PART 1: INTRODUCTION AND BACKGROUND

Chapter 1: Introduction

The A13 Thames Gateway DBFO Roadscheme (Fig. 1.1)

The A13 Thames Gateway DBFO (Design, Build, Finance and Operate) Roadscheme refers to a series of improvements along a 20km stretch of the A13 trunk road through the East London Boroughs of Tower Hamlets, Newham and Barking and Dagenham (Fig. 1.1). The £146 million project was approved as part of the Accelerated Review of the trunk road programme in 1997 and provides a vital link in the east-west transport infrastructure to assist regeneration in East London. The route is of major importance to industry located along the A13 and provides heavy goods vehicle links from Docklands and the Lower Lea Valley to the M25 and Tilbury Docks.

The A13 DBFO contract was awarded to Road Management Services (A13) plc (RMS) by the Highways Agency in April 2000. The contract was novated from the Highways Agency to Transport for London (TfL) under the terms of the Greater London Authority (GLA) Act in July 2000. As part of the 30 year DBFO contract RMS was required to undertake a series of improvements at key junctions or route sections. This included carriageway widening and an additional flyover at the Ironbridge to Canning Town section (CT), new underpasses and slip roads at the Prince Regent Lane junction (PRL), replacement of an existing flyover and carriageway widening at the Woolwich Manor Way junction (WMW), improvement of the Old Roding Bridge (RB) and a new underpass at the Movers Lane junction (ML). The DBFO contract made provision for a programme of archaeological works to be undertaken in advance of, and during, construction works.

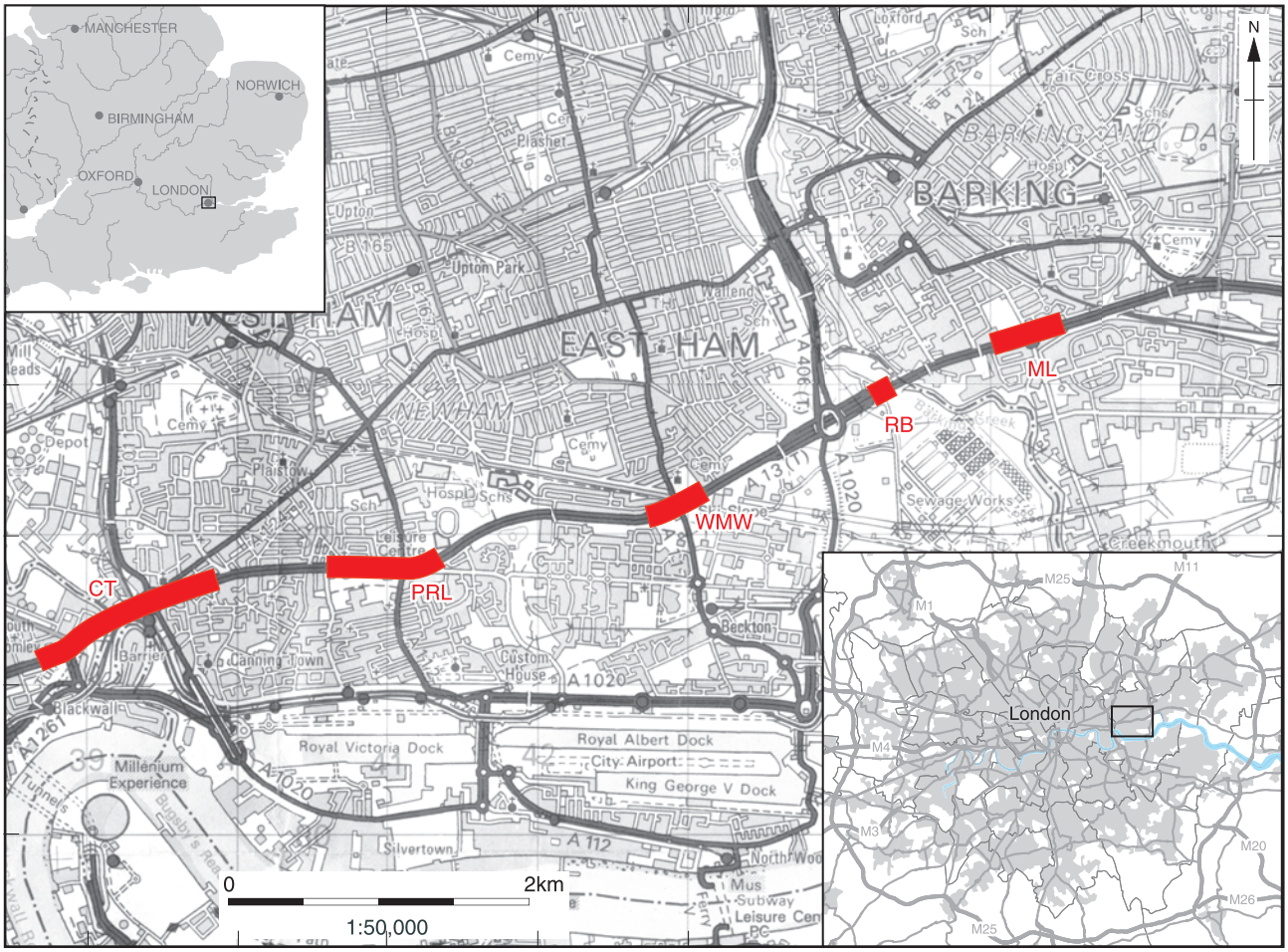

Fig. 1.1 Site location

Table 1.1 Summary of phased archaeological investigations

Route section		*Phase I evaluation*	*Phase II evaluation*	*Phase III excavation*	*Phase III WB*
CT	A13 Ironbridge-Canning Town	•			•
PRL	A13/A112 Prince Regent Lane	•	•	•	•
WMW	A13/A117 Woolwich Manor Way	•	•	•	•
RB	A13 Old Roding Bridge	•			
ML	A13 Movers Lane	•	•	•	•

The route of the A13 at this location runs parallel to the River Thames, traversing the very edge of the Thames gravel terraces and alluvial floodplain. Previous archaeological work has shown the Thames gravel terraces to be one of the most intensively occupied regions of southern England during the prehistoric period and locations on or adjacent to the terrace edge have high potential for preserving waterlogged organic remains, such as timber structures. Three phases of archaeological fieldwork were undertaken between 2000 and 2003 to evaluate and mitigate the impact of the road improvements on potential archaeological sites. Evaluation Phases I and II comprised a series of boreholes, test pits and trenches at five locations and Phase III a series of targeted excavations at three of the five sites, followed by watching briefs during construction work (Table 1.1).

