-fields' and strip farming in Suffolk did not follow the typical Midlands model of two or three large open fields, (Rackham 1986; Williamson 1986; 1987), open fields and strips did exist in Suffolk, particularly in the Breckland and Sandlings areas (Martin 1999e). Although the remains of other forms of agricultural extraction or quarrying appear to be common in the project area, this 'linear' type of quarrying, however, does not appear to be a regular feature of the coastal Sandlings. The rectangular pits created for the retting of flax or linen in the textile industry, on the other hand, may be a feature of some parts of Suffolk, and could potentially be confused with SFBs (see section 11.9.2).

Under suitable conditions hall structures can be identified on aerial photographs, as illustrated at Freston. As well as difficulties in dating, it must also be highlighted that such structures can also be more complex than is apparent on the aerial photographs, or can be associated with more features than are visible. This is illustrated by the '5-hole Site' post built structure site identified on aerial photographs at Witton in Norfolk (Lawson 1983), which upon excavation proved to be a complex hall site. The implications for the Suffolk project are that the settlement sites discussed above are probably more complex than the evidence visible on aerial photographs might suggest. This may be particularly significant for Freston, regardless of the actual date of the structure. This can only be fully assessed by excavation.

#### 10.4 Characterising the settlement pattern

The difficulty in identifying the Anglo-Saxon settlement pattern in Suffolk is reflected in the fact that most evidence for the 5<sup>th</sup> to 7<sup>th</sup> centuries derives from the excavation of cemeteries. Cemeteries are often assumed to be paired with settlements, and with much of the evidence for *probable* cemeteries being based on isolated finds of metalwork, the evidence for *possible* settlement locations is therefore tenuous (Newman 1992, 25). The identification of inhumation burials as cropmarks from the aerial photographs is difficult, unless they occur in numbers in cemeteries, or at a significant location, such as a co-location with a church, as at Covehithe (Wilson 2000, 104). Therefore the evidence for this site type is largely biased towards ground survey methods. Similarly, the limited additional evidence for the distribution of Anglo-Saxon settlements in Suffolk comes from surface scatters of only broadly datable pottery.

A preference in the early Anglo-Saxon settlement pattern for lighter soils, particularly river terraces, has been perceived in archaeological studies for many years, and the possibility that this may be a bias resulting from excavation in advance of gravel extraction, or the better visibility of cropmarks on these soils, has also been discussed (Rahtz 1976; Hamerow 1992). The current distribution of known early Saxon sites in Suffolk is no exception to this pattern (West 2000; Wade 2000). The distribution of settlements appears to be divided into two main areas; the heads of the major river valleys on the Sandling soils of the south-east of the county and the Brecklands to the north-west (Newman 1992; West 2000; Wade 2000). This potentially has a number of implications for the results of the NMP survey, which are summarised below.

A recent extensive fieldwalking survey in south-east Suffolk, around the head of the River Deben (Newman 1992) suggested that early Saxon settlement did not extend onto the areas of Suffolk's central claylands settled in the Roman period, and seemed to show a marked preference for the hinterland of the tributaries of the River Deben, rather than the immediate area of the main estuary itself (Newman 1992; fig 6). The south-east Suffolk survey area partly overlaps with the NMP survey's Block three, but many of the new sites identified on the ground are in areas not covered by the NMP survey (see Figure 29). If this wider estuarine hinterland settlement pattern is representative of the early Saxon settlement pattern for the remainder of the coastal zone, it is likely that the NMP survey area is too narrow to include those areas *most densely* settled in the early Saxon period (for the extent of the NMP project area see Figure 1).

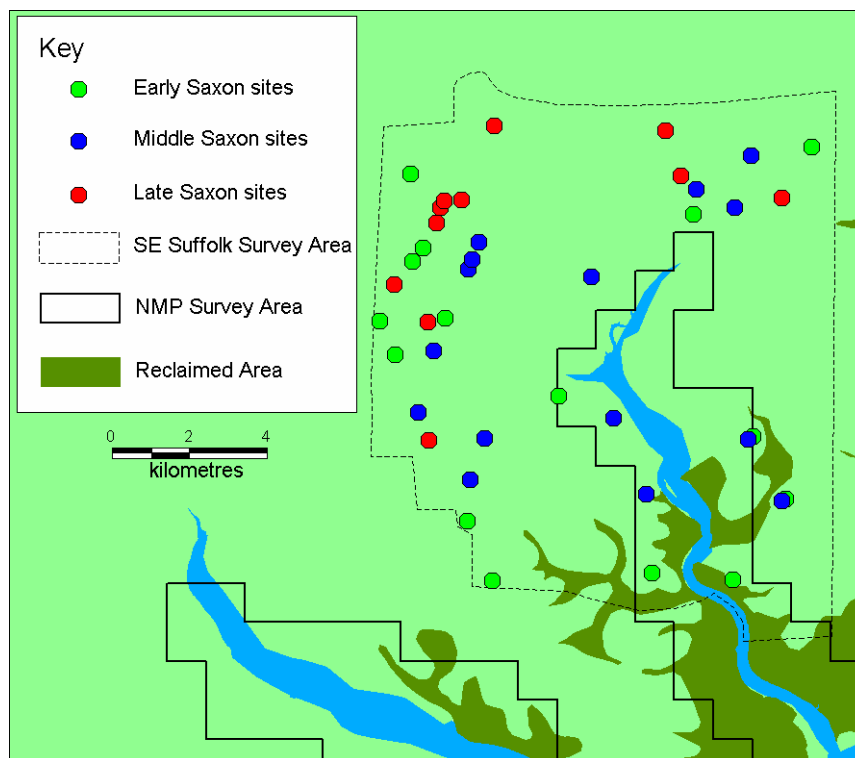


Figure 29. Area of a major fieldwalking survey in south-east Suffolk (after Newman 1992 scale 1:200000).

In addition, as described in section 4, a significant proportion of the estuarine area included within the project area is composed of saltmarsh that was drained and reclaimed in the medieval and post-medieval periods. Although natural resources were probably exploited in such areas in the post-Roman and Anglo-Saxon periods, it is probable that much of this area would have been unsuitable for settlement. The predominantly pastoral economy of much of the coastal zone into the 20<sup>th</sup> century has also limited the suitability of this area to cropmark formation and the possibility of surface finds. The extent of this possible bias in the NMP survey area can be illustrated by examining the topography in the immediate area of Burrow Hill (see Figure 30). The area in green indicates the extent of land which was probably suitable for settlement in the Saxon period, and is reflected in the corresponding visible cropmarks.

Newman (1992) argues that the results of the south-east Suffolk survey suggests that the early Saxon rural settlement pattern for the early Saxon period follows that of the Roman period; relatively widely dispersed settlements on the lighter soils. He also argues that the majority of the identified sites are relatively small, contradicting the idea that the larger nucleated early Saxon site at West Stow was typical for early Saxon settlement in Suffolk. If the pattern of small dispersed settlements is representative for the remainder of the coastal zone, it could have implications for the visibility of sites from the air. Such smaller settlement sites would be inherently less apparent on aerial photographs than larger nucleated sites. In combination with the issues related to the

extent of the NMP survey area described above, this may partially account for the low representation of early Saxon sites in the NMP survey area.

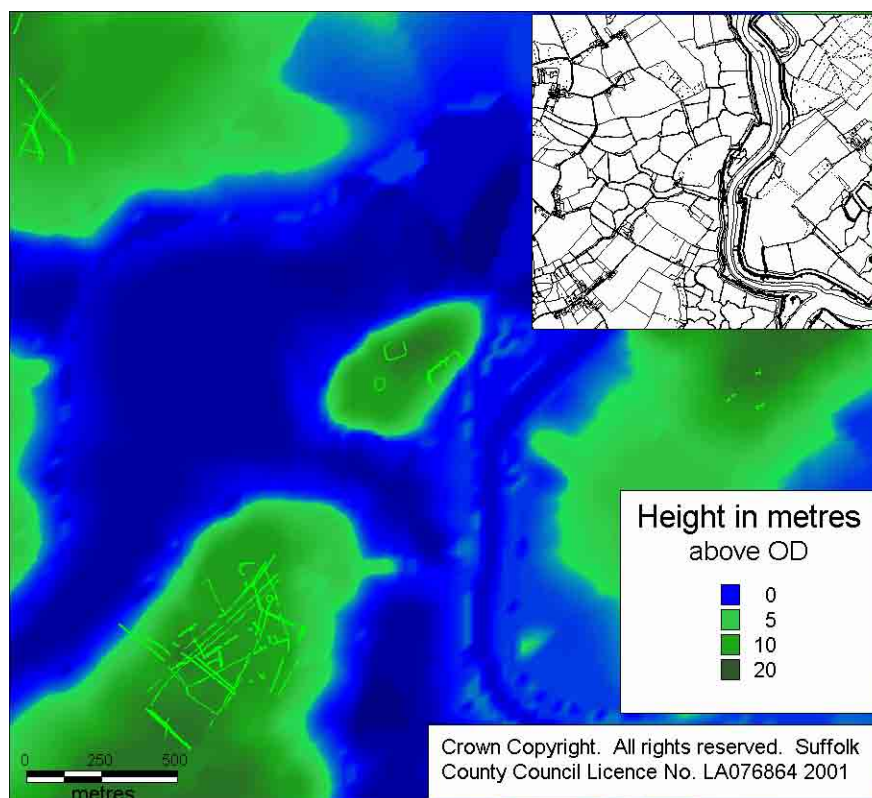


Figure 30. Thematic map illustrating the topography in the area of Burrow Hill (scale 1:25000).

The middle Saxon period saw a phase of settlement shift in Suffolk, as typified by the abandonment of West Stow in the 7<sup>th</sup> century. The possible reasons for this are complex and may be related to the emergence of the East Anglian Anglo-Saxon kingdom, the development of large estates and increased agricultural productivity, but such topics are beyond the scope of this report and have been discussed in detail elsewhere (Hamerow 2002; Scull 1992; Warner 1996). The implications of this settlement shift for landscape studies in East Anglia, that the origins of many villages and towns, and the development of the parish system, dates from the later Saxon period, have been recognised for a number of years (Fowler 1976). The implications of this for the archaeological survival and visibility of Anglo-Saxon settlement evidence are twofold. Firstly, the early Saxon settlements, as illustrated by Newman (1992) are visible to ground survey, and potentially to aerial survey, but are also suffering damage by continued cultivation. Secondly, many middle and later (7 to 10<sup>th</sup>-century) Saxon settlements in Suffolk will now be situated underneath villages and towns with few opportunities for excavation, typified by the limited data available for the middle Saxon *Wic* site at Ipswich (cf. Wade 1988). They will effectively be invisible to both ground and aerial survey techniques, and may have suffered some damage by later

development. Alternatively, features may be sealed by later deposits, as in the discovery of a middle Saxon cemetery at the Buttermarket, Ipswich, and be at less risk than the earlier sites (Wade 1988).

### **10.5 Identifying agricultural landscapes**

Anglo-Saxon agricultural practice is a poorly understood area and nationally there is little excavated evidence for Anglo-Saxon agricultural practice (Hamerow 1992; Hooke 1998). However, the limited environmental evidence available suggests that the post-Roman landscape remained largely unforested and the pollen evidence also suggests that there was some continuity in the range of crops produced into the Anglo-Saxon period (P. Murphy in Wade 1997). This suggests that agricultural practices continued from the Roman period into the early Saxon period (Hamerow 1992, 44; Scull 1992, 12; Hooke 1995, 103; Hinton 1999, 55). As Esmonde-Cleary states:

“...it seems sensible that (the Anglo-Saxons) should fit into the existing landscape with its own long established agricultural regime. At first they adapted to it; only later did they adapt it”

(Esmonde-Cleary 1995, 16)

Recent work on the possible survival of field boundaries, or at least of their influence on the organisation of subsequent landscapes, suggested the possibility that some current field systems on the Suffolk claylands could originate in the Romano-British or later prehistoric periods (Williamson 1986; 1987). The NMP evidence does not support an argument for the establishment of widespread unified co-axial field systems on the coast, but does suggest that some probably later prehistoric features have influenced the development of later field patterns on the Sandlings in a more limited fashion. Some of these features, now visible as cropmarks, have been discussed above (see section 8). A more recent project on the historic field systems of East Anglia supports this view, but also suggests that some co-axial field systems are in fact Saxon or early-medieval in date (Martin and Satchell 2004).

It is probable, therefore, that the NMP project has in fact mapped and recorded field systems of Anglo-Saxon date as cropmarks, but they are difficult to recognise and differentiate from earlier and later field systems.

Understanding the development of Middle and Later Saxon settlements is complicated by periods of settlement expansion and shift, what has been described as the ‘Middle Saxon Shuffle’ (Wade 2000). The application of aerial survey to identifying field systems associated with these Middle and Later Saxon settlements probably suffers from the problems described above for the earlier periods.

## **11. THE MEDIEVAL AND POST-MEDIEVAL PERIODS: AD 1066 - 1900**

### **11.1 Introduction**

Suffolk's coastal zone is dominated by landscape modifications dating from the post-medieval period. These modifications, such as enclosure and reclamation were driven by social and economic imperatives, and often had significant impact on the organisation of the landscape that had become established by the medieval period.

For this reason, this section will summarise the results of the NMP survey for the medieval and post-medieval periods together, under thematic headings, which place the medieval results within the wider context of the later post-medieval landscape.

Glazebrook has said that the 'apparent ubiquity of post-medieval remains and the richness of the documentary record' (Glazebrook 1997, 67) has made the value of studying the archaeology of the post-medieval unclear to some. For this reason, this section will summarise only those categories of results from the NMP project which are felt to demonstrate significant contributions to the study of the period.

### **11.2 Enclosure**

The process of 'enclosure' can be simply defined as 'the creation of hedged (or walled) fields on land which had previously been open: either as large arable open fields or as some form of common land or 'waste' such as greens, heaths, moors, fens and marshes' (Dymond 1999, 104). This process is most commonly associated with the Midlands where Parliamentary Acts of the 18<sup>th</sup> and 19<sup>th</sup> centuries resulted in the enclosure of large areas of open fields. The process was in fact extremely complex and was driven by a range of social and economic factors, which have been concisely summarised elsewhere (Williamson 2000).

In Suffolk, the pattern of enclosure is somewhat different. Some areas of north-western Suffolk were redesigned through Acts of Parliament in the 18<sup>th</sup> and 19<sup>th</sup> centuries, and in the process some open fields were enclosed. However, much of Suffolk had been enclosed at a much earlier date and much of central, or 'high' Suffolk, is composed of relatively small enclosed fields, what Rackham has termed 'Ancient Countryside' (Rackham 1986). Many of the Parliamentary Acts in Suffolk were for the enclosure of open areas, such as greens and commons (Dymond 1999), while the overall



organisation of land use continued to reflect and possibly preserve the earlier pattern, as discussed above (see sections 8.3.2 and 10.7; cf. Williamson 2000)

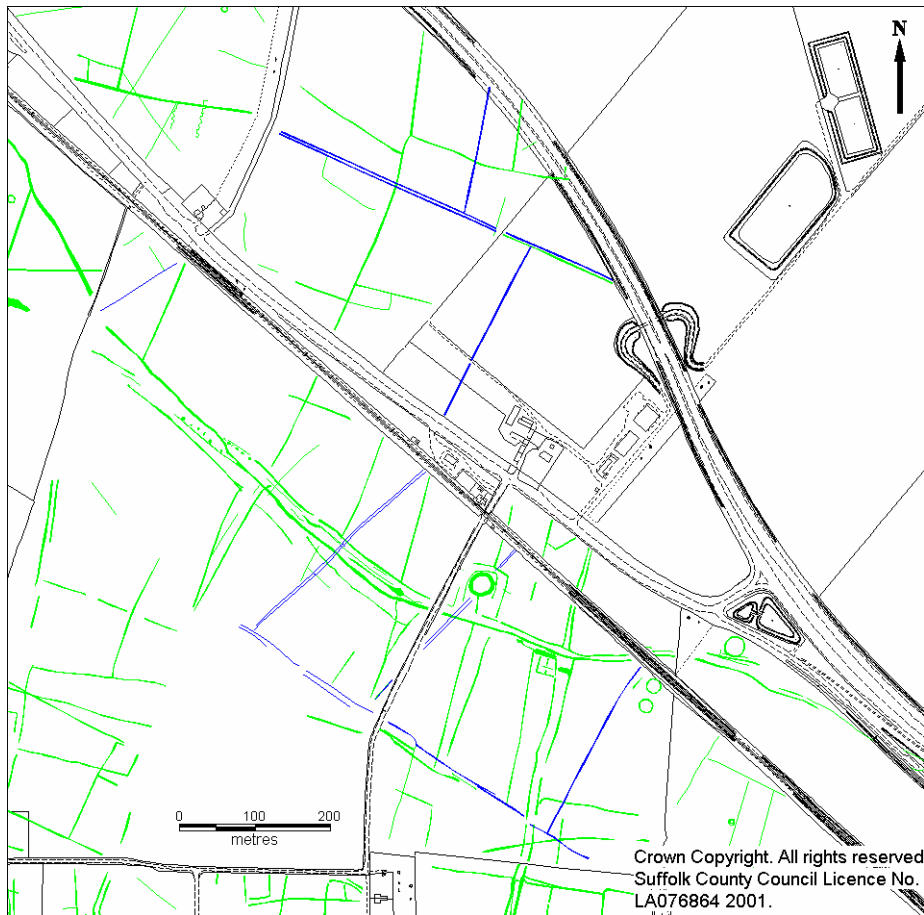
As such, land organisation in the medieval and post-medieval period coastal zone appears to largely reflect that of earlier periods, with very few areas of wholesale reorganisation being apparent on aerial photographs. This is illustrated in the continuation of boundaries and significance of prehistoric features discussed throughout this report.

The NMP survey evidence appears to largely confirm Dymond's statement that 18<sup>th</sup> and 19<sup>th</sup> century enclosure of agricultural land by Act of Parliament in Suffolk's coastal Sandlings zone was of limited extent, and that most enclosure was in fact of modern date (Dymond 2000). For instance, a number of examples have been identified where cropmarks of very regular field boundaries can be directly related to field boundaries recorded on 18<sup>th</sup>-century estate maps or the 19<sup>th</sup> and early 20<sup>th</sup>-century first or second Edition 25" OS maps. Where cropmarks of such recent boundary features have been identified, they have generally not been recorded as part of the survey, unless elements of them could potentially be mistaken for archaeological features of different periods. In other cases, the cropmarks of boundaries which do not appear on historic maps have been interpreted as probably post-medieval in date if they directly abut surviving boundaries. In these cases, they have been recorded if thought to be noteworthy.

A significant proportion of the large scale enclosure visible on aerial photographs in the coastal zone is definitely modern in date: the NMP survey has identified numerous field boundary hedgerows that have been removed and have formed cropmarks since the 1940s.

However, in a few instances, boundaries have been visible as cropmarks which are not marked on historic maps, do not relate to extant boundaries, yet morphologically appear too regular to be easily interpreted as prehistoric in origin. For example, see Figure 31.

These cropmarks may represent phases of landscape reorganisation in the medieval or early post-medieval period that were not a result of an Act of Parliament. If this is the case, then the aerial survey evidence may have revealed episodes of enclosure in the coastal zone which were of small scale, or of which little is known.



*Figure 31. Possible post-medieval field systems on Levington Heath. Cropmark features highlighted in blue may represent post-medieval enclosure unrelated to the surrounding surviving land division (scale 1:10000).*

### 11.3 Reclamation

The visually unremarkable nature of sea defences and the fact that they are often still in use and marked on modern maps may obscure their status as the remains of an important part of the complex process of enclosure. They represent a process which has shaped the character and the archaeology of the Suffolk coastal landscape arguably more than any other; reclamation.

These earthworks, known as sea walls, are probably the most extensive single class of feature to be recorded during the NMP survey. These banks are upstanding along the course of every major river in the project area and act as sea defences in many of the low lying coastal areas. In total, roughly 200km of sea walls has been recorded in the project, much of this in continuous lengths of up to 15km. Figure 32 illustrates the extent of these banks in the NMP project area.



Figure 32. The extent of sea walls in Suffolk's coastal zone.

Although not as extensive as in Essex and Norfolk, reclaimed land makes up a significant proportion of Suffolk's coastal landscape; for example approximately 30% of the NMP project area is composed of drained, reclaimed and embanked land (see Figure 4).

The implications of reclamation for the survival and visibility of archaeological remains of earlier historical and archaeological periods has been discussed in the previous sections of this report. The significance of the physical remains of the banks themselves will be summarised in this section.

The history of reclamation in England is long and complex and in some areas can be traced to the Romano-British and Anglo-Saxon periods (Rippon 1999; Silvester 1999). In Suffolk, the earliest recorded reclamation probably took place in the area of Orford in the 12<sup>th</sup> century. The monastic organisation of drainage is well known elsewhere in

Britain, as at Glastonbury Abbey (Bond, 2004), and earlier reclamation may have been attempted in Suffolk at the site of the first Leiston Abbey (TM 472659, LCS 002), founded in 1182. Here, cropmarks may represent the remains of a complex system of drains surrounding the old monastic complex (see Figure 33). However the relationship of the cropmark features to the extant drains and sea walls is unclear. Leiston Abbey was relocated to a site roughly 3km inland in the 14<sup>th</sup> century because of repeated flooding, which suggests that the monastic reclamation attempts were ultimately unsuccessful. The later post-medieval reclamation may therefore bear no relation to the medieval drainage which it superseded.

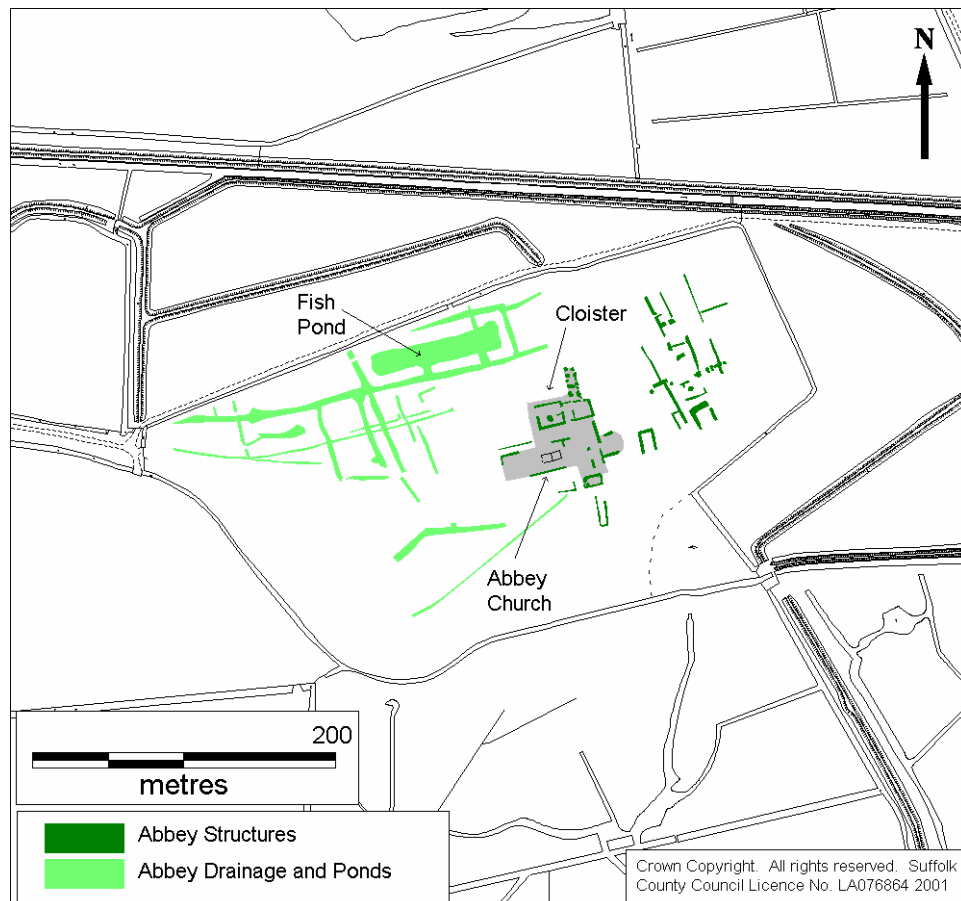


Figure 33. Leiston Old Abbey; evidence for medieval reclamation? (scale 1:5000)

The reasons for land reclamation in the medieval and post-medieval periods are complex. In the county as a whole, as seen at Orford, the marsh was probably largely reclaimed to protect valued grazing marsh from flooding.

