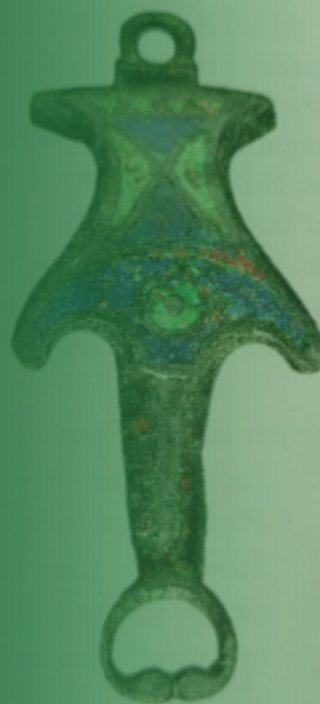


Of Chalk and Water:

An Archaeological Characterisation of the Ebbsfleet Valley and Surrounding Communities

December 2022



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Introduction

The Ebbsfleet Development Corporation (EDC) was established in 2015 to oversee and facilitate the delivery over more than 15,000 homes and create a 21st century garden city in north Kent. It acts as the local planning authority for the designated area and thereby observes the requirements of the National Planning Process Framework.

The EDC has a Vision for 2035 - *“Ebbsfleet exploits its strategic location to continue the tradition of great placemaking in the UK; combining the best of urban and rural living and building on the ethos and pioneering spirit of Georgian, Victorian and Edwardian planned communities to deliver a new benchmark for 21st century development including up to 15,000 high quality new homes”*. The Vision further states *“Building on the unique landscapes inherited from its industrial legacy where gorges, bridges, tunnels and clefts connect former chalk quarries, Ebbsfleet promotes its identity as a healthy and dynamic place which is seen as a prime destination for recreation and leisure in Kent.”*

Heritage helps new communities arising from development be better integrated into the existing social landscape. Heritage helps connect new development with the past and can build community strength and identity through pride and sense of place. There is also evidence that engaging with heritage brings significant benefits in terms of physical and mental health. Areas containing heritage sites are more sought-after and retain distinctiveness and character. Therapeutic or social benefits can come from community heritage activities; for example, enjoying heritage, group activities and being outdoors are all recognised health and wellbeing benefits.

EDC's Vision for delivery clearly depends, therefore, on making the most of the heritage of the EDC area, and in particular its historic industrial landscape. To help enable this, in 2018 EDC commissioned Kent County Council's Heritage Conservation team to enhance the data in the Kent Historic Environment Record (HER) in order to upgrade its spatial detail and make it more comprehensive, thus enabling it to become a more effective planning, research and educational tool. The 406 Monument records that existed prior to the project were enhanced to more than 1,500 following it and the 74 Event records (records of archaeological excavations and studies) were broken down into over 500 records by the end of the project. In addition, a set of deposit models were produced to provide guidance to archaeologists and developers on the geological sequences in the EDC area and the likely depth of archaeological layers.

Enhancing HER data does little in itself for aiding understanding. Indeed, adding more detail to the HER can actually make it more difficult to understand. Data does not tell the 'story' of what the data represents. To do this the data must be sorted and

sifted to allow stories to emerge. These in turn help us understand how the EDC area came to take on its current form and to identify those heritage assets – archaeological sites, historic buildings and landscape features – that are of most significance. We can use this understanding to shape development to preserve and enhance those assets, and to develop social, community and educational programmes to explore the past and help people connect it with their modern lives.

In 2022, therefore, EDC commissioned Kent County Council to develop an Archaeological Characterisation for the EDC area. The goals for the Characterisation were:

- To review the heritage information for the EDC area, on a period-by-period basis and produce character maps as appropriate to the underlying data
- To highlight key heritage assets and features of significance
- To identify the key outstanding research questions affecting each period

The intended audience for the Characterisation is archaeologists, planners and researchers, who will be able to use it to guide and underpin decision-making with respect to the archaeology of the study area. The Characterisation can also serve as the basis for further heritage interpretation, by which the story of the study area can be brought to a wider audience, or for the development of planning tools. It is important to note, though, that this Characterisation is not in itself a planning document. It has no formal status any more than any other historical review.

It should also be recognised that any characterisation can only be a snap-shot in time. It tries to learn the lessons of the data that exists at the time of writing and of course becomes increasingly obsolete as new data, ideas and interpretations emerge that challenge what has gone before. This Characterisation will therefore be a dynamic document that will be reviewed from time to time, probably every few years, to ensure it remains as up to date as possible.

The study area selected for the Project (Fig i) includes a larger area than just the EDC urban development area boundary. The EDC area is highly irregular being divided into a number of areas of different shapes and sizes. To provide suitable context for the Characterisation, a single large polygon was adopted as the study area that includes all the EDC urban development area and a small buffer. The study area therefore includes Northfleet, Ebbsfleet, Swanscombe and the Swanscombe Peninsula. It does not include Greenhithe (except for Ingress Park) as this was judged to be too far from the EDC area of responsibility and to include it would not add greatly to the study but would involve considerable additional research. It did include a buffer zone south of the A2, though, so that the whole of the Springhead Roman settlement could be considered.

The heritage of the study area

The study area contains a wealth of heritage assets. Many of these derive from the area's own agricultural, riverine, industrial and geological resources that made the area attractive to settlement and exploitation from earliest times. Located as it is, immediately south of the river Thames and north of ancient trackways and Roman Watling Street, with the formerly navigable river Ebbsfleet traversing the area from south to north, the study area is also ideally placed for trade and communication. These communication routes allowed the communities in the study area to influence, and be influenced by, regional, national and international processes which have in turn formed the dynamic and rapidly-changing social and economic landscape of the study area today. Within this landscape lie heritage assets of all periods and types. Many of these, such as the 'Swanscombe skull', Roman Springhead, the Anglo-Saxon watermill and early examples of the cement industry are of exceptional, and even international importance, while others are of regional or more local importance. All are nonetheless markers of the history of the study area and still contribute character and individuality today.

Characterisation

Historic England has described character as 'attempt to bring together as many aspects of a place as possible, in order to appreciate and understand it better'. The range of information about a place is enormously diverse and complex. For example, the study area includes archaeological sites and buildings of a wide range of types – quarries, factories, Roman temples, shops, residential houses, streets and lanes, an Anglo-Saxon watermill, wharves and jetties, military sites, Palaeolithic flint discoveries, churches, leisure areas, parks, hotels and pubs etc. These sites and buildings also sit in a natural environment that itself includes many variables such as landform and geology – the valleys, hillslopes, rivers and waterfront. What we want to do is make sense of all this detail. What is all this data telling us about the study area – how did it 'work' and how did it grow, change and develop over the centuries?

Characterisation is the process by which we make sense of the detail and try to understand a place in its totality rather than as a collection of individual sites or buildings. Characterisation can work at many different scales. It has been applied to whole regions and counties as in historic landscape characterisation, to sub-regions such as in this project, or to towns, villages or even individual archaeological sites, for example by using finds distributions to develop an understanding of the arrangement of working areas.

In the case of this project there were three main objectives for the Characterisation:

- To identify patterns in the data that allow us to make generalized statements about spatial areas. For example, in older periods, evidence of working surfaces and yards, hearths and furnaces, energy sources and waste products can lead us to conclude that an area was industrial in nature. Evidence of houses, cellars, cess pits, narrow lanes and domestic debris might allow us to conclude that the area was dedicated to domestic settlement. In more recent periods areas of factories, quarries and workshops were industrial in nature whereas areas of dense housing, pubs, shops and schools were more settlement focused.
- To understand how these spatially discrete areas, or components, relate to each other. This understanding helps explain how the study area worked and allows us to understand the 'big picture'. For example, if an area of domestic settlement is adjacent to an industrial area with direct communication links between the two, we might suggest that the occupants of the settlement may have provided the workforce for the industry. An area of settlement elsewhere, far from the industry, probably did not, which might lead to insights about differing social status in different areas of the town.
- To understand how these components changed over time. Few settled areas are completely stable in their form and function, and they generally change over time, growing, contracting and evolving depending on circumstances both within and external to the area itself.

Characterisation thus provides a method of understanding complexity by summarizing and generalizing data. This does bring with it some risk, however. Summarising anything involves bringing out the salient details at the expense of details that differ from the group. In reality, no area of land-use is completely homogenous. There will always be outliers in the generality of the data. Within an industrial area there may be a street of domestic houses. In settlement areas there will be occasional factories. Sometimes these outliers are all the more interesting as some historical process has led to them being placed in a location that is unexpected and for which there was clearly a competing use. A characterisation is not a map, where everything of interest is shown, rather it is a model, designed to show the functioning of a complex system. It will always be important to return to the underlying data both to understand the model and to identify the data elements that do not fit easily into it. Finally, it must be remembered that characterisation is data dependent. It is an interpretation of what is already known and cannot easily account for biases in the data due to biases in preservation, recording or publication.

Characterisation is thus best seen as a research tool – a hypothesis about the working of a complex system that can be continually tested and modified. It raises questions in the mind of researchers and can help direct further research. It is definitively not a planning tool and development control decisions should not be taken based on a characterisation. It is rather part of the evidence base that can help inform development control decisions.

In this Characterisation it will be seen that different archaeological periods may have been characterised differently. It is not possible to characterise the study area by using the same character types in each period as the differences between, say prehistory and the Post-Medieval and industrial periods are too great. It has also not always been possible to characterise the entire study area for some periods – the later prehistoric periods for example – as there is simply insufficient data from across the area. For other periods, eg the Medieval, there is an imbalance between the large amount of historical information available, and the paucity of archaeological discoveries, which without significant additional research only permits a very limited characterisation map to be defined. In such circumstances characterisation has been reserved for those areas that permit such an approach or site distribution maps have been presented for key areas. It should not be assumed, however, that areas or themes for which character maps are not presented are not significant. The lack of data may arise from a lack of archaeological investigation, or in the case of this study area, from the eradication of data by extractive processes, as much as deriving from less intense human activity in the past.

It is nonetheless true that certain parts of the study area do re-occur as centres of intense activity. From the Neolithic period to the Anglo-Saxon period, the Ebbsfleet valley seems to have played a particularly important role in the area, based on its strategic position between the Thames and historic routeways traversing north Kent, on the natural resources it offered and the quality of the soils along its length. It therefore attracted settlement, agriculture, industry and trade for thousands of years, as well as becoming a centre of ritual and religion. Similarly, the Thames waterfront played a key role across multiple periods as did those population centres that would grow into Swanscombe and Northfleet. In more recent periods the relevance of the Ebbsfleet declined, whereas the extraction of chalk and other deposits along the Thames rose to ever greater prominence until the quarries came to define the industrial and modern landscape around which, to some extent, the modern communities of the area have had to fit. Today, to a visitor, the study area can appear to be an area of continuous development. This is not so, however, and Northfleet and Swanscombe, as well as many of the settled areas along the Thames and hamlets in the hinterland, retain an individuality and character of their own.

The Characterisation has identified many of the themes, processes and ‘stories’ of the study area. It has shown how much of the archaeological resource – both buried and standing – remains to help shape and add character to the modern landscape. It is also a story of loss, however. The extractive industries have swept away a great deal of archaeological heritage and have irrevocably changed the landscape in which the surviving heritage sits. Modern development continues to threaten the survival of the remaining heritage. It is ever more important therefore, that the heritage assets of the region are identified by projects such as this and by archaeological and historical research, that they are revealed, displayed and

interpreted for the local community, and enhanced and protected by decision-makers.

To allow readers to learn about the individual sites mentioned in the text, each is accompanied by its reference number in the Kent Historic Environment Record (eg TQ 67 SW 400), an accessible version of which can be seen online at <http://www.kent.gov.uk/HER>.