Although not prolific in cultural material, the archaeology recorded covers a wide chronological range representing intermittent activity spanning the Mesolithic through to the post-Roman period. Regionally important evidence of early Neolithic agriculture was recovered during evaluation of the Woolwich Manor Way site, that was subsequently preserved *in situ.* The greatest concentration of activity, however, dates to 2nd millennium BC and includes several waterlogged timber structures and trackways with associated wetland edge occupation. Extensive geoarchaeological and palaeoenvironmental sampling carried out during the lifetime of the project provides an important record of landscape evolution and periods of major change can be detected, both natural and anthropogenically induced. As well as providing a context for the archaeology along the A13, this raises a number of issues regarding the interaction of local communities with the natural environment; how they responded to change and to a certain extent exploited it. Ultimately this is of relevance not only to understanding the past, but also to current concerns regarding environmental management along the Thames estuary today.

Archaeological project history

Due to the long-running and complex nature of the construction project, the A13 archaeological programme saw an unusually complex interaction between project sponsor, construction contractor and the various archaeological consultants and contractors. The responsibilities of the various parties are explained below.

The archaeological advisor to the Departments' Agent team (representing the Project Sponsor, TfL) was Oxford Archaeology (OA), who were responsible for supervising the tendering process and monitoring the Principal Contractor for compliance with the terms of the DBFO contract. OA were represented by George Lambrick during the tender evaluation phase, Tim Allen during the Preliminary Design, Phase I and Phase II evaluation, and Stuart Foreman during the Phase III Further Archaeological Works and post-excavation phases. External monitoring during the fieldwork, on behalf of the local authorities, was undertaken by Nicholas Truckle of English Heritage Greater London Archaeological Advisory Service (GLAAS), assisted by Dr Jane Sidell (English Heritage regional scientific advisor). Christopher Place, acting on behalf of Chris Blandford Associates, was appointed Project Archaeologist by RMG/RMS in July 2000. He prepared designs for the Phase I and II evaluations and the watching briefs, with detailed input from the main archaeological contractor, Ken Whittaker of Gifford and Partners. Dr Martin Bates, as subconsultant to Gifford and Partners, provided specialist geoarchaeological advice in formulating the schemewide research strategy. Paul Falcini of Wessex Archaeology took over as Project Archaeologist in June 2001 and produced the Phase III Further Archaeological Works designs.

All Phase I and Phase II archaeological works were undertaken by Gifford and Partners (GP), under the direction of Ken Whittaker (latterly replaced by Simon Blatherwick). Pre-Construct Archaeology (PCA) were employed by Gifford and Partners as fieldwork sub-contractor. Phase III further archaeological works, including preparation of assessment reports, were split between Gifford and Partners and Wessex Archaeology for contractual reasons, the former working on Prince Regent Lane and Woolwich Manor Way, the latter on Movers Lane.

For the purpose of this project, the DBFO contractors' responsibilities for analysis and reporting were discharged on completion of the post-excavation assessment phase for the individual sites. The scheme-wide post-excavation project design was prepared by Stuart Foreman and Elizabeth Stafford of Oxford Archaeology who co-

ordinated post-excavation specialist analyses and publication, reporting directly on behalf of the funding body, TfL.

Structure of this volume

This volume is divided into three parts. Part I (chapters 1 and 2) summarises the history and aims of the project and provides a general background to contextualise the archaeological discoveries found along the route. It also includes detail of the strategies and methodologies employed during the fieldwork, assessment and specialist analytical stages. Part II (chapters 3-7) focuses on the key sites. Each site is presented as a separate chapter and includes a description of the sediment sequences and associated palaeoecological evidence, followed by a period-based description of the cultural evidence. The description of the cultural evidence primarily focuses on the structural remains, both cut features and timber structures, but also integrates the artefactual evidence where appropriate. The date ranges of the periods used in this volume are presented in Table 1.2. Part III of the volume comprises a series of thematic discussions that summarise the routewide evidence within the wider regional context. Full details of the scientific dating programme, together with detailed specialist reports for both artefactual and palaeoenvironmental remains are included in the appendices.

Table 1.2 Chronology of the archaeological periods referenced in this volume

Period	*Date Range*
Modern	AD 1800 - Present
Post-medieval	AD 1500 - 1799
Medieval	AD 1066 - 1499
Late Saxon	AD 850 - 1066
Mid Saxon	AD 650- 850
Early Saxon	AD 410 - 650
Late Roman	AD 250 - 410
Mid Roman	AD 150 - 250
Early Roman	AD 43 - 150
Late Iron Age	43 BC- AD 100
Middle Iron Age	400 - 100 BC
Early Iron Age	700 - 400 BC
Late Bronze Age	1100 - 700 BC
Middle Bronze Age	1500 - 1100 BC
Early Bronze Age	2400 - 1500 BC
Later Neolithic	3000 - 2400 BC
Earlier Neolithic	4000 - 3000 BC
Mesolithic	8500 - 4000 BC
Early Post-Glacial	10000 - 8500 BC
Late Glacial (Late Upper Palaeolithic)	12,000 - 10,000 BP
Upper Palaeolithic	30,000 - 10,000 BP
Middle Palaeolithic	150,000 - 30,000 BP
Lower Palaeolithic	500,000 - 150,000 BP

Geology, topography and recent land-use
(Figs 1.2 and 1.3)

Greater London lies in the centre of the London Basin, an area bounded by the exposed Cretaceous chalk of the Chiltern Hills to the north and north-west, the Berkshire Downs to the west and the North Downs to the south-west and south (Fig. 1.2). To the east the Thames Basin opens onto the North Sea (Sumbler 1996). The chalk extends beneath the entire basin and is overlain by Palaeocene and Eocene deposits. The Palaeocene deposits consist of Thanet Sand and the Lambeth Group (Upnor, Reading and Woolwich Formations) laid down around 60 million years ago. The Eocene deposits consist of London Clay laid down 55 million years ago, in places capped by the Claygate Member and Bagshot Formation (British Geological Survey sheet 257).

Superficial drift deposits occur throughout the central part of Greater London along the course of the River Thames and its tributaries (Fig. 1.3). These deposits are all Quaternary in origin; predominately formed by fluvial or fluvial-glacial action with some periglacial deposits. Boulder clay or till of glacial origin is almost absent from the London area although localised deposits of the Lowestoft Till occur at Chigwell and Havering to the north-east and Finchley Common, Belmont and Chase Side to the west. The most extensive drift deposits are found in West London where gravels relating to a number of phases of river downcutting and terrace formation underlie most of Hammersmith to Slough and Egham. Other substantial deposits occur in the Lea Valley and to the north-east at Tower Hamlets to Havering. The terrace gravels are variably capped by expanses of Langley Silts ('brickearths') which are especially extensive and deep in the areas to the west of London. The youngest of the terrace gravels in the valley bottoms are capped by Holocene (*c* 10,000 years to present) alluvial deposits, which occur along river margins. In Central and East London these deposits are extensive from Westminster downstream, with significant deposits in the Thames, Lea, Roding, Darent and Mar Dyke valleys.