Reclamation is seen by some as the final culmination of a process that begins with the seasonal exploitation and settlement of wetlands, proceeds to the establishment of permanent settlement or farmsteads on small areas of drained land, and finally includes large-scale drainage and embankment to protect the new land from flooding (Silvester 1999; Rippon 1997). The process is complex and probably varied from region to region and should not be seen as simply reactive or environmentally determined. Indeed on

the Suffolk coast and estuaries, it appears that the model described above may not apply, as very few settlements or farmsteads are actually located on the reclaimed land, most remaining on the adjacent higher ground, above 5m OD. This may be because the predominantly pastoral 'sheep-walk' economy of the coastal zone provided less incentive to relocate to reclaimed land than the inland arable farming economy.

The date and precise sequence of drainage and reclamation along most of the Suffolk coast is unclear, and this report is not the place to review the historical context of the social and economic forces behind reclamation. These have been summarised and explained elsewhere (Silvester 1999: Taylor 1999: Rippon 1997). However, a basic requirement for the process is a significant investment of both time and money. It was therefore unlikely that individual landowners would have the resources available to reclaim areas on a large scale. It is unclear precisely which areas were first drained and reclaimed around Orford in the late 13<sup>th</sup> century, but a large area of reclaimed marsh to the south and east of Orford is named as King's Marshes on historical maps, suggesting both that the initial reclaimed area was extensive and probably required royal investment and organisation.

The earliest map evidence for embankment in the project area is Norden's map of Orfordness, from circa 1601. This shows that the reclamation of the surrounding saltmarsh, although extensive, was far from complete by the beginning of the 17<sup>th</sup> century. The eastern edge of King's Marshes for example, remained un-embanked at this time, probably due to the partial protection provided by the shingle beach.

Most areas of the coastal zone do not have historical evidence to establish a date of construction for the sea walls, or early map evidence to provide a date after which reclamation must have occurred. However, the NMP evidence for the area of Orfordness will be summarised as a case study to illustrate how NMP data can enhance the knowledge of reclamation in even a relatively well understood area.

#### *Case study: reclamation around Orford*

The NMP project has mapped a number of earthworks in reclaimed zones behind the current sea walls. A number of these have been interpreted as relict sea banks. A good example can be seen to the north of Orford (TM 441514, SUE 022; see Figure 34). Historical maps date the construction of these banks to at least the early post-medieval period. That the construction of these banks reflects the limits of Orford's parish boundary may indicate organised construction on a highly localised basis. Silvester (1999) describes how medieval communities coordinated to reclaim areas of the Fens and the Somerset levels, and Taylor (1999) describes a similar cooperation of parishes in the 18<sup>th</sup> century in Cambridgeshire. Such organisation is also reflected in the evidence for other areas of the coastal zone, as can be seen in Figure 35, and implies that the construction of most sea walls in Suffolk, and therefore the process of

reclamation, was probably carried out on a relatively small scale, at different dates and over varying lengths of time. This is supported by the map evidence; in 1601, unlike its neighbouring parish of Orford to the south, the estuarine saltmarsh and banks of the River Alde in Sudbourne parish remained un-drained and un-embanked (see Figure 36).

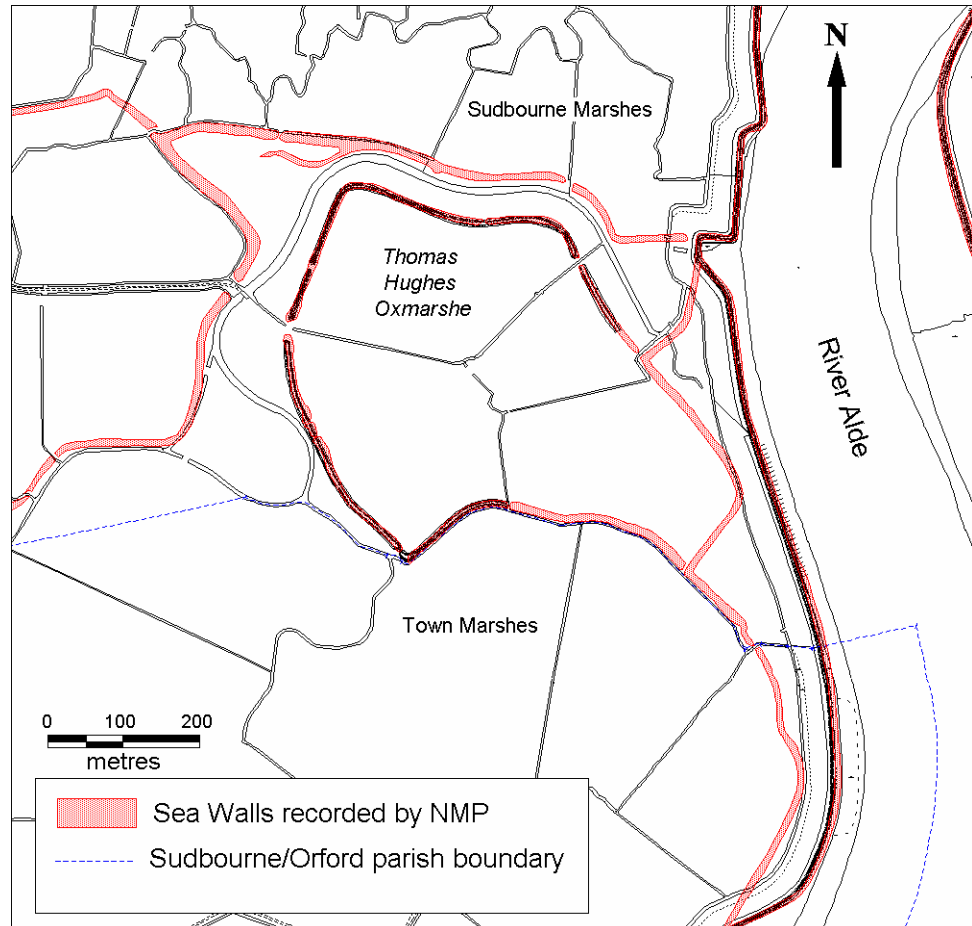
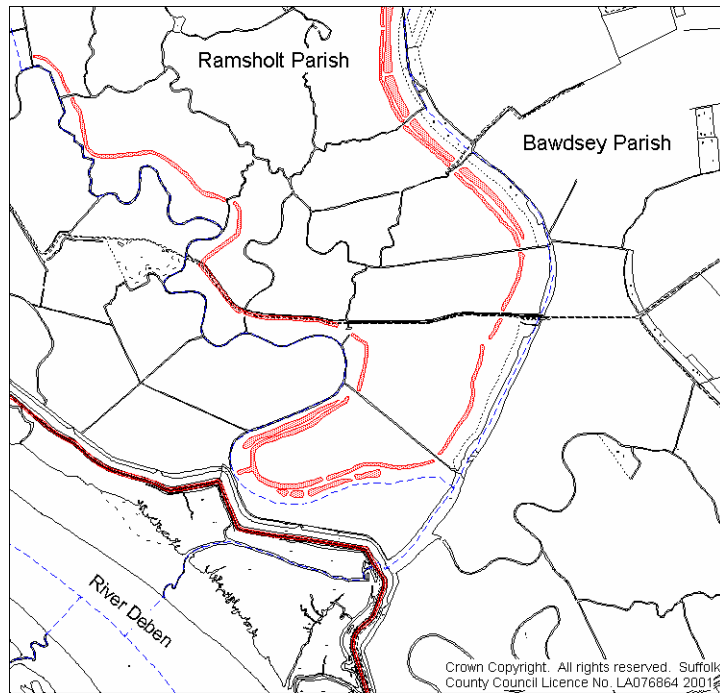


Figure 34. Relict sea bank to the north of Orford (scale 1:10000).

However, it is possible that once the process had begun in one area or parish, small landowners or communities in neighbouring parishes may have cooperated to take advantage of the work already done, and reclaim small adjacent areas in a piecemeal fashion. This may be reflected in the irregularly shaped embanked enclosure abutting the relict bank described above at circa TM 439513, immediately to the north of Orford parish (see Figure 34).



Sea Walls recorded by NMP

Parish boundary

Scale 1:20000

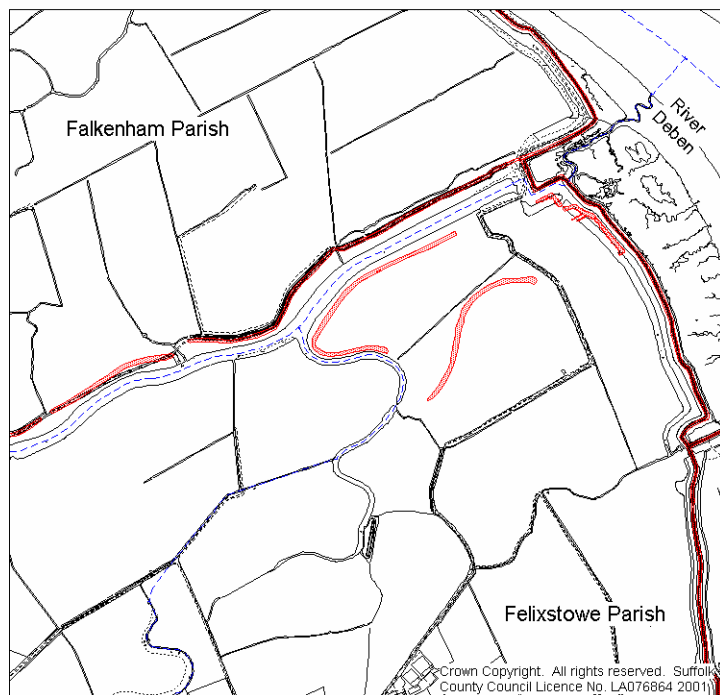


Figure 35. Evidence for the construction of sea banks in relation to parish boundaries.



Figure 36. Excerpt of Norden's 1601 map.

This enclosure matches an apparently embanked area on the 1601 map named as *Thomas Hughes Oxmarshe*, suggesting that prior to this date, someone took advantage of the work by Orford parish to minimise their labour costs in creating an area of embanked pasture, probably for grazing cattle.

At some point between 1601 and circa 1800, the date of the next available historical map for this area, the banks of the River Alde in Sudbourne parish are embanked, along with those in much of the surrounding area. The new banks supersede the earthworks of *Thomas Hughes Oxmarshe*. Probably because they have been made redundant they are not marked on the new map. However, it becomes clear that the new banks again take advantage of the previous work and abut the *Oxmarshe* earthworks.

### 11.3.1 The NMP evidence for reclamation

It is probable that a similar pattern of progressive reclamation took place along much of the coast. In fact it is probable that the progressive construction of sea walls in part established the conditions for further reclamation. The new walls would cause the deposition of silts along their margins, consolidating and expanding the surface of the surrounding saltmarsh. When this accumulated surface had reached a viable area or stability, this could then be embanked (Silvester 1999, 125). Although little documentation of such piecemeal reclamation survives, this pattern is visible on the



Suffolk coast through aerial survey. For example, to the south of Orford, in the parish of Gedgrave, a series of relict banks appear to form cells of reclamation, progressing laterally along the course of the river (TM 398475, GED 029 to GED 032; see Figure 37). In this instance, only the southernmost, and possibly latest, relict bank survives sufficiently as an earthwork to be recorded on the current Ordnance Survey map, the rest now only visible on aerial photographs as low earthworks.

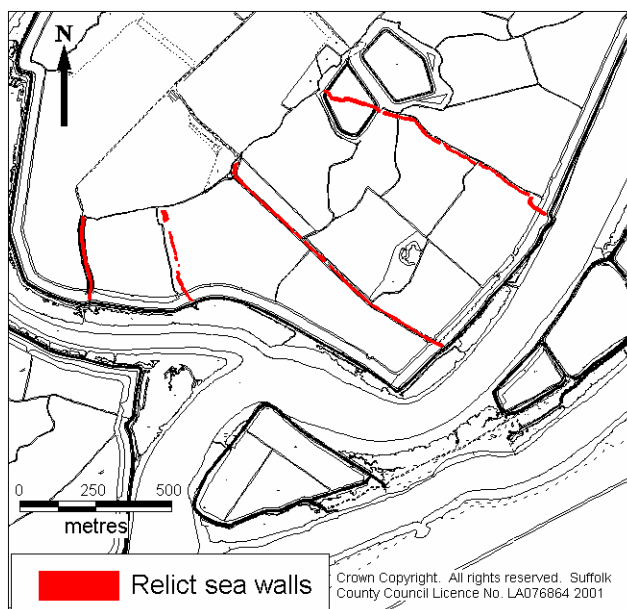


Figure 37. Progressive reclamation to the south of Orford (scale 1:25000).

Taylor (1999) states that the period 1750 to 1850 was the last phase of expansion in reclamation in Britain, and that more land was reclaimed in this period than any other. It is probable that the bulk of the reclamation in Suffolk described above was carried out in this period, but the final push on the Suffolk coast probably continued slightly longer. For example, the tip of the spur of land in Sudbourne parish was reclaimed at some point between 1800 and 1884, but a similar spur to the south of Cattawade in Brantham parish was not reclaimed until the early 20<sup>th</sup> century.

### 11.3.2 Reclamation: success, survival and dating

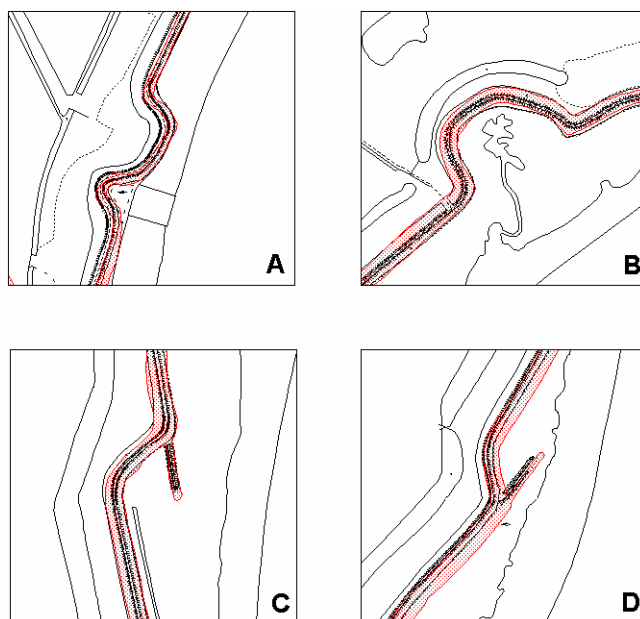
Of course, not all reclamation attempts were ultimately successful. For example, a spur of land that projects into a meander of the River Alde near Iken church is reclaimed and embanked by circa 1837(TM 405566, SNP 050). However, this bank is only partially marked on the current base map and the NMP survey has demonstrated that it was breached and flooded between the revision of the Ordnance Survey map in about 1919 and its appearance on the earliest available aerial photographs. A more complex system of reclamation can be seen to have suffered a similar fate on the banks of the River Stour (TM 129331, BNT 054). It was breached again at some point between the

second edition Ordnance Survey 25" map and 1946, the fragmentary state of the earthworks on even the earliest aerial photographs illustrates how rapidly such historic features can be destroyed by tidal erosion without ongoing repair and maintenance. The cause of the abandonment of reclaimed land is beyond the scope of this report, but is probably related to what Taylor (1999) calls 'the greatest agricultural depression in British History' (Taylor 1999, 154).

Unfortunately the repair and maintenance required to maintain the banks in working order also has implications for archaeological investigations. The sea walls depicted on the current Ordnance Survey base map may follow the *general* route of the original medieval or post-medieval banks, but continuous maintenance may have obscured the original structure of the wall, or replaced it altogether, potentially a number of times. This ongoing maintenance is evidenced by the presence of pits along the 'inside' of many walls, probably excavated to provide material for repair. Unfortunately opportunities to obtain dating materials through the excavation of sea walls, whilst they are in use, are understandably rare. When opportunities for investigation do arise, they may face difficulties in dating the sea walls due to these repairs. For example, the examination of a sea wall during a breach caused for managed realignment at Trimley, observed no structural components of any great age, and the presence of brick and squared stakes at the base supported an interpretation of relatively recent repair or maintenance (Everett 2000).

The irregular course of many sea walls, which often includes various annexes, coves and occasional 'stumps' of bank projecting from the main body of the wall, might suggest that breaches and subsequent repair and remodelling have modified the shape of the surviving banks over many years. It is also probable that some of these deviations are deliberate diversions, for instance around tidal creeks, or are extensions to provide a mooring from, or access to the saltmarsh. Examples of such irregularities are illustrated in Figure 38 (A & B: TM 453531, SUE 085; C: TM 446561, ADB 142; D: TM 394482, GED 039).

In some instances, large scale modification and regulation of sea walls resulting from redevelopment is apparent, as at one island in the River Stour, to the south of Cattawade (TM 102328, BNT 045). The course of the sea wall on the northeast side of the island was altered in the 19<sup>th</sup> century during the construction of a railway bridge, and straightened in the late 20<sup>th</sup> century during the remodelling of the road bridge.



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*Figure 38. The irregular course of many sea banks may reflect episodes of breach and repair (scale 1:5000).*

The ultimate threat now facing the survival of many relict historic sea walls must be considered. In the second half of the 20<sup>th</sup> century, to meet the post-Second World War demand for food, intensive arable cultivation has expanded on to many areas of reclaimed land previously kept as pasture, and as a result many relict sea banks face destruction from ploughing. This process is already advanced; the relict bank described above on the spur of land in Sudbourne, was completely levelled between 1940 and 1952 and is now only visible on aerial photographs as a soilmark. Aerial survey provides a rapid and cost-effective way of assessing the survival and potential significance of sea banks in such areas under threat.

#### **11.4 Water meadows**

*Case study: Benacre Broad Water meadow, Covehithe (TM 521825, COV 097)*

The post-medieval enthusiasm for land 'improvement' may have also been behind the attempted creation of a water meadow in Covehithe parish. This site is visible on aerial photographs as a series of earthwork ridges and parallel ditches that run at roughly ninety degrees to the line of a central drainage channel, on Benacre Broad. This pattern of channels covers at least 11 hectares, and may extend for as much as 18 hectares along the southern half of the broad.

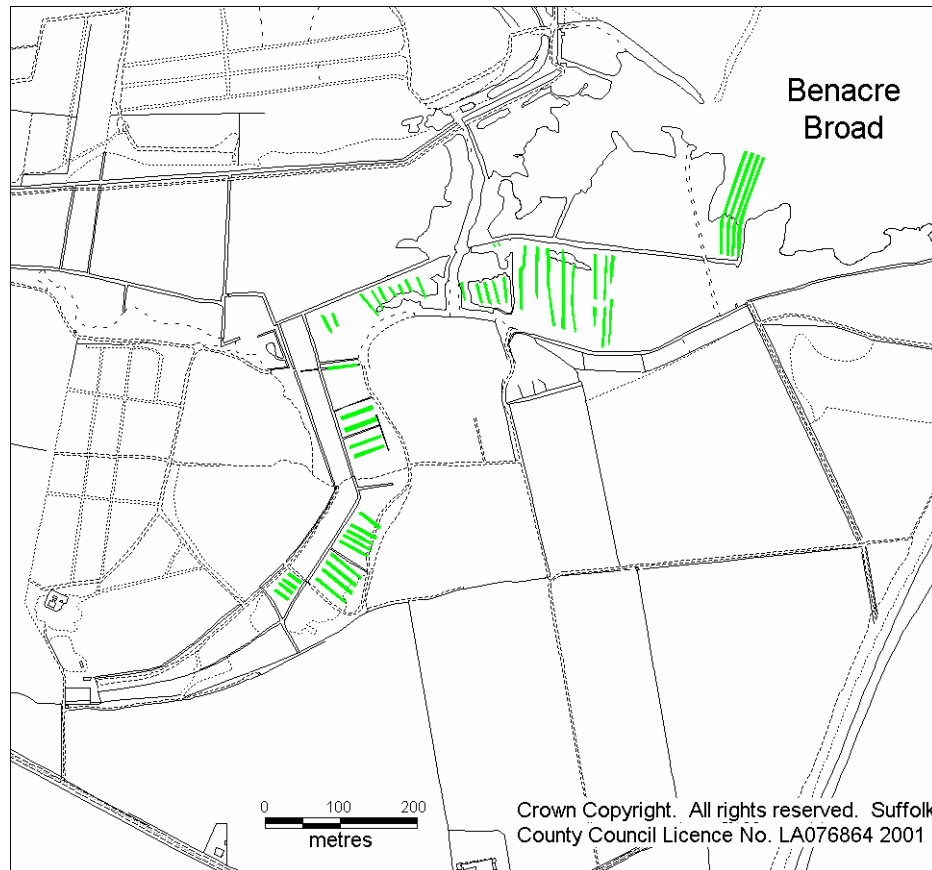


Figure 39. A failed water meadow at Benacre Broad? (scale 1:10000)

The purpose of lightly irrigating grassland was to provide an early spring growth of grass on which to graze sheep, thereby reducing the amount of over-wintering feed required. The development of water meadows in the south of England and their method of operation and construction has been discussed in detail by Bettey (1999) and Brown (forthcoming), and will not be covered here. Records indicate that water meadows became widespread in the 17<sup>th</sup> century, and were particularly successful on the chalklands of Wessex and the South-West (Brown, forthcoming). The technique spread further throughout the period of 'High Farming' and prosperity during the 'agricultural revolution' of the late 17<sup>th</sup> and 19<sup>th</sup> century, although examples in East Anglia are rare (Williamson 1999; Wade Martins and Williamson 1994).

The arrangement of channels and ridges at Benacre broad strongly resembles the arrangement of principal carriers and side drains that make up the type of water meadow known as a 'bedwork' system. The possible water meadow site itself is very similar in appearance to a successful early 19<sup>th</sup> century water meadow at Castle Acre in Norfolk, and is probably of similar date (cf. Williamson 1999, 202).

However, there are a number of factors which cast doubt upon the efficient functioning of this site. Unlike the meadow at Castle Acre, which is located in the valley of the

River Nar and fed by leats, springs and rainwater run-off, the Benacre Broad site does not appear to have a substantial enough source of water to provide the necessary head of water to irrigate the meadow. In East Anglia, the gentle gradients of the valleys often required the construction of lengthy leats to build up a suitable head of water (that at Castle Acre is 0.5 miles long) and no such leats are visible at Benacre Broad (T. Williamson, pers comm). This does not mean that this site was not built as a water meadow, but it could suggest that it was an unsuccessful attempt to create one. It has been suggested that the 19<sup>th</sup> century exponents of improvement might not have fully understood the limitations of water meadow 'floating' in the regions in which they were trying to establish them (Williamson 1999), and it is possible therefore that the Benacre Broad site was constructed by a local landowner attempting to create a profitable and fashionable agricultural 'improvement' in an area unsuited to its use. The area of the possible water meadow appears to be scrubland on the first and second Edition 25" Ordnance Survey maps, suggesting that any attempt at operating the water meadow was relatively brief.

### **11.5 Parks and gardens**

A number of large park estates fall within the area of the NMP survey, but the survey has identified very few features that may relate to the previous extent, function or ornamentation of parks and gardens. From their association with established parks or houses, most features identified can be interpreted as being post-medieval in date.

#### *Case study: Grimston Hall*

An exception to this may be a large pond to the east of Grimston Hall (TM 268364, TYN 090). This could be the shrunken remains of a medieval moat or larger system of ponds, the former extent of which may be visible as a hollow to the north (TM 269366, TYN 008).

To the south and east of Grimston Hall, a number of features are visible as banks and ditches (TM 268364, TYN 090). Some of the earthworks appear to relate to field or enclosure boundaries to the south and east of Grimston Hall that are marked on the first edition 25" Ordnance Survey map of 1881, and it is possible that they are the remains of post-medieval garden features. This interpretation may be supported by the visibility of two areas of bank on a similar alignment, marked on the first edition 25" Ordnance Survey map of 1881, in areas of woodland between the features visible on the aerial photographs. These have been previously interpreted as the possible remains of dams for a network of ponds, which may be the case. However, ponds on the scale of those now in existence are not marked on the first edition 25" Ordnance Survey map, and it is possible that these banks, with the features visible on the aerial photographs, are the remains of terraces that defined the extent of a former garden.

Much of the land to the east of the Hall has now been taken into arable cultivation and these features are only visible as cropmarks.

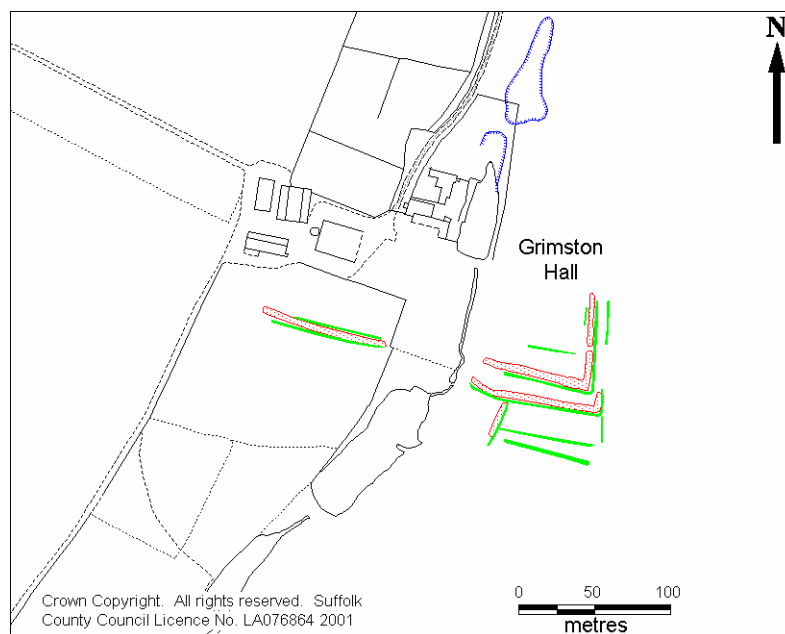


Figure 40. Garden features at Grimston Hall (scale 1:5000).