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and surrounding communities

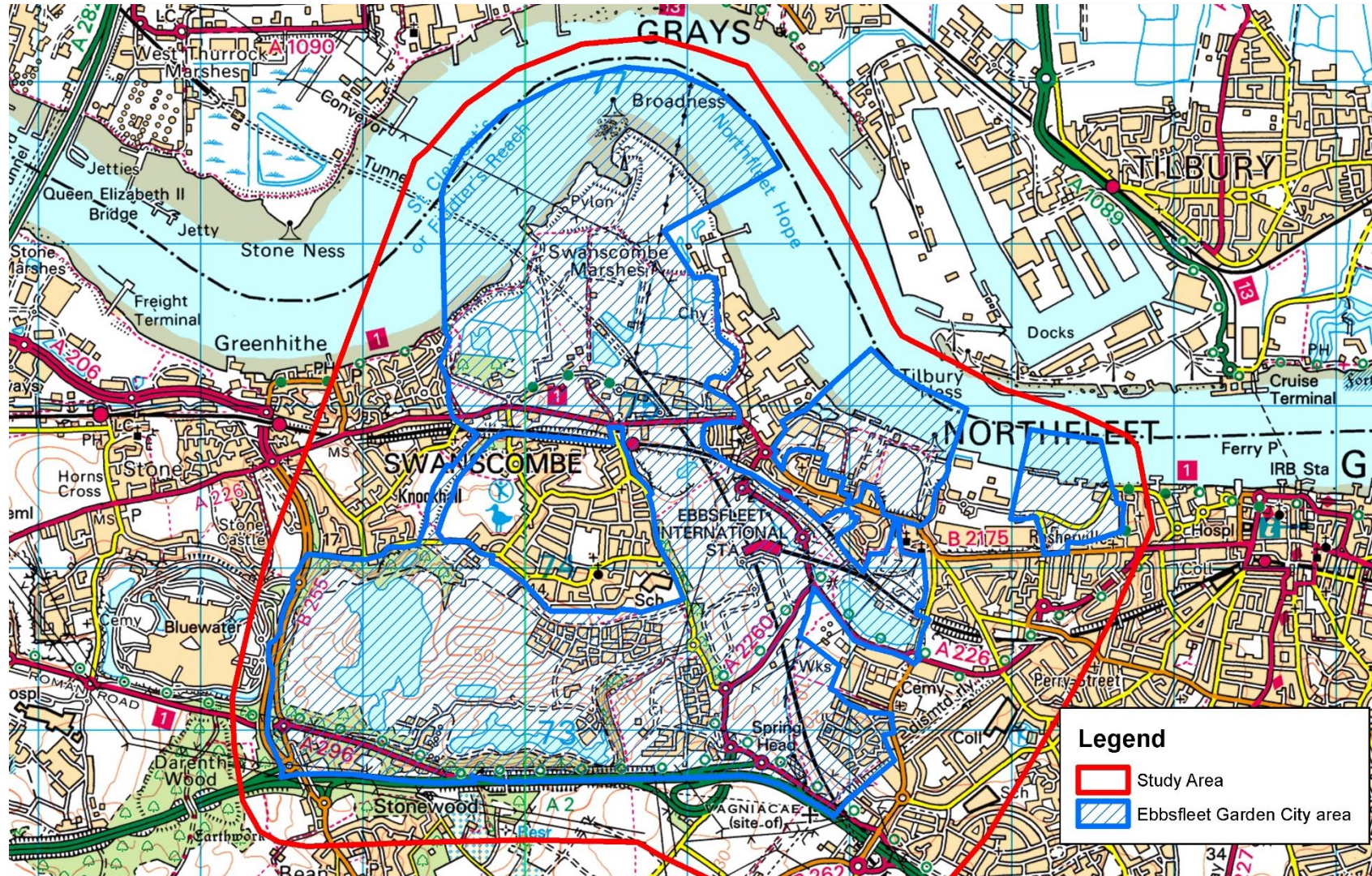


Figure i: Ebbsfleet Development Corporation archaeological characterisation study area

1 Palaeolithic 850,000 – 9,500 BC

1.1 Introduction to the Palaeolithic Period

Swanscombe/Ebbsfleet is an area of national and international importance for Palaeolithic archaeology. There are important remains from three separate stages of the Palaeolithic: the Lower Palaeolithic, the earlier Middle Palaeolithic and the final Upper Palaeolithic.

Lower Palaeolithic remains are associated with remnants of ancient river deposits that were laid down by an early course of the Thames running along what is now the higher ground above its south bank between c. 430,000 and 375,000 BP [years Before Present, typically used for the more-distant past]. These deposits - which underlie most of Swanscombe, hence their colloquial name “the Swanscombe 100-ft terrace” - contain abundant fossil bones and other faunal remains, as well as lithic artefactual evidence of the contemporary early human ancestors, or “hominins”. The artefacts are typically the classic hand-held pointed flint tool of the earlier Palaeolithic, the handaxe (Figure 1.8), or waste flakes from their manufacture. Non-handaxe-making (Clactonian) industries also occur in lower-lying horizons. A human skull from these deposits - the “Swanscombe skull” - is unique within the UK for this period, and shows the people of this era to be ancestors of Neanderthals.

Remains from the earlier part of the Middle Palaeolithic are associated with deposits in the Ebbsfleet valley, which cuts northward towards the Thames through the Swanscombe 100ft terrace, and contains slightly younger deposits, dating to c. 250,000-200,000 BP. These also contain abundant faunal remains and lithic artefacts, although with a very different (Levalloisian) approach to stone tool manufacture (Figure 1.9). The Ebbsfleet valley is the major site in the UK for remains of this period, and the only one where they have been found within a deep sequence with faunal evidence that allows them to be situated within a good chronological and palaeo-climatic context. We have no evidence of which hominin species was responsible, although it was likely to be an early Neanderthal.

Lithic artefacts from the final part of the Upper Palaeolithic, dating to c. 10,000 BC, have been found from deposits in the lower-lying parts of the Ebbsfleet valley and from below the alluvial marshes at the south side of the Thames. These represent the first re-colonisation of Britain after the end of the last Ice Age. The lithic evidence of this period takes the form of a distinctive “Long Blade” industry (Figure 1.10), with large parallel-sided flint blades struck from carefully-made flint cores up to 25cm long. Although nationally rare, sites of this period are relatively abundant in the Thames basin, and especially in and around the Ebbsfleet valley.

The natural landscape of the EDC area has been substantially affected by quarrying since the mid-19th century. Areas of previous quarrying are mostly devoid of Palaeolithic (and other) archaeological potential - other than industrial heritage -

although small undisturbed patches of ground may contain valuable evidence. The natural faces around previously-quarried areas may, however, preserve important evidence. Some of the most important deposits in the EDC area are those that have survived unquarried due to either being below the Victorian road network, or below housing. Given the high Palaeolithic importance of the area, development proposals will inevitably attract scrutiny on a case-by-case basis, taking account of their situation in the landscape and their proximity to previous discoveries. This Palaeolithic characterisation will help streamline that process by identifying not just areas of higher potential, but also areas of lower, or no, potential.

1.2. Palaeolithic background

1.2.1. *The Palaeolithic and the Pleistocene*

The Palaeolithic (or Stone Age) represents the earliest phases of human occupation of Britain, as evidenced by the stone tools that survive in ancient deposits attributable to various dates between c. 800,000 BP and the end of the last ice age c. 10,000 BC [calibrated radiocarbon years before 0 AD/BCE, typically used for younger dates within the last 20,000 years or so]. Britain was not continuously occupied through the Palaeolithic, due to climatic oscillations which made it periodically too cold to survive. The British Palaeolithic has been subdivided into different cultural stages (Lower, Middle and Upper) based on changes in stone tool types and manufacturing techniques through this period (Table 1.1). The distinction between the Lower and Middle stages of the traditional framework is, however, very fuzzy. There is significant chronological overlap between late instances of handaxe-dominated sites (culturally “Lower Palaeolithic” - see Figure 1.8), and early examples of Levalloisian prepared-core technology (culturally “Middle Palaeolithic” - see Figure 1.9).

The Lower and Middle Palaeolithic periods are associated with early human ancestors (*Homo heidelbergensis*, and their Neanderthal descendants). This ancestral lineage became extinct in Europe between 40,000 and 30,000 BP, and was replaced by anatomically modern humans, who spread into western Europe at this time, having evolved considerably earlier, most likely in Africa, but possibly in Asia. Thus modern humans should be regarded as cousins of the Neanderthals, but not as direct descendants. Archaeologically and culturally, modern humans are associated with the Upper Palaeolithic.

The Palaeolithic (in Britain) is associated with the second half (Middle and Late stages) of the Pleistocene geological epoch, which began c. 1.8 million years ago. This was a time when the earth’s climate oscillated over the course of millennia between cold ice ages (glacials) and warm periods (interglacials). The end of the

Of Chalk and Water: an archaeological characterisation for the Ebbsfleet Valley and surrounding communities

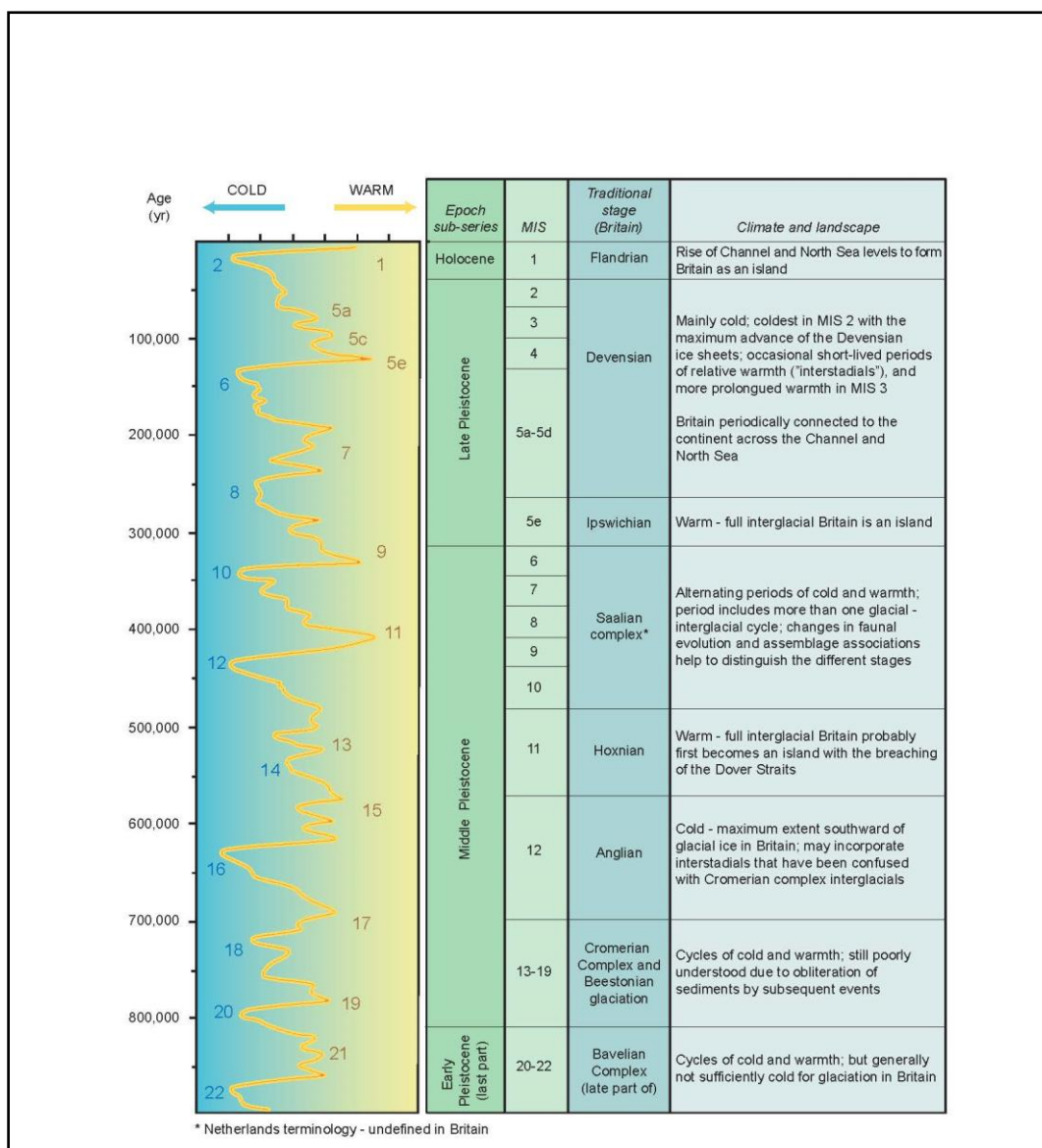


Figure 1.1: British Quaternary framework

Pleistocene is defined by the end of the last ice age c. 9,500 BC. The subsequent warm phase (which continues to the present day) is known as the Holocene. It is probably no coincidence that the changes in lithic material culture that define the end of the Palaeolithic (and the start of the subsequent Mesolithic period) coincide with the climatic transition that defines the boundary between the end of the Pleistocene and the start of the Holocene. Whether the archaeological change from Upper Palaeolithic to Mesolithic in the southern UK represents a population change, or just changing behaviour of the same population, is uncertain, and one of the important archaeological questions of the period.

Pleistocene deposits are generally dated with reference to numbered marine isotope stages (MIS) derived from analysis of changing proportions of oxygen isotopes (O18 and O16) in the continuous deep-sea sedimentary record that reflect the global climatic oscillations. Even-numbered MI stages represent cold glacial troughs in the

continuous sequence, and odd numbers represent warm interglacial peaks. The continuous deep-sea record provides a reference framework against which the discontinuous terrestrial record can be related (Table 1.1; Figure 1.1). Terrestrial deposits can sometimes be directly dated or can be dated in relation to other deposits on the basis of their contained faunal evidence or their stratigraphic relationships. Therefore, following almost two centuries of scientific work, we have quite a good idea of the Palaeolithic and Pleistocene framework for southern England, and the Lower Thames valley in particular.