The A13 Thames Gateway route begins on the low-lying floodplain, to the north-east of the Isle of Dogs peninsular, in the London Borough of Tower Hamlets. At this point it is in the valley of the River Lea, a tributary of the Thames. From here the route extends eastwards across the London Borough of Newham, running parallel with the edge of the gravel terraces and floodplain. Exceptions to this are where the route crosses the River Roding into the London Borough of Barking and Dagenham. Recent landuse along the route predominantly comprises urban and industrial areas and in places

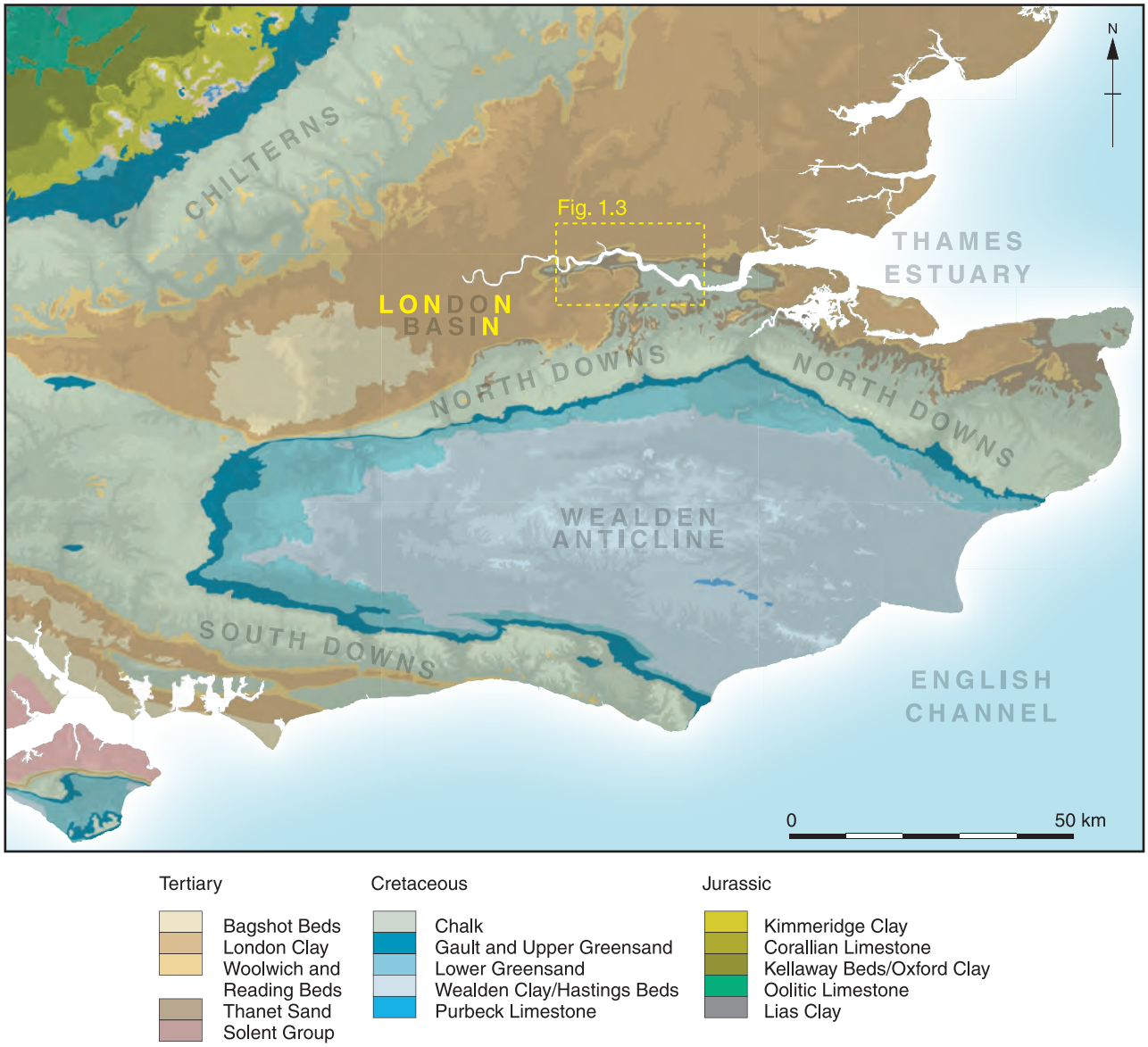

Fig. 1.2 Solid geology and topography of south-east England

a significant thickness of modern deposits mask the underlying Holocene alluvial sediments and the natural topography of the terrace gravels.

Geoarchaeological and environmental background (Fig. 1.4)

In order to understand fully the character and distribution of archaeological sites in the lower estuary area and the reasons behind major changes in settlement patterns in the past it is necessary to understand the changing nature of the estuary. The geological history of the Thames is complex. Today the estuary is characterised as "tide-dominated" (*sensu* Dalrymple *et al.* 1992) in which major sandbars occur within the outer estuary area, a marine-dominated zone, and tidal meanders in an inner mixed energy zone (Fig. 1.4, Bates and Stafford forthcoming; Bates and Whittaker 2004).

The recent geomorphologic development of the area and the establishment of the modern topography have resulted from major drainage pattern modifications during the Quaternary. The Pleistocene deposits of the Lower Thames have been extensively studied (Gibbard 1985; Bridgland 1994; 1995; Bridgland *et al.* 1995). Deposition in the Thames Valley began in the late Anglian stage (*c* 500,000 BP) and continued intermittently throughout the Pleistocene. Sediments, deposited in cold climate braided stream systems, exist as wedges of sand and gravel on the valley sides, subsequently eroded by fluvial incision during periods of lowered sea level to create terraces. The most recent episodes of gravel deposition formed the Shepperton Gravels in the valley bottom. Despite extensive research on the Pleistocene deposits however, considerable controversy exists regarding the age of some of the older aggradational units and their