#### Case study: Erwarton Hall

Earthworks to the south of Erwarton Hall (TM 222348, ARW 054) have been interpreted as the remains of dams for a number of large ponds and an ornamental lake that are marked on an 18<sup>th</sup> century estate map as part of a small area of enclosed park and paddock.

The grounds of Grimston and Erwarton Hall are towards the smaller scale of 'parkland', what Williamson (2000) has described as more normally being called 'lawns' or 'paddocks'. These were possibly created by landowners who didn't want, or couldn't afford, to remove farms or walled gardens to create open parks as part of a scheme of landscape 'improvement' (Williamson 2000, 83). However, these appear to be representative of the type of garden features that survive in the coastal zone and which have been recorded as part of the NMP survey. Many of the 'improved' landscape features of the larger parks and gardens associated with country houses, for example avenues, gatehouses, woodland planting and so on, have survived into the modern period, and the history of their creation is often well recorded. Often such large-scale landscaping has removed most traces of earlier settlements or garden features, with the consequences that few earthworks of any age are visible to archaeological survey.

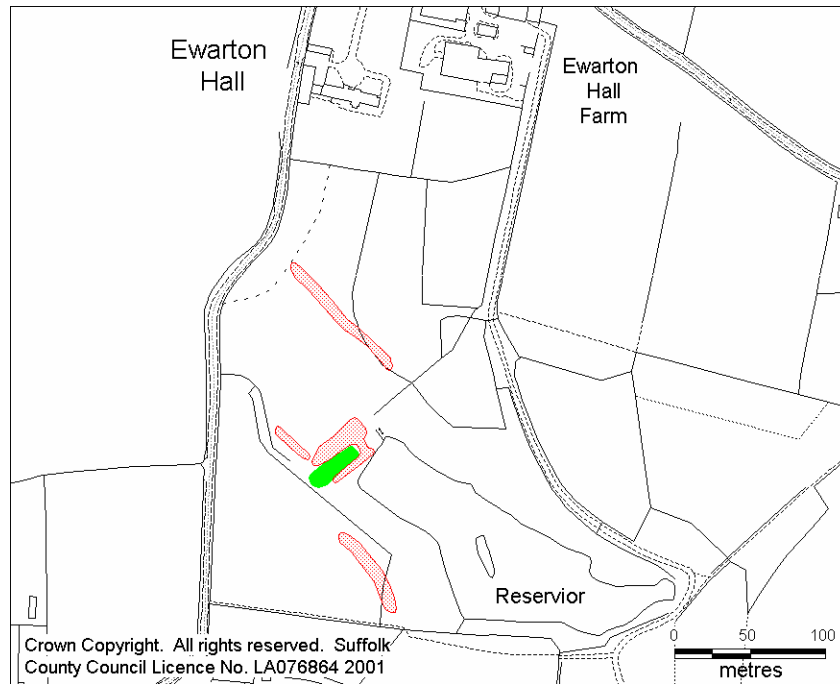


Figure 41. Garden features at Erwarton Hall (scale 1:5000).

In contrast, there is potential to record more modest garden features from aerial photographs. These can occasionally be identified in urban or built up areas that have escaped later development. For instance, a small earthwork terrace, about 25 by 15m in size, is visible in the grounds of the Old Rectory in Orford.

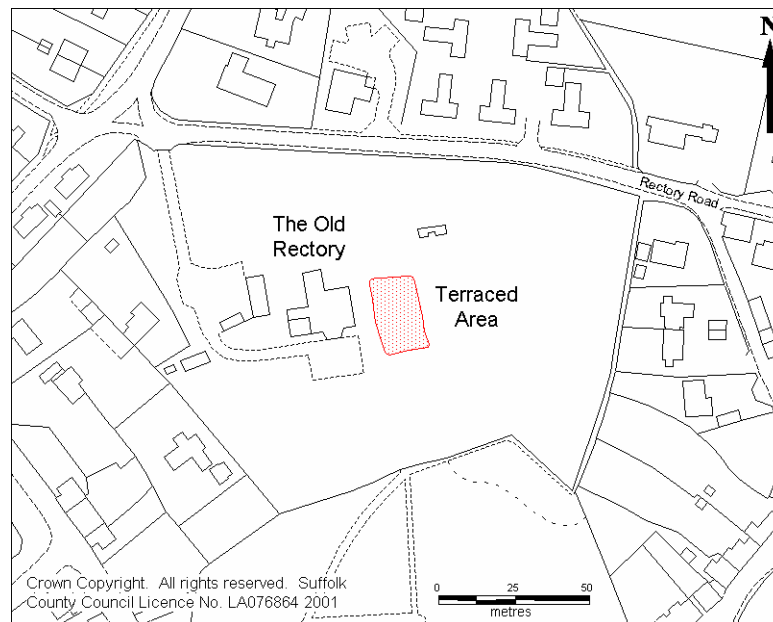


Figure 42. Garden features at the Old Rectory, Orford (scale 1:2500).

## 11.6 Oyster beds

The confident identification of oyster beds from aerial photographs is problematical and published archaeological material on historic oyster beds is scarce. Extensive areas of oyster beds are also known from Essex (Strachan 1995) and Norfolk (S. Massey, pers comm), but few detailed studies have been made of shellfish production sites regionally, and little comparative data exists (cf. Cushion 1999).

A variety of pits are situated in the estuarine inter-tidal zone. Some rectangular pits, for example, are cut into the reclaimed saltmarsh on the 'inside' of the sea walls, and could

easily be mistaken for oyster pits. However, their location on drained and reclaimed land would prevent them from experiencing the regular inundation of sea water required for the cultivation of shellfish. An alternative interpretation for many of these pits is as quarries, or 'borrow pits', excavated to provide the material to repair or maintain the sea walls, as discussed above. Other small pits are probably the result of recent activity, such as digging for bait by anglers and have not been recorded. The majority of irregular features that can be mistaken for pits in the saltmarsh, however, are simply natural formations that result from the erosion of the saltmarsh along the line of tidal creeks.

Many problems of interpretation will hopefully be addressed by the future publication of the NMP results for Norfolk and Essex. The possible historic oyster pits in the Suffolk NMP project area have therefore been interpreted largely on the grounds of their morphology, or identified from annotations on historical maps.

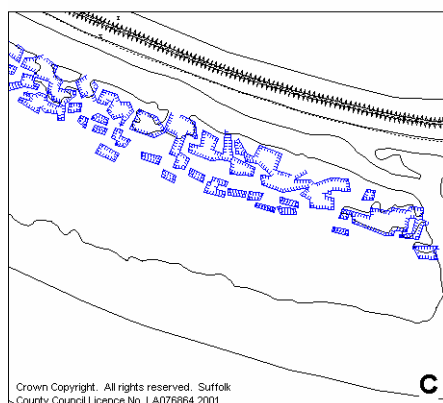


Figure 43. The range of oyster pits visible in the project area (scale 1:2500)



Most of the oyster pits recorded as part of the NMP project are roughly rectangular or square in shape and have been cut into the estuarine inter-tidal saltmarsh, often following the irregular route of an existing tidal creek. They vary greatly in size, from circa 2m square to over 70m in length. They also fluctuate in density between regularly distributed and embanked pits (see Figure 43 'A'), apparently planned arrangements of un-embanked pits (see Figure 43 'B'), to seemingly chaotic combinations of large and small, inter-cutting and irregularly shaped pits (see Figure 43 'C'). However, some trends have been identified.

The greatest density of probable oyster pits is to the north of the confluence of the rivers Alde and Ore and the Butley River. The pits in this area range from about 2m squared to rectangular pits about 15m long by 8m wide, and are often irregularly formed and interconnected by narrow channels, which probably housed sluices (as seen in Figure 43 'C'). The pits seem to follow the line of the sea wall and therefore almost certainly post-date the reclamation of the saltmarsh. However, the possibility must be considered that earlier oyster pits were destroyed or obscured by the reclamation of the saltmarsh and are now located behind the sea walls underneath accumulated silts.

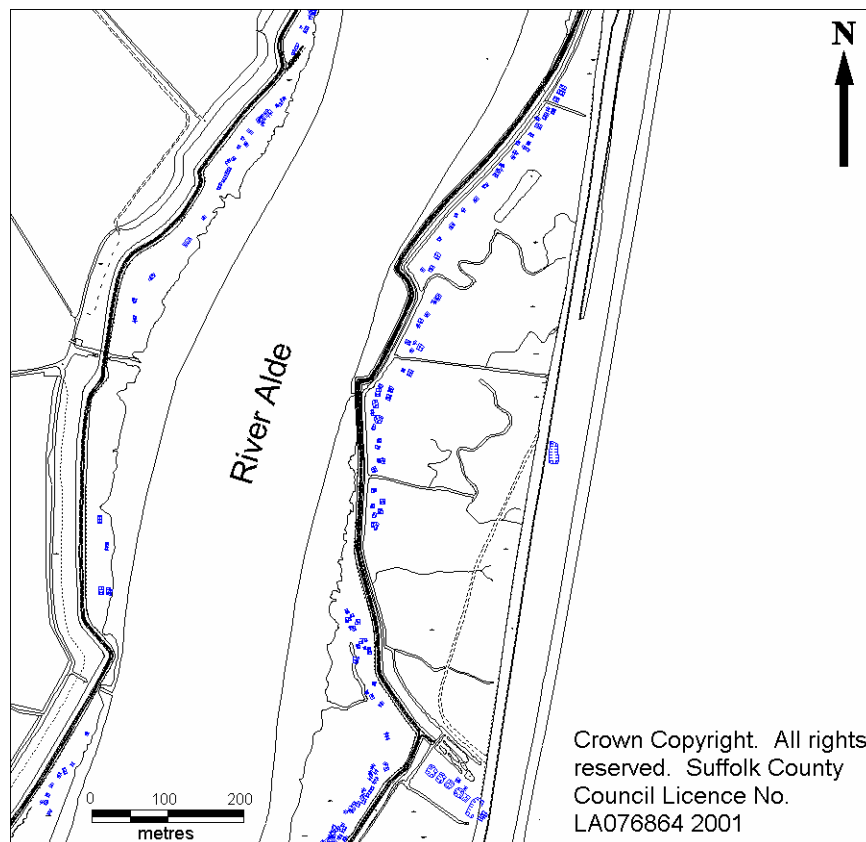


Figure 44. Oyster pits in Lantern Marshes (scale 1:10000).

Possible opportunistic expansion of oyster pits may also be illustrated by their encroachment into areas that were *previously* embanked and reclaimed but have suffered breaches of their flood defences. For example, probable oyster beds are visible on coastal saltmarsh in Lantern Marshes, Sudbourne parish, to the east of the sea wall that separates the course of the River Alde from the coast (see Figure 44). The historic maps available to the survey do not show whether this area was ever fully embanked on the seaward side, but visible drainage channels crossing this area, and the full embankment of King's Marshes to the south suggests that this area was also originally drained and reclaimed. However, any early sea wall has probably been destroyed by coastal erosion. While this has left the interior of this area vulnerable to regular inundation, it also provided a relatively sheltered area for exploitation. Similarly, the breach of an area of sea wall between Lantern Marshes and King's Marshes has allowed the encroachment of oyster beds along the line of a creek that had probably previously been utilised as a drainage channel (see Figure 45).

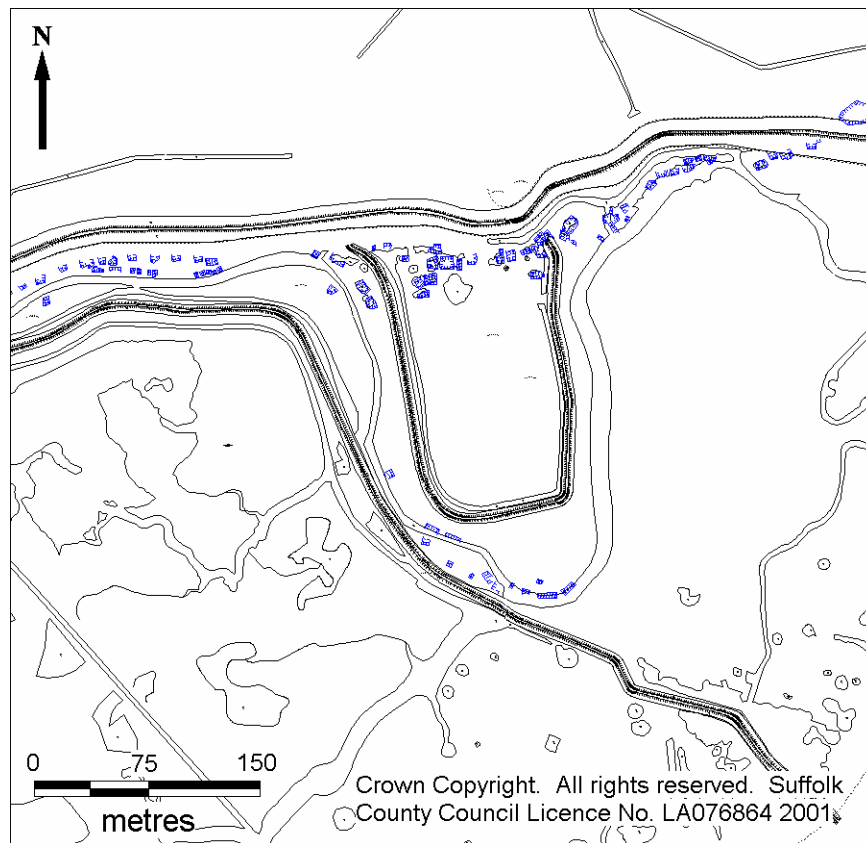


Figure 45. Oyster pits between Lantern Marshes and King's Marshes (scale 1:5000).

The dating of these small possible oyster beds is problematical. As has been discussed above, the reclamation of the saltmarsh and construction of sea banks in the area of Orford probably began in the 13<sup>th</sup> century, during the reign of Henry II (<http://www.nationaltrust.org.uk/orfordness/main/nature/nature.htm>, last viewed 11-Oct-

04). It is possible, therefore, that some of the pits adjacent to the sea wall in this area date to the medieval period. However, as described above, the reclamation process accelerated into the post-medieval period and 20<sup>th</sup> century and most of the sea walls are of this later date. The implications of this for the NMP survey are that the alignment of the majority of pits on the sea walls suggests that most oyster beds are probably also post-medieval or modern in date. This pattern would match the historical growth of the oyster industry in Essex into the mid-19<sup>th</sup> century, which saw the rise of both large companies and individual producers (Strachan 1998). As described above, the final stages of the reclamation process can be charted on a number of historic maps and it is therefore possible to confidently ascribe a post-medieval date for the creation of oyster beds in some areas. For example, the date of the sea wall that encloses the spur of land along the west bank of the River Ore near the Sudbourne/Aldeburgh parish boundary is known to post-date 1800, and the oyster beds that closely follow the line of the sea wall in this area must therefore also post-date 1800.

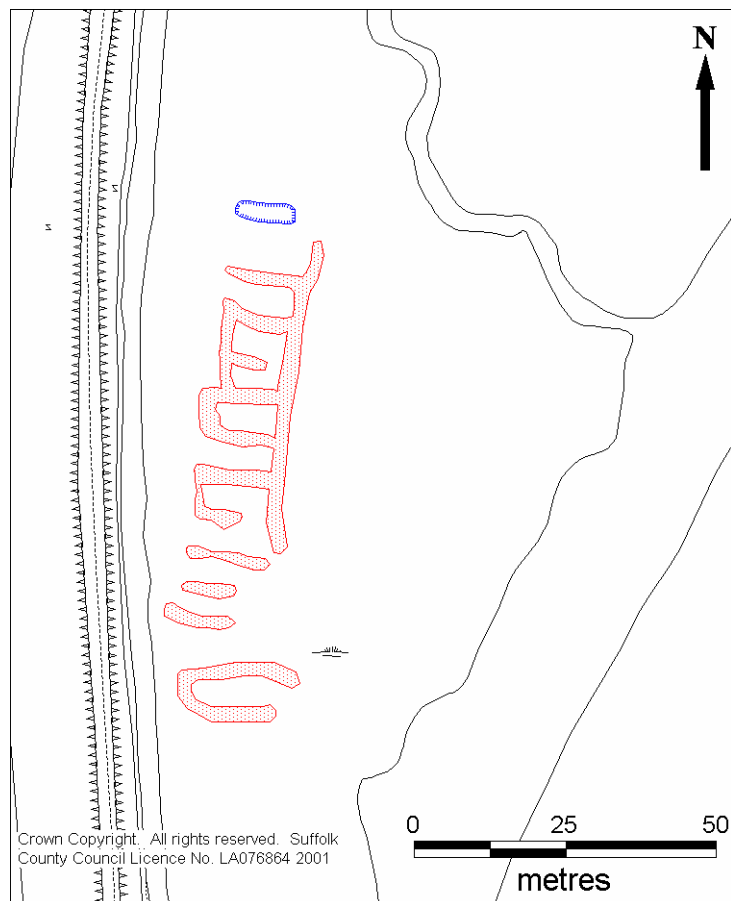


Figure 46. Oyster beds of possible medieval origin (scale 1:1250).

A small number of oyster pits are significantly larger, are more regularly formed and are enclosed by substantial earthwork banks. The creation of these larger pits may cover a wide date range and represent a more organised activity. They can be illustrated by looking at the following examples.

Two small groups of oyster beds are defined by earthwork banks enclosing pits on the saltmarsh on the west bank of the Butley River below Burrow Hill. The first at TM 391483 (BUT 040) can be seen in Figure 46. The remains of about 12 or 13 'cells', defined by earthwork banks can be seen on aerial photographs, but any internal features, such as the pits themselves are largely obscured, probably by silt deposition. One pit, visible at the northern end of the earthworks, though silted up, provides an indication of the size of the pits.

The second group, below Burrow Hill at TM 395486 (BUT 039) appears to be slightly better preserved (see Figure 47). The enclosure has an unusual curved 'annexe' on its north-western edge which may have originally formed the base of a structure such as a packing shed (cf. Strachan 1998).

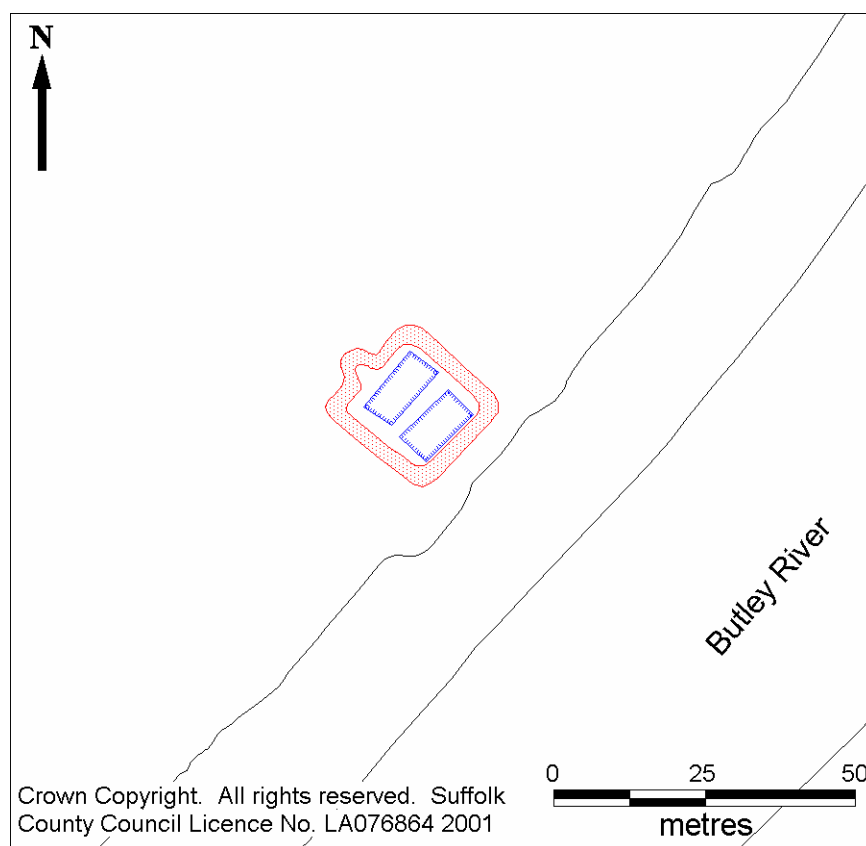


Figure 47. Embanked oyster beds on the Butley River (scale 1:1250).

Neither of these groups are marked on the first or second edition Ordnance Survey 25" maps and therefore could be interpreted as being modern in date. However, they both appear to be in an eroded condition on aerial photographs of the early 1940s, and it is possible that they were out of use by the time of the first edition Ordnance Survey 25" map. Their relatively high level of sophistication in comparison with the majority of un-embanked pits in the area suggests that they were maintained and exploited in a more systematic manner than the smaller pits. Their location immediately below Burrow Hill,

which was owned by Butley Priory 'for whom the island was the main stepping-stone in their ferry-route to Orford' (Fenwick 1984) may suggest a monastic connection and they may therefore have a medieval origin or precursor.

A similar, although larger group of oyster beds have been recorded to the south of Orford Ness on the saltmarsh of Stony Ditch (TM 432485, ORF 024). See Figure 48.

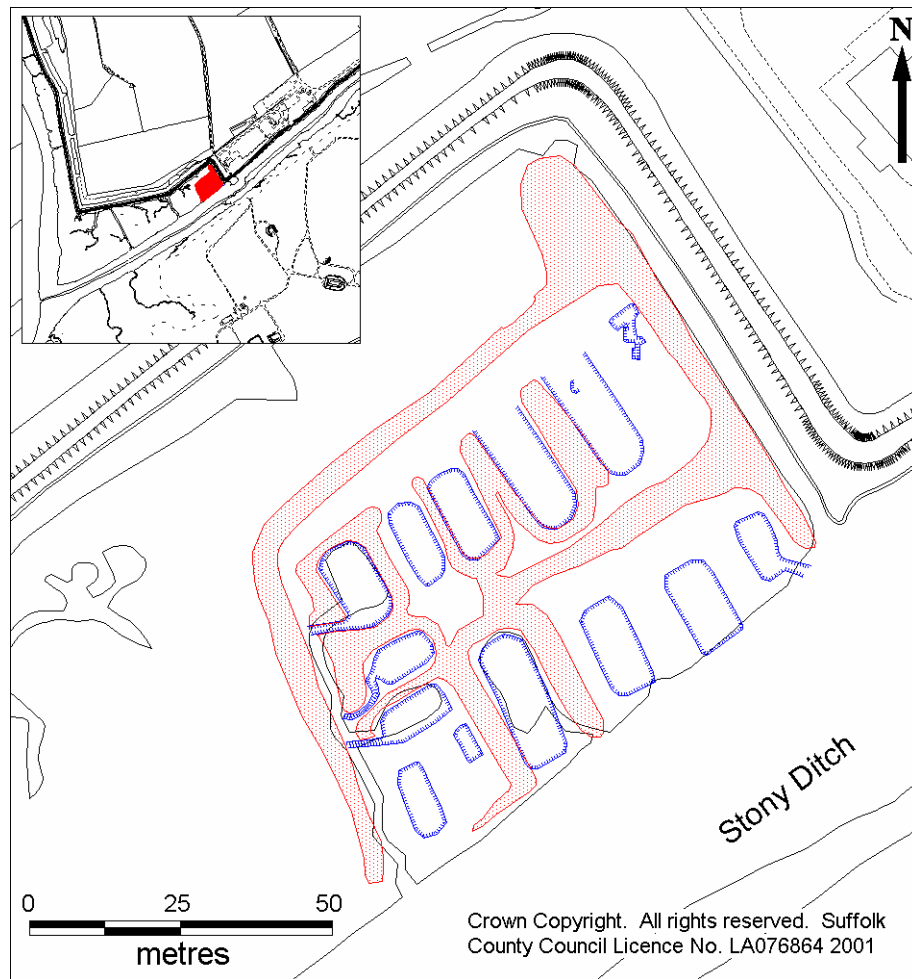


Figure 48. Embanked group of large oyster beds at Orfordness (scale 1:1250).