Key Pleistocene stages for the EDC Palaeolithic characterisation are:

- MIS 12 (the Anglian glaciation, which lasted between c. 475,000 and 425,000 BP)
- MIS 11 (the Hoxnian interglacial, which followed the Anglian, and lasted between c. 425,000 and 360,000 BP)
- the Last Glacial, which represents the predominantly cold phase from MIS 5d through to the end of MIS 2, from c. 115,000 BP through to c. 11,700 BP
- the Last Glacial Maximum (LGM) between c. 24,000 and 16,000 BP, which corresponds with the cold trough of MIS 2, and represents the coldest part of the Last Glacial
- the end of the Last Glacial at c. 11,700 BP, when the significant warming trend that defines the end of MIS 2 and the start of MIS 1 (the present warm Holocene epoch) occurs, following some relatively rapid warm and cold oscillations after the LGM

| Traditional Palaeolithic stage | Human species | Lithic artefacts and other material culture | MI Stage | Date (BP) | UK geo stage |
|---------------------------------------|--|---|-----------------|------------------|------------------------|
| Upper Palaeolithic | Anatomically modern humans (<i>Homo sapiens sapiens</i>) | Dominance of blade technology and standardised tools made on blade blanks; personal adornment, cave art, bone/antler points and needles | 2-3 | 11,500-35,000 | Late Devensian |
| Middle Palaeolithic | Late Neanderthals (<i>Homo neanderthalensis</i>) | The appearance of <i>bout coupé</i> handaxes; discoidal flake/core reduction strategies | 3-5d | 35,000-115,000 | Early/Middle Devensian |
| | - | Britain uninhabited | 5e | 115,000-125,000 | Ipswichian |

| | | | | | |
|-------------------------------|--|---|-------|-----------------|--------------------------|
| Lower Palaeolithic | Early pre-Neanderthals | Still some handaxe-dominated sites, but growth of more standardised (Levalloisian) flake and blade production techniques (eg. Baker's Hole, Crayford) | 6-9 | 125,000-425,000 | Hoxnian /Saalian complex |
| | evolving into <i>Homo neanderthalensis</i> | Handaxe-dominated (eg. Swanscombe, Cuxton), but appearance of more standardised flake and blade production techniques (Levalloisian); occasional industries without handaxes (Clactonian) | 8-11 | | |
| | - | Britain uninhabited | 12 | 425,000-475,000 | Anglian |
| | <i>Homo cf heidelbergensis</i> | Handaxe-dominated (eg. Boxgrove), with occasional unstandardised flake core production techniques and simple unstandardised flake-tools; occasional unifacial flake-tool industries without handaxes (High Lodge) | 13 | 475,000-500,000 | Cromerian complex IV |
| | <i>Homo ergaster</i> | Simple flake/core industries with no standardised flake-tools (Pakefield; Happisburgh) | 13-19 | 500,000-780,000 | Cromerian complex I-III |

Table 1.1: Overview of the British Palaeolithic and Pleistocene framework

1.2.2. Geology, landscape and palaeo-environment

The Pleistocene history of landscape development of the EDC area and the wider surrounding region is tied in with the topography and geology. The EDC area (Figure 1.2) is located on the southern bank of the present-day Thames, which runs broadly eastward from London towards the North Sea. Chalk forms high ground (the North Downs) to the south, and the current Lower Thames runs eastward in the base of a ripple in the Chalk bedrock structure where it abuts the London Clay basin. Here the Chalk is capped by Thanet Sand and younger Tertiary deposits (Lambeth Group, Harwich Group and London Clay). Chalk bedrock is directly exposed at the ground surface as the North Downs rise further to the south, and then is capped on the highest parts of the North Downs by the widespread Clay-with-flints deposit, which results from the residual decay of long-exposed Chalk bedrock.

Before 500,000 BP the lower part of the Thames flowed much further to the north, heading northeast across Essex. However, it was forced south into its present valley between Purfleet and Dartford by the expansion of the Anglian ice-sheet c. 450,000 BP, which blocked the more-northerly drainage route. The Thames then stayed in this valley as the climate warmed at the end of the Anglian, and major series of fluvial sand and gravel deposits - so-called "terrace" deposits - were laid down through the Hoxnian along what is now the higher ground above the south side of the present Thames.

The precise dating and correlation of the various late Anglian and Hoxnian terrace deposits in the EDC area are disputed. One reasonable interpretation is presented here (Figure 1.2), with a slightly earlier route of the Thames leaving terrace deposits at Dartford (Dartford Heath Gravel), and then a slightly later route passing further east to Swanscombe (Swanscombe 100-ft terrace) and then looping back on itself to the north, before then resuming an eastward direction towards the North Sea.

As reviewed in more detail below (Sections 1.2.3 and 3) the Hoxnian terrace deposits at Swanscombe are particularly rich in Palaeolithic archaeological and faunal remains. These allow us to reconstruct the climate as fully interglacial, with a mosaic landscape comprising a mixture of forest, light woodland, and with patches of open grassland. In combination with the river flowing through it, bounded by Swanscombe Hill to the south - quarried away in the 20th century as Eastern Quarry - this would have provided a rich and diverse environment, full of resources advantageous for hominin survival. There would also have been abundant flint for tool manufacture, since flint nodules are a natural component of the local Chalk bedrock.

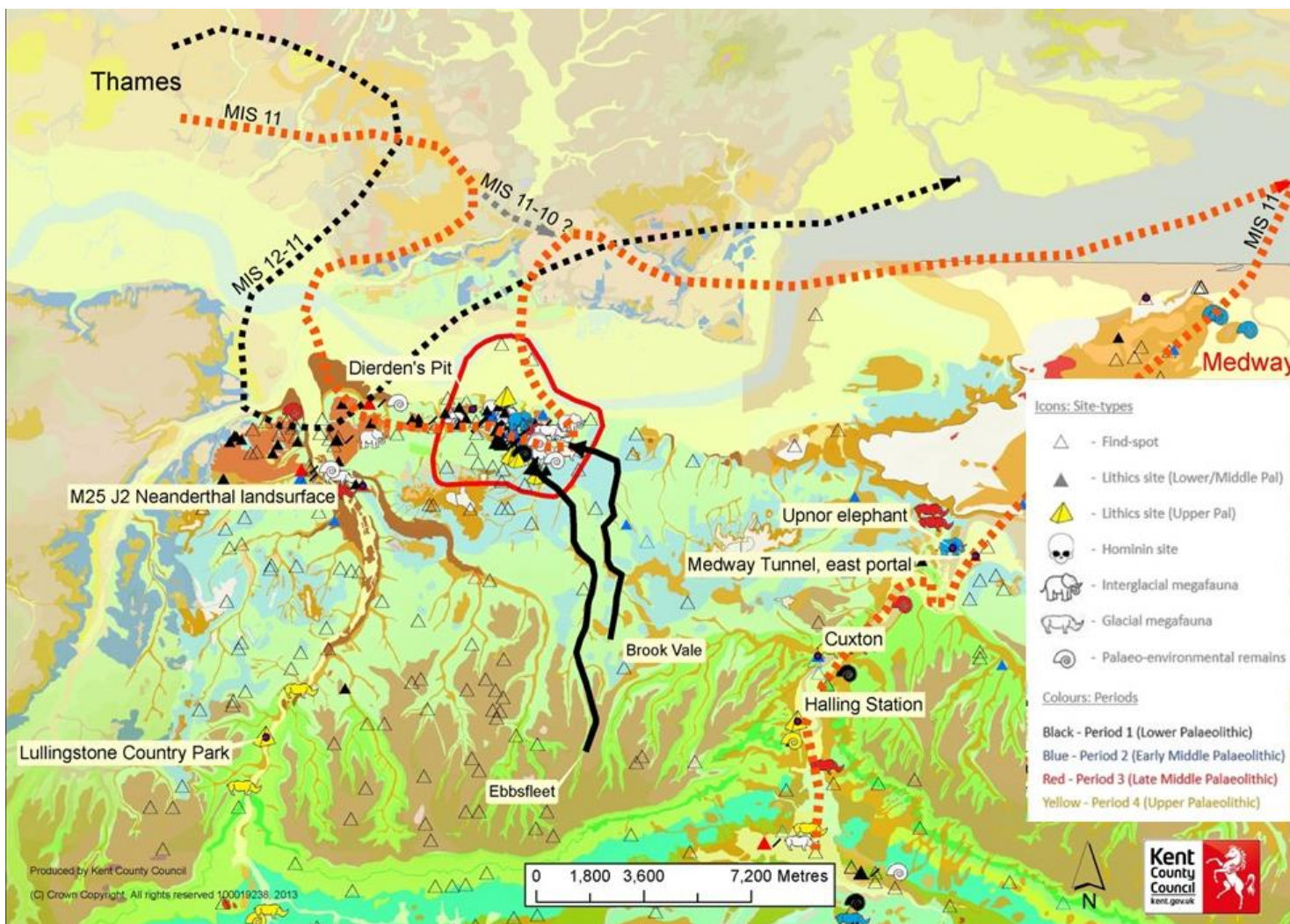


Figure 1.2: Regional background: Palaeolithic sites and geological landscape

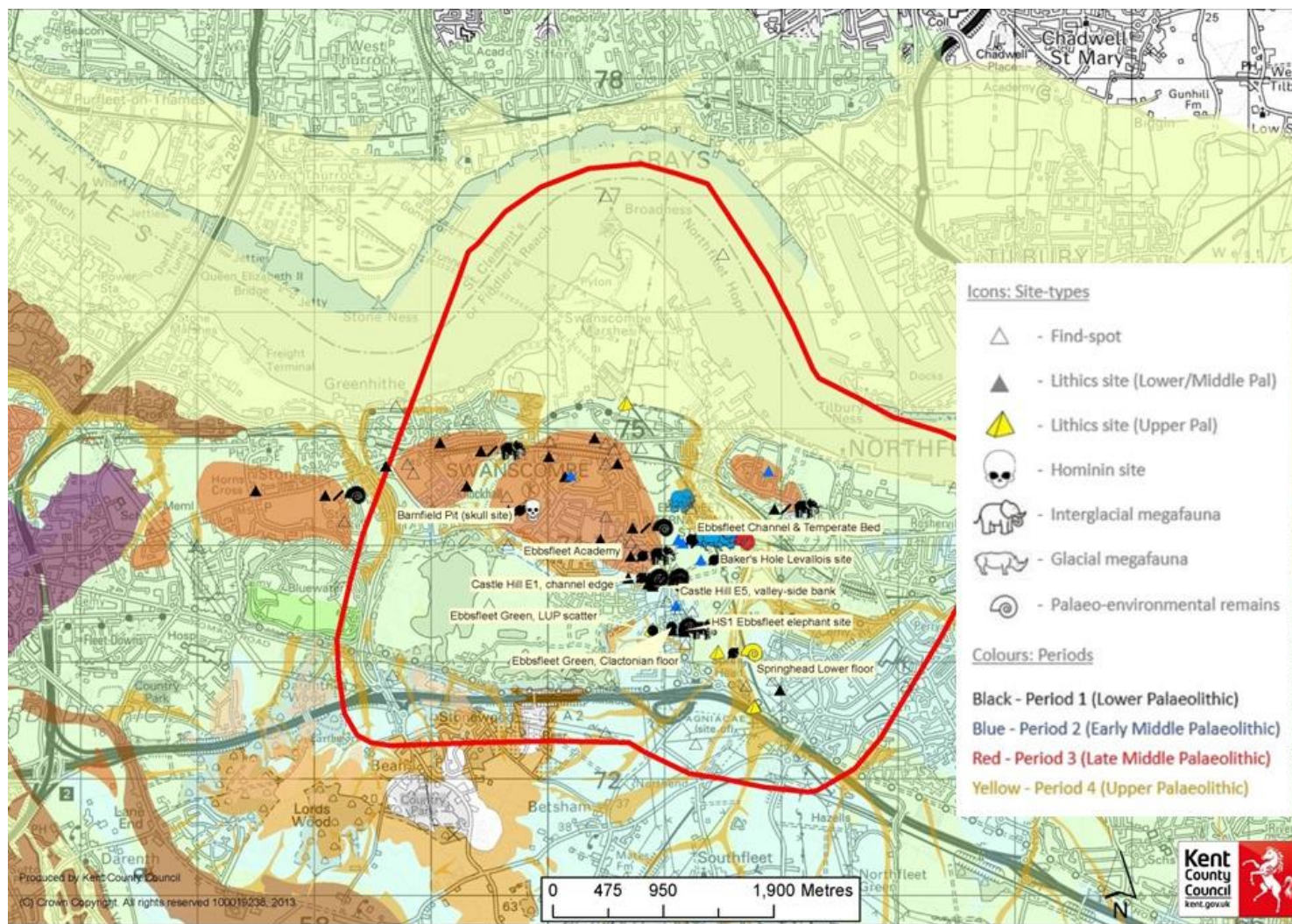


Figure 1.3: EDC area: Palaeolithic sites and geological landscape

The early Ebbsfleet would have flowed northward from the North Downs plateau, originating from near Fairseat, and joining the Thames at the southeast outskirts of present-day Swanscombe. There would also have been a broadly parallel course of the ancient Brook Vale a short distance further east. This would originally probably have exited directly north to the Thames through the southwest part of Gravesend (Perry Street), passing to the west of Windmill Hill.