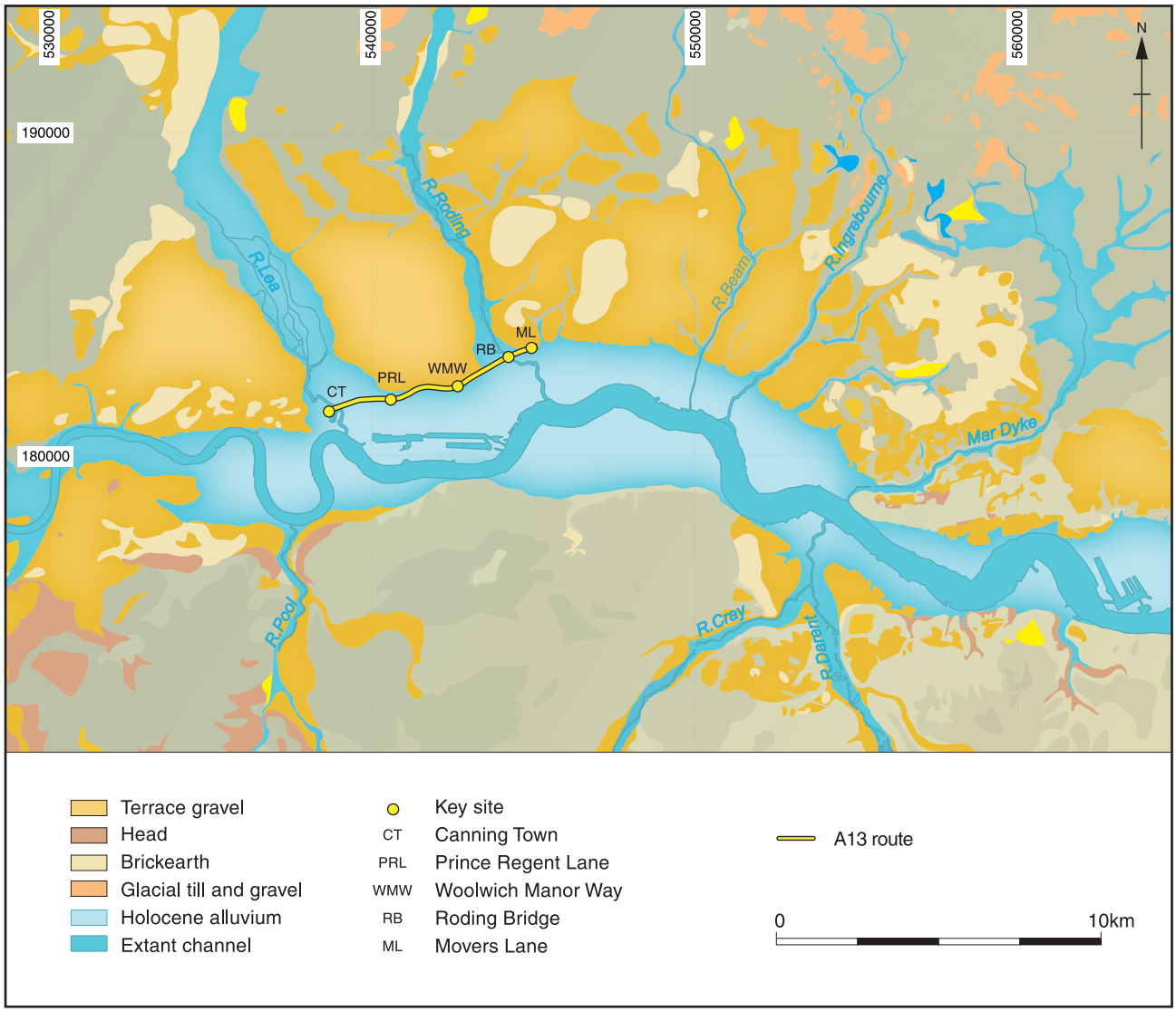

Fig. 1.3 Quaternary geology of East London

correlation with the global oxygen isotope stratigraphy (Gibbard 1994; Bridgland 1994).

The surface of the valley bottom gravels formed the 'template' over which alluvial and estuarine sediments were later deposited, during the Holocene. The landscape during this period saw a number of changes, largely attributed to a rise in sea level caused by the continued shrinking of the polar ice caps and tectonic subsidence. The Holocene sediments form a wedge thickening downstream, from less than 2m at Tower Bridge to a maximum thickness of 35m east of the study area at Canvey Island (Marsland 1986). Within the inner estuary, Holocene sediments consist of complex sequences of minerogenic and organic clay, silts, sands and peats, deposited in a variety of environments representing variously: freshwater alder carr, fen, reedswamp, intertidal saltmarsh and mudflats.

In contrast to the relatively well known sequences of the Pleistocene, the nature of the Holocene sediments deposited during the last 12,000 years are not well understood and have, with few exceptions, only been described superficially. Over the years the most commonly adopted stratigraphic sequence for the Lower Thames has been based on work undertaken by Devoy (Devoy 1977; 1979; 1980 and 1982). Borehole stratigraphies were integrated with biostratigraphic studies to infer successive phases of marine transgressions (Thames I-V) represented by clay/silt units, and regressions (Tilbury I-V) represented by peat units. Devoy constructed two age-altitude curves of relative sea level movement, one for Tilbury (outer estuary) and one for Crossness, Dartford and Broadness (inner estuary). The model suggests transgressions occurred in the Palaeolithic to early Mesolithic periods, the late Mesolithic to early Neolithic periods, throughout the Bronze Age, the middle Iron Age and at the beginning of the 4th century AD.

The 'Thames-Tilbury' model is regarded as the seminal work in this area (Haggart 1995) and has been widely applied by researchers outside the