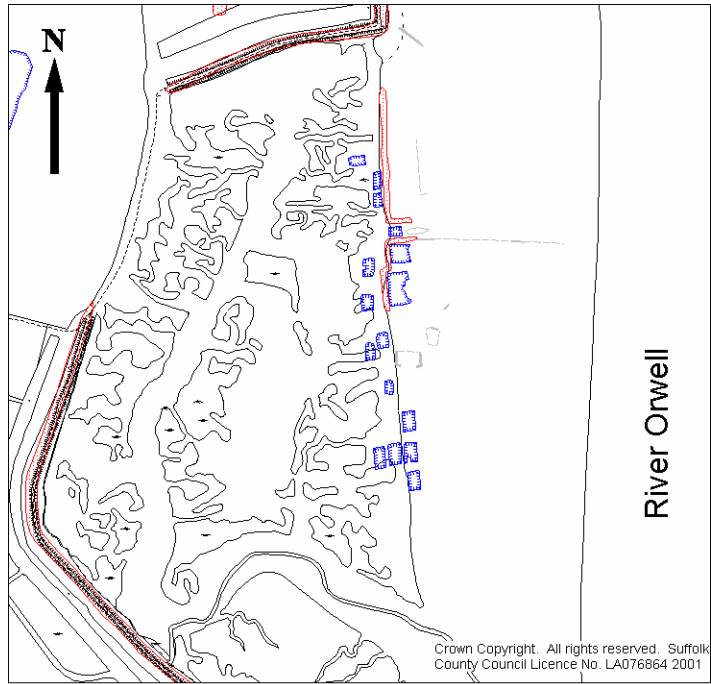
The pits here range in size from 14m by 5m to 20m by 8m, although the precise size of the cells is difficult to determine due to their eroded and silted condition. The significance of this group lies in their location adjacent to the sea wall centred on TM 439494 (ORF 059). The group of pits is visible in a corner, formed where the sea wall turns approximately 90 degrees to the south-east for about 90m. As described above, the sea wall to the north-west of the pits is marked on Norden's map of 1601 and is therefore probably medieval or early post-medieval in date. The sea wall to the east of the pits is not marked on this map and is therefore likely to be later in date. It is possible therefore that the groups of oyster pits was constructed at some point either

before, or soon after the first phase of sea wall construction, but prior to the construction of the section to the east. The dog-leg in the line of the sea wall appears to respect the location of the oyster pit enclosure, suggesting that the embanked pits were well enough established and of sufficient status to dictate the path of the later sea wall. This example highlights the possibility of the continuity of *organised* exploitation of oysters from the medieval period into the post-medieval, but cautions against universally interpreting a relative date from sea wall construction.

The operation of a highly developed commercial shellfish industry on the Suffolk coast is suggested by two groups of oyster beds on the River Orwell. The group SLY 064 (TM 247360), on the west bank, includes a number of the smaller, irregularly laid-out pits, on average 15m by 7m in size, but is dominated by the remains of earthwork banks, pits and timber revetment defining an area approximately 150m in length and 15 to 20m wide (see Figure 49). On the first Edition Ordnance Survey map of 1881 this is visible as an embanked complex of large oyster beds. The remains suggest a high level of sophistication and investment. This group also appears to be served by a dedicated boat hard at TM 248361 (SLY 065), also visible on the aerial photographs. However, by the publication of the second edition OS map in 1904, the pits are marked as disused.

The second group of pits, at TM 277354 (FEX 195) on the east bank of the Orwell, below Fagbury Cliff at Felixstowe, probably reflects a yet more developed industry (see Figure 50). The water supply to eight large rectangular pits is managed by a complex arrangement of sluices, with the whole area enclosed by about 1100m of earthwork bank. The oyster beds are also marked on the first edition Ordnance Survey map of circa 1881 (see Figure 50 'B'), and again, by the second edition of 1904 are out of use. However, they represent a higher level of investment and sophistication than any other oyster beds visible in the project area and probably operated on an advanced business footing. Unfortunately these beds were destroyed in the expansion of Felixstowe docks in 1982 (see Figure 50 'A').

To summarise, a small number of oyster pits may date from the medieval period or represent a continuation of a medieval tradition into the post-medieval period. However, it is probable that the majority of the pits visible on aerial photographs are post-medieval in date, and a few reflect the peak of oyster consumption in the mid 19<sup>th</sup> century when oysters formed a common food for the urban poor, as well as a seasonal resource or economy for the rural population (Strachan 1998). More integrated archaeological survey work is needed to firmly establish a date range for the creation of the surviving oyster beds and to establish methods of construction, subtleties that are not apparent on aerial photographs (Strachan 1995).



Scale 1:5000

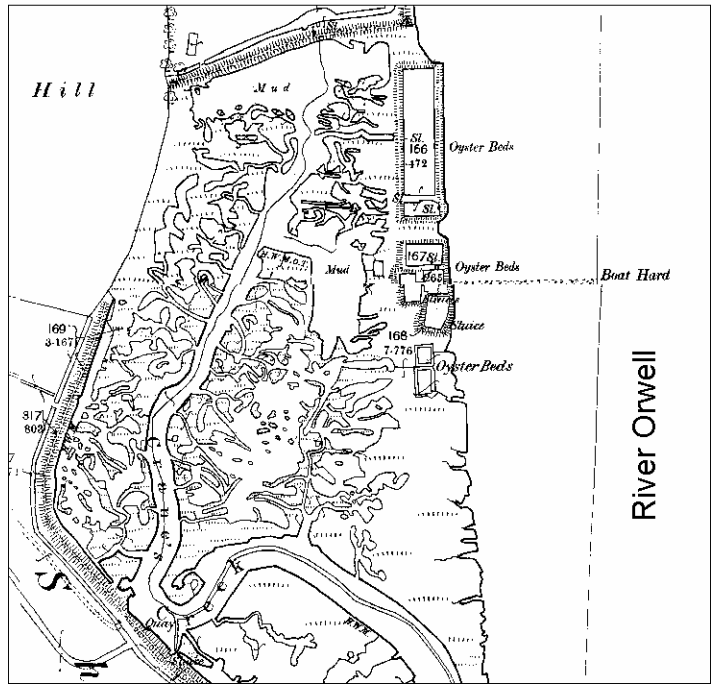


Figure 49. Post-medieval commercial oyster pits on the west bank of the River Orwell (scale 1:5000).

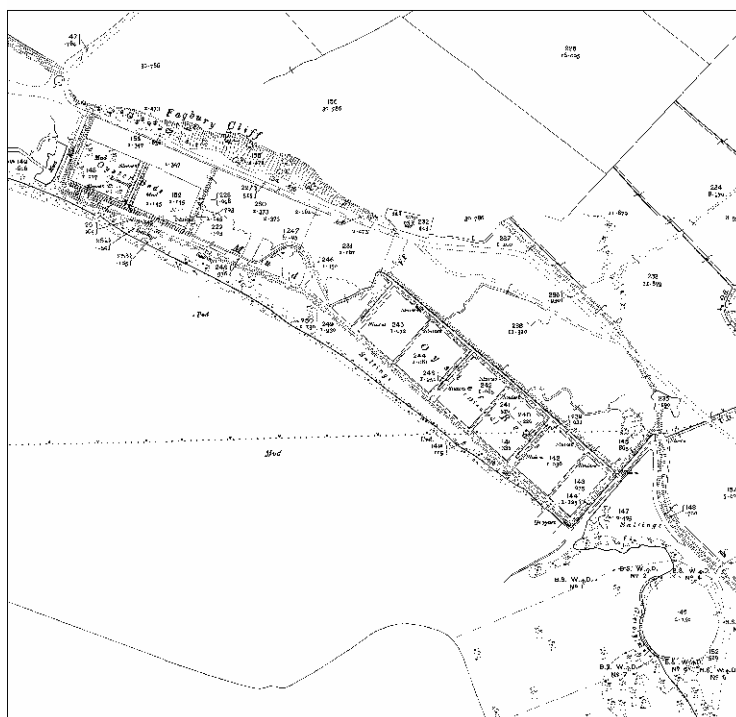
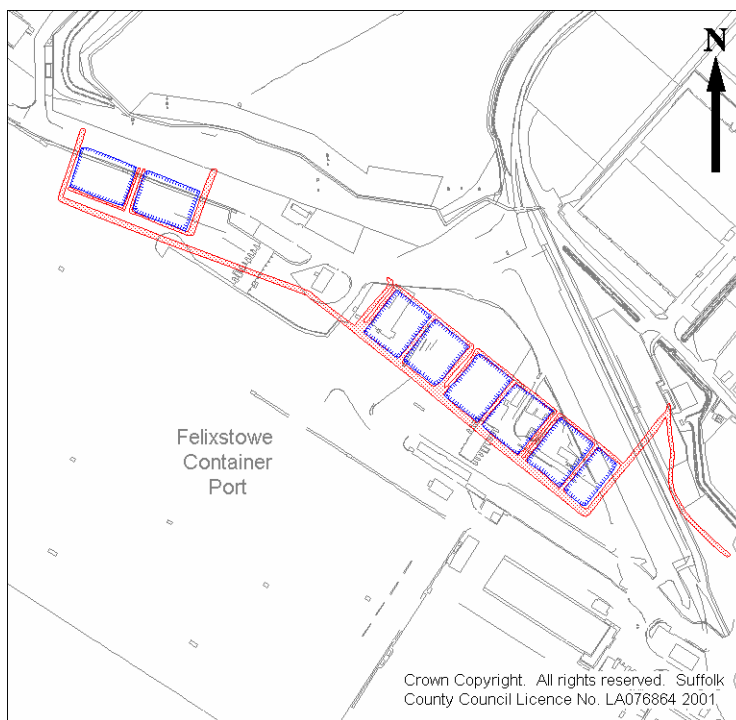


Figure 50. Probable 19<sup>th</sup>-century commercial oyster pits on the east bank of the River Orwell (Scale 1:10000).

### 11.7 Warrens

Rabbits are thought to have been introduced to England in the 12<sup>th</sup> century (Orgill 1936) and were initially unsuited to Britain's climate and landscape. They were often unable to burrow and required constant attention and protection from predators. Because of



this, warrens were often constructed from mounds of soft loose material to encourage the creatures to create their own burrows. They were therefore initially a food that required some investment, a high status delicacy. Their unsuitability to Britain's environmental conditions meant they were rare in many parts of Britain as late as the 18<sup>th</sup> century, and did not spread into the wild until relatively recently (Williamson 1997; Williamson and Loveday 1988). They were therefore seen as a viable product for farming, and warrens were established on a business basis in many areas of Britain. Once they had adapted to the wild, rabbits became a pest to agriculture. This process had probably begun in the Brecklands in the early 16<sup>th</sup> century, but was not widespread until the later post-medieval period (Bailey 1989). Due to this change in availability, and the unpopularity of warrening with post-medieval agricultural 'improvers', by the beginning of the 19<sup>th</sup> century rabbit became a cheap foodstuff available to the poor, and the practice of warrening declined (Muir 2004; Williamson 1997). For more information about the history of rabbits in Britain, see Sheail (1971).

Two possible warren sites, of probable medieval and post-medieval date, have been recorded as part of the NMP project.

*Case study: Sizewell warren, Leiston (TM 472633, LCS 107)*

The possible warren at Sizewell is visible as earthwork banks that form a number of land boundaries, most notably a large enclosure approximately 300m square with an embanked annex of just over 2 hectares on its southern side. A 300m long boundary to the south of the warren was also defined by a bank.

Such earthwork boundaries are unusual within the coastal NMP project area. The possibility that this feature was a warren was not immediately apparent from the modern map evidence as this area has now been completely redeveloped and lies below Sizewell power station (see Figure 51 'A'). However, the first and second Edition Ordnance Survey 25" maps of 1884 (see Figure 51 'B') and 1904 both mark this area as 'The Warren' and a house at the north-west corner of the large square enclosure is named as Warren House.

The role of the earthworks is not clear. The boundaries are not marked as earthworks on the historic maps, and the area of the warren appears to extend beyond the earthwork enclosures, and it is therefore unlikely that they were intended to confine the rabbits. Indeed, the possible warren is located on the Sandlings, an area of soft soils, which would have made containment within earthworks difficult. However, it is possible that they were constructed to encourage burrowing within certain areas, and they may have been intended to concentrate the rabbits to help with trapping or to protect breeding grounds. The location of the warrener's house near a possible entrance also suggests an element of protection, probably from predators both animal and human (Muir 2004; Williamson 1997).

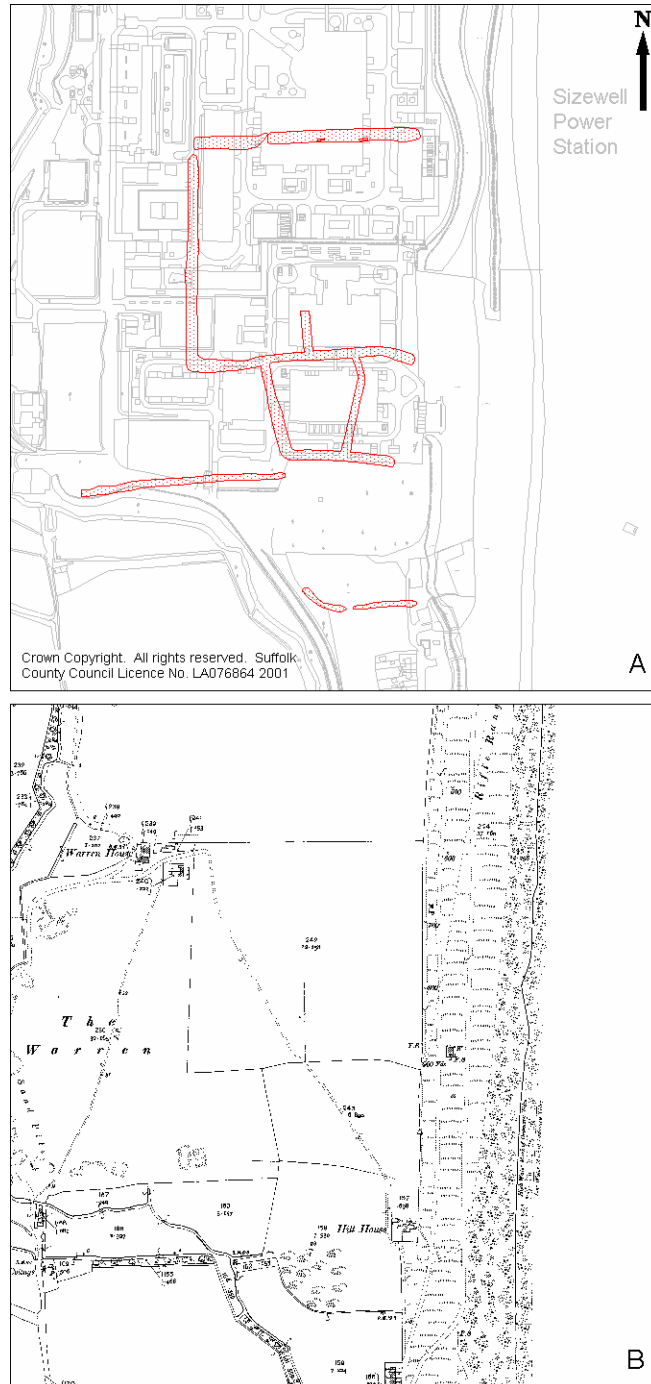


Figure 51. Sizewell warren (Scale 1:10000).

It is possible that the site was selected to provide containment. It sits on a low knoll, between 5 and 10m above OD, bounded on the south, west and north by reclaimed land crossed by numerous drains, and on the east by the coast. In addition to providing ready-made burrows, early warrens were often located on coastal islands to protect the valuable creatures from predation (Williamson 1997). It is possible therefore that an earlier warren was located on the site.

The association of warrens with monastic sites is well known (Stocker and Stocker 1996) and the site of the first Leiston Abbey about 2km to the north suggests the possibility of a medieval monastic connection in the establishment of the warren.

However, it is probable that the features visible on the aerial photographs are the result of later activity, a production site imposed on Leiston Common. The large scale of the earthworks and the construction of Warren House suggest that the rabbit farm became highly developed in the later post-medieval period, probably in the mid-18<sup>th</sup> to mid-19<sup>th</sup> century. The construction of additional housing between Warren House and the earthworks, at some time between the drawing up of the first edition and second edition Ordnance Survey 25" maps, suggests that the warren went out of use at least by the beginning of the 20<sup>th</sup> century, though it was probably earlier, during the general decline in popularity of rabbit production from the mid-18<sup>th</sup> century to the middle of the 19<sup>th</sup> century (Williamson and Loveday 1988).

*Case study: Warren, Stratton Hall parish (TM 251393, TYN 009)*

The establishment of a warren in this field is strongly supported by the name 'Warren house' on a map of 1791. Kirby/Johnson's map of 1784 annotates this field as 'Old Warren House' and it is marked with a symbol for 'a cottage wasted', suggesting that the warren has passed out of use by this time. The date of these maps suggests an early post-medieval date for the establishment of the warren, but the association of the site enclosure with a possibly much older track may suggest medieval origins.

This possible warren differs in scale and form, and therefore probably has different origins than the Leiston warren. It is visible as cropmarks on early aerial photographs as a circular mound inside a rectangular ditched enclosure (see Figure 52). It abuts a sinuous trackway, which appears to be connected with a ditched field system to the south that has been interpreted as being of later prehistoric date (TM 241401, SNH 005).

The rectangular form of the enclosure and its apparent association with later prehistoric features prompted a previous interpretation of the site as a Romano-British religious enclosure (Palmer 1995). A re-examination of the aerial photographs and historic map evidence, supported by medieval pottery and peg-tile fragments found in the area by fieldwalking, prompted a re-assessment of the site. It now seems likely that the site was adapted for use as a warren, the structural evidence being the remains of a warrener's cottage (Newman 1996).



Figure 52. Stratton Hall warren (scale 1:10000, inset 1:2500).

However, it is probable that the development of this site is more complex than any single element of the interpretations summarised above. The NMP survey revealed that the mound is part of a group which is visible as earthworks on aerial photographs of the 1940s and 1950s and later as soil and cropmarks. This group has been interpreted as the remains of a Bronze Age barrow cemetery, of which there are a number in the immediate area (less than 2km to the north and east). The barrow cemetery appears to have been respected by the route of a later prehistoric trackway which seems to have continued in use into the medieval period, as the line of the track was preserved in the post-medieval field system, and is recorded on an estate map of 1791. It even continued as the parish boundary until 20<sup>th</sup> century re-organisation.

The association of warrens with early earthworks, such as hillfort ramparts and Bronze Age barrows is well known in Britain, for example as at Knap Hill in Wiltshire and Ashley in Hampshire (Williamson and Loveday 1988). The possible *reuse* of prehistoric burial mounds to create a warren is also known from Hatfield Forest in Essex (Williamson 1997; Williamson and Loveday 1988, 296; Rackham 1986,47).

The NMP survey data in combination with the evidence summarised above therefore supports the interpretation that the site of a Bronze Age mound was re-used in the medieval period as a convenient warren earthwork.

## 11.8 Fish traps

*Case study: Kiddles in the River Deben, Sutton parish (TM 290451, SUT 127-130)*

A number of fishtraps, of a type known as 'kiddles' (Strachan 1995) are situated off Stonner Point in the inter-tidal zone of the River Deben. The fish traps consist of groups of posts arranged in lines to create roughly v-shaped and possibly inter-connected structures which point out into the channel (see Figure 53).

A large Anglo-Saxon or medieval v-shaped fish trap has been identified at Holbrook Bay on the River Stour, and is discussed above in section 10 (TM 170336, STU 067). The kiddles would have worked on a similar tidal basis, but probably using nets strung between the posts, and operated on a seasonal basis (Crump and Wallis 1992). The kiddles in the Deben also appear to have operated on a more extensive scale than the Holbrook Bay trap. If all visible kiddles were in use simultaneously, they would have covered at least 1.5km of the estuary.

The dating of the kiddles is problematical and can only be based on their morphology and examples known from elsewhere. Such kiddles are known to have operated in Essex from the medieval period to the 20<sup>th</sup> century (Strachan 1995), and examples at Mersea Island in Essex show evidence for a number of phases of adaptation and extension, suggesting they were in use over considerable length of time (Crump and Wallis 1992). The inter-connected form of the Deben kiddles also supports the interpretation that they were in use for a considerable period of time, and may represent the development of an important local industry from the medieval into the post-medieval period.

However, the fish traps are only visible on one run of aerial photographs from 1945, and they appear to have been abandoned by this date. It is likely that the development of a large mud bank in the centre of the channel may have impeded their operation, and consequent changes in tidal patterns has possibly obscured them under accumulation of silts or has caused their destruction from erosion. The location of the kiddles on the river mud-flats makes it difficult to carry out investigative ground survey, and indeed they were not located by the Suffolk County Council Rapid Coastal Zone Assessment Survey, but future monitoring by aerial survey may reveal whether the features have survived.

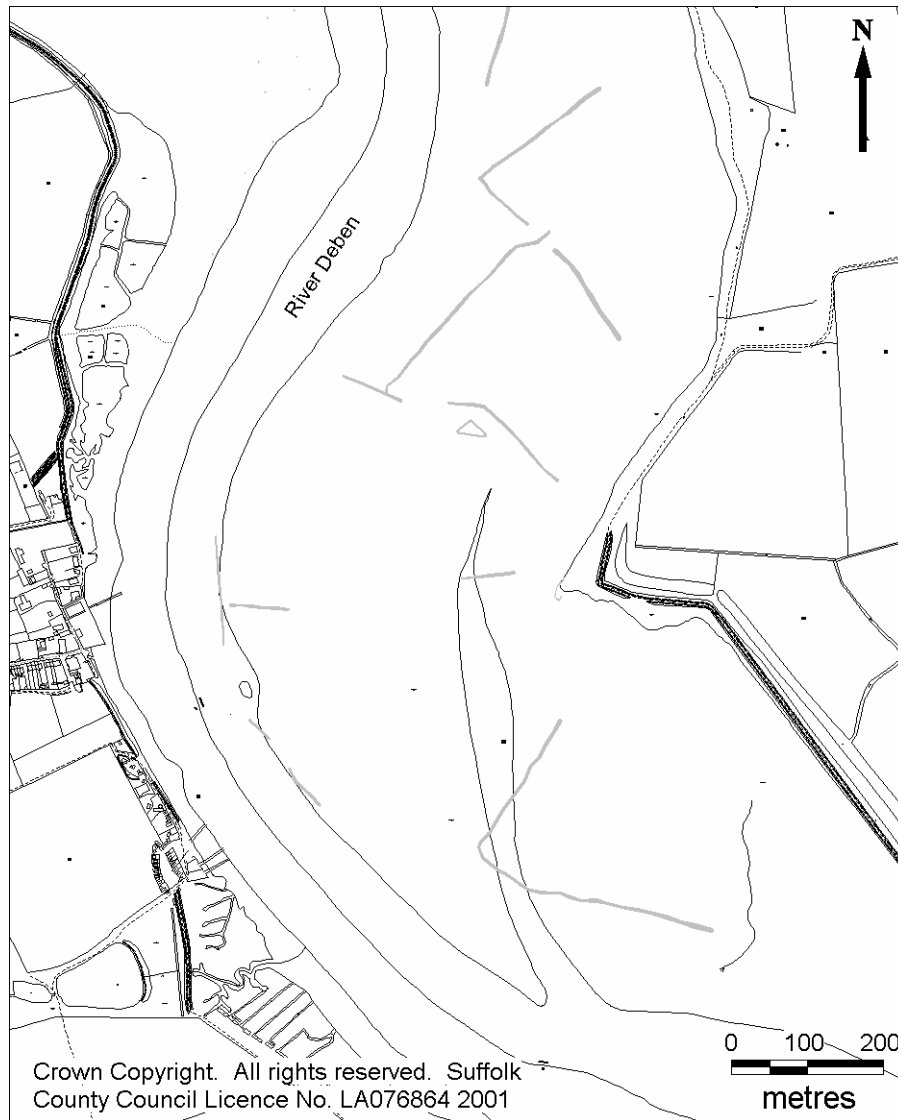


Figure 53. Kiddles in the River Deben (scale 1:10000).

### 11.9 Medieval and post-medieval industry

Few sites that relate to medieval or post-medieval industrial practices have been interpreted along the Suffolk coast as part of the NMP project. For the purposes of this report, 'industry' is taken to mean the manufacture of a product, not the production of foodstuffs. For food production sites, see sections 10.6 to 10.8. Of the industrial sites that have been identified, their confident interpretation has been largely dependant on historic map evidence.

### 11.9.1 Brickworks

The manufacture of bricks resumed in Britain in the 12<sup>th</sup> century after an apparent hiatus since the Roman period. The lack of good quality building stone probably prompted the development of the earliest medieval brick industry in the country in East Anglia in the 12<sup>th</sup> century, and the earliest known medieval brick buildings in Britain are to be found in Suffolk (Pankhurst 1999).