This pattern of drainage was slightly re-arranged after the Hoxnian (Figure 1.3). Firstly, there was a major landslip down the east side of Swanscombe Hill, which blocked off the direct northward course of the Ebbsfleet, instigating it to divert slightly further to the east. And secondly, the downstream end of the Brook Vale channel was captured by a minor east-side tributary valley of the Ebbsfleet, causing it to divert westward and join with the Ebbsfleet, to form a south-bank tributary of the Thames that cut northward through the Swanscombe 100-ft terrace, leaving remnants of this older terrace forming the higher ground capping the Ebbsfleet valley sides above its exit into the Thames.

The Hoxnian landscape was blanketed in its lower-lying parts by varyingly gravelly and clayey/silty slopewash sediments when the climate deteriorated at the end of MIS 11. Almost no deposits are preserved in the EDC area from the following warm stage of MIS 9. However, there was substantial deposition in the Ebbsfleet valley during the subsequent warm stage of MIS 7. Fluvial deposits and marshy alluvium from warmer episodes within this climatically-complex stage were deposited in a wide spread along the western valley side between about 5m and 15m OD, interspersed with slopewash deposits from cooler episodes within MIS 7. Although much of the original deposits are now lost to quarrying, numerous Palaeolithic artefacts and faunal remains were recovered in the 19th and 20th centuries, allowing reconstruction of the climate and palaeoenvironment, and identification of the lithic industry.

The faunal remains reflect a predominantly-mild climate through MIS 7 with substantial grassland and a horse/mammoth/deer-dominated “mammoth-steppe” fauna, with occasional colder periods, and occasional brief periods of interglacial warmth during which more-forested areas developed. The hominins of this era were practising the distinctive early Middle Palaeolithic “Levalloisian” lithic industry (see below, Section 4.1). Since no skeletal remains from this period have been found in the UK (apart from a few teeth) it is unknown what species of hominin were living in the EDC area at this time, although it is likely they were early Neanderthals.

There is then another substantial hiatus in the representation of the Palaeolithic in the EDC area during the period from MIS 6 through to near the end of MIS 2, covering c. 175,000 BP to 9,500 BC. MIS 6 was a prolonged period of glacial cold, and it is likely that Britain as a whole was unoccupied. This was followed by a short period of interglacial warmth - the Ipswichian (MIS 5e, between c. 125,000 and 115,000 BP) - during which Britain was likewise unoccupied. From a climatic and

environmental point of view it would have been habitable, so the sea-level must have risen quick enough due to the melting of global ice-caps during the warming transition from MIS 6 to MIS 5e that Britain was isolated as an island by the time that hominins had resettled the northern continental coast.

MIS 5e was followed by the prolonged Devensian glacial, between MIS 5d and 2 (115,000 BP through to 10,000 BC). This period corresponds with the extinction of Neanderthals and their replacement by modern humans at c. 35,000 BP, and there are several examples of this transition in cave and rock-shelter sites in France and Belgium. Modern humans seem to have developed a better capability than the Neanderthals to survive glacial conditions, and the northwest parts of continental Europe were increasingly populated with these ice age hunters during the later parts of the Devensian, through MIS 3 and 2. Britain seems, however, to have been very sporadically occupied through this time, with occasional incursions of Neanderthals (and later of modern humans) from mainland continental Europe when there was the right combination of accessibility across the English Channel (or North Sea) region and sufficiently mild climate to survive.

There was substantial sediment aggradation through this period in and around the EDC area. Major bodies of sand/silt formed as slopewash deposits down the sides of valleys such as the Ebbsfleet valley, and aeolian loessic deposits formed on level plateau and in various depressions and undulations, although these often then were reworked as slopewash, feeding into the dry valley network down the North Downs dip-slope and blanketing any older outcrops of deposit - such as the MIS 7 fluvial deposits of the Ebbsfleet valley. There is one incidence of hominin presence on a sealed palaeo-landsurface near Dartford at c. 100,000 BP, which must represent a rare Neanderthal incursion, but no evidence from this period in the EDC area until very near the end of the Devensian.

The EDC area is however notable within the UK for a plethora of Palaeolithic evidence from the end of the Devensian, between c. 11,500 and 9,500 BC, when Britain was undergoing rapid warming corresponding with the final transition from glacial to interglacial conditions. At this time bands of Ice Age hunters were present along the nearby continental European coast, using a distinctive "Long Blade" lithic industry. These people seem to have passed into Britain at this time, possibly making use of the Thames as either a convenient waterway, or perhaps as a frozen highway for sledding over. Although sites of this period are nationally rare, quite a few are known from the Thames basin, and several are known from within the EDC area. They mostly occur on low-lying ground on the floor of the Ebbsfleet valley floodplain and on the southern bank of the Thames, where the Late Glacial landscape has become sealed by alluvial deposits reflecting rising sea-level at the start of the Holocene.

1.2.3. Regional and EDC Palaeolithic overview

Palaeolithic remains are relatively abundant in Kent (Figure 1.2). This reflects several factors: its geographic situation south of landscape disturbance by previous Pleistocene glaciations, the widespread distribution of Chalk bedrock with flint nodules that would have been highly prized as raw material for tool manufacture, and the survival of terrace deposits from rivers that were flowing through the Kent landscape during the Palaeolithic. Two main groups of remains occur: (a) those recovered from known locations and known geological context, here categorised as “sites”, and (b) those without accurate information on where they were found or on their geological provenance, here categorised as “find-spots”. Faunal remains - in particular animal bones and snail shells - provide important evidence to complement lithic artefacts. Besides potentially providing direct evidence of diet and behaviour such as hunting or scavenging, they also allow reconstruction of climate and local environment.

Palaeolithic sites (ie. remains from known context) are mostly associated with fluvial terrace remnants in three main areas in the EDC region: Dartford, Swanscombe-Ebbsfleet, and the Medway valley. Otherwise, the Palaeolithic record is dominated by find-spots in the surrounding landscape. These usually represent either residual surface finds from high ground, or finds that have been reworked into the widespread dry valley network, and then recovered from field surfaces, often by the prolific antiquarian collectors of the Victorian era. Despite their lack of stratigraphic context and poor dating control, the former group of find-spots reflect their original point of discard, and so provide important information about the distribution of Palaeolithic activity around the landscape. The latter group have less potential to contribute to understanding of the period. However, they can signpost source areas from which material might have originated, and which might contain *in situ* remains of higher research potential.

The most-numerous Palaeolithic remains in the EDC region are from the Lower Palaeolithic (Figures 1.2, 1.3). In the EDC area, these are associated with the Swanscombe 100-ft terrace, and with contemporary deposits relating to its southern tributary, the Ebbsfleet. A large patch of the Swanscombe 100-ft terrace underlies Swanscombe, in the centre of the EDC area. This was extensively quarried for gravel and chalk in the late 19th and early 20th centuries. This facilitated archaeological collecting, and Swanscombe was recognised by the late 19th century as one of the most prolific Lower Palaeolithic sites in the UK. Investigations were carried out in the Associated Portland Cement Company's Barnfield Pit in the early 20th century. These established the basic geological sequence, and identified an archaeological pattern with the lower and earlier terrace deposits containing evidence of a non-handaxe core/flake/flake-tool (Clactonian) industry, and the higher and slightly younger deposits (although still within MIS 11) showing evidence of a handaxe-dominated (Acheulian) industry. Further investigations took place (a) in the 1930s and 1950s following discovery of the Swanscombe skull in the Acheulian horizons, and (b) in the 1970s when it was realised that undisturbed Clactonian

remains were present at a horizon previously thought to have been devoid of Palaeolithic evidence. Lower Palaeolithic remains have also been found on other nearby outcrops of the Swanscombe 100-ft terrace, at Greenhithe/Knockhall to the west of Ingress Vale, and at Northfleet to the east of the Ebbsfleet valley.

More recently, since the 1990s, it has become clear that the Swanscombe 100-ft terrace extends further south than previously thought, concealed by subsequent slopewash deposits. Thus flint tools and faunal remains such as a tusk of the extinct straight-tusked elephant *Palaeoloxodon antiquus* (Figure 1.12) were found during construction of the Ebbsfleet Academy in the southeast part of Swanscombe, and similar remains were found a little further to the south in the eastern part of the Castle Hill housing development. There have also been recent finds from MIS 11 Ebbsfleet deposits further to the south, notably an undisturbed Clactonian elephant butchery site - the “Ebbsfleet elephant”, another example of the extinct *Palaeoloxodon antiquus* - found during construction of the link road to the Ebbsfleet International station (Figure 1.13).

Middle Palaeolithic remains are less abundant than Lower Palaeolithic remains in the EDC region. The details depend, however, on how and when the division between Lower and Middle Palaeolithic is defined. Here, remains that are reliably attributed to a date younger than MIS 11 but before 40,000 BP are regarded as Middle Palaeolithic. This time-range has been sub-divided here into “Early Middle Palaeolithic” covering from c. 350,000 BP to what must have been the local extinction of UK hominins by c. 150,000 BP in the harsh conditions of MIS 6, and “Late Middle Palaeolithic” covering the period from 150,000 BP through to 40,000 BP in the middle of the Last Glacial (the Devensian).

Hence the Early Middle Palaeolithic includes faunal remains and handaxe industries from Medway terraces dating between 350,000 and 250,000 BP, such as the important handaxe sites at Cuxton (21 Rochester Road and the Rectory) and the Upnor elephant skeleton. In the EDC area, Early Middle Palaeolithic evidence is dominated by Levalloisian finds and faunal remains from MIS 7 deposits along the west flank of the Ebbsfleet valley. These are thought to date slightly younger than the handaxe-dominated Cuxton sites. However, it is possible that very different lithic industries were being practised contemporaneously in nearby parts of northwestern Kent at this time.

Britain only seems to have been occupied during the later part of the Late Middle Palaeolithic, with no re-colonisation until after the end of the Ipswichian interglacial at c. 115,000 BP. Late Middle Palaeolithic evidence in the EDC region is dominated by *bout coupé* handaxe and faunal finds along the Medway valley, the *bout coupé* handaxe being recognised as the signature artefact of Late Neanderthals in the UK at this time. The most significant locality is at J2 of the M25 outside Dartford, where a palaeo-landsurface with lithic remains has been dated to early in the Devensian, perhaps c. 100,000 BP. Other important localities are at the Eastern portal of the Medway tunnel in Chatham and at Allhallows on the Hoo peninsula, where fresh

condition *bout coupé* handaxes have been recovered from fine-grained deposits overlying the Devensian fluvial gravels. Evidence of this period is, however, almost entirely lacking in the EDC area, the only find being a bovine tibia from Ebbsfleet river gravels, recovered during work in advance of HS1.

Upper Palaeolithic finds are, same as for the UK as a whole, generally rare in the EDC region (Figure 1.2). The most common finds are Ice Age faunal remains, such as mammoth and/or woolly rhinoceros, from Late Devensian river gravels underlying present-day alluvial floodplains. As well as these, however, there are several sites and find-spots from the very end of the Upper Palaeolithic, where lithic artefact remains - the “Long Blade” industry (Figure 1.10) - from late Ice Age populations have been found, representing the re-colonisation of southern Britain during the climatic transition from the Last Glacial to the Holocene. Sites of this period are rare within UK, but are relatively common in the Thames Basin, perhaps reflecting the Thames valley as the route for the recolonisation of Britain at this time. Sites are mostly associated with river flood-plains, representing activity in the late Ice Age landscape that has become sealed below early Holocene alluvium as sea-level rose. Two such sites are known in the wider EDC region, at Halling Station (Medway) and Lullingstone (Darent). There are, however, four sites within the EDC area, all of them within the Ebbsfleet valley, as well as two find-spots (Figure 1.3). The EDC sites are discussed in more detail below (Section 1.5).

1.3. The Lower Palaeolithic: before Neanderthals (850,000-350,000 BP)

As reviewed above, the Swanscombe 100-ft terrace - formally known as the Middle Pleistocene Boyn Hill/Orsett Heath Formation - is preserved on the south side of the Lower Thames as an intermittent east-west trending band of deposits between c. 20m and 40m OD, from Dartford Heath through Dartford, Stone, Greenhithe and Swanscombe to Northfleet. The deposits consist of a sequence of predominantly-fluviatile loam, sand and gravel sediments laid down by the ancient Thames in the Hoxnian interglacial period between c. 430,000 and 375,000 BP (Figure 1.11).