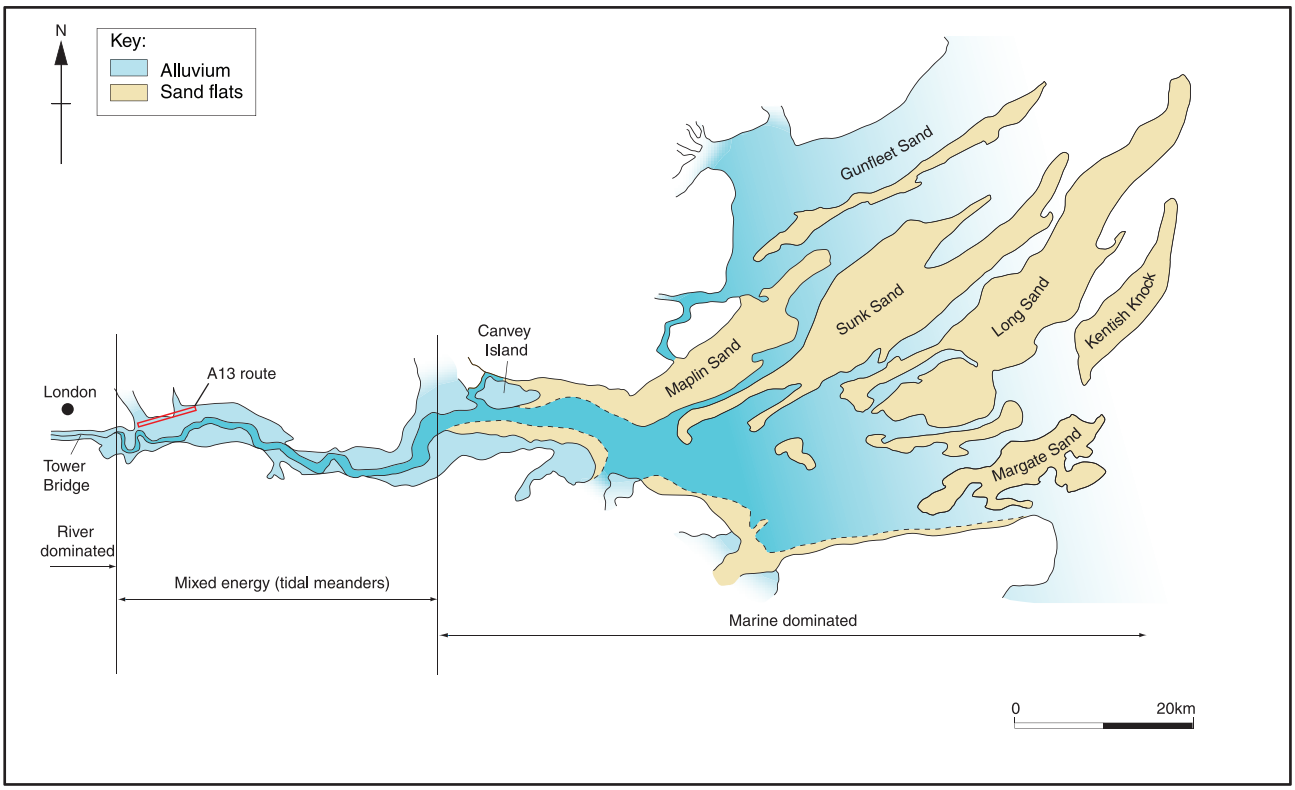

Fig. 1.4 Sub-division of the Thames Estuary and location of different estuary zones (after Bates and Whittaker 2004)

original study area. It should be noted, however, that more recent work (Bates 1999; Bates and Barham 1995; Bates and Stafford forthcoming; Haggart 1995; Sidell *et al.* 2000; Sidell *et al.* 2002; Sidell and Wilkinson 2004) has highlighted several problems, such as the need for two age/altitude curves, suggesting it cannot always be easily applied to the whole of the Thames Estuary, either in terms of lithology or age/altitude analysis. This reflects the complex nature of the floodplain environment during this period, consisting of peat forming communities, migrating channels and sand eyots (Sidell *et al.* 2000). More recently a simplified (tripartite) model for floodplain development has been presented by Long *et al.* (2000). A similar model was presented by Bates and Whittaker (2004) which examined the likely impact of these changes on human activity (Table 1.3). This latter cultural landscape model has been utilised and developed during the various stages of work on the A13 scheme in order to contextualize the archaeological remains discovered and provide a framework of investigation (Table 1.3).

Bates and Whittaker (2004) pointed out that one of the consequences of the Devoy model for archaeologists, and the use of pollen analysis to aid vegetation reconstruction and understand sea-level changes, has been a focus on the landscape at a regional scale. The nature and archaeological context of sites vary considerably across the landscape as a result of environmental as well as cultural factors (for example the location of tributaries, areas of local impeded drainage and the presence of local topographic features). Consequently the scale and focus of palaeoenvironmental reconstruction may require refinement for archaeological purposes. Over the last two decades a number of detailed site-specific investigations have been undertaken, many in association with developer-funded archaeological work (Fig. 8.2), for example the Jubilee Line Extension (Sidell *et al.*. 2000), High Speed 1, formerly known as the Channel Tunnel Rail Link (Bates and Stafford forthcoming), various sites in Southwark (Sidell *et al.* 2002) and excavations at Silvertown (Wilkinson *et al.* 2000; Crockett *et al.* 2002). Many of these investigations are located at floodplain-terrace edge and tributary locations and begin to address the complex range of factors responsible for sequence accumulation.

Archaeological background (Figs 1.5 and 1.6)

The low-lying areas of the Inner Thames Estuary have been shown to contain a varied archaeological resource dating to the prehistoric period. This includes surface middens, lithic concentrations representing flint procurement, knapping and hunting camps and other features such as wooden structures. It is only relatively recently, however, that the importance of wetland contexts has been fully recognised (Bates and Barham 1995; Meddens and Beasley 1990; Merriman 1992; Rackam 1994). This is most probably due to the problems of access

Table 1.3 Lower Thames Cultural landscape model (from Bates and Whittaker 2004)

Model Stage	*Time frame*	*Geological events*	*Dominant sediment type*	*Inferred environments*	*Associated archaeology*
1a	15-30ka B.P.	Reworking of the East Tilbury Marshes Gravel	Sands and gravels	Cold climate periglacial slopes with active solifluction and possible loess blow	Occasional activity associated with channel margins and sporadic finds across floodplain surface. Most finds reworked
		Downcutting		*Active erosion*	
1b	10-15ka B.P.	Deposition of the Shepperton Gravel	Sands and gravels	Braided channels	
2	8-10ka B.P.	Landscape stability	Some sand deposition in meandering channels, elsewhere weathering of late Devensian sediments to form soils	Development of woodlands and meandering channels on floodplain	Occasional activity associated with channel margins and sporadic finds across floodplain surface. Some reworked finds
3	5-8ka B.P.	Sea-level rise resulting in transgression of marine/estuarine conditions from outer estuary into inner estuary and progressive backing-up of lower reaches of freshwater channels	Fine grained silts, clays and sands	Expanded freshwater marshland systems resulting from back-up of lower reaches of river channels giving way to estuarine channels and saltmarsh systems	Occasional activity associated with channel margins and sporadic finds across floodplain surface. Occupation becoming focused on drier ground at margins of floodplain. Mixed *in situ* and reworked finds
4	3-5ka B.P.	Expansion of semi-terrestrial wetlands and marshes giving way to coastal marshlands during phase of apparent relative sea-level fall	Peats and organic silts with minerogenic sedimentation in channels	Alder carr wetlands with replacement brackish marshland towards end of phase	Extensive occupation of the dry ground at the margins of the floodplain as well as activity on remnant 'islands' of sand and gravel within the floodplain. Construction of wooden trackways at the edges of the marsh in places. *In situ* material probably common
5	3-1ka B.P.	Expansion of brackish water conditions due to rising relative sea level.	Fine grained silts, clays and sands	Estuarine channels and saltmarsh systems	Activity sporadically throughout the flood plain with evidence for resource gathering/hunting and watercraft and infrastructure. Eventual colonisation of floodplain with land reclamation
6	1ka B.P.+	Continued rise in relative sea level	None	Managed floodplains	Drainage systems, land reclamation, construction of tidal defences. Waterside structures.

within urban and floodplain areas where the deposits are often deeply buried in waterlogged conditions

The A13 lies at the foot of the latest terrace formed between 110,000 and 13,000 BP. The few Palaeolithic stone tools that have been found associated with the gravels are frequently tools that have been washed down from higher, earlier, terrace deposits (Wymer 1991; 1999; Merriman 1990; Gibbard 1994). Evidence is largely confined to isolated find spots which in the vicinity of the A13 include finds from the basal Mucking gravel at Upton Park, Forest Gate, Manor Park and Little Ilford (Wymer 1999, map 10).