Medieval and post-medieval bricks were made from brickearth, a mixture of clay and sand extracted from shallow pits, possibly initially by itinerant brick-makers and probably close to the location in which they were needed. In the post-medieval period in Suffolk, particularly from the 16<sup>th</sup> to the 18<sup>th</sup> century, many small local brickworks were probably created all over the county, and groups of pits and patches of red earth have been noted as their probable remains (Pankhurst 1999).

A number of features have been confirmed as post-medieval brickworks from historic map evidence. For example, earthworks visible on aerial photographs to the east of the River Deben in Kirton parish are probably the foundations of brickwork structures and associated kilns, as marked on the Ordnance Survey 25" first Edition map of circa 1881 (TM 291414, KIR 025; see Figure 54 'B'). By the publication of the second Edition map in 1904, however, the site is marked as 'Old Kiln' and is presumably out of use.

Numerous pits recorded by the NMP project are annotated on the first edition Ordnance Survey maps as 'clay pit', or 'old clay pits', and their creation cannot therefore be closely dated. However, the reuse of a number of such pits by 1881, for example as the location of farm buildings, may indicate that they have been out of use for some time by the 19<sup>th</sup> century.

Many recorded pits do not have a function annotated on the 19<sup>th</sup> and early 20<sup>th</sup> century maps. It is probable that a high proportion of these relate to agricultural activities such as marl or sand pits, but a number may be pits for the extraction of brickearth for early brick or tile works, and may indicate the distribution of the very extensive, but highly individualised and mobile medieval and early post-medieval industries.

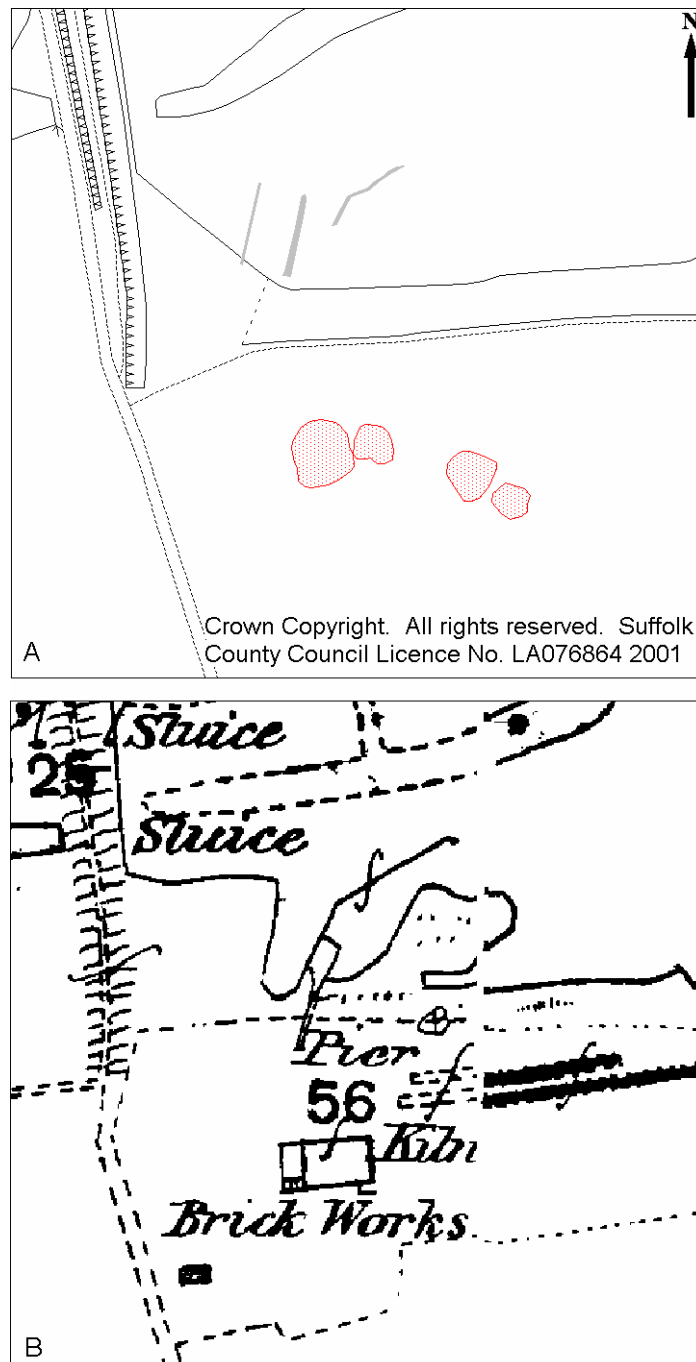
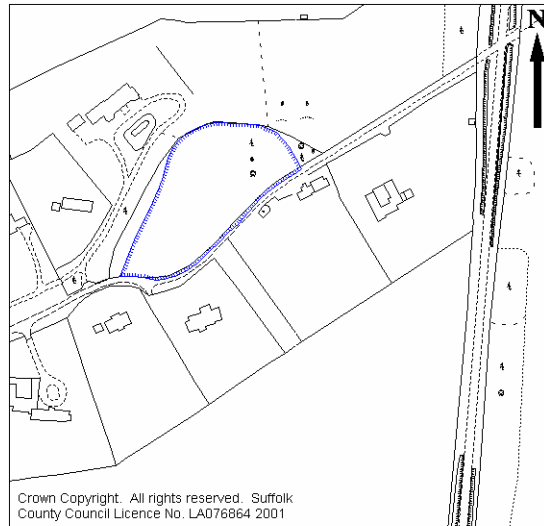


Figure 54. Brickworks in Kirton parish (Scale 1:1250).

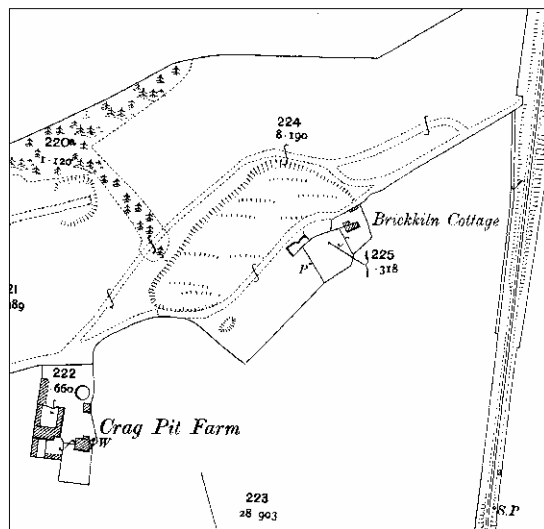
A concentrated area of red earth to the south of Painter's Wood in Trimley St Mary parish (TM 265359, TYY 006), was initially identified as a possible Romano-British 'red-hill' site. However, a site visit by the Suffolk County Council Archaeological Service field team identified that the discolouration of the soil was caused by the presence of brick and tile of medieval or post-medieval date. It is likely therefore that this site is the location of a medieval or post-medieval kiln. However, this raises the possibility that other medieval or post-medieval kilns have been mistaken for Red Hills or natural geological colouring and have been mis-interpreted. The continuing liaison of the



English Heritage reconnaissance team and the Suffolk County Council field team will go some way towards identifying such sites. For more information about red-hills discovered during the NMP survey, see section 9.2.4.



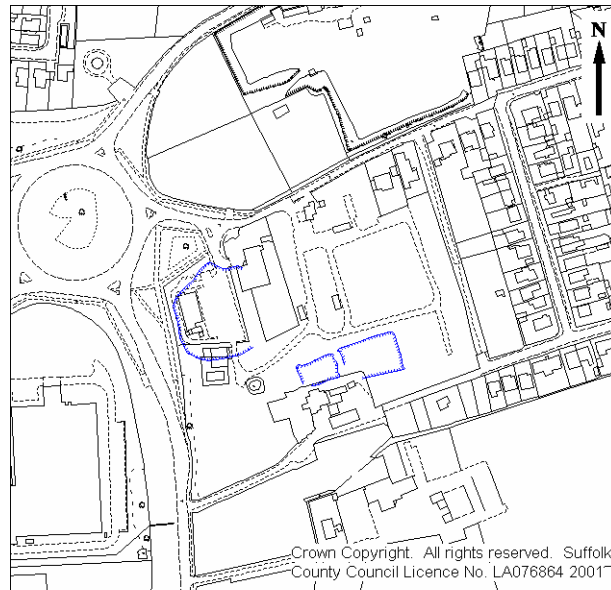
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The remains of most post-medieval brickwork sites are only identifiable on aerial photographs from the remains of their associated quarries, as at the brickworks to the north-west of Aldeburgh (TM 459582, ADB 069; see Figure 55 'A'). At this site, although a sizeable complex of buildings is marked on the Ordnance Survey 25" first edition map of circa 1882, (see Figure 55 'B') this complex is also out of use by 1904, and no structural remains are apparent on the aerial photographs. The structural remains of such sites appear to be insubstantial and are rapidly degraded.

Figure 55. Brickworks to the north of Aldeburgh (Scale 1:5000).

The possible foundations of a number of buildings, probably brick drying sheds, two kilns and three brick-earth quarries have all been recorded as earthworks at a brickworks site to the south of Lowestoft (TM 533897, LWT 134; see Figure 56 'A'). This site is not marked on the Ordnance Survey 25" first Edition map of circa 1882 but is marked on the second Edition map of circa 1904 as disused (see Figure 56 'B'), giving this industrial site an operational phase of less than 20 years. The observation that not all pits or earthworks visible on the aerial photographs of the 1940s are marked on the 1904 map may indicate that some structures had gone out of use by this time, reinforcing the impression of short-lived activity.



The operation of these sites appears to have declined in the later 19<sup>th</sup> and early 20<sup>th</sup> centuries, coinciding with the decline of the brick industry in Suffolk at the turn of the 20<sup>th</sup> century, itself a reflection of the introduction of mass produced Fletton bricks (Pankhurst 1999).

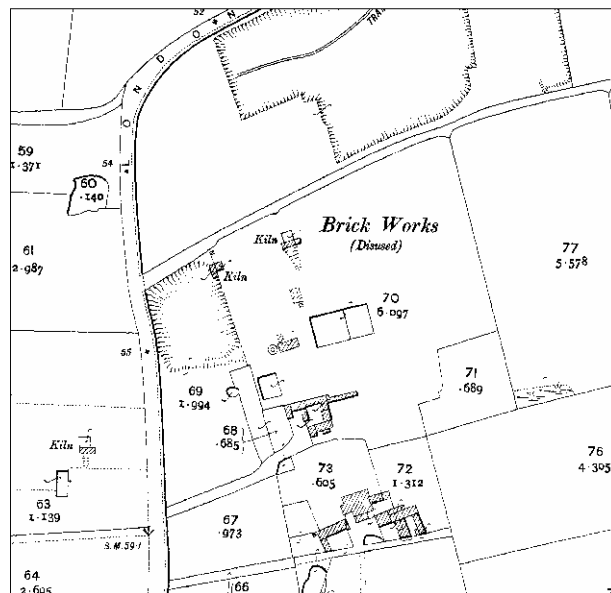


Figure 56. Brickworks to the south of Lowestoft (scale 1:5000).

### 11.9.2 The linen industry

*Case study: Retting ponds, Covehithe (TM 521805, COV 003)*

The remains of approximately 45 roughly rectangular pits between 6 by 3 and 10 by 3m in size are visible as cropmarks to the east of Warren House in Covehithe (see Figure 57). The site was known prior to the NMP project, and place-name evidence had resulted in the site previously being interpreted as the remains of quarries for warren mounds. However, their apparently random distribution is not a common pattern for warrens, and there is no corresponding cropmark evidence for a mound adjacent to the pits. Indeed, there does not appear to be enough space between many of the pits to locate a mound.

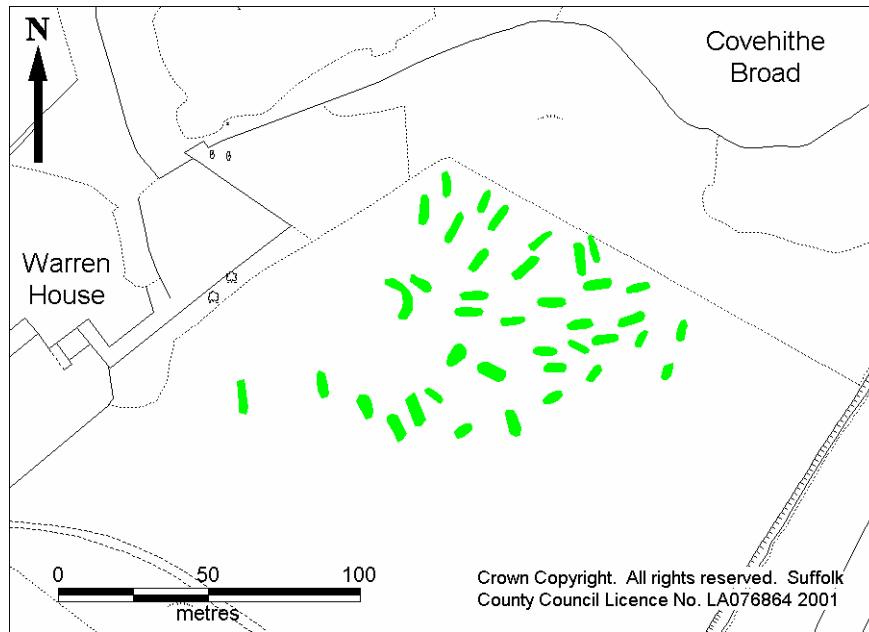


Figure 57. Retting pits at Covehithe (scale 1:2500).

An alternative interpretation is that they are retting ponds, pits associated with the production of linen. The linen industry grew in Suffolk in the 17<sup>th</sup> and 18<sup>th</sup> centuries, as elsewhere, probably as a response to the opportunities provided by a locally grown hemp crop, and partly because the trades ancillary to linen weaving, such as heckling, spinning and bleaching, could be operated on a part-time basis around other agricultural activities (Evans 1999). The presence of linen weavers at Covehithe in this period has been identified by Evans (1999), and it is possible that the pits to the east of Warren House are part of the linen production process, specifically the *retting* process which involves the soaking of the hemp in water to remove the fibres from the stems (Baines 1998). A good fresh water source is required for this process and the location of this site immediately adjacent to Covehithe Broads would provide water in abundance. In addition, the surface geology of this area is slightly unusual for the coastal zone, being composed of peat soils associated with clay deposits which would aid the construction of watertight pits; in other areas of the well draining Sandlings such pits may have required additional lining.

The linen industry declined in the later 18<sup>th</sup> century (Evans 1999). The pits at Covehithe probably passed out of use around this time, and would have easily been filled in. It is possible that the site was reused as a warren in the late 18<sup>th</sup> or early 19<sup>th</sup> century, but this seems unlikely as the 19<sup>th</sup> century first edition Ordnance Survey map seems to suggest that the warren itself was further to the east, in areas now lost to erosion.

The site may have remained as pasture until it was ploughed in the second half of the 20<sup>th</sup> century. In addition, as the site is located towards the bottom of a slope below the

5m contour, on clay soils on the edge of Covehithe Broads, these factors may have limited the visibility of the pits as cropmarks on aerial photographs. If the location of this site is representative of the requirements for retting ponds in the coastal zone, the visibility of this site on only one run of photographs may suggest that other remains of this industry may yet survive and could be identified by aerial survey in the future.

### **11.10 Transport**

The archaeological evidence on aerial photographs that can be confidently identified as resulting from medieval and post-medieval transport is limited, as many communication networks probably continued in use, but possible transport and communications features have been identified in both inter-tidal and terrestrial contexts.

#### 11.10.1 Inter-tidal features

A range of possible medieval and post-medieval inter-tidal features relating to transport and communications have been identified, but are confined to the estuaries. This is probably due to the destruction of coastal features by erosion, and by modern developments particularly in urban and industrialised areas such as Felixstowe container port.

#### *Wrecks*

The most visible and recognisable inter-tidal transport features identified by the NMP survey are probably the remains of wrecked vessels. Although easily identifiable as wrecks due to their shape, their often poor condition means many wrecks are less easy to classify as a particular type of vessel from aerial photographs. In addition, the information available for most estuarine wrecks contrasts with that for many coastal wrecks. Historically, maritime wrecks have been well recorded due to their documentation for insurance purposes, information which is often noted on the SMR or NMR. The absence of such information for most estuarine wrecks means they are probably the remains of less valuable vessels, and consequently are not datable with any confidence.

In some cases, the association of the wreck with other remains can suggest a function for the vessel. For example, the wreck to the north east of Crane's Creek, (TM 247361, SLY 066) lays adjacent to oyster beds and a boat hard of probable late 19<sup>th</sup> century date and may be the remains of an oyster dredger (cf. Strachan 1998; see SLY 064 discussed above).

Wrecks can be dated as probably later post-medieval in date due to their relatively intact condition on photographs of the 1940s, and location within creeks in the saltmarsh. Occasional problems with interpretation can arise, as relatively recent wrecks can be subject to movement due to tidal action or unusual weather conditions, as with a wreck at TM 278336 (FEX 187). However, once identified, such vessels can usually be recognised on later photographs if they have shifted to a different position, as with a wreck at TM 281334 (FEX 188).

Some wrecks, such as that recorded as MTN 044, are only visible on a few low tide photographs as fragmentary hulks eroding from the saltmarsh or river silts. However, their poor condition and buried context suggests they have been underneath the alluvial silt for a number of years and are probably pre-20<sup>th</sup> century in date.



Figure 58. A fragmentary wreck visible at low tide in the inter-tidal zone of the River Deben (scale 1:2500).

In a few instances, wrecks visible on aerial photographs had been identified and closely dated prior to the NMP survey. However, the NMP survey has, in a number of cases, provided the first accurate transcription and location of the wrecks, as with the wreck of the *The Three Sisters of Maldon* (TM 291415, HMY 008) which was previously recorded as lying almost 400m to the north of its actual position. This data should be valuable in monitoring and managing these aspects of the inter-tidal resource.

Occasionally it is possible to add a human element to the aerial photographic interpretation of wrecks. The wreck of the trawler *Iona* (TM 462556, ADB 141), on the

bank of the River Alde near Slaughden Quay was visible on aerial photographs from the 1940s to the 1970s.

It was previously unrecorded on the SMR, possibly because it was destroyed by fire in 1975. However, the significance of the Iona goes beyond that of a relic of the fishing industry. The trawler was grounded on the saltings of the River Alde with the intention of being broken for parts but was converted into a houseboat in 1872 (Phelps 1991). It was used as holiday accommodation for a number of years, particularly by underprivileged families in the inter-war years. Unfortunately, its condition deteriorated and the wreck was destroyed by fire in 1975. It is unclear from recent photographs whether any remains survive.

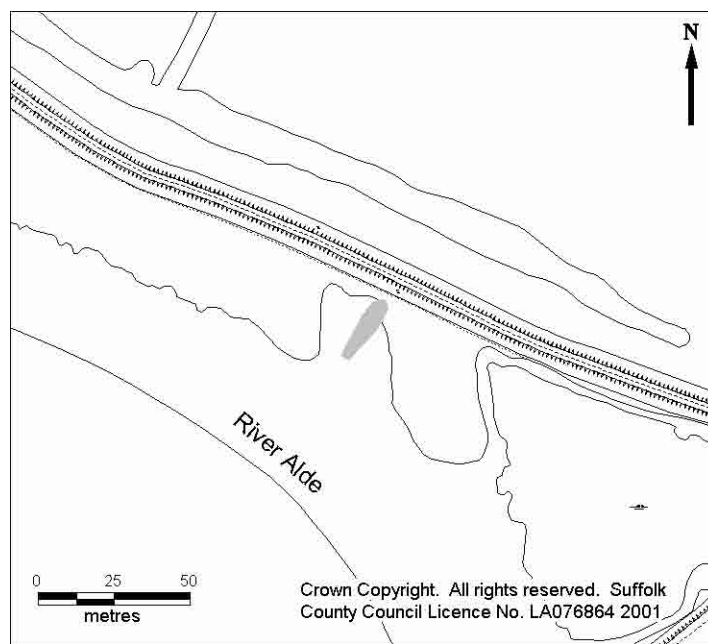


Figure 59. The wreck of the trawler Iona (scale 1:2500).



### Inter-tidal structures

A number of structures of probable medieval or post-medieval date have been recorded in the estuarine inter-tidal zone, projecting from the saltmarsh into the river channels. Some have been identified from 19<sup>th</sup> and early 20<sup>th</sup> century map evidence as the remains of boat hards or quays of at least 19<sup>th</sup> century date. For example the map evidence for the hard at Redgate Lane, Wherstead (TM 172406, WHR 053) can be seen in Figure 60 'A', and the quay at Waterhouse Creek in the Stour estuary, Arwarton parish, (TM 225340, ARW 041) can be seen in Figure 60 'B'.

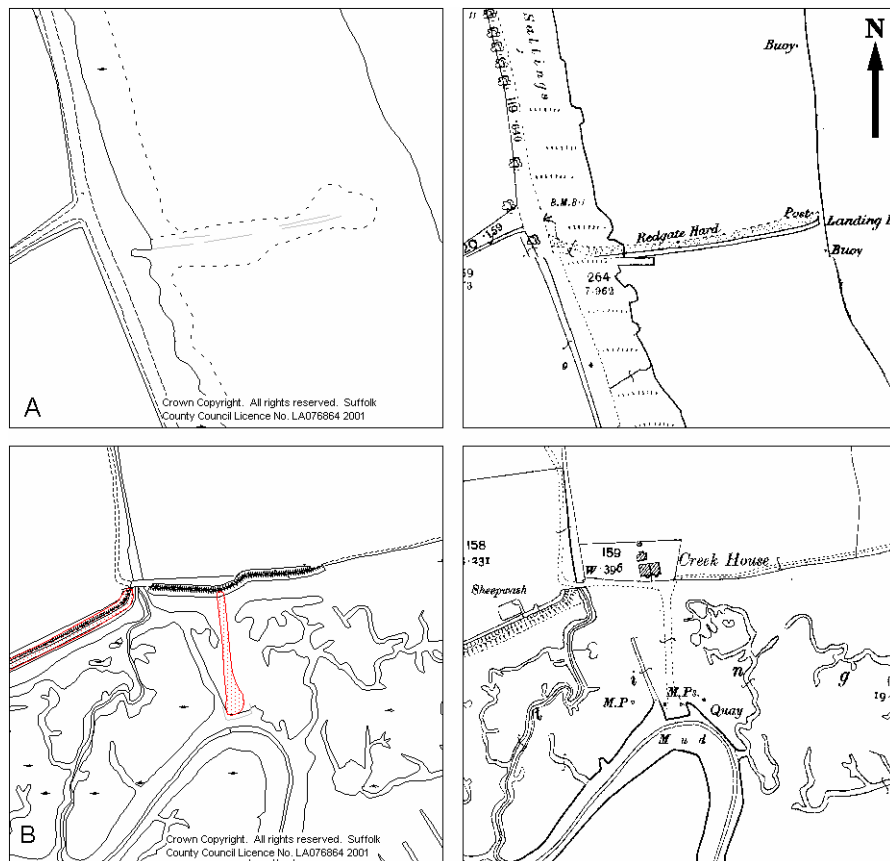
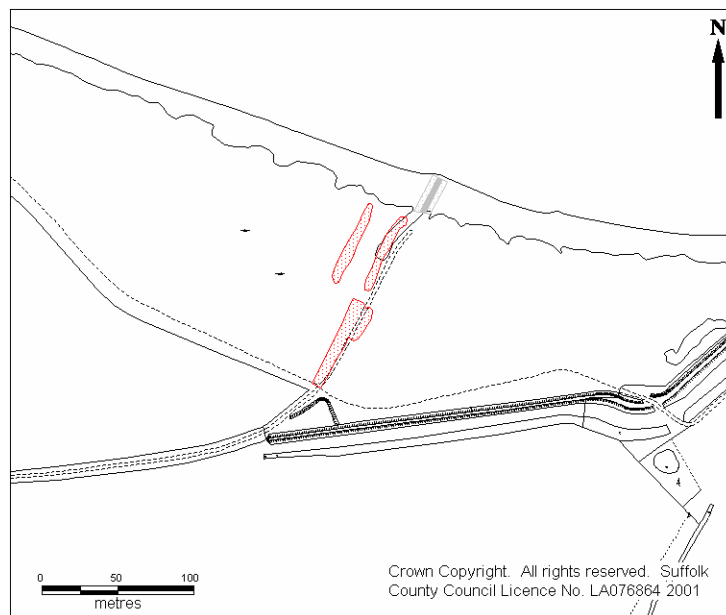


Figure 60. Boat hards and quays as marked on late 19<sup>th</sup> and early 20<sup>th</sup> century Ordnance Survey maps (Scale 1:5000).

The identification of these site types has aided the interpretation of other similar features which do not have historical map evidence, such as the probable post-medieval hard and jetty at Holbrook Bay in Stutton parish (TM 165340, STU 063; TM 161339, STU 074).