These terrace deposits are of international Palaeolithic significance. They have been demonstrated through a long history of investigation to be exceptionally rich in artefactual remains at many investigated sites, and also to contain rich fossil mammalian remains, including very rare hominin fossil material. Deposits in the old Barnfield Pit - in the heart of the EDC area (Figure 1.3) - were particularly rich and have been thoroughly investigated through the 20th century. The deposits (Table 1.2) contained lithic and faunal remains incorporated in stratified fluvial sand and gravel units, accompanied by biological palaeo-environmental evidence. Palaeo-landsurfaces preserving intact evidence of Lower Palaeolithic activity were present in one of the lower deposits, the Lower Loam. And one horizon within the middle phase of the Barnfield Pit sequence - the Upper Middle Gravel - produced an early human fossil

skull (the Swanscombe Skull), as well as copious artefacts, making it one of only two sites in England with Lower or Middle Palaeolithic hominid skeletal evidence - the other being Boxgrove, in West Sussex.

The evidence from Barnfield Pit is fundamental to our understanding of the British Lower Palaeolithic. There is evidence of changing lithic material culture through the Hoxnian, with earlier lithic industries (Clactonian) in the bottom parts of the sequence based on relatively simple flake-tools made on blanks from minimally-structured approaches to flake production. Conversely, later industries higher in the sequence (Acheulian) are characterised by a predominance of finely-made handaxes. This sequence of change is also seen at other Hoxnian sites across south-east Britain, and seems to represent a broad picture of cultural change through the Hoxnian in Britain. The Barnfield Pit sequence therefore provides a reference framework not just for the regional Lower Palaeolithic, but also for the national picture.

| <i>Phase</i> | <i>MI Stage</i> | <i>Date BP</i> | <i>Stratigraphic unit</i> | <i>Height OD (m)</i> | <i>Palaeolithic archaeology</i> |
|--------------|------------------------|-----------------------|---------------------------|----------------------|--|
| III | 11–10/ 10/ 10-8? | 300,000 - ?375,000 | Upper Gravel | c. 33-35 | Uncertain, no reliably provenanced material |
| | | | Upper Loam | c. 32-33 | |
| II | 11 | ?375,000 - 400,000 | Upper Middle Gravel | c. 28-32 | Mostly pointed handaxes with thick partly-trimmed butts (often large and well-made, but also small and crude); also occasional cores, debitage and <i>ad hoc</i> flake-tools — Acheulian [Swanscombe Skull was found at the junction between Upper and Lower Middle Gravels] |
| | | | Lower Middle Gravel | c. 27-29 | |
| I | 11 | 400,000 - 425,000 | Lower Loam | c. 25-27 | Cores, debitage, <i>ad hoc</i> flake-tools, and very occasional crude "proto-handaxes" — Clactonian |
| | | | Lower Gravel | c. 23-26 | |

Table 1.2: Stratigraphic and archaeological summary of Barnfield Pit sequence, Swanscombe

Several other sites in the EDC area have also produced important Lower Palaeolithic remains (Figure 1.3), in particular: the Swan Valley Community School (now Ebbsfleet Academy), the eastern part of the Castle Hill housing development in the old Eastern Quarry, the HS1 elephant butchery site a short distance further to the southeast (Figure 1.13), and the Ebbsfleet Green housing development.

Swan Valley School was investigated during its construction between 1997 and 2001. The important aspects of this site were not only that it provided abundant lithic evidence of Lower Palaeolithic activity, but also that it demonstrated that the key Swanscombe 100-ft terrace deposits extended much more widely than was previously known. Work at the Castle Hill housing development demonstrated that archaeologically rich parts of the Boyn Hill/Orsett Heath Formation extended even further south than the Swan Valley School, and into the eastern side of Castle Hill. This area would have been above the southwest bank of the Thames channel at this time, near its confluence with the Ebbsfleet.

The HS1 elephant butchery site - the “Ebbsfleet elephant” - was discovered in late 2003 and excavated in 2004 (Figure 1.13). The site is located immediately to the east of the Ebbsfleet Green housing development, near the start of the access road to Ebbsfleet International station. Here, undisturbed remains of an elephant skeleton were recovered along with flint tools used to butcher it, and evidence of their on-the-spot manufacture. The remains were contained in a sequence of fluvial, marsh and slopewash deposits that are not part of the Swanscombe 100-ft terrace, but which are equivalent Ebbsfleet deposits of the same age.

A small area of undisturbed palaeo-landsurface was excavated at Ebbsfleet Green in 2014, a short distance upslope to the west of the HS1 Ebbsfleet elephant, and contemporary with it. The horizon had undisturbed evidence of the Clactonian lithic industry, involving knapping flake-blanks for tool manufacture, as well as numerous flake-tools such as large convex-backed flake-knives and notched cutting tools.

A broad model of the Lower Palaeolithic landscape of the EDC area is provided, showing the location of these key sites (Figure 1.4) in relation to courses of the Thames and Ebbsfleet. The likely route of the initial channel of the Thames during the first phase of deposition of the Swanscombe 100-ft terrace is shown, when the Lower Gravel and Lower Loam were laid down, and when there was a Clactonian lithic industry. This was then overlain by the much-wider floodplain associated with the second phase of deposition of the Swanscombe 100-ft terrace, when the Lower Middle Gravel and Upper Middle Gravel were laid down. The course of the contemporary Ebbsfleet is also shown, forming a south-bank tributary of the Thames. The higher ground above the west side of the Ebbsfleet (where the Ebbsfleet Green Clactonian site is located) would have been an exposed gravelly terrace from an older pre-Hoxnian course of the Ebbsfleet.

1.4. The Middle Palaeolithic

1.4.1. *Early Neanderthals (350,000-150,000 BP)*

The main remains of this period in the EDC area (Figures 1.3, 1.5) are Levalloisian lithic artefacts and faunal remains from deposits in the Ebbsfleet valley that are attributed to MIS 7. Some Levalloisian remains, however, are of less certain date, and may well date to MIS 8, or perhaps earlier. These were all found in fluvial and colluvial/solifluction deposits at elevations between c. 5m and 15m OD in the area to

the east of Swanscombe, now mostly occupied by Ebbsfleet International station and its car park.

Levalloisian flint artefacts were first identified early in the 20th century from chalk-rich solifluction deposits in the northwest corner of the Southfleet Chalk Pit (colloquially known as “Baker’s Hole”), overlying the Chalk bedrock and forming the infill of one of the dry valleys down the west side of the Ebbsfleet valley. The distinctive lithic industry attributed as Levalloisian involves the removal of large flake-blanks from a core, their general form having been pre-determined by careful preparation of the core (Figure 1.9). The relationship of these deposits with the well-dated MIS 7 Ebbsfleet fluvial deposits is uncertain, although most evidence suggests they are older, probably dating to MIS 8 or perhaps even earlier. Even if the chalk-rich solifluction deposits themselves are younger, their contained artefactual remains are probably reworked from pre-MIS 7 deposits. Similar Levalloisian technology is known from deposits dating to the period MIS 10 through 8 in northern France (in the Somme valley), so it is likely that there was some link between the populations of southern England and northern France at this time.

Further work through the 20th century identified several other important localities in the Ebbsfleet valley, in particular: (a) the Ebbsfleet Channel site where undisturbed Levalloisian knapping scatters were recovered from an early MIS 7 landsurface in association with a range of faunal remains, (b) the Northfleet Allotments site, where faunal remains were recovered from Ebbsfleet fluvial deposits dating to a warm peak early in MIS 7, (c) the Temperate Bed site where faunal remains were recovered from Ebbsfleet fluvial deposits dating to a warm peak late in MIS 7, and (d) the ZR4 pylon where faunal remains were recovered from Ebbsfleet fluvial deposits dating to a different warm peak late in MIS 7.

Although reconstructing the inter-relationship of these separate sites is difficult, it seems likely that between them they represent the three separate warm sub-stages of MIS 7, namely 7e, 7c and 7a, and that the Levalloisian evidence from Burchell’s Ebbsfleet Channel site dates to the start of the cooler period 7d that followed 7e. A few lithic and faunal remains thought to be of broadly MIS 7 date have been recovered from a spread of deposits on the south side of the Brook Vale arm of the Ebbsfleet valley during work in advance of housing (Springhead Quarter). And a few flakes of unspecific lithic industry were recovered from remnant Thames gravels in the old Northfleet Cement Works, that probably date to the period MIS 10-8.

An outline model is shown (Figure 1.5) of the route of the Ebbsfleet and Brook Vale through the Ebbsfleet valley in MIS 7, and the locations of known Early Middle Palaeolithic sites and surviving deposits. These are set within the landscape of older terrace remnants from MIS 11 and before, which persist on the higher ground around the Ebbsfleet valley. It is worth noting that the rich history of finds to the west of Ebbsfleet International results from the exposure of deeply-buried remains due to quarrying activity. The relative lack of finds further east in Brook Vale probably reflects

a lack of exposure and investigation, rather than being an accurate indication of an absence of Palaeolithic evidence.

1.4.2. Late Neanderthals (150,000-40,000 BP)

Deposits from this period are substantial and relatively widespread in the Ebbsfleet valley, although not elsewhere in the EDC area. The remnant Ebbsfleet MIS 7 deposits in Brook Vale and further down the Ebbsfleet valley after its confluence with Brook Vale are covered by 2-3m of silt/sand slopewash deposits that date to the first half of the Devensian, overlying earlier slopewash deposits that probably date to MIS 6. Ipswichian fluvial deposits are also present in lower-lying parts of the Ebbsfleet valley, at elevations between c. 2m OD and -2m OD.

Despite the abundance of deposits, no artefactual evidence from this period has been found in the EDC area however, and very few faunal remains. A bovine tibia was recovered from Devensian river gravels in the Ebbsfleet valley during fieldwork in advance of HS1, and mollusc shells were identified in a few of the lower-lying Ipswichian deposits along the route of the rail-line, also investigated as part of the pre-HS1 fieldwork.

Although nationally rare, evidence of the final Upper Palaeolithic "Long Blade" industry seems to be relatively prevalent in the Thames basin, and particularly in the EDC area. Six localities are known, comprising 4 sites and two find-spots (Figures 1.3, 1.6). This industry represents the recolonisation of Britain at the end of the last ice age, the Devensian. However, the precise details of exactly how this colonisation relates to the changing climate remain uncertain, due to (a) the paucity of datable material at the known sites, and (b) due to an awkward plateau in the radiocarbon calibration curve that affects the accuracy of the dates that we do have. Therefore we don't know whether these Long Blade sites first occurred during the warm oscillation that preceded the final end of the Devensian, whether they were coincident with its final cold snap, or whether they only appeared after the climate began to warm up properly after c. 10,000 BC - or perhaps some combination of these options. Resolving this uncertainty is a major issue for Palaeolithic research, and thus identifying and investigating sites of this type in the EDC area is a curatorial priority.