During the Mesolithic period the climate gradually became warmer and as sea level rose Britain eventually became an island separated from mainland Europe. Temporary campsites or hunting sites have been excavated in the London region. The favoured locations for such sites are along the Thames itself and in tributary valleys such as the Colne and the Lea, with a particular emphasis on floodplain edges, high points within the valley floors, and areas adjacent to the main channels (see for example Lewis with Rackham 2011; Corcoran *et al.* 2011). The majority of archaeological remains recorded in the Greater London Sites and Monuments Register (GLSMR) consist of single finds of flint artefacts, although larger assemblages have also been recorded in low-lying areas to the west of the study area , for example Three Ways Wharf, Uxbridge and the B&Q site in Bermondsey. To the east of the City, Mesolithic finds are notably sparse. A few flint artefacts have been recovered from the Lower Lea Valley in Newham, including an assemblage from Stratford Market Depot, approximately 2km to the northeast of the A13/A1011 junction at Canning Town. Several axes and a disturbed knapping site have also been recorded close to the Hackney Brook some distance upstream (Lacaille 1961; Harding and Gibbard 1983). On the Thames floodplain, in Newham, a flint flake was recovered at Beckton Gasworks, approximately 1km southwest of the A13 junction with Woolwich Manor Way. Further to the east flint artefacts have been recovered along the terrace edge at Rainham and Wennington, between 7km and 10km east of the Movers Lane Junction.

The Neolithic period saw the beginnings of the spread of agriculture, which eventually led to a fundamental change both in the landscape of the Lower Thames valley and in the lifestyle of its inhabitants. Riverside occupation sites such as Runnymede to the west of London or in the east at Brookway, Rainham, have provided the earliest evidence of more permanent settlements with houses and domestic waste deposited in tree-throws, pits and middens, although the evidence does suggest that people were still relying very much on gathering local wild fruit, nuts and shellfish. To the west of Central London, however, higher areas overlooking the floodplain have been described as ritual or monumental landscapes (Merriman 1990, 22). Excavations have revealed surprisingly large numbers of monuments which include causewayed enclosures which have been interpreted as ritual meeting places, for example at Staines (Robertson-Mackay 1987), Eton Wick (Ford 1983; 1986) and Dorney (Allen *et al.* forthcoming). A series of cursus monuments have been located under the western edge of Heathrow Airport, including the so-called Stanwell cursus, an embanked avenue some 2.5 miles in length (Framework Archaeology 2006; 2010).

Low-lying late Mesolithic and Neolithic sites predominantly occur on stable terrestrial surfaces, formed on the top of late Pleistocene deposits or the 'topographic template'. These are typically sand bodies where well-developed palaeosols exist. The environment appears to have been one of closed mixed deciduous woodland on a stable floodplain, although there was variation in terms of species composition associated with changes in local topography and hydrology (for example at Erith: Seel 2000). The surface of the Shepperton gravels was, on the whole, accessible during the Mesolithic prior to flooding caused by marine transgression which began around 6000-7000 BP. Sea-level fluctuations and hydrological changes restricted later dry land activity to increasingly smaller areas of higher valley bottom terrain. In some areas, however, this surface remained accessible in the valley bottoms until the first millennium (Bates and Whittaker 2004). Excavations in East London by the Newham Museum Service and others (in particular the Thames Valley Archaeological Service (TVAS), Pre-Construct Archaeology (PCA) and Museum of London Archaeology (MoLA)) have produced some evidence for Neolithic occupation in this area, although generally sites are still quite rare. In the vicinity of the A13, a mixed flint assemblage associated with soil horizons containing burnt flint and pottery of Neolithic and Bronze Age date was identified at Royal Docks Community School, Custom House, approximately 500m to the south of the A13 Prince Regent Lane junction on the Thames floodplain (Holder 1998) (Fig 1.5, 1). At Fort Street, Silvertown, approximately 1.5km to the south of the A13 in the same area, a wooden trackway over marshy ground seems to have been constructed, anchored with posts driven vertically into the ground (Crockett *et al*. 2002) (Fig. 1.5, 2). To the north, in the Lea Valley finds include an axe hoard from Temple Mills, Stratford (Holgate 1988, 285) and single finds of flint axes at Manor Road and Stratford Market Depot, between 4.5km and 2km to the north-east of the A13/A1011 junction at Canning Town (MoLAS 2000). A number of finds have also been located to the east of the route, along the edge of the floodplain and gravel terrace at Rainham which include pits, flintwork and pottery at Brook Way Allotments and Bridge Road (ibid.).

During the Bronze Age there is firm evidence for the establishment of field systems that replaced or appeared amongst the earlier, and still relatively