A small number of inter-tidal features can be confidently identified as being earlier than 19<sup>th</sup> century. For example, an earthwork causeway and structures were identified projecting from the Sudbourne side of the River Alde at circa TM 450551, into the inter-tidal zone for approximately 155m (see Figure 61).

These features are not marked on the first or second edition Ordnance Survey 25" maps, or on more recent Ordnance Survey maps, suggesting that they have gone out of use by 1882. However, place name evidence in the immediate area suggests a possible function for them as a ferry quay; Ferry Farm and Ferry Cottages are less than 1km to the south and the causeway itself appears to extend from a track called Ferry Lane. The route of this track, along the only ridge of higher ground in the area to the bank of the Alde, would support the interpretation of this site as having pre-reclamation origins. Norden's map of circa 1601 shows a crossing point on the Alde in this area raising the possibility that the quay was already established in the medieval period.



*Figure 61. Medieval ferry quay in Sudbourne (scale 1:5000).*

The continued importance of this crossing into the post-medieval period may also be supported by the fact that over 9ha of saltmarsh in the immediate area of the quay remained un-reclaimed. This may simply have been a case of economical reclamation, utilising the higher ground in the area of the quay to minimise the construction of expensive sea walls, as occurred at Burrow Hill. Alternatively, if the ferry was an important communications feature, it is possible that the area of the quay remained unreclaimed so as to allow the uninterrupted operation of the ferry.

#### 11.10.2 Terrestrial features

##### *Roads*

The probable continuation and consequent invisibility of the Saxon and medieval settlement pattern and field systems into the modern period in Suffolk, and the



implications of this for archaeological research have been discussed above (see section 10). Similarly, it is probable that many roads and tracks of medieval and post-medieval dates continued in use into the post-medieval and modern period, and have been obscured by the construction of the modern road network. It has been possible however, to identify a number of routes that appear to have passed out of use, and in some cases, suggest a cause for this change.

A number of simple tracks or roads have been identified as of probable medieval or post-medieval date. For example, a road or track (TM 234401, LVT 030) is visible as cropmarks for approximately 550m to the north of Levington Park, near Ipswich (see Figure 62). It is unclear where this track leads to, to the north, but on the 19<sup>th</sup> century first edition Ordnance Survey maps it appears to meet a second trackway, suggesting it was previously part of an established network of routes. Although it is not possible to be sure due to 20<sup>th</sup>-century building developments, it is possible that this trackway continues to the south-east towards Trimley St Mary at TM 241401(SNH 005), as a trackway with possible later-prehistoric origins that probably continued in use into the medieval period.



Figure 62. Medieval trackway to the north of Levington Park (scale 1:5000).

This area was subject to evaluation trenching by Suffolk County Council in 1997 which dated a number of the surrounding field boundaries to the medieval period and it is therefore likely that the track is of comparable date.

A similar track can be seen heading south from Erwarton village in Arwarton parish (TM 219343, ARW 016) for about 600m, towards the bank of the River Stour (see Figure 63 'A'). The northernmost 80m is marked as a track leading to The Street in Erwarton on the first edition Ordnance Survey map of 1881 (see Figure 63 'B'), and the whole track is marked on the Erwarton estate map of 1770. The track is therefore of post-medieval date, but its appearance on the 1770 map suggests it may have earlier origins.

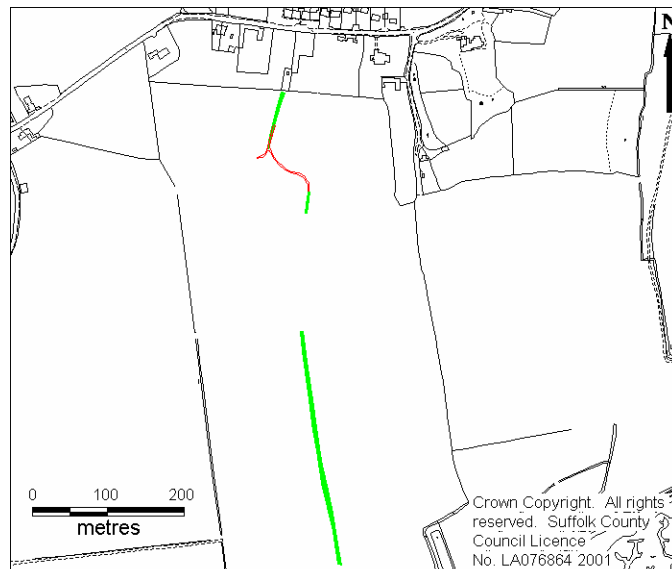
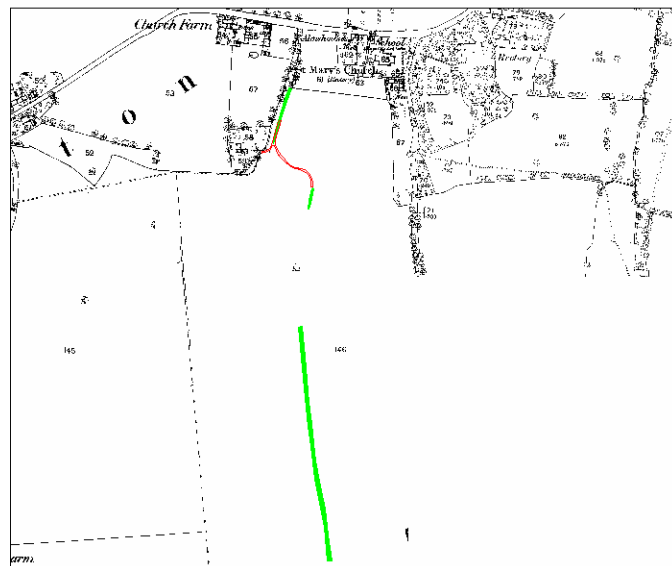
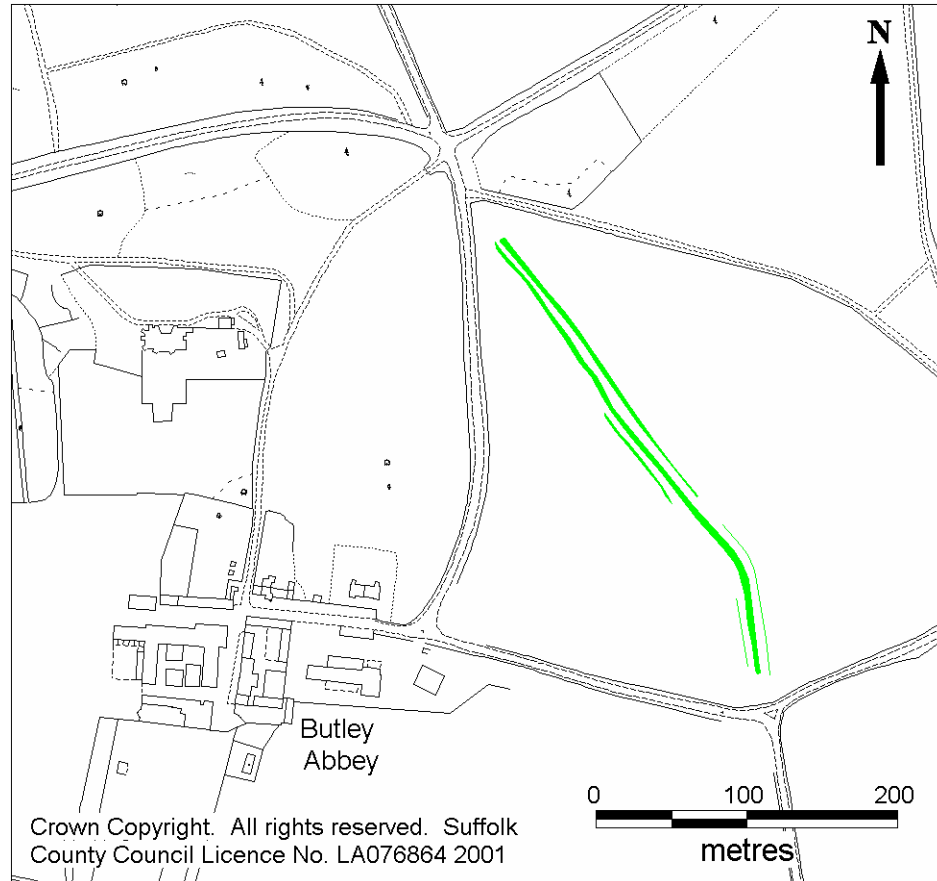


Figure 63. Possible medieval trackway to the south of Erwarton village (scale 1:10000).



It is not apparent why the Levington route went out of use, but at Erwarton it is probable that at some point between 1881 and the second edition 25" map of 1904, the consolidation of landholdings to the south of the village as part of the enclosure movement removed the requirement for access to the field from the village.

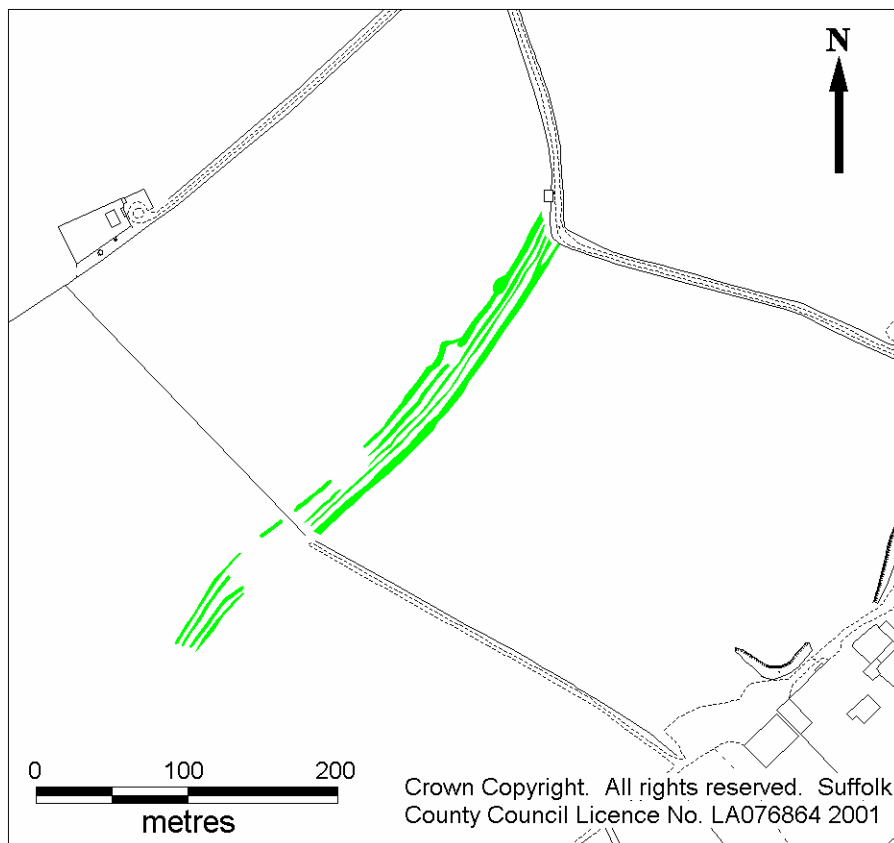
A number of more substantial possible medieval or post-medieval relict routes have also been recorded. This can be illustrated by looking at a probable length of road visible as a cropmark approximately 340m in length to the east of Butley Abbey (TM 377492, BUT 068; see Figure 64).



*Figure 64. Road of probable medieval date to the east of Butley Abbey (scale 1:5000).*

The relict road appears to connect the road to Capel St Andrew to the south with the east-west road from Capel Green to Butley Low Corner. The relict road would originally have skirted the site of Butley Abbey and may reflect the line of a medieval road around the abbey's precinct boundary. The road appears to have been superseded by the dog-legged road currently serving the buildings on site of the abbey, which may therefore reflect a post-Dissolution reorganisation of the landscape.

The route of a probable post-medieval track or road can be seen in Boyton parish, to the north-west of Boyton Hall Farm. The road is visible, for approximately 370m at TM 379465, as a number of parallel cropmarks defining a route that was ditched or enclosed by boundary hedges (BOY 067; see Figure 65).



*Figure 65. Post-medieval road to the north-west of Boyton Hall Farm (scale 1:5000).*

The road is not marked on the first edition 25" Ordnance Survey map of 1881, but does match the route of a road marked on Hodskinson's map of 1783. The road is the northernmost of two roughly parallel roads between Boyton and Hollesley on Hodskinson's map. The route of the southernmost road has apparently been diverted at some point between 1783 and 1881, to take the road to the north of Boyton Hall Farm, which sits approximately 300m to the south of the relict road, rather than through the farmstead. The line of the relict road was maintained in the surviving field boundaries for a number of years, but these boundaries have been removed as part of the enclosure resulting from the agricultural intensification of the 20<sup>th</sup> century.

### **11.11 Summary**

The NMP evidence illustrates that aerial survey data can add archaeological information to periods that are perceived to be relatively well understood, and in the case of the post-medieval period, well documented.

The NMP data is potentially particularly valuable in contributing to the understanding of the development of medieval and post-medieval processes of coastal landscape change, such as enclosure and land-reclamation. These processes often occurred in a piecemeal fashion, for which little documentation exists, and must now be recorded in light of ongoing threats of agriculture and coastal erosion. The NMP results can also throw light onto the consequences of these processes for other aspects of everyday life, such as the provision of foodstuffs and the patterns of communications and industry.

It is important that future aerial survey work monitor the impact of the ongoing threats to what is seen by some as an undervalued archaeological landscape (Williamson 2004), and that liaison with field survey continue to add detail to the larger picture.

## 12. TWENTIETH CENTURY MILITARY REMAINS ON THE SUFFOLK COAST

### 12.1 Background

When German forces swept through Europe and into France in the late spring of 1940, the British government quickly realised that the underlying threat of invasion that had been developing over some months was suddenly close to being a reality and that a national system of defences was necessary to protect the country's coastline (Dobinson 1996, 1-3). From June 1940 onwards a huge programme of defence construction was undertaken by civilian contractors under the guidance of the Royal Engineers. These defences had a dramatic affect on the coastal landscapes of southern Britain. The Suffolk coast was strategically important in this defence system, as it had been in defence systems for hundreds of years. The low-lying nature of the coast provided mile upon mile of potential landing beaches and its geographical location so close to Europe also made it vulnerable (Dobinson 1996, 55).

The NMP project has interpreted, mapped and recorded these anti-invasion defences in great detail including their development and alteration throughout the Second World War. This has been possible due to the availability of extensive coverage of RAF vertical photographs taken during the war as well as some USAAF photographs. High quality photography, often from consecutive years, has enabled the recording of the construction, development and demolition of these sites and gives us a better understanding of how the isolated concrete remains that we can still see today fitted into the wider defensive schemes of the Second World War.

The NMP survey is the first in Suffolk to systematically examine the historical vertical collections of photographs held in the National Monuments Record. It is also the first project in the county to record the modern military remains systematically from contemporary sources directly into the SMR database. Gazetteers resulting from the documentary survey of the military records by Colin Dobinson (Dobinson 1996, all volumes) still need to be added manually to the Suffolk SMR as is the case with the Defence of Britain project, which only recorded extant defences.

### 12.2 Early 20<sup>th</sup>-century military sites: 1900 - 1939

Despite the impact of the Second World War defences on the Suffolk coast, a number of sites that have been interpreted, mapped and recorded by the NMP project may belong to an earlier phase of 20<sup>th</sup>-century activity associated with the build up to the First World

War, the First World War itself and the inter-war years. In many cases it is information from additional sources, such as historical documents or ground survey that enables us to identify pre-Second World War sites, as many lack any diagnostic form that easily differentiates them from Second World War structures on aerial photographs. In addition, RAF photography is only available from 1940 onwards for the Suffolk coast, after the construction of the Second World War defences, making it difficult to positively identify anti-invasion defences that were built prior to that time.

Most of the sites recorded in the NMP survey identified as belonging to this pre-Second World War period relate to military bases that continued in importance into the Second World War. This is presumably because more documentation is available for these large sites than for those smaller pre-Second World War defences which became swamped when construction of the Second World War defences began in 1940. Military bases with documented pre-Second World War activity include Orfordness (TM 4450, ORF 021) and Landguard Fort (TM 284318, FEX 064). RAF Bawdsey (TM 340383, BAW 051) also saw military activity prior to the Second World War but the most important period in the history of the site came in the build-up to the Second World War, and it shall therefore be considered in the Second World War section. The pre-Second World War airplane hangars from RNAS Felixstowe are also visible on aerial photographs.

*Case study: Orfordness Research Establishment (TM 4450)*

The shingle spit of Orfordness was the location of several phases of military experimental research in the 20<sup>th</sup>-century (Kinsey 1981), all of which have left structures and archaeological traces that have been mapped from aerial photographs during the NMP project (see Figure 66). At present the NMP results are contributing to the assessment of the case for preservation of these remains by the National Trust, who now own the Ness. The functions of some of the buildings and structures recorded from the aerial photographs have only been elucidated by consultation with Angus Wainwright, the National Trust archaeologist responsible for the site.

Between 1915 and 1921 the Royal Flying Corps had an airfield located on the Ness where an experimental squadron which carried out research on machine guns, bombs and navigation was based (Kinsey 1981; Zimmerman 2001, 78). Evidence of activity from this period can be seen on the aerial photographs in the form of bomb stores (TM 438488, ORF 070), the foundations of a World War One prisoner of war camp (TM 444497, ORF 072) and a motor transport shed (TM 438490, ORF 075). Subsequently the Aeroplane and Armaments Experimental Establishment had a firing and bombing range on the Ness, between 1921 and 1939 (Kinsey 1981; Zimmerman 2001, 78). Earlier buildings were re-used at this time and a bomb ballistics building (TM 445492, ORF 067) and munitions stores (TM 438488, ORF 071) have been identified on the aerial photographs. Other evidence visible on the aerial photographs includes craters

and bombing range markers (TM 451502, ORF 063, ORF 066). Experimental work on the first radar systems, led by Watson-Watt, commenced on the shingle spit in 1936. A year later this research programme had expanded to include a new site at RAF Bawdsey (Zimmerman 2001, 78-92). The concrete bases of receiver masts used during the radar experiments are visible on the aerial photographs (TM 434487, ORF 080).

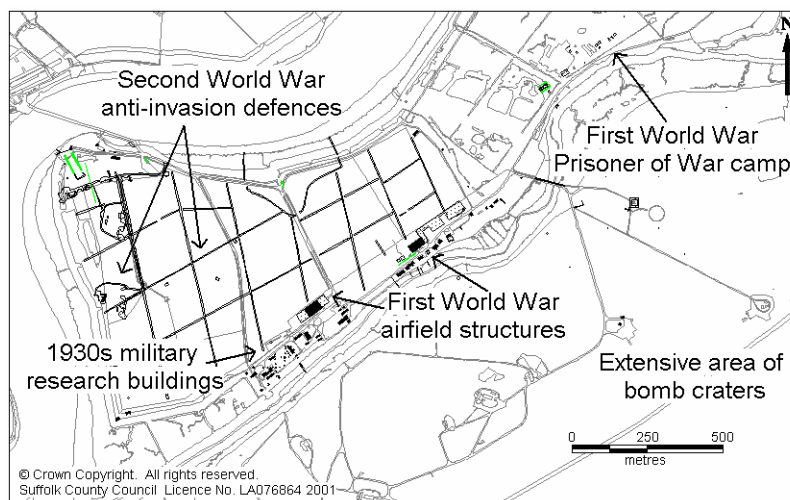


Figure 66. The Orfordness Research Establishment (scale 1:25000)

A number of “crenellated” practice trench systems are visible as cropmarks on Levington Heath (TM 246400, LVT 011), near Brackenbury Fort (TM 316355, FEX 115) and at Carmen’s Wood, Butley (TM 384501, BUT 064), on photographs taken in the early 1940s suggesting that they were excavated prior to the Second World War. This form of trench system is commonly associated with the First World War but it must be noted that these “crenellated” practice trenches were also dug in the Second World War, making the dating of these features problematic.

*Case study: Crenellated trenches on Levington Heath (TM 246400, LVT 011).*

These systems of practice trenches are visible as cropmarks on aerial photographs of Levington Heath (see Figure 67). Most of the trenches appear to follow a roughly ‘crenellated’ pattern in plan. The trenches are likely to have been constructed for practice purposes and the uncultivated heath would have provided an ideal location to construct these types of field-works. The trenches are not visible on photographs taken in the 1940s suggesting that they must have been excavated and backfilled by that date. Their crenellated form suggests that they may have been dug around the time of the First World War.



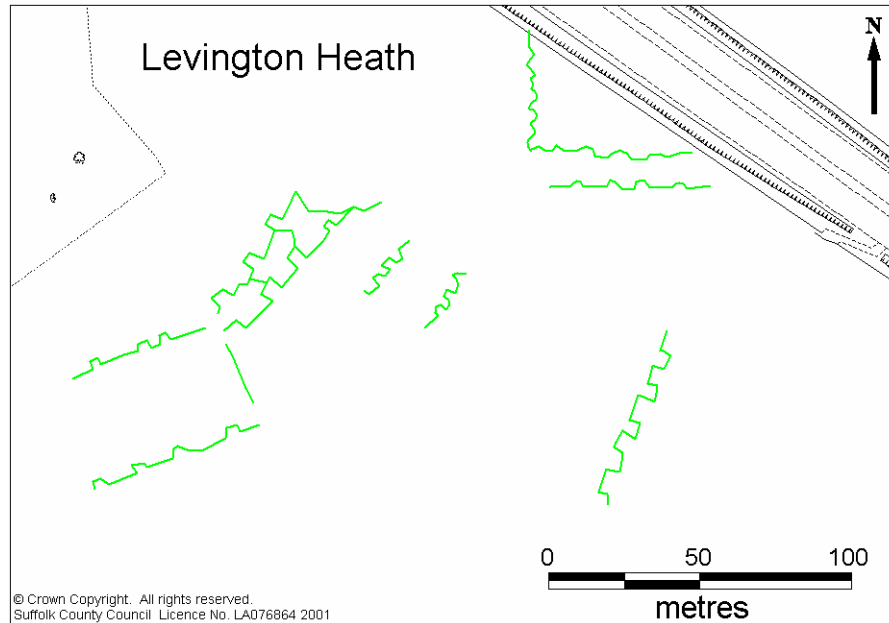


Figure 67. Crenellated trenches on Levington Heath (scale 1:2500).

### 12.3 Second World War military remains

The density of Second World War defences means that it is only possible to provide an overview of the massive number and variety of features that were recorded during the survey (Figure 68). Over 900 records for sites of Second World War date have been created during the project, although it must be noted that this large number reflects the fact that the project represents the first systematic attempt to record features of this date on the Suffolk SMR. Five broad categories of site are identifiable; coastal anti-invasion defences, anti-aircraft defences, temporary training sites and camps, established military bases and civil defence sites.

World War II sites recorded by the Suffolk Coastal NMP project

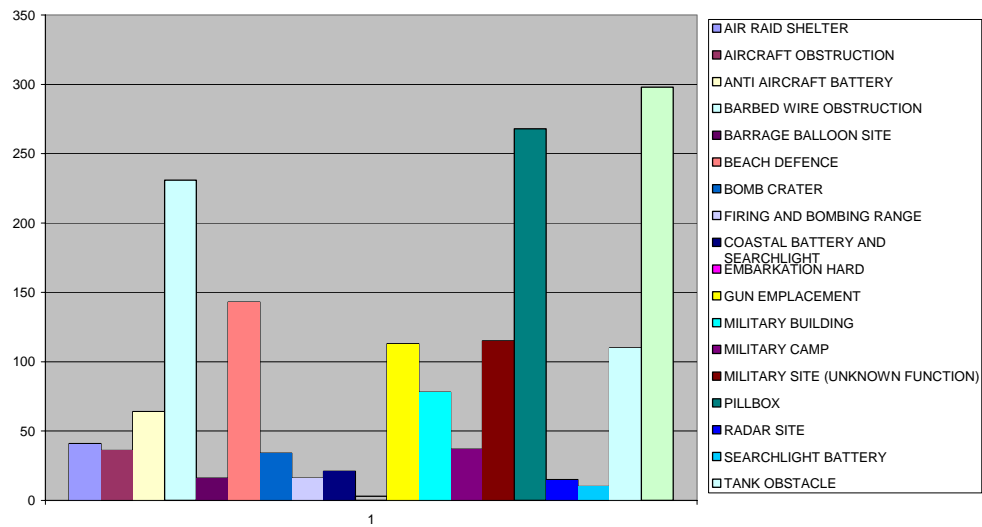


Figure 68. Military sites recorded during the NMP survey

### 12.3.1 Coastal anti-invasion defences

The vast majority of 20<sup>th</sup>-century military features recorded by the project relate to the coastal anti-invasion defences which stretched for virtually the entire length of the Suffolk coast during the Second World War. The only significant stretch of coast where these types of linear defences are not visible is around Hollesley, Butley, Orford and Sudbourne where the long shingle spit of Orfordness provides a natural barrier to invasion. These defences are characterised by long linear obstacles, made from barbed wire, scaffolding or concrete anti-tank cubes, which run parallel to the sea across the coastland, saltmarsh and beaches. Minefields also occasionally form part of these linear defences. The linear barriers link important nodal points along the system of defences, which can be anything from a single pillbox to a coastal gun battery or military camp. The recording of the linear defences is particularly important as these are the elements of the system that were removed quickly after the war and leave little trace on the ground today. Dobinson (1996, 4) also stated in the documentary survey he conducted that, for anti-invasion defences, “information on the precise location of the sites is less systematically organised than for most other categories of works” and therefore “there can be no doubt that fieldwork has a larger part to play in the study of anti-invasion defences than for any other category of site”. The interpretation, mapping and recording of the data available from the aerial photographs is therefore particularly valuable in studying these types of remains.