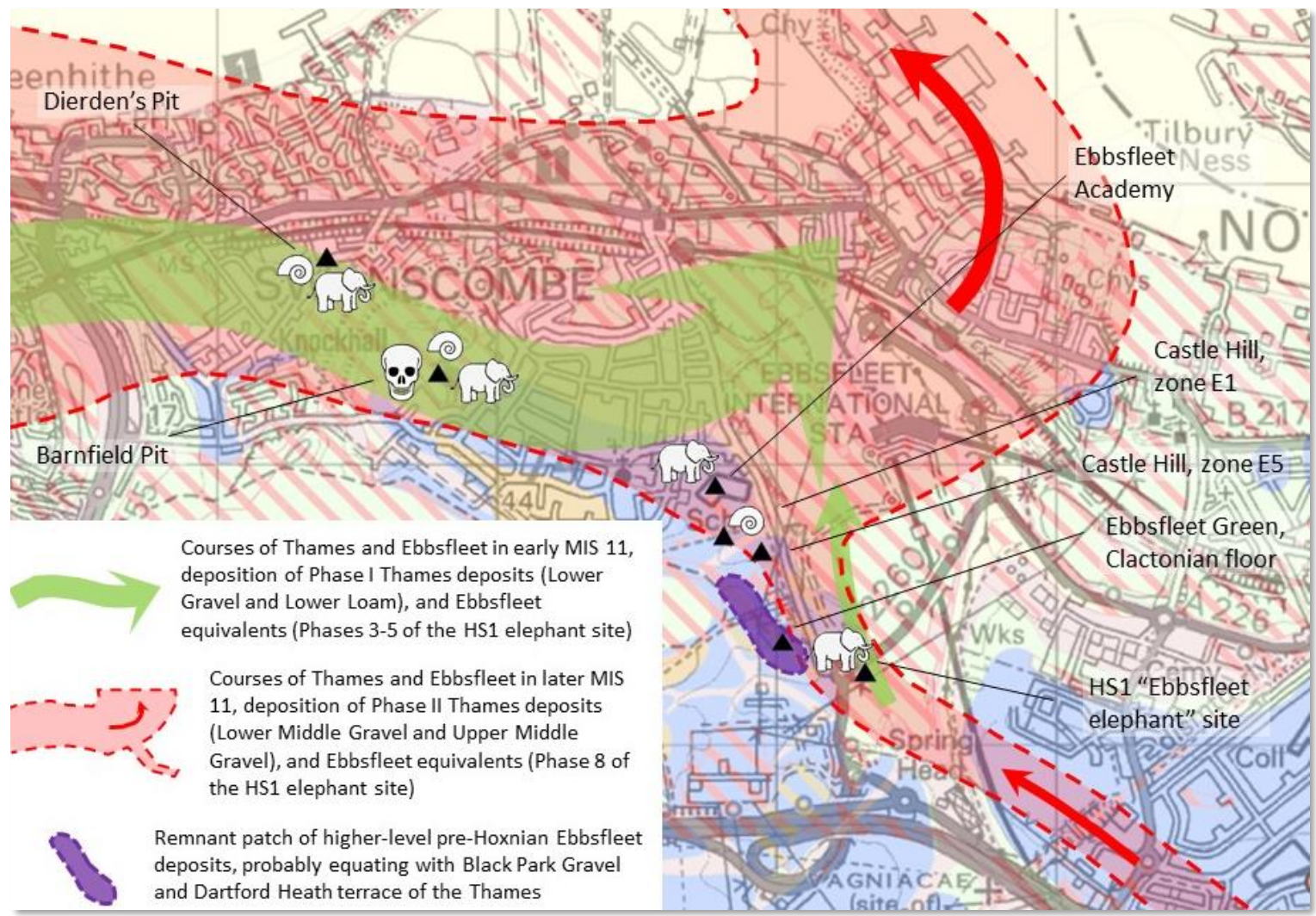


Figure 1.4: EDC urban development area, Lower Palaeolithic

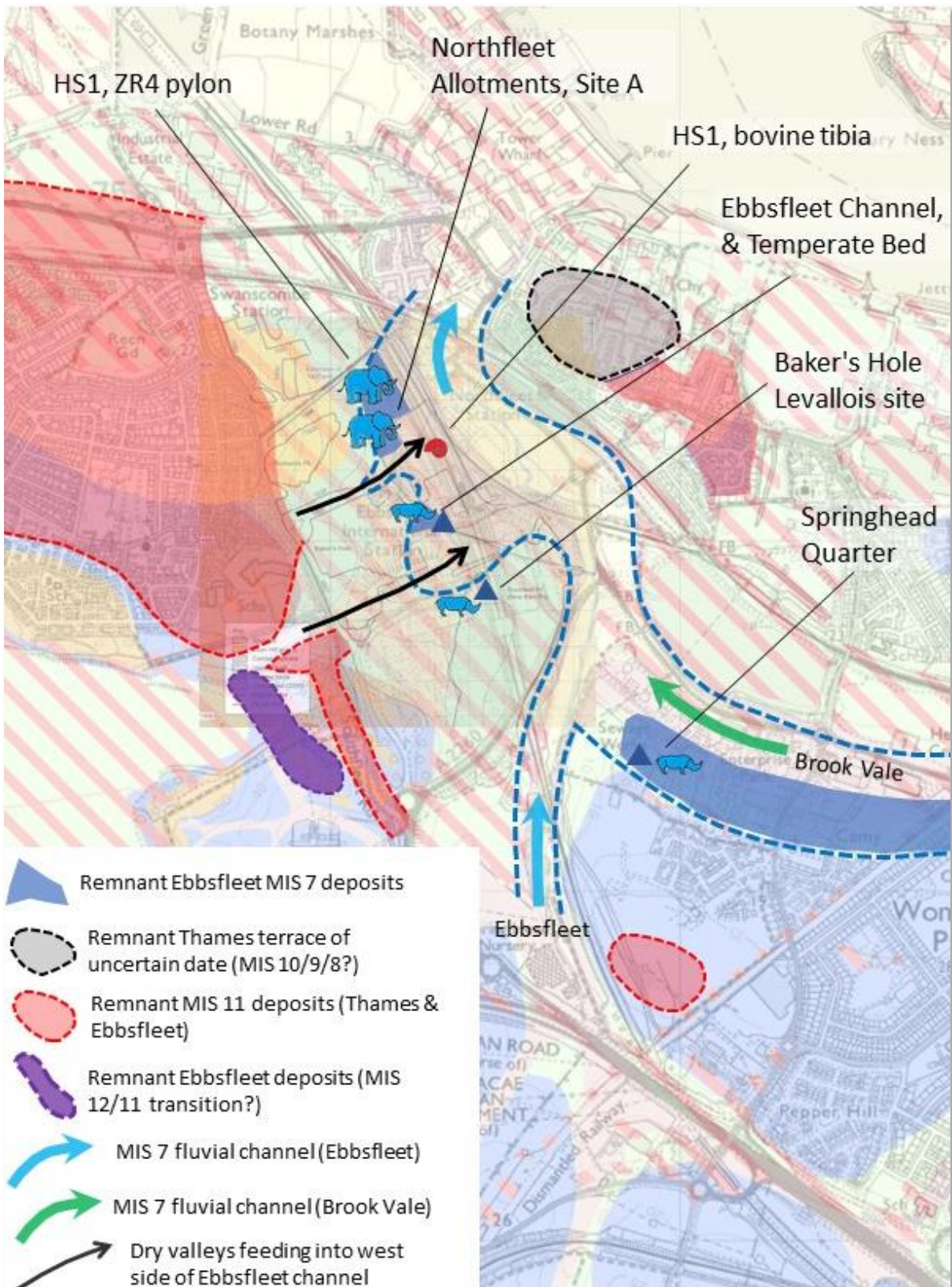


Figure 1.5: EDC urban development area, Middle Palaeolithic

1.5. The Upper Palaeolithic: modern humans (40,000 BP - 9,500 BC)

A broad model of the EDC area is provided (Figure 1.6), showing the known Late Upper Palaeolithic localities in relation to the landscape at the end of the Last Glacial. Sea-level would have been much lower at this time, and the spreads of Holocene alluvium that now form marshland beside the present Thames and in the floor of the Ebbsfleet valley would not yet have formed. The channel of the Thames would have been well to the north of the present mouth of the Ebbsfleet, with a gravelly foreshore butting up against the Chalk rising to the south. The Ebbsfleet itself would likewise have had a narrow channel running across a gravelly floodplain, cutting through Chalk bedrock in places, but also cutting through major bodies of sandy/silty slopewash that had slumped into the Ebbsfleet valley during the Devensian. The higher ground surrounding the Ebbsfleet valley would have been capped in places by terrace outcrops from earlier in the Palaeolithic, and there would have been a patch of land-slipped ground that was predominantly gravelly clay, but which also had a deeper-lying chalk-rich bed rich in flint nodules.

The Ebbsfleet valley and its surrounding area would have been a very favourable area for these people, with abundant opportunities to collect flint raw material for tool manufacture where Chalk (from which flint nodules originate) was exposed at river channel banks, or from chalk-rich landslips. The Late Upper Palaeolithic landscape was buried under Holocene alluvium as sea-level rose after 10,000 BC, and by Holocene slopewash slumping down the dry valley networks in the area. Both of these processes are relatively gentle and can bury archaeological remains with little disturbance, so there is high potential to recover Late Upper Palaeolithic Long Blade sites below Holocene alluvium in particular, and also on occasion below Holocene slopewash in dry valleys.

The known Late Upper Palaeolithic Long Blade sites in the Ebbsfleet valley are of exactly these types. A major concentration of material was recovered in the 1930s from the base of the Holocene alluvium at a site ("Springhead lower floor"), towards the head of the Ebbsfleet Valley. In addition to this, excavations for HS1 produced further evidence of Long Blade material at Springhead Nursery, and at the southern portal of the HS1 tunnel under Thames, in the southern part of Swanscombe marshes. More recently, a substantial scatter of Long Blade material was recovered during pre-development investigations by MOLA at Ebbsfleet Green (Figure 1.10). Complementing these sites, several distinctive Long Blade artefacts were collected in the late 19th century from the now-quarried-away surface of Swanscombe Hill, and from near the mouth of the Ebbsfleet.

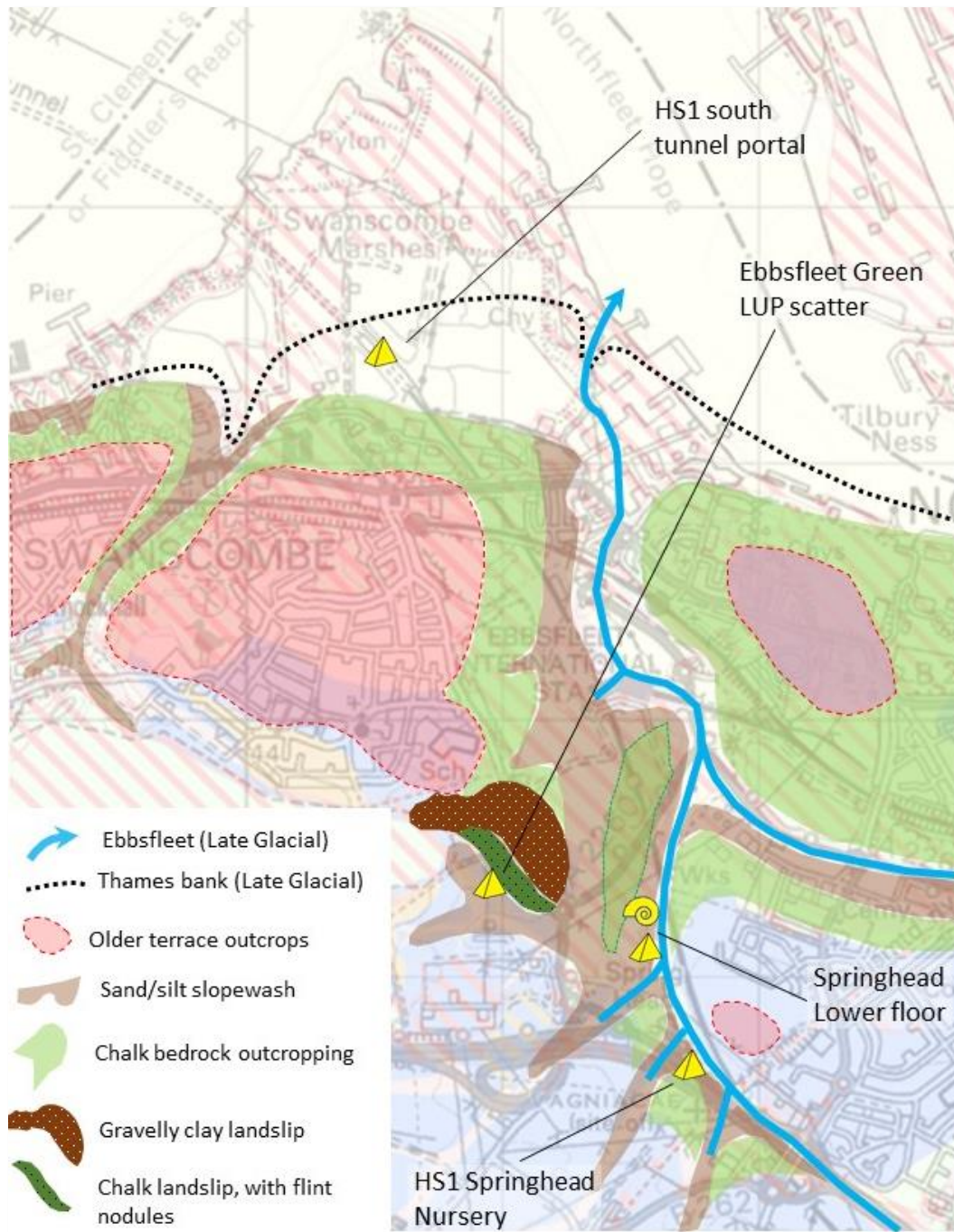


Figure 1.6: EDC urban development area, Upper Palaeolithic

1.6. EDC Palaeolithic character areas

A deposit-led and landscape approach, together with the history of previous work and discoveries, have combined to identify zones of differing Palaeolithic character and archaeological importance (or potential) within the EDC project area (Figure 1.7). Twenty-five zones were identified. Several of these have, however, got multiple sub-zones. Zone 6 for instance, “Previous quarries in the Swanscombe 100-ft terrace”, has four separate sub-zones 6a-6d covering, respectively, the Globe Pit (Greenhithe), Barnfield Pit, the New Craylands Lane Pit and an old pit that is now the recreation

ground in the centre of Swanscombe. Therefore, there are, in total, 32 separate Palaeolithic character zones. These can, however, be grouped into thirteen broader Palaeolithic character areas. These are reviewed here below, and a complementary table summarising each zone in turn is provided as an appendix.