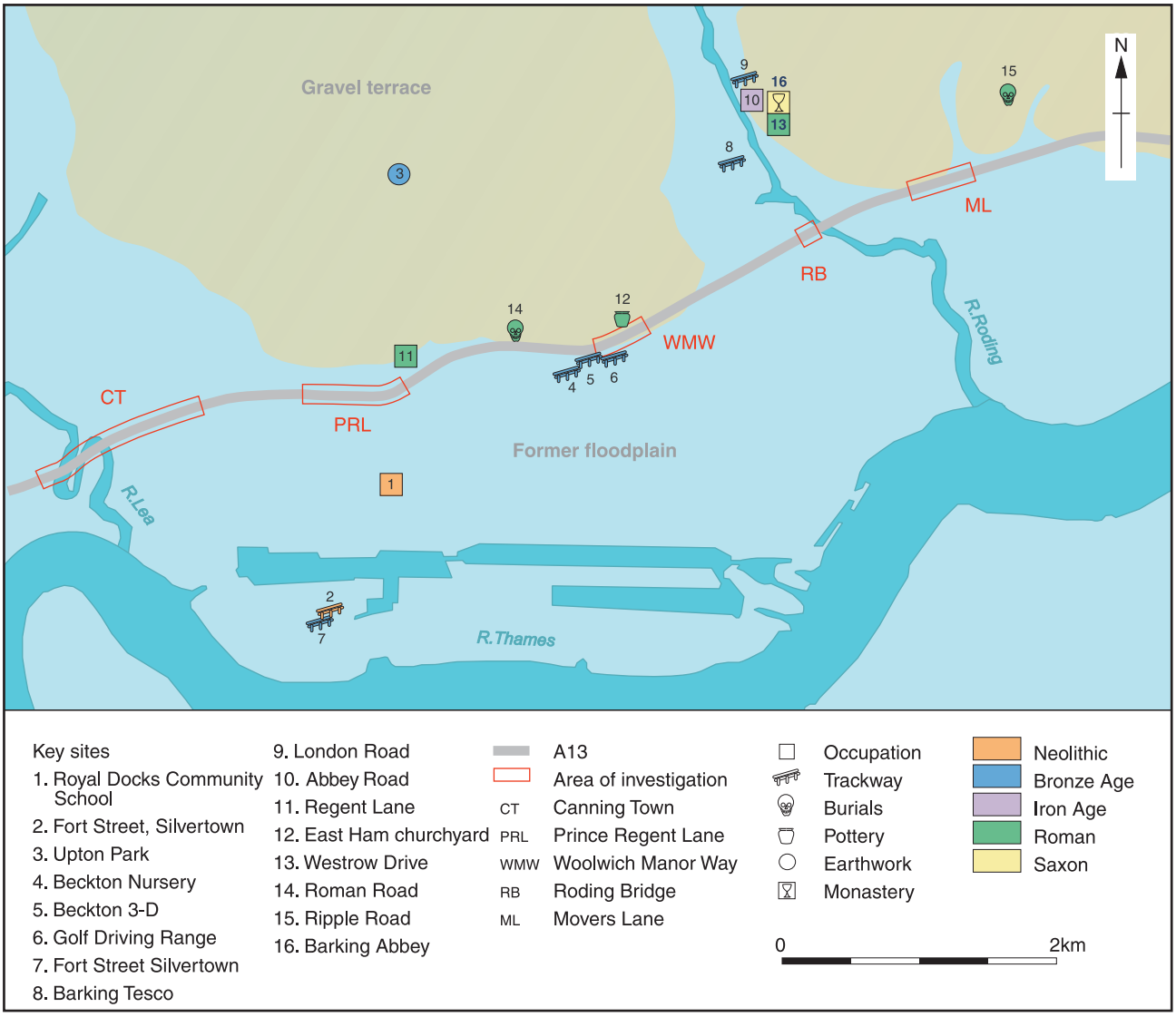

Fig. 1.5 Distribution of known archaeological sites in the vicinity of the A13

forested, landscape. Large excavations at Heathrow and further upstream at Eton have found the remains of ditches which marked the field boundaries (Framework Archaeology 2006 and 2010; Allen *et al.* forthcoming). More direct evidence of arable agriculture has been found at sites in north Southwark and Bermondsey, where a dense patchwork of marks in the subsoil have been interpreted as ard marks (Sidell *et al*. 2002, 35-7). There is also evidence of increasing wealth in the Bronze Age as the London area became a centre for production and consumption of bronze. It seems likely that society became more hierarchical and possibly more violent too, as a warrior aristocracy emerged who controlled land and competed for wealth and prestige. Late Bronze Age defended settlements, where metalworking and exchange were probably carried out, have been identified at Carshalton and at Mayfield Farm, near Heathrow although the date of the latter site remains open (J. Cotton pers. comm.). Evidence of religious practice comes from a few early Bronze Age burial mounds, such as that at Teddington and a number of middle Bronze Age cremation cemeteries found in West London (eg Barrett 1973). Few settlement sites have so far been located in East London. The majority of the evidence comes from the higher ground on the gravel terraces. Isolated pits and artefact assemblages have been found in the Lower Lea and Roding Valleys and in a ring ditch at Upton Park (Fig. 1.5, 3). At Rainham, a late Bronze Age ring work associated with buildings, field systems and cremation burials was excavated at Scott and Albyn's Farm, on the terrace overlooking the Ingrebourne River (Guttmann and Last 2000). Nearby and on lower lying ground on the flood-plain, evidence for animal husbandry was found in the form of a wattle enclosure fence and evidence of trampling by cattle in the sediments on the stone causeway (Meddens 1996). Further evidence of field systems has also been identified further up the Ingrebourne Valley at Hornchurch

Aerodrome and Hacton Lane, Upminster (MoLAS 2000; Howell *et al*. 2011).

A large quantity of late Bronze Age luxury metal work and some human remains have been found during dredging of the Thames: it would seem that the river was a focus for religious ritual and possibly cremation and inhumation burial towards the end of the Bronze Age (Merriman 1990; Rackham 1994). Of note are the finds of two socketed axes on the Barking marshes, some 700m south of the A13/A117 Woolwich Manor Way junction, adjacent to the River Roding (MoLAS 2000).

Recent work in East London has identified a number of trackways dating to this period, in which piles, brushwood, wattle hurdles and logs were used to build timber causeways over the wet marshland. In the vicinity of the A13 a series of wooden trackways have been located at Beckton Nursery (Fig. 1.5, 4) the Beckton 3D site (Fig. 1.5, 5) (Meddens 1996) and most recently the Golf Driving Range (Fig. 1.5, 6; Carew *et al.* 2010) between 350m and 150m south-west of the A13/A117 Woolwich Manor Way junction. Trackways have been identified in association with peat deposits at the edge of the terrace in the Roding Valley at the Barking Tesco and London Road sites, 0.5km and 1.5m north of the A13/A406 junction (Fig. 1.5, 8 and 9; Meddens 1996). Three kilometres to the east of Movers Lane, at the Hayes Storage site in Dagenham, a 'causeway' 4m wide and 0.27m deep constructed from pebbles, sandy silts and burnt flint was traced for 23m, sandwiched between peat deposits (Divers 1996). At Bridge Road, Rainham, a brushwood trackway was located on the bank of the Ingrebourne River (Meddens 1996). A number of other wooden structures have also been identified in Westminster and on the south bank of the Thames in Southwark and Bexley (Meddens and Beasley 1990; MoLAS 2000).

The gravel terraces of the Lower Thames are known to have been intensively settled in the Iron Age and Roman periods (Wilkinson 1988) with the development of London as a major provincial capital and the subsequent remodelling of the surrounding economies. The gravel terrace was still the focus for occupation and it is possible that the first elements of the marshland draining process may have begun at this time. Significant changes in this period include the growth of salt-making as an important activity along the estuarine and coastal margins (ibid.). Archaeological excavations have produced evidence of Iron Age agricultural hamlets and villages at sites such as Heathrow and Dawley in West London and Rainham in the east. Increasing numbers of defensive hillforts and settlements were built. Several are known in East London, such as Loughton Camp and Ambresbury Banks in Epping Forest and the later very large univallate enclosure at Uphall Camp on the River Roding in Ilford. The Thames during this period continued as an important transport route and a setting for ritual activities (Merriman 1990; Rackham 1994). Evidence for Iron Age occupation at the terrace edge and on the floodplain in east London is currently sparse. However, Iron Age settlement has been recorded at Abbey Road, Barking (Fig. 1.5; 10) and across the river at the Woolwich Arsenal site.