*Case Study: Anti-invasion defences on Aldeburgh beach (TM 467577)*

The photograph below (Figure 69), taken in December 1941, shows a typical stretch of Suffolk's coastal defences, just to the north of Aldeburgh. The defences consists of layers of obstacles which comprise, moving inland from the sea, a stretch of beach scaffolding located in the breakers (ARG 051), a minefield running along the beach (ARG 050), a line of concrete anti-tank cubes on the higher ground behind the beach (ADB 154), a substantial anti-tank ditch and finally another anti-tank ditch further inland, formed from the connecting and widening of existing drainage ditches (ADB 106).

Contemporary wartime aerial photographs show that all these defences appear to have been started in 1940, though some were being completed or modified in 1941. To the northern (left) end of the photograph, two bomb craters (ADB 064) are visible close to anti-glider ditches (ADB 063) and to the south, just off the photograph, barbed wire enclosures (ADB 109), typical of the coastal defences, are visible. The enclosures contain pillboxes, Light Anti-aircraft Artillery (LAA) posts and slit trenches and may be related to the more intensive defences protecting the town of Aldeburgh itself. Again the construction of these enclosures within the defensive line (often known as 'strongpoints') was started in 1940, but developments and modifications can be seen on photographs taken in 1941. The coastal defences at Aldeburgh were part of a network of linear defences which covered the whole of East Anglia. The vulnerability of the region was such that Eastern Command became the most heavily defended area in the country outside the London District and Aldershot Command (Dobinson 1996, 55).



RAF 2A/BR167 8 17-DEC-1941  
English Heritage (NMR) RAF Photography

*Figure 69. Anti-invasion defences at Aldeburgh in December 1941*

### 12.3.2 Anti-aircraft defences

Light Anti-aircraft Artillery (LAA) and Heavy Anti-aircraft Artillery (HAA) positions were an integral part of the coastal defence scheme. These varied from reasonably permanent structures to those that were extremely ephemeral and may have been constructed of sand bags. HAA batteries have proved easier to identify on the aerial photographs than LAA sites due to their distinctive layout and greater size (see Figure 70 for examples of HAA battery layouts). These sites were evenly spread along the coastal strip in order to provide anti-aircraft defences for the whole of the coast.

Many of the 50 new HAA sites that were recorded during the project were probably related to the DIVER Strip, a defensive line of HAA batteries that was constructed in September 1944 in order to combat the V1 flying bomb (Lowry 1996, 62). The strip stretched from Clacton in Essex to Yarmouth in Norfolk (Dobinson 1996a, 8). The batteries in the DIVER Strip were often co-located with LAA sites and were the most substantial sites of all the DIVER gun deployments (Dobinson 1996a, 87). Often these batteries are only visible on one run of RAF photographs taken in 1944 and they have often been dismantled in the few years following the end of the war making the record created by the NMP survey particularly important.



*National Monuments Record (RAF Photography)*

*Figure 70. Typical layouts of A: a Heavy Anti-aircraft Artillery battery and B: a DIVER battery*

*Case study: DIVER Strip sites around Orford (TM 4249) (GED 020, 026, 027, ORF 021, 056, 057, 091, SUE 063, 083)*

The area around Orford saw a particularly dense concentration of Heavy Anti-aircraft Artillery batteries during the Second World War (Figure 71). Three batteries were constructed post-1943 and seven post-May 1944. The layout of the gun emplacements

suggest that they are all related to the DIVER strip, where the guns were arranged in a line rather than in a circle “enabling the stops of the two flank guns to be lowered to permit engagement of low-flying targets” (Dobinson 1996a, 91) (see Figure 70). Examination of the gazetteers in the HAA, LAA and DIVER volumes of the 20<sup>th</sup> Century Fortifications in England surveys by Dobinson (1996a; 1996b; 1996c) shows that most of the sites around Orford were built as part of the DIVER strip redeployment in September and October 1944. The two batteries located on Orfordness (TM 428488 and TM 428491, ORF 021) and the one to the east of Gedgrave Hall (TM 407490, GED 020) were not recorded during Dobinson’s comprehensive documentary survey, highlighting the importance of the aerial photographic resource in supplementing the documentary evidence and assessing the true distribution of these sites.

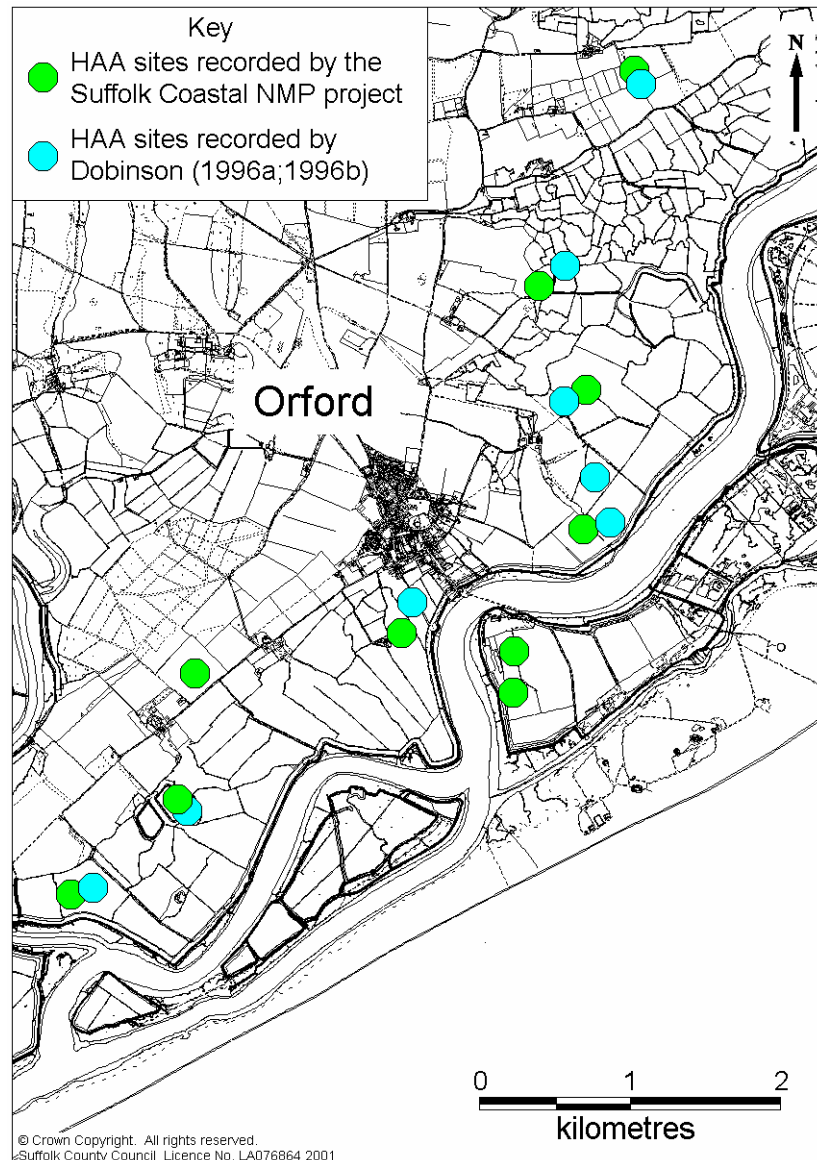


Figure 71. The location of DIVER sites around Orford during the Second World War as recorded by the NMP survey and the documentary survey by Colin Dobinson (1996a; 1996b). Scale 1:50000.

The comparison of the National Grid References calculated from the documentary survey and the actual location of the batteries recorded by the NMP project also shows an advantage of the photographic records; the imprecise recording of the site locations originally and the problems of converting the military Cassini Grid into National Grid coordinates mean that the grid references from the documentary survey are often inaccurate by up to 200m. It is also possible that the construction of the two batteries on Orfordness was not recorded in the military records in the same manner as the other batteries due to the more sensitive nature of the activities taking place on the site.

So-called 'anti-glider' ditches are also a common feature recorded in the coastal project area. These obstructions generally consisted of narrow ditches with piles of spoil on either side of the ditch intended to prevent the landing of large troop carrying aircraft (rather than gliders) on large areas of open land such as Felixstowe Marshes (TM 322379) and the marshes to the north of Aldeburgh (TM 466586). Anti-aircraft obstructions in the form of rows of poles crossing fields were recorded in Levington parish (TM 247391).

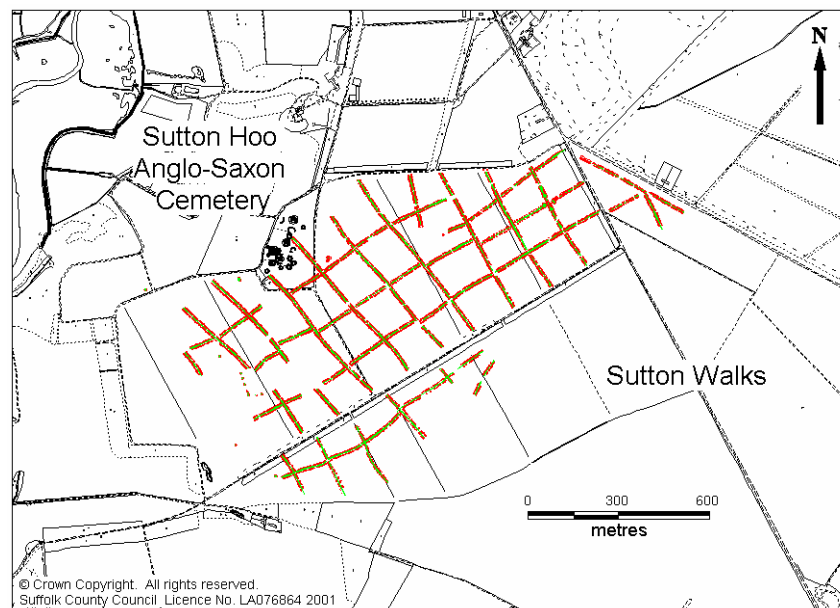


Figure 72. Second World War 'anti-glider' ditches at Sutton Hoo (scale 1:25000)

*Case study: 'Anti-glider' ditches at Sutton Hoo (TM 293487, SUT 057)*

Earthwork 'anti-glider' ditches were excavated across a vast swath of open heath land to the south and east of Sutton Hoo during the Second World War. The small section shown here is centred on TM 293487 but the ditches extend well beyond the project area. The open and relatively flat area of land is located close to Woodbridge airfield crash landing strip and the lowest crossing point of the River Deben at Melton, so it would have made an attractive landing ground for enemy aircraft. Virtually all of the

mapped area had been taken into arable cultivation and the ditches destroyed by the 1980s, though three stretches of 'anti-glider' ditch are still preserved as earthworks within the scheduled area of the Sutton Hoo Anglo-Saxon cemetery (TM 288486).

### 12.3.3 World War II temporary camps and training sites

A number of sites which appear to have functioned as temporary camps or training areas have also been interpreted, mapped and recorded by the project. Often these sites consist of large numbers of tents arranged in the grounds of a country house. In some cases changes in these temporary camps can be linked to historical events. For example, an increase in tents, presumably indicating an increase in troops, is visible in the grounds of Wherstead Park (TM 160408) prior to the D-Day landings. This is followed by a subsequent decrease in tents, presumably after embarkation. In other cases, like that of Orford Park (TM 216394), the tents do not appear to be clearly linked to any particular event or wartime activity. It is possible that local knowledge or a detailed search of the military records may be able to clarify the activities occurring on some of these sites. The NMP results do at least provide base-line data by recording the military presence on these sites and the form it takes. The repeated cutting of slit trenches is also a common feature that has been recorded at a number of sites (e.g. Landguard Fort) and this may be related to 'make-work' for troops awaiting D-Day embarkation (TM 289328).

#### *Case study: Boyton AFV Range (TM 391470) (BOY 024)*

An Armoured Fighting Vehicle (AFV), or 'tank' as it is more commonly known, training area and firing range was located on Boyton Marshes during the Second World War (Figure 73), centred on TM 391470, and was recorded from aerial photographs during the project. In December 1942 it was agreed that accommodation and other facilities would be built at Boyton. The site was predominantly used as a firing range under Eastern Command control, though the 79th Armoured Division were stationed in this area from April 1943 onwards and may have used this facility as part of the Orford Battle Area (Kinsey 1981, 70-72). AFV units used the type of range at Boyton for basic training before moving to the larger War Office controlled AFV ranges elsewhere in the country. The tanks drove around the triangular trackway which provided multiple opportunities to fire at moving targets from different angles during a single run. Firing was in a south-easterly direction towards Orford Ness so that the missed shots would fall into the sea (James 2003). The targets were probably pulled along behind protective banks, located roughly 470m and 900m to the south east of the firing point, on a narrow gauge railway, by winches that were housed in blockhouses at the eastern end of the banks. Two further blockhouses are also visible on the aerial photographs, as earthworks covering concrete structures. These were used for observation but also

housed the mechanism for operating 'pull up' targets, which were activated by cables housed in cable runs visible as thin trenches between the blockhouses and large banks. A series of structures at Banters Barn, connected to the AFV range by a concrete road, housed a maintenance and service area. By December 1943 an additional bank had been built that ran parallel with the sea wall for circa 900m before connecting with it at TM 389461. The 79th Armoured Division may have used this as a mock sea wall in trials of 'funnies', specially adapted tanks that were intended to breach the Atlantic Wall during in the D-day landings. Boyton AFV Range closed soon after June 1944 (Hayward 2001, 95).

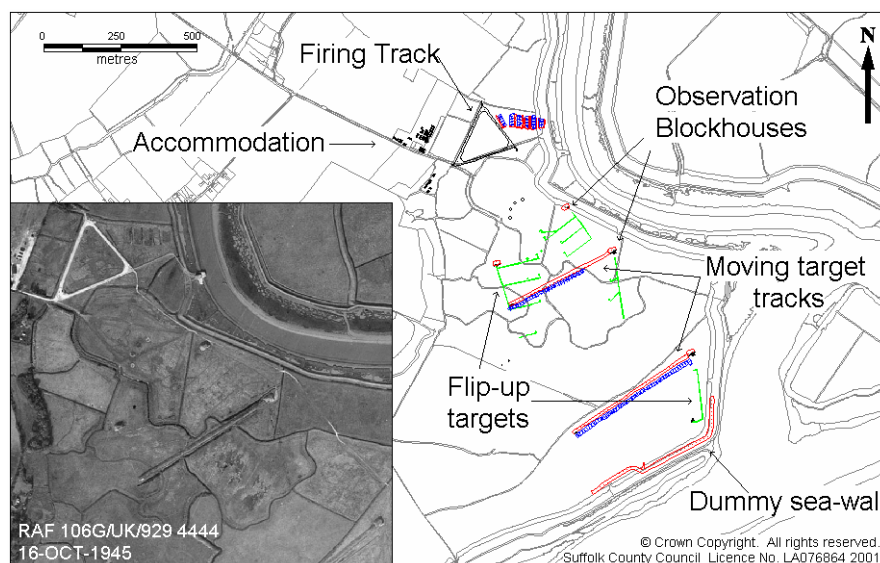


Figure 73. The AFV training ground at Boyton (scale 1:25000)

#### 12.3.4 Second World War activity on established military bases

A number of significant military bases are located within the NMP project area. Though these bases were established prior to the Second World War, many of the sites gained new importance and functions at this time. A few of these sites are of national significance, with the RADAR development site at RAF Bawdsey possibly being the most important. The contemporary wartime photographs taken from 1940 onwards have enabled the interpretation, mapping and recording of many developments on these major sites during this period. The NMP survey has detailed vast numbers of minor changes on these large bases during the war, evidence of which, in some cases, no longer exists due to the continuing use of these sites into the Cold War period (see section 12.5).

Within the project area there are four major military sites which saw a significant amount of activity at this time, the HMS Ganges Royal Naval training base on Shotley peninsula (TM 2534, SLY 094), the Orfordness Research Establishment (TM 4349, ORF 021), Landguard Fort at Felixstowe (TM 283319, FEX 064) and finally RAF Bawdsey (TM



337382, BAW 051), which saw the expansion of Watson-Watt's research into RADAR which began at Orfordness. Many important and ground-breaking experiments were carried out at Bawdsey. All of these sites saw an increase in military activity, an establishment of anti-invasion defences around their perimeters and increased construction of buildings for accommodation and training and/or research between 1939 and 1945.

*Case study: Landguard Fort and Landguard Point, Felixstowe (TM 2831)*

The first defences constructed on Landguard Point date to the 1540s and consisted of 'semi-permanent batteries' constructed of earth and timber (Kent 1988, 99). These earthworks were rebuilt in 1625 as a square fort with square angle bastions and brick buildings in the interior. It was later encased in brick and stone (Kent 1988, 91). Between 1717 and 1751 the fort was rebuilt in a pentagonal form and then repeatedly extended (Kent 1988, 109). The fort remains in this form, but the whole interior including its circular building and circular courtyard dates to 1875 (Figure 74 'A'). The gun batteries of the fort were enhanced and replaced throughout the early 20<sup>th</sup> century (Figure 74 'B'). The fort again became an important strategic point during the Second World War. By July 1940 a number of the guns had been replaced and were ready for action with concrete gun houses and director towers built over them. A number of fixed-beam searchlights were constructed (e.g. Figure 74 'I') (Kent 1988, 127). The fort itself was used as barracks and as a plotting room (Kent 1988, 128).

Some of the activity and changes close to the Fort and on the surrounding area of Landguard Point during the Second World War are recorded on aerial photographs taken from 1940 onwards. These include the construction of extensive anti-invasion defences around the point, consisting of 'dragon's teeth', beach scaffolding, anti-tank cubes and a number of pillboxes (Figure 74 'H'). Behind these defences a number of other features are visible including barrage balloon sites (e.g. Figure 74 'G'), a Heavy Anti-aircraft Artillery battery (Figure 74 'C') and the searchlights related to the guns of the fort itself, as mentioned above (e.g. Figure 74 'I'). Other features visible on the photographs may be related to the use of the fort as a barracks, including the large number of practice trenches visible (e.g. Figure 74 'F') and the concrete embarkation hards built for the D-Day offensive (Figure 74 'E'). One interesting feature visible on the photographs is the floating defensive boom which runs from Landguard Point across to Harwich, protecting the entrance to Harwich Haven (Figure 74 'D').

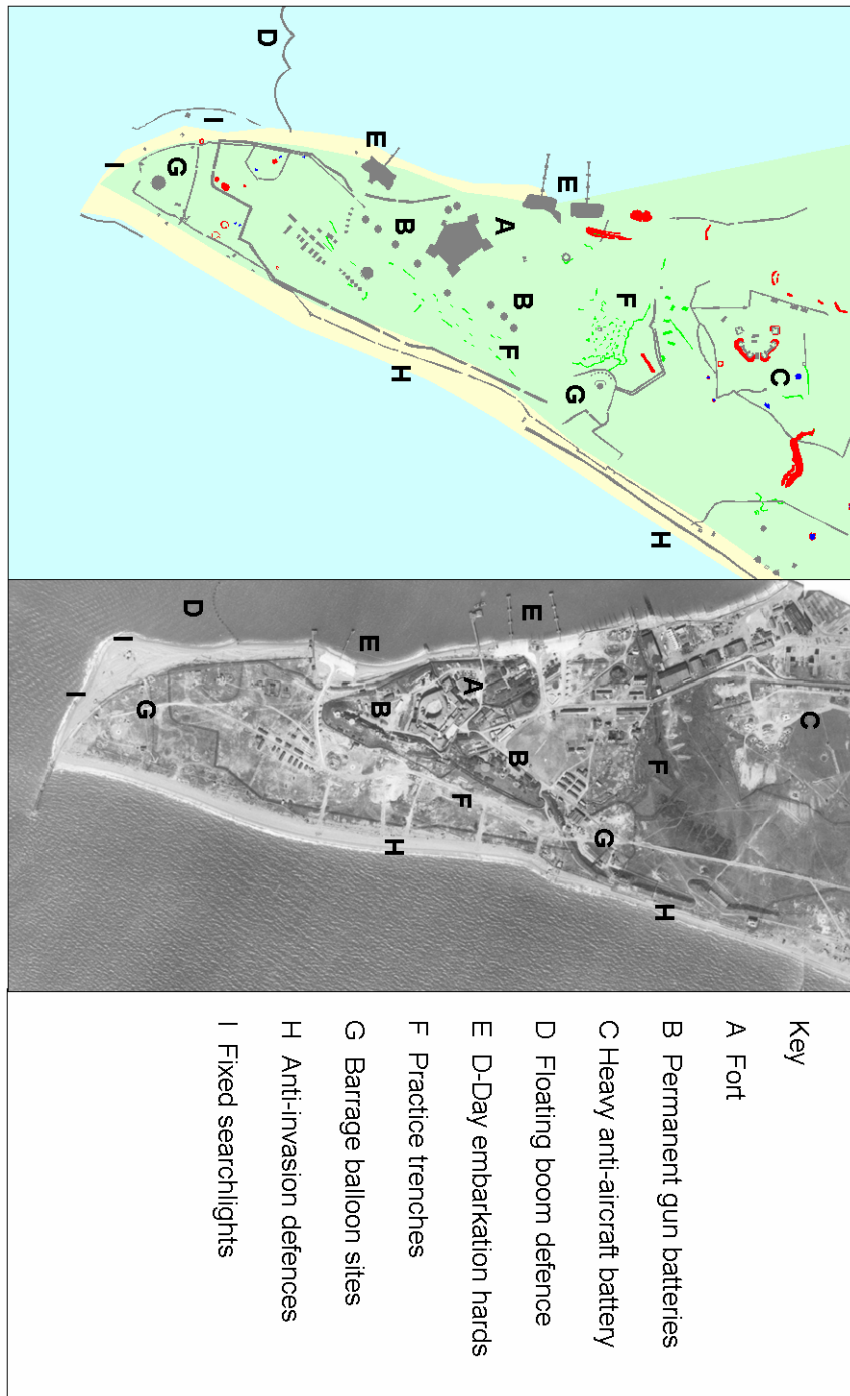


Figure 74. Second World War activity on Landguard Point

### 12.3.5 Civil defence

The location of several towns, including Felixstowe and Lowestoft, on the Suffolk coast has meant that structures related to civil defence have also been recorded by the project. These included a bombing decoy located on the boundary between Ramsholt and Shottisham parishes (TM 312427, RMS 042); this consisted of groups of baskets surrounded by fire-break trenches with a track leading north-west from the decoy to the operations shelter and its associated structures. According to documentary sources this site was located as a decoy for Ipswich and combined two types of decoy, a Civil Starfish (SF) decoy which was meant to replicate the incendiary fires that are created during a bombing raid and a Civilian QL decoy which was meant to represent the dimmed light that would be visible from a city at night (Dobinson 2000, 266; 282), both drawing bombers into a false target.

Air raid shelters have also been recorded in numerous locations including two large zigzag shelters located on Cobbolds Road, Felixstowe (TM 302347, FEX 102). 43 records created during the NMP project relate to air raid shelters, though some of these are associated with military sites rather than civilian defence.

Barrage balloon sites have also been recorded in numerous places, focusing around Shotley, Felixstowe and Lowestoft. 15 SMR records encompass this type of site. Barrage balloons were intended to force enemy aircraft to fly at a greater height, therefore making them an easier target for anti-aircraft gunners and reducing the accuracy of their bombing (Lowry 1996, 63). If the balloon itself is not visible, the sites can be identified from the air by the distinctive pattern of concrete tethers visible on the ground (see Figure 75). The pattern of balloons protecting Felixstowe, located on Landguard and Shotley points, is particularly notable as balloons tethered to ships moored in the mouth of the Orwell completed the defensive line. A balloon storage depot was also visible close to Lowestoft Docks (TM 548927, LWT 100).