1.6.1. Late Glacial Thames channel and floodplain (Zone 1)

In the present-day this area comprises the main channel of the Thames, and the northern part of the Swanscombe peninsula, which is reclaimed and made-up marshland. At the end of the last ice age there would have been braided channels running across a gravelly flood-plain, probably with a migrating major channel. This area would have been exposed as a landscape for human activity in the Late Upper Palaeolithic, but much of that landscape was probably scoured out as fluvial energy and flow volumes increased during the transition from the Last Glacial to the Holocene. Thus the overall Palaeolithic potential is LOW, although it is possible that the Late Glacial palaeo-landsurface survives below alluvium in places; if so, there might also be archaeological remains from Late Upper Palaeolithic activity.

1.6.2. Late Glacial river-banks (Zones 2a-b, 20)

This area comprises the late Last Glacial river-side landscape, where it was gently buried by Holocene alluvium as sea-levels rose during the transition from the Last Glacial to the Holocene. This area would have been exposed as a landscape for human activity in the Late Upper Palaeolithic, and the evidence of this very likely survives undisturbed below the Holocene alluvium in many areas. Several sites have already been identified, despite difficulty of accessing the palaeo-landsurface (which is typically deeply-buried below several metres of alluvium) and a minimum of investigation. The Palaeolithic archaeological potential is therefore, HIGH. Key aspects of the archaeological potential are (a) the likely preservation of undisturbed remains, including organic evidence and artefacts, and (b) the likely survival of rich and diverse associated palaeo-environmental evidence. Zones 2a and 2b lie along the southern side of the Thames, and Zone 20 represents the floodplain of the Ebbsfleet valley and its westward (Brook Vale) arm. Zone 2a is still mostly natural marshland. Zones 2b and 20 are, in contrast, substantially-developed, although this superficial disturbance mostly hasn't impacted the deeply-buried deposits of high archaeological potential.

1.6.3. Valley slopes, lower (Zones 3,14)

This area comprises the lower valley-side slopes of the Thames and Ebbsfleet valleys (Zones 3 and 14 respectively). These are formed of Chalk bedrock, which is mostly very close below the present ground-surface. The Chalk is overlain by a thin veneer of variably gravelly/silty/sandy slopewash, which thickens downslope and, at the base of the slope, probably interdigitates with Holocene alluvium. This area is of

LOW Palaeolithic potential. Any Palaeolithic artefacts from the slopewash deposits would have been reworked from up-slope, and would thus have very poor chronological control, giving them little value for addressing current research questions.

1.6.4. Valley slopes, higher (Zones 4a-c, 17)

This area comprises the higher valley-side slopes of the Thames and Ebbsfleet valleys (Zones 4a-c above the southern bank of the Thames, and 17 above the west bank of the Ebbsfleet). These areas have been substantially quarried for Chalk through the 19th and 20th centuries, although pre-quarrying deposits survive in places, often below the road network, much of which goes back to the pre-quarrying Victorian era. These zones mostly had Chalk bedrock close below the ground-surface prior to quarrying. The higher parts of these zones often contained the disrupted margins of Pleistocene terrace deposits, and there were also colluvial/slopewash deposits overlying the Chalk bedrock in places. These would mostly have been shallow, although would also have infilled some depressions and minor channels down the slope quite thickly. This area is of LOW Palaeolithic potential. Firstly it is already mostly quarried-out. Secondly, any Pleistocene deposits that do survive are most likely to be disrupted terrace-edge remnants or slope-wash deposits. However, the road and footpath network across these areas preserves a valuable record of the pre-quarrying landscape topography.

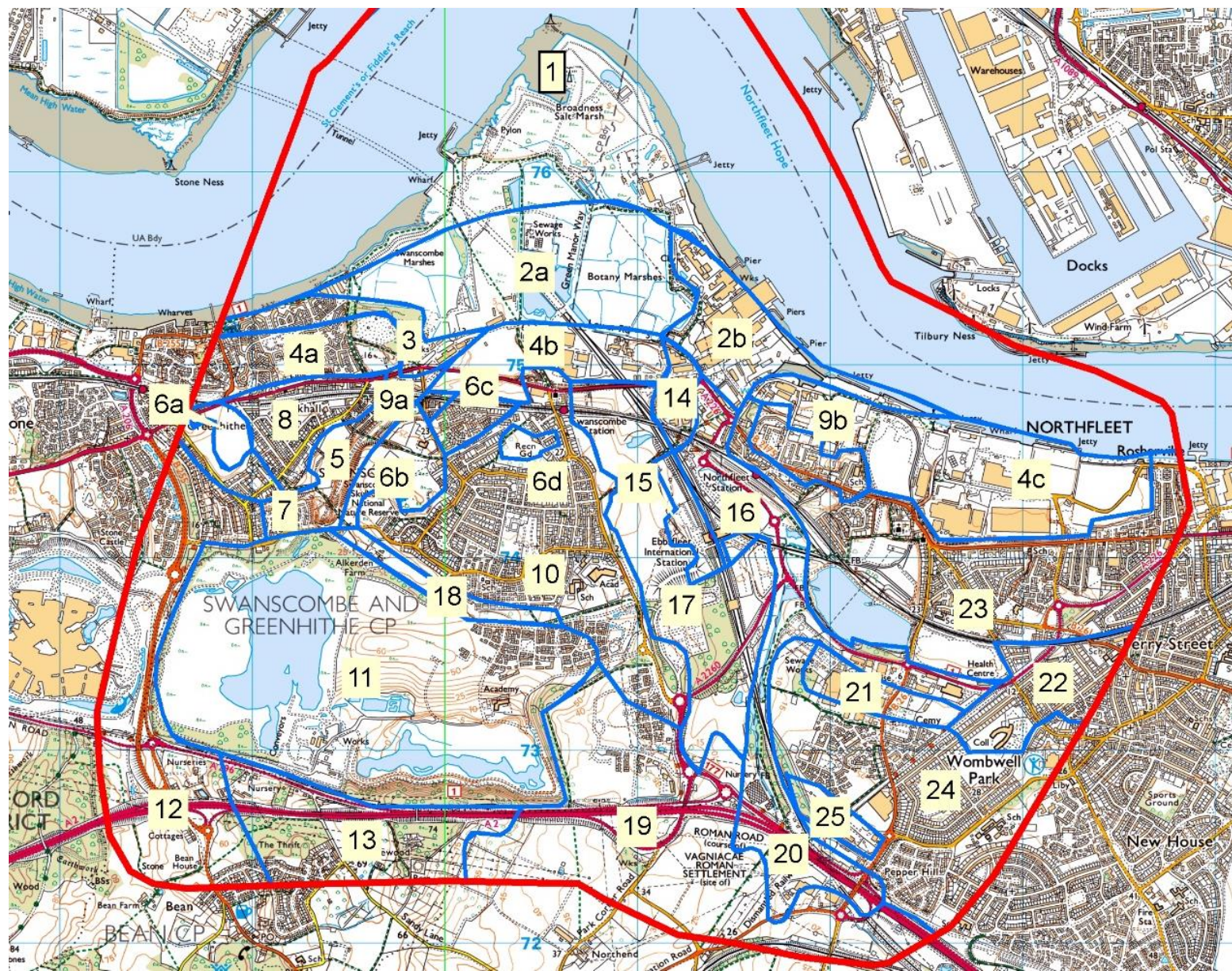


Figure 1.7: Map of Palaeolithic character zones

1.6.5. Thames/ Brook Vale watershed (Zone 23)

This area comprises the watershed between the mainstream Thames and the Brook Vale arm of the Ebbsfleet valley. The bedrock geology comprises Chalk, overlain in places by Thanet Sand, and includes a few areas of historic Chalk quarrying. There are no records of Pleistocene deposits or Palaeolithic remains, and the Palaeolithic potential is LOW. The area is of landscape interest, however, as providing a barrier for the eastward continuation of mainstream palaeo-Thames deposits dating to MIS 11 that have been identified on the other side of the Ebbsfleet valley to the west and southwest (towards the southeast corner of Zone 10). The absence of MIS 11 Thames deposits here in Zone 23, is an important indication that the Thames must have flowed due north at this time into the Orsett Heath area of Essex, before turning east towards the North Sea.

1.6.6. Earlier Middle Pleistocene terraces (Zones 7-8, 9a-b, 10, 25)

This area comprises earlier Middle Pleistocene river terrace deposits, mostly Swanscombe 100-ft terrace deposits dating to MIS 11 (Zones 7-8, most of 10, and 25), but including palaeo-Ebbsfleet deposits of similar age, and some areas that may date to late MIS 12 (a small area in the southeast corner of Zone 10), and others that may date to MIS 10-9 (Zones 9a-b). As well as fluvial sands and gravels, there are also extensive spreads of slopewash sediments, mostly overlying the river terraces, but also sealed under them in some places. All the zones in this area are of HIGH Palaeolithic importance. The deposits in this area are frequently rich in Lower Palaeolithic remains, often including flint artefacts and mammalian remains, as well as other palaeo-environmental evidence. Key finds from this area include the HS1 Clactonian elephant butchery site in the southeast part of Zone 10, and numerous handaxes from Dierden's Pit in the eastern corner of Zone 8, where calcareous fluvial gravels are also very rich in faunal remains. The Swanscombe Skull also came from similar deposits in Barnfield Pit, although this site is here included under the different heading of "Previous quarries in the Swanscombe 100-ft terrace" (see below, **Section 1.6.8**).

1.6.7. Later Middle and Late Pleistocene deposits (Zones 15-16, 21-22)

This area comprises later Middle Pleistocene and Late Pleistocene deposits of HIGH potential, mostly terrace and slopewash deposits dating to MIS 8-6, but also including some slightly younger deposits dating to MIS 5. In Zone 15 there are various isolated "islands" of unquarried deposits preserved within a wider quarried and partly-relandscaped area to the west of HS1 and Ebbsfleet International station. These comprise fluvial and slopewash deposits rich in faunal remains dating to MIS 8-6 and also including palaeo-landsurfaces with undisturbed early Middle

Palaeolithic (Levalloisian) lithic evidence in places, all overlain by a thick blanket of younger slopewash sediments dating to MIS 6-5. Zone 16 contains downslope remnants of the same deposits, as well as slightly younger fluvial and slopewash deposits with faunal remains dating to MIS 5-4. Zones 21 and 22 are mostly uninvestigated, but the presence of similar deposits to Zone 15 is predicted from their landscape situation and from geological mapping.

1.6.8. Previous quarries in the Swanscombe 100-ft terrace (Zones 6a-d)

This area comprises four of the larger previous quarries in the Swanscombe 100-ft terrace, namely: the Globe Pit, Greenhithe (Zone 6a), Barnfield Pit (Zone 6b), the New Craylands Lane Pit, also known as the Craylands Lane Pit, East (Zone 6c), and an old pit that is now the recreation ground in the centre of Swanscombe (Zone 6c). Three of these sites (Globe Pit, New Craylands Lane Pit, and the recreation ground pit) are entirely quarried-out and backfilled, and so are of VERY LOW Palaeolithic potential within the quarrying footprint, although of course the unquarried faces around the quarrying footprints are of HIGH potential as preserving good sequences through the surrounding terrace deposits. The southeast part of Barnfield Pit remains only partly-quarried, due to the discovery there of the Swanscombe Skull - three different pieces of which were, amazingly, found on separate occasions in 1935, 1936 and 1955. This part of the old pit is now designated as the Swanscombe Skull Site National Nature reserve, and is of VERY HIGH importance, with archaeologically-rich remnants of the full original deposit sequence, including the skull horizon.

1.6.9. Dry valleys and vales (Zones 5, 12)

This area comprises two larger dry valleys (or vales) that cut northward towards the Thames from higher ground to the south, namely: the Bean-Greenhithe valley (Zone 12) at the western edge of the EDC area, and Ingress Vale a bit further to the east (Zone 5). They cut down through Pleistocene terrace deposits and into the underlying bedrock, which is mostly Chalk, although Thanet Sand and other Tertiaries occur in their higher southern parts. The higher flanks of these dry valleys/vales have often been quarried for Chalk. This area is generally of LOW Palaeolithic potential. Any remains would most likely be found in thin veneers of slopewash deposits of uncertain date lining the valley/vale sides, and would be reworked from the surrounding terrace deposits or other higher ground to the south.