The Roman city of *Londinium* was founded soon after the Roman invasion under Emperor Claudius in AD 43; a wooden drain by the side of the main Roman road at No. 1 Poultry was dated by dendrochronology to AD 47 (Hill and Rowsome 2011). The land east of *Londinium* is crossed by several roads, including the main Roman road to Colchester (*Camulodunum*) (Brown 2008). These roads probably crossed the tributary rivers of the Thames on the higher gravels to the north of the study area. East of the River Lea, the London to Colchester highway probably follows the line of the Romford Road in Stratford where a section, assumed to be Roman by virtue of its position directly above natural gravels, was observed in 1963 in front of the Passmore Edwards Museum. Settlement evidence is associated with roads and river crossings as at Old Ford on the River Lea, 2.5km north of the A13. The area was probably agricultural land occupied by small settlements, farmsteads or villas exploiting the fertile soils of the gravels and managing the timber resource. A Roman farmstead was identified approximately 400m north-east of the A13/A112 Prince Regent Lane junction (Fig. 1.5, 11) and a pottery assemblage and building debris was also recovered from East Ham churchyard approximately 100m north of A13/A117 Woolwich Manor Way junction (Fig. 1.5, 12). Settlement evidence has also been recorded at Westrow Drive, approximately 1.4km north-west of Movers Lane (Fig. 1.5, 13) and at a number of other sites on the terraces to the east (Howell *et al*. 2011). On the gravel terraces to the east around Rainham numerous Roman period settlement sites have been excavated; these include field systems, ditched enclosures and farmsteads from sites such as Moor Hall Farm, Hunt's Hill Farm, Whitehall Wood and Manor Farm (ibid.). Roman burial sites have been found at Roman Road, East Ham, approximately 150m north of the A13, between Prince Regent Lane and Woolwich Manor Way (Fig. 1.5, 14) and at Ripple Road, approximately 1km north-east of Movers Lane (Fig. 1.5, 15).

As the city of London regained importance towards the end of the Anglo-Saxon period, the recognisable pattern and place-names of the surrounding villages began to form. The origins of East Ham and West Ham, Plaistow and Beckton probably date to this period. Much of the floodplain of East London was by now marshland as a result of the continued relative rise of the Thames. Barking and Dagenham both appear to have developed as local centres during the Anglo-Saxon period. Dagenham is first mentioned in AD 690 and an abbey of Benedictine nuns was founded at Barking in AD 666. The remains of the abbey buildings, scheduled as an ancient monument, are located

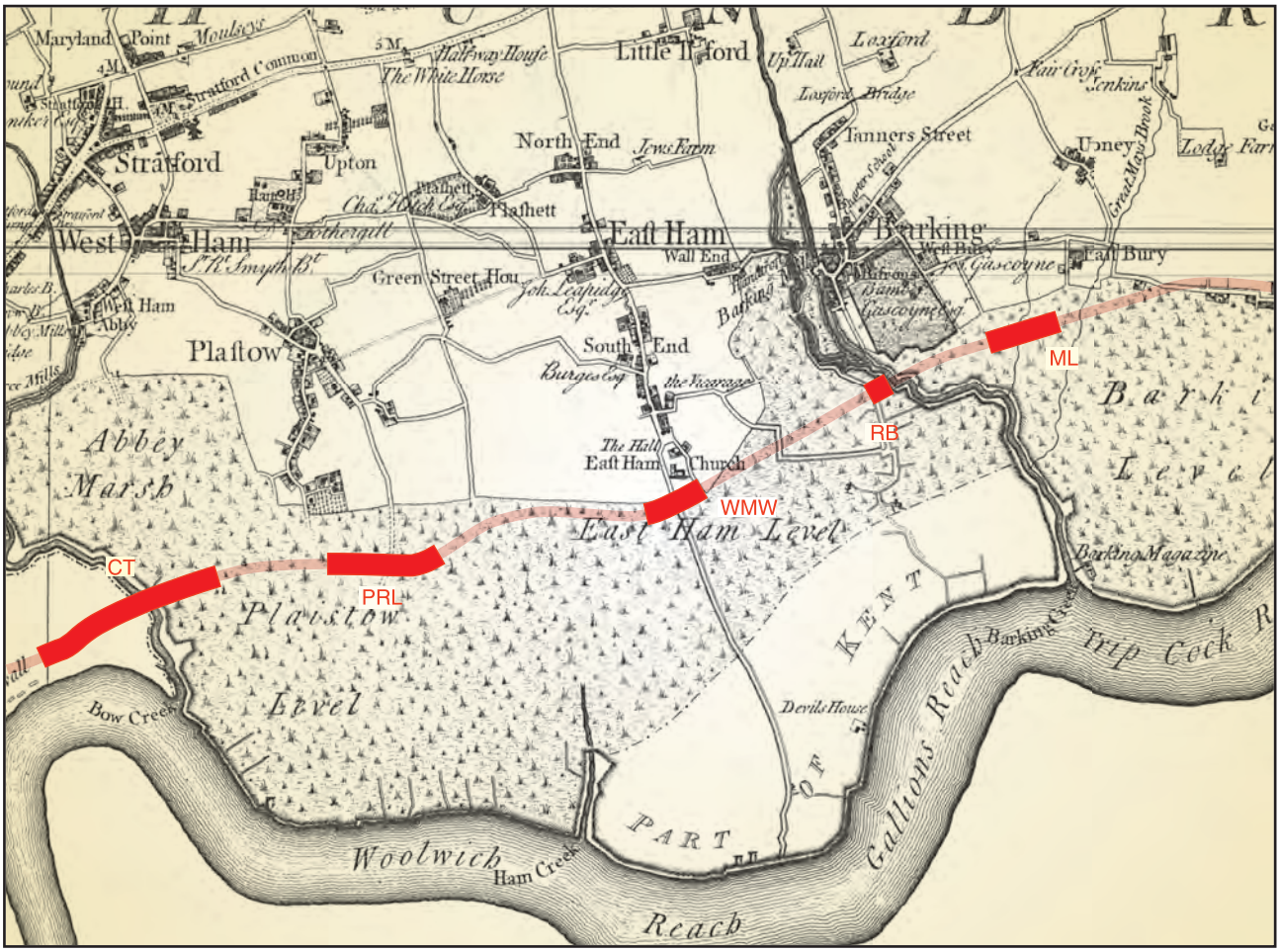

Fig. 1.6 Chapman and Andre's map (1777)

approximately 1km north of the A13 on the east bank of the River Roding (Fig. 1.5, 16). A recent evaluation in Rainham on the lower edge of the gravel terrace overlooking the River Ingrebourne, 500m north of the A13/Dovers Corner junction, revealed regionally important late Roman (AD 360-410) and early Saxon (AD 410-550) pottery, field ditches and a well (MoLAS 2000).

A number of medieval manors are known to have existed in the area. By the 13th century the marshes, which were prone to frequent flooding, were used for fishing, fowling, grazing, reed growing and tanning. There are references to floods, marshland management and river defences throughout the medieval period, although more systematic reclamation was undertaken from the 16th and 17th centuries. By the 18th century the marshland areas in the vicinity of the Route were known as the Plaistow, East Ham and Barking Levels, as illustrated on Chapman and Andre's map of 1777 (Fig. 1.6).

As London became an increasingly important port, the East London area became a zone for industrial expansion. Former villages were swallowed up by the expansion of London: quays and later huge docks were built along the north of the River Thames and the marshland of the flood-plain began to be drained for agriculture and settlement. The historic character of the marshland over a large part of East London has largely disappeared through reclamation and recent development and at the time of the investigations most of the buildings along the A13 route were 20th century industrial or residential.