Road blocks are also a fairly common feature on the RAF photographs and are usually visible as either concrete anti-tank cubes positioned across the road or as the slots into which temporary barriers could be inserted. This highlights the remarkable detail visible on some of the wartime photographs. 29 SMR records encompass Second World War road blocks but, as with the air raid shelters, some of these may be related to military sites rather than civilian defence.



*Figure 75. A Second World War barrage balloon site at Pewitt Hill, Felixstowe*

#### **12.4 The contribution of the NMP project to Second World War studies on the Suffolk coast**

The RAF photographs available for examination during the project have provided a unique and extremely valuable insight into the defences and wartime activities on the Suffolk coast during the Second World War. Some sites were extremely short-lived and the vertical RAF photographs provide the only photographic record of how the sites were actually laid out on the ground, even if their intended layout is recorded in the Home Guard's Defence Schemes. A programme of removal of defences at the end of the war, and subsequent neglect and coastal erosion, have left just a fraction of these sites remaining in situ today. Usually the only survivors are the concrete blockhouses or pillboxes which were once linked into an extensive defence system by more ephemeral features such as barbed-wire and scaffolding. In some areas of the Suffolk coast, such as at Covehithe, erosion has meant that all features of this date have fallen into the sea (see Figure 76).

Access to the fragile early 1940s photographs is limited, particularly to the 'M' series photographs where no negatives exist, and the process of systematically examining and transcribing information taken from thousands of vertical photographs during and after the war is a lengthy process. The NMP survey has collated and synthesized the information visible on these photographs and has made it more widely available through the maps and database records provided to the Suffolk SMR and the NMR. Much of the information available on the RAF and USAAF vertical photographs would otherwise have remained beyond the access of many people.

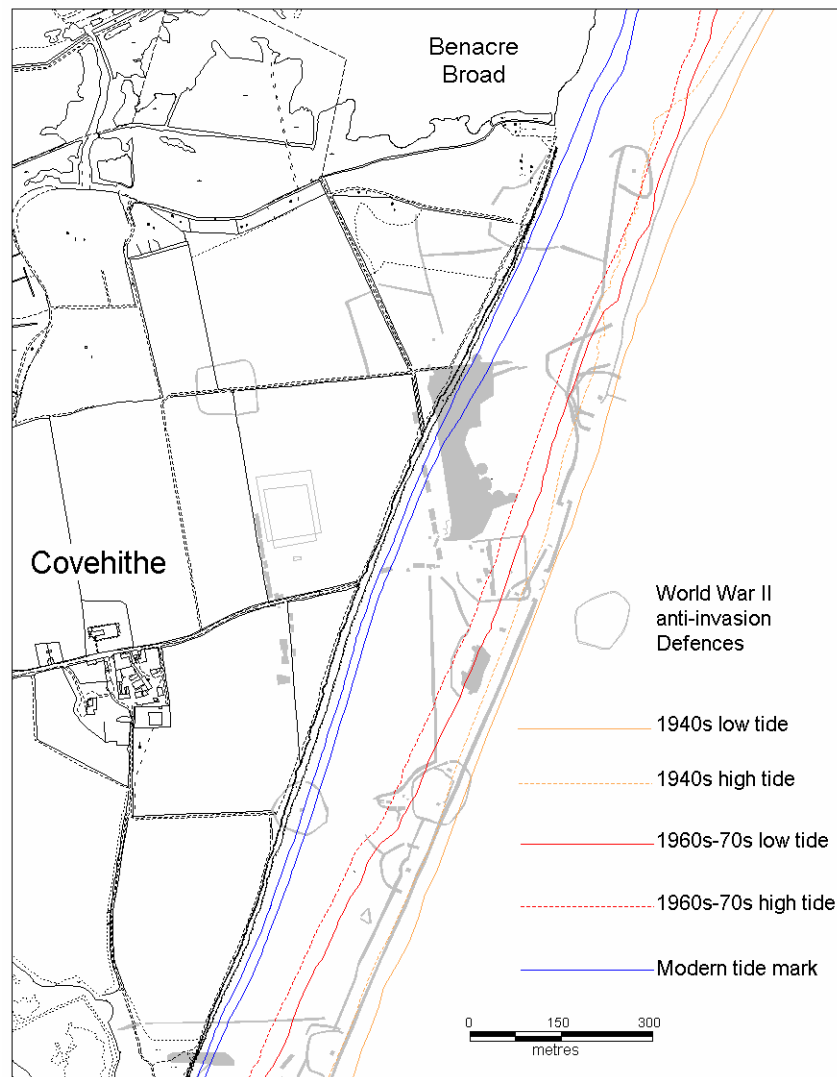


Figure 76. Erosion and the loss of Second World War remains at Covehithe.

An important outcome of the interpretation, mapping and recording of these defences by the NMP project was the publication of an article entitled “The Coastal Landscapes of Suffolk during the Second World War” in the Autumn 2003 edition of *Landscapes* (Newsome 2003). A danger with surveying the archaeology of any period, but perhaps with modern military defences in particular, is that it can turn into a quantification exercise or an analysis of military strategy and the human impact of these structures can often be forgotten. Because these defences were constructed within living memory there exists a great opportunity to bring these sites to life and understand their impact on the landscape in more than purely strategic terms.

Examination of the Documentary, Sound and Photographic Archives at the Imperial War Museum helped to provide an important insight into this period, with the most interesting information coming from the personal accounts of soldiers and civilians. The transcriptions of the Ipswich Record Office oral history tapes also provided local detail

on the impact and construction of the anti-invasion defences that were mapped during the project. General insights included one person noting that the book borrowing at Ipswich library increased during the war because people could not travel out to the coast on day trips (Anon. OHT187) and more specific observations describe, for example, the construction of the embarkation hard at Woolverstone prior to the D-Day landings (TM 194390, WLV 042) (OHT183).

### **12.5 Cold War**

The interpretation, mapping and recording of Cold War sites does not come within the remit of the National Mapping Programme and will only be briefly mentioned here. The most important point to note is that some military sites on the Suffolk coast continued in importance and use after the Second World War, including the weapons research establishment on Orfordness, the construction of the bloodhound missile site at Bawdsey and the Cold War Heavy Anti-aircraft battery at Searson's Farm. Therefore, on the more recent photographs, yet another phase of military activity is visible from the air.

## 13. FURTHER WORK AND RESEARCH TOPICS

### 13.1 Aerial photographic surveys

There are a number of potential benefits of extending NMP survey using existing aerial photographs to other parts of Suffolk. The research agenda and strategy for the Eastern Counties states, "Of the current initiatives, aerial survey is the only long-term research which is producing valuable new data about the archaeological resource on a regional basis" (Brown & Glazebrook 2000, 54) and the advantages of carrying out further aerial photographic survey in Suffolk in order to add value to the results of the coastal NMP survey have been highlighted throughout the project.

Further aerial photographic survey projects in the county, that is projects which look at existing photographic archives, could address a variety of issues depending on their geographical extent. Future work to address the problems created by the narrow coastal survey project area could involve the mapping of the Suffolk Coasts and Heaths AONB or significant landscape blocks such as the Sandlings or river valleys. This would extend the mapped area of prehistoric and Roman landscapes and focus on an area with soils and land use patterns which have proven fruitful for aerial survey and are conducive to cropmark formation.

The extension of the air photographic survey beyond the coastal zone would be particularly valuable for the study of the prehistoric, Roman and early medieval landscapes. The cropmark evidence for these landscapes extends inland across the Sandlings meaning that potentially significant areas have not yet been interpreted, mapped and recorded. An extended project area may also, in some areas, more successfully encompass the location of the coast in the prehistoric, Roman and early medieval periods.

Other landscape zones are also in need of future survey, such as the Waveney Valley. The valley has already been subject to significant gravel extraction and it would be beneficial to record what is visible on the historic photographs and has now been destroyed as well as the archaeology which potentially remains for further study. There would be potential for topographical analysis of the resulting data through detailed landscape modelling of the Waveney Valley in a GIS. This data would also be complementary to that available on the Stour Valley (Strachan 2002).

However, concentration on any one particular landscape zone, such as the Sandlings and loamy soils with their reasonably long history of aerial reconnaissance, would

perpetuate current biases in the data. Collection of comparative data for other less well understood areas, such as the clays, should be a priority.

Transects across the landscape zones of the county could partly address this problem. The sampling of different landscape zones could also be used to plan larger projects in the county by providing an indication of the air photographic coverage and the evidence visible on the photographs. It would be possible to use the data in aspects of management and conservation, perhaps with the development of predictive models. Interesting changes in the archaeology may be visible between landscape zones and changes in preservation may enable the enhancement of existing Historic Landscape Characterisation data. This is the most academically useful approach as an approach based on soils responsive to cropmark formation may lead to a bias in the results whilst other areas remain unexamined.

A full county NMP survey would also have a number of benefits against which the cost and duration of such a project would have to be balanced. A county NMP project would probably double the number of known archaeological sites. This would provide benefits to the public, the local authorities and academic researchers through the enhancement of the county Sites and Monuments Record. The coastal NMP project has also suggested that sites in Suffolk may be under represented in the National Monuments Record.

A NMP survey of the whole county would enable synthetic analysis of the county's archaeological landscapes on a number of levels. As the coast has already been completed the ability to analyse the rest of the county would bring added value to the data collected during the project by providing contextual and comparative data. With Essex NMP complete and Norfolk NMP under way, a countywide Suffolk NMP survey would complete the East Anglian region and enable an understanding and synthesis of the region's archaeological landscapes, contributing to regional research strategies. Such a project would enable the examination of the large clay band which stretches through the county addressing current research issues and traditional biases in aerial archaeology.

Whether countywide or landscape specific there would be numerous benefits of future aerial photographic survey in Suffolk. East Anglia has the highest level of arable cultivation in the country and sites are constantly under threat whether they are already levelled or at the agricultural margins. Any project would increase our knowledge of the county's archaeology enabling both Suffolk County Council and English Heritage to assess conservation priorities. Any large project should involve working in partnership with Suffolk County Council and other local agencies, such as the Suffolk Coasts and Heaths AONB. There would also be potential for community outreach activities. Any project would raise the profile of the partner organisations with both the general public and with the relevant local bodies. The survey could be organised to integrate ongoing



English Heritage reconnaissance and Suffolk County Council field survey and to incorporate results of previous fieldwalking and excavation.

### **13.2 Aerial reconnaissance**

A continuing reconnaissance programme is essential to build on the coastal NMP survey results and the reconnaissance undertaken during the project.

As conditions for aerial photography and cropmark formation vary greatly, a systematic reconnaissance programme should maximise the potential for the discovery of new archaeological sites from the air. Reconnaissance on the Sandlings during the NMP project has shown that new sites, and new detail for known sites, can be discovered even in areas that have been subject to intensive reconnaissance in the past. If future NMP surveys were to examine the clay areas of the county, carefully timed reconnaissance would be necessary. Though clay is traditionally thought to be unresponsive to cropmark formation, photographs taken in Bedfordshire in 1996 show that impressive results can be obtained given the right weather conditions (Mills 2003, 15).

The inter-tidal zone needs repeated reconnaissance due to the rapidly changing nature of the environment, as has been discussed in previous sections of this report (see sections 3 and 4). Though results from reconnaissance in these areas so far has differed from expectations there remains the potential for discovering new sites, due to the pattern of shifting silts and the steady erosion of the saltmarsh in many areas.

The ability to carry out reconnaissance in response to specific conditions may become even more important as future changes to European agricultural policy may see a reduction in subsidies for sugar beet, thereby shortening the cropmark season (D. Grady, pers comm). A continuation of the crop diversification, seen particularly over the Sandlings in the past 10 years, may see an increase in crops such as turf, at the expense of cereals in which cropmarks are more likely to form (D. Grady, pers comm).

Reconnaissance planned to address more specific problems could also be of benefit in the future. It could address any remaining geographical gaps in the NMR photographic collections, identified during the coastal NMP project. The combination of two reconnaissance flights and a number of site visits by the Suffolk County Council field team have already demonstrated the potential for the discovery of traces of a Roman salt production industry in the county, or Red Hills as they are commonly known (see section 9.2.4). Reconnaissance could also be targeted to investigate sites known from fieldwork such as excavation and field walking (see J. Newman, pers comm in following section).

### 13.3 Further work with the coastal survey data

A number of research themes and suggestions for specific pieces of work have emerged from the survey, some involving other survey methods or investigation techniques.

A number of specific sites that were recorded during the project were felt to warrant further work. Some of the most important were thought to include the possible longhouse within Freston causewayed enclosure (see section 6), the possible Roman villa enclosure at Wherstead (see section 9.2.3), the pit circle at Boyton (see section 6) and the sunken featured buildings at Covehithe (see section 10.4.2). All these sites are potentially of regional importance and all have been under arable cultivation for a number of years. Small-scale excavation seems appropriate to characterise these features in order to ascertain whether intensive ploughing has removed all archaeological evidence but that held in the bases of the ditches. The importance of the Freston structure has been discussed in previous sections (6 and 10.4.2) but the sunken featured buildings in Covehithe also merit rapid attention as these may fall into the sea in the next 70 years (Loader unpublished). Further work is already planned on the possible Anglo-Saxon fish trap in Holbrook Bay (see section 10.4.1).

Our understanding of the wider coastal landscape also needs to be addressed as work focused on specific sites may fail to add significantly to our understanding of more general aspects of the historic coast. In the case of the pre-medieval landscapes, visible in the project area as ditched field systems and enclosures, field walking programmes may be the most productive way to try and understand the date and function of elements of these landscapes. Excavation may have limited success especially if the excavators are reliant on dating material from the ditches where the historic land surfaces have been destroyed by the plough. The field system at Shotley (section 8.2.3), with its clear definitions of space, may benefit from a systematic field walking programme. The examination of enclosures within the field systems with a variety of integrated techniques may also be useful.

A number of ways of integrating the NMP survey data with other forms of archaeological work have been suggested. One suggestion has been to target Anglo-Saxon sites known from field walking with aerial reconnaissance and aerial photographic survey (J. Newman, pers comm). Another has been to use comparisons with excavated Anglo-Saxon sites to enable morphological differentiation of cropmark sites where possible (J. Newman, pers comm). Further aerial reconnaissance and field visits to Red Hill salt production sites will also create a body of data that can be used to predict the location of Red Hills and improve our understanding of what now appears to be a mini industry. How the red hills relate to secondary processing sites where briquetage has been found, and how these might be tied into settlement evidence in form of cropmarks, may also be

an interesting topic of research. In order to increase the value of the NMP survey data it would be useful to try and relate the NMP results to existing data sets and issues such as how the possible prehistoric sites relate to the corpus of flint evidence from the county could be examined.

There are also categories of sites that could be addressed by site visits and documentary research in order to provide a better understanding of the NMP data. The data on the Second World War defences is a prime candidate, as has been demonstrated in a recent article (Newsome 2003). There is huge potential for checking for the existence of remains on the ground of many of the coastal defences and for the relating of the NMP evidence to military records and plans. With this aspect of the project there is also great potential for local community involvement in the form of oral history projects and exhibitions.

Though Ivan Ringwood's documentary research on the coast has been valuable, certain aspects of the medieval and post-medieval landscapes appear to warrant a wider programme of documentary research. In particular there is need for further work on the vast numbers of oyster pits which have been recorded in many of the estuaries. There appears to be little published work on these types of sites and no established typologies or chronologies. These sites may benefit from further in-depth documentary research, possibly outside the region, and ground recording in order to put the vast amount of data recorded by the NMP survey into the context of the industry as a whole. Some areas of reclamation would almost certainly benefit from further documentary research on processes of enclosure and ownership so that it can be related to the aerial photographic evidence. The results of the Norfolk NMP survey will be of particular benefit when used in conjunction with the Suffolk Coastal NMP data, particular for aspects like the oyster pits where published comparative data is not available.

## 14 CONCLUSIONS

The Suffolk Coastal NMP project has been successful in increasing our understanding of the archaeology of the Suffolk coast and the factors that affect its discovery and survival. Nearly 1500 new records have been created in the county Sites and Monuments Record and over 300 existing records have been amended. The project has recorded new sites potentially from all periods from the Neolithic to the Second World War and has added new detail to many known sites. A number of major themes have emerged during the project, including the prehistoric and Roman landscapes, post-medieval drainage, fishing and transport and the military remains of the Second World War. In many cases the survey data has changed our perception or increased our understanding of particular aspects of the historic Suffolk coast.

The NMP survey has been complemented by the inter-tidal field survey, documentary research and a programme of aerial reconnaissance in the coastal zone and has again shown the benefits of an integrated approach to survey, not only in terms of the results of the surveys themselves, but also in terms of the valuable opportunity for archaeological surveyors using different techniques to share ideas and different perspectives on a particular landscape of common interest.

The coastal survey has, in particular, highlighted the potential of aerial survey in the county and what it can bring to areas which are both well and poorly understood. Future aerial survey projects should not only increase the value of the coastal survey data but also bring similar enhancements of our understanding of the importance and extent of archaeological resources in the county.

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## APPENDIX 1 PROJECT STAFF AND STEERING GROUP MEMBERS

### Project staff:

Cain Hegarty	Suffolk County Council	Project Officer
Abby Hunt	Suffolk County Council	Project Officer
Tom Loader	Suffolk County Council	Project Manager
Andy Miller	Suffolk County Council	Project Officer (Pilot areas)
Sarah Newsome	English Heritage/Suffolk County Council	Project Officer

Norfolk/Suffolk RCZAS steering group members (in addition to project staff listed above):

### Suffolk County Council:

Linzi Everett  
Jude Plouviez  
Keith Wade

### English Heritage:

Bob Bewley  
Tom Cromwell  
Simon Crutchley  
John Ette  
Peter Murphy  
Steve Trow  
Philip Walker  
Steve Waring  
Helen Winton

### Norfolk County Council:

James Albone  
Jan Allen  
Brian Ayres  
Jayne Bown  
Mark Brennand  
Henrietta Clare  
David Gurney  
Sarah Massey  
David Robertson  
Sophie Tremlett

### University of East Anglia:

Ivan Ringwood  
Tom Williamson

## APPENDIX 2 NATIONAL MAPPING PROGRAMME METHODOLOGY

### **Archaeological scope of the survey**

All archaeological features have been recorded, both plough-levelled and upstanding remains, with a potential date range from the Neolithic period to the twentieth century, including industrial and military features. Sites appearing on the Ordnance Survey base map which have not been photographed, or which are completely obscured by vegetation, have not been recorded, but have been discussed where they may relate to visible archaeological remains.

### *Plough-levelled features and earthworks*

All cropmarks and soilmarks which represent buried cut features (i.e. ditches and pits), earthworks or stonework of archaeological origin have been recorded. All earthwork sites visible on aerial photographs have been recorded, whether or not they have been previously surveyed (including those marked on the Ordnance Survey maps), and whether or not they are still extant on the most recent photography. The accompanying Sites and Monument Record database record will specify which elements of any particular group of earthworks survive or have been levelled and/or destroyed.

### *Ridge and furrow and water meadows*

Areas of ridge and furrow have been recorded using a standard convention to indicate the extent and direction of the furrows. Areas of extensive water meadows thought to pre-date 1945 have also been transcribed and recorded.

### *Buildings*

Foundations of buildings which appear as earthworks or exposed stonework have been recorded. Cropmarks and soilmarks representing earthworks or buried foundations have also been recorded. Standing buildings which have been destroyed have been recorded when there is no other adequate record.

### *Industrial and 20th-century military archaeology*

Areas of industrial archaeology have been recorded using the appropriate conventions where they can be recognised as pre-dating 1945. Extraction sites have been mapped if their inclusion was thought to enhance the record.

20<sup>th</sup>-century military features have been recorded to an appropriate level of detail. The major buildings and structures within military complexes, as well as isolated military structures, e.g. buildings associated with searchlight batteries, pillboxes or anti-invasion obstructions have been mapped.

#### *Field boundaries and geological marks*

Removed field boundaries have not been routinely recorded unless they are extensive and could be confused with the remains of earlier field systems or are not recorded on historic Ordnance Survey maps, in which case their presence and extent has been noted in a monument record.

Geological features visible on aerial photographs have been plotted only if their presence helps to define the limits of an archaeological site. If the marks could be confused with archaeology then they may be noted in the SMR database monument record.

### **Sources**

#### *Aerial Photographs*

Oblique and vertical photographs have been consulted where available.

#### 1. National Monuments Record (NMR) vertical and oblique collections:

NMR Enquiry and Research Services  
English Heritage  
National Monuments Record  
Kemble Drive  
Swindon  
SN2 2GZ  
01793 414700

#### 2. Unit for Landscape Modelling (formerly Cambridge University Committee for Air Photography (CUCAP) vertical and oblique collections:

University of Cambridge  
Unit for Landscape Modelling  
Sir William Hardy Building  
Tennis Court Road  
Cambridge CB2 1QB  
01223 764377



3. Suffolk County Council Sites and Monuments Record (SMR) oblique collection:

Suffolk County Council Archaeological Service  
Shire Hall  
Bury St. Edmunds  
IP33 2AR  
01284 352445

4. Additional sources: Environment Agency vertical collection:

Eastern Area  
Environment Agency  
Cobham Road  
Ipswich  
Suffolk  
IP3 9JE

*Documentary sources*

1. Suffolk Sites and Monuments Record

The relevant Monument and Event records from the SMR have been used as an aid to interpretation.

2. National Monuments Record (NMR)

The relevant Monument and Event (including Excavation Index and maritime records) records from AMIE have also been used as an aid to interpretation.

3. Historic maps.

These included Ordnance Survey first and second edition 25" maps from the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. The 1955/6 edition Ordnance Survey Archaeology Division 1:10,560 field sheets (the precursors to the current NMR record maps) have also been consulted and have proved valuable in identifying removed field boundaries and structures. These have been supplemented by a large number of historic maps dating from the 17<sup>th</sup> to the 19<sup>th</sup> century, which have been catalogued, by Ivan

Ringwood, a researcher under the supervision of Dr Tom Williamson, at the Centre of East Anglian Studies at the University of East Anglia, Norwich.

#### 4. Source material for modern military sites.

These sources included the results of two recent major projects, the Defence of Britain Project, administered by the Council for British Archaeology (CBA), and the *Twentieth century fortifications in England* report series by Colin Dobinson, commissioned by English Heritage from the CBA. The *Twentieth century fortifications in England* report series is unpublished but available for research at the NMR library.

Council for British Archaeology

Bowes Morrell House

111 Walmgate

York

YO1 9WA

01904 671417

<http://www.britarch.ac.uk/projects/dob/index.html>

## **Methodology**

### *Digital Transcription*

#### Rectification of photographs

The photographs were scanned and rectified using the AERIAL5 Photograph Rectification programme designed by John Haigh at the University of Bradford. Control information taken from digital copies of Ordnance Survey 1:2500 scale maps for terrestrial areas will be within a level of accuracy of +/- 3m. Where necessary, digital terrain models were created from the Ordnance Survey 5m-interval contours to compensate for height distortion across the control points.

Difficulties exist in obtaining suitable control points for transcription in the inter-tidal zone. Sufficient control for features within the saltmarsh can often be obtained from the outline of main channels and creeks in the inter-tidal zone or the line of the sea walls as depicted on the OS base map. For sites photographed in featureless areas of inter-tidal mud-flat, liaison with field survey teams may currently present the only viable solution for accurate location.

The archaeological features on the rectified images were digitised in MapInfo GIS using the appropriate NMP conventions (see p. x). The control points and mapped detail are accurate to the base map within 2m. Archaeological features are depicted according to the form of remains e.g. banks, ditches, stonework etc. The features transcribed from the photographs should be within 5m of true ground position.

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### *Database Records*

#### 1. Sites and Monuments Record

Monument records have been created for each site mapped in a copy of the Suffolk County Council SMR, using the ExeGesIS HBSMR software. Each record is linked by a unique identifier reference number to a MapInfo monument polygon, defining the geographical extent of the record. The main elements of the monument record comprise location, indexed interpretation, textual description and main sources, including the aerial photographs which best illustrate the site.

#### 2. Aerial Survey Records

Morphological records have been created for the appropriate sites using the Interim Morphological Recording Module.

### *Storage of data and archiving*

The graphical record consists of the digital files created in MapInfo. A paper copy of each 1:10,000 sheet will be produced for the NMR archive. All other materials selected for archiving will be archived according to English Heritage guidelines.

The copyright for all transcriptions, digital files and accompanying records (paper and digital) is jointly held by English Heritage and Suffolk County Council.

### *Access to data*

All NMP project data will be integrated into the main Suffolk County Council SMR database held in Bury St Edmunds, and into the NMR database (AMIE) held at the National Monuments Record in Swindon, and will therefore be available for public access.

### **Project statistics**

During the project 1465 new records have been added to the SMR. This equates to approximately a 7% increase on the total number of records in the SMR. 306 existing records have been amended.

The number of new records can be broken down into broad period ranges as follows:

Prehistoric and Roman	13.4%
Post-Roman	0.3%
Medieval and Post-medieval	20.5%
Modern	65.8%

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