1.6.10. Eastern Quarry (Zone 11)

This was a substantial Chalk quarry, active through most of the 20th century. Prior to quarrying, this area formed a wooded hill - Swanscombe Park, or Swanscombe Hill -

to the south of Swanscombe rising to over 80m OD. The deeper-lying Chalk was capped by Tertiary (Palaeocene/Eocene) deposits, namely (going up through the sequence): Thanet Sand, Woolwich Beds, Blackheath Beds and (in places) London Clay. Outcrops of clayey deposits, including areas where clayey landslips had infilled depressions in the bedrock surface, were exploited for brickmaking. Numerous Palaeolithic finds were recovered, both from the ground surface and also from deposits exposed in the various clay pits that dotted the hill-top. However whole hill-top was removed in the mid-20th century, to allow access to the valuable underlying Chalk. The quarry footprint is thus of NO Palaeolithic (or other archaeological) value now, all the potentially relevant deposits having been lost. Nonetheless, it is important to remember the previous existence of this high ground and its geological character, since these factors have bearing on landscape development, Palaeolithic activity and site formation in the surrounding Swanscombe landscape.

1.6.11. Head of the Ebbsfleet valley, west (Zone 19)

This area comprises the western flank of the Ebbsfleet valley, upstream of Springhead. The ground mostly comprises a slope between 15m and 25m OD, just rising to 35m OD in the southwest corner. Geological mapping shows Thanet Sand bedrock, dissected by small dry valleys descending to the northeast, infilled with colluvial/slopewash deposits. There may be small and unrecognised outcrops of Middle Pleistocene Ebbsfleet terrace deposits in this zone. Identifying these would contribute to building an overall picture of landscape development through the Pleistocene. Any surviving terrace deposits would, however, be of LOW-MODERATE potential. They would be unlikely to contain Palaeolithic remains due to the lack of a local flint raw material source and poor preservational conditions for organic remains; although if any such terrace deposits are found, this supposition should be investigated.

1.6.12. Head of the Ebbsfleet valley, east (Zone 24)

This area comprises the spur of higher ground between the Ebbsfleet and Brook Vale arms of the forking Ebbsfleet valley, mostly above 20m OD. This area is of LOW Palaeolithic potential. Thanet Sand bedrock outcrops close to the ground surface, and various previous investigations have shown no sign of any Pleistocene deposits or Palaeolithic remains.

1.6.13. Higher ground to south of Swanscombe (Zones 13, 18)

This area comprises high ground to the south of Swanscombe, formed of surviving unquarried outcrops of Tertiary (Palaeocene/Eocene) deposits. This area has two zones, one (Zone 18, at slightly lower elevation) just to the north of Eastern Quarry,

and the other (Zone 13, at higher elevation) just to the south. The underlying geology comprises (going up through the geological sequence, with geological higher deposits occurring close below the ground surface at progressively higher elevations): Thanet Sand, Woolwich Beds, Blackheath Beds and (at the highest parts of Zone 13) London Clay. Early Pleistocene (or perhaps Pliocene) patches of “Plateau Gravel” were also shown in this area in late 19th and early 20th century geological mapping, although these have been omitted from subsequent geological maps. The bedrock geology is dissected by the heads of dry valleys, mostly descending to the north, and infilled by colluvial slopewash deposits. The area is generally of LOW Palaeolithic potential, although there is some research and interpretive value for any Palaeolithic artefacts found. Residual Palaeolithic artefacts may occur on plateaus, and reworked artefacts might be found in the dry valley infill deposits. Despite the lack of chronological control, if any such artefacts were found they could not have moved far (if at all) from their original discard location. They would, therefore, provide a valuable record of the distribution of hominin presence and activity in different parts of the landscape.



Figure 1.8: Handaxe from post-Hoxnian slopewash on west side of the Ebbsfleet valley



Figure 1.9: *Levalloisian prepared core (modern replication)*



Figure 1.10: *Long Blade scatter under excavation by MOLA at Ebbsfleet Green*



Figure 1.11: Swanscombe 100-ft terrace deposits exposed during construction of Ebbsfleet Academy



Figure 1.12: Tusk of extinct straight-tusked elephant discovered during construction of Ebbsfleet Academy



Figure 1.13: The Ebbsfleet elephant under excavation, pale smudges represent crushed remnants of its tusks

1.7. Key Palaeolithic research questions

The South-East Research Framework (SERF 2019, <https://www.kent.gov.uk/leisure-and-community/history-and-heritage/south-east-research-framework>) exists to set the research agenda for the archaeology of south-east England (defined for SERF as Kent, Surrey and East and West Sussex). The Greater Thames Research Framework (GTRF, 1999 revised 2011 https://archaeologydataservice.ac.uk/archives/view/gtrf_na_2011/overview.cfm) carried out a similar function but was focused on the Thames Estuary. Both provide a chronological and thematic overview of the state of current archaeological knowledge for the study area and identifies numerous research questions that need to be answered. Many of these are relevant for the study area and some that are particularly significant are presented below.

- in general, to refine our understanding of the complexity of the deposit sequence and archaeological content of the Swanscombe 100-ft terrace, distinguishing and dating different phases within it, and investigating cultural change through the sequence;

- specific questions relating to the Swanscombe 100-ft terrace include: (a) the route of Phase I (the Lower Gravel and Lower Loam) of the classic Barnfield Pit sequence; (b) to establish how terrace deposits known only from borehole records under the eastern side of Swanscombe relate to the classic Barnfield Pit sequence; (c) to establish if, and how, the Upper Loam as defined at Barnfield Pit correlates with similar loamy deposits near the top of the terrace sequence across the wider Swanscombe area; (d) to establish whether or not the Upper Loam (and similar deposits) are fluvial or slopewash deposits; (e) to establish if any artefacts can be reliably provenanced to the Upper Loam, and if so, to establish their technological/typological character; (f) to consider how the various horizons of the Swanscombe 100-ft terrace relate to other terrace deposits in the wider area, such as those at Dartford Heath, those at Wansunt Pit, and terrace deposits on the opposite (northern) bank of the Thames in Greater London and Essex; (g) to investigate whether there are small patches of post-MIS 11 fluvial terrace deposits preserved as small outcrops (Zones 9a and 9b) that have previously been attributed to the MIS 11 terrace; and (h) to trace the southern valley-side bank of Phase II (Lower Middle Gravel and Upper Middle Gravel) under the thick mantle of overlying colluvial/slopewash deposits in southern Swanscombe, and to investigate Lower Palaeolithic activity in this zone;
- to confirm whether, as suggested here, Zones 21 and 22 in the eastern part of the EDC area contain significant remains from the period MIS 8-6 (the earlier Middle Palaeolithic);
- and if so, to investigate their archaeological and palaeo-environmental content, and establish how the results complement or contrast with the evidence of similar date from historic investigations further to the west in the main part of the Ebbsfleet valley, and to refine our understanding of the complex history of climate oscillation and faunal communities through MIS 8-6, and how this relates to hominin presence and changing cultural practices;
- to establish how the reoccupation of Britain at the end of the last ice age, as represented by Long Blade sites in the Thames basin, relates to changing climate through the transition from the late Last Glacial to the early Holocene - the EDC area has high potential for addressing this national research priority, since it is likely to contain well-preserved sites with organic preservation under the Holocene alluvium, in Zones 2a, 2b and 20.

1.8. Key sources and further reading

Wenban-Smith FF, 2007. The Palaeolithic archaeology of Kent. In (JH Williams, ed) *The Archaeology of Kent to AD 800*: 25-64. The Boydell Press, Woodbridge.

Swanscombe Heritage Park web-link. <http://www.swanscombeheritagepark.co.uk/>

Appendix Palaeolithic zones table

| Zone | Text section and character area | Sub-zone | Zone/Sub-zone details and comments | Palaeolithic importance (or potential) |
|------|---|----------|--|--|
| 1 | 6.1. Late Glacial Thames channel and floodplain | - | Braided channels running across a gravelly flood-plain at the end of the last ice age, but much of that landscape scoured out as fluvial energy and flow volumes increased during the transition to the Holocene | LOW |
| 2 | 6.2. Late Glacial river-banks | 2a | <i>Swanscombe and Botany Marshes</i> . Late Last Glacial river-side landscape, gently buried by Holocene alluvium. Late Upper Palaeolithic remains likely to be widespread and well-preserved on sealed palaeo-landsurface below the alluvium. | HIGH |
| | | 2b | <i>Mouth of the Ebbsfleet</i> . Late Last Glacial river-side landscape, gently buried by Holocene alluvium, and then reclaimed and built on since the 19 th century. Late Upper Palaeolithic remains likely, however, to be widespread and well-preserved on deeply-buried sealed palaeo-landsurface at the base of the alluvium. | HIGH |
| 3 | 6.3. Valley slopes, lower | - | Lower part of the north-dipping slope forming the south bank of the Thames, overlain by a thin veneer of slopewash, which probably interdigitates with Holocene alluvium at the base of the slope. Any Palaeolithic artefacts would have been reworked from up-slope, giving them little value. | LOW |
| 4 | 6.4. Valley slopes, higher | 4a | Higher part of the north-dipping slope forming the south bank of the Thames at Greenhithe, mostly quarried-out for Chalk | LOW |
| | | 4b | Higher part of the north-dipping slope forming the south bank of the Thames at Swanscombe, mostly quarried-out for Chalk | LOW |
| | | 4c | Higher part of the north-dipping slope forming the south bank of the Thames at Northfleet, mostly quarried-out for Chalk | LOW |
| 5 | 6.9. Dry valleys and vales | - | Ingress Vale, cutting northward towards the Thames through Pleistocene terrace deposits and into the underlying bedrock, which is mostly Chalk. The sides of the vale have mostly been quarried for Chalk. Colluvial infill of mostly Last Glacial and Holocene date is preserved along the base of the vale. | LOW |

| | | | |
|---|----|---|-----------|
| 6.8. Previous quarries in the Swanscombe 100-ft terrace | 6a | <i>Globe Pit, Greenhithe.</i> Worked initially for gravel in the mid-19 th century, and then expanded for Chalk extraction in the early 20 th century, before being backfilled with landfill in the late 20 th century. Interesting Palaeolithic handaxes were found in this pit, but there are no good records of the stratigraphy. | VERY LOW |
| | 6b | <i>Barnfield Pit, main part.</i> This was the largest pit in the area in the late 19 th and early 20 th century, before expansion of Eastern Quarry in the second half of the 20 th century. It was initially worked for sand and gravel, before extraction becoming focused on the more valuable and deeper-lying Chalk. Intensive Palaeolithic and geological investigations took place in the early 20 th century, and the site is one of the most prolific sources of handaxes in the world, with tens of thousands having been recovered, and being present in numerous national and international museum collections. However this part of the site has been full quarried-out and is now backfilled, so has no ongoing Palaeolithic value [cf. the southwest extension, see below] | VERY LOW |
| | | <i>Barnfield Pit, southwest extension.</i> Quarrying expanded into this part of Barnfield Pit in the 1930s, and, as well as numerous artefacts, A.T. Marston found two parts of the Swanscombe Skull here, in 1935 and 1936. A third part was found in 1955, by J.J. and B.O. Wymer. Quarrying therefore ceased in this area, and the site was designated as a National Nature Reserve. It preserves deposits from all the currently-recognised phases of the Swanscombe 100-ft terrace sequence, including horizons with abundant artefactual and faunal remains, and undisturbed palaeo-landsurfaces. | VERY HIGH |

| | | | | |
|---|--|----|---|----------|
| | | 6c | <i>New Craylands Lane Pit.</i> This pit, to the east of Craylands Lane, was opened in c. 1910, and then rapidly worked-out for Chalk extraction in the 1920s, becoming a large pond by the 1930s. The pit was slowly filled in through the rest of the 20 th century, and was finally fully infilled and developed for housing in the early 2000s. There is one important record from the 1910s of a deposit sequence with Palaeolithic artefacts somewhere along the southern edge - although unfortunately the precise location isn't specified. But the information is sufficient to suggest that the unquarried deposits to its south, underlying Broomfield Road, may be slightly different, and contain different Palaeolithic remains, from the well-studied deposits of Barnfield Pit to the west. | VERY LOW |
| | | 6d | <i>Pit to north of Milton Road.</i> This is now backfilled and forms a recreation ground in the northern part of Swanscombe. It was originally worked as a gravel pit in the late 19 th century, and then was expanded and deepened for Chalk extraction in the first half of the 20 th century. Few, if any, records of previous finds can reliably be linked back to this specific pit, although without doubt it was the source for many 19 th C finds provenanced to Swanscombe, Milton Road, or Milton Street. | VERY LOW |
| 7 | 6.6. Earlier Middle Pleistocene terraces | - | Remnant of the Swanscombe 100-ft terrace to the west and south of Globe Pit, Greenhithe. This is a potentially important and little-investigated area, that may provide evidence to improve current understanding of the 100-ft terrace deposits, and their archaeological content. Important deposits may extend up to 10m below the ground surface. | HIGH |
| 8 | 6.6. Earlier Middle Pleistocene terraces | - | Remnant of the Swanscombe 100-ft terrace at Knockhall, to the east of Globe Pit, Greenhithe, and west of Ingress Vale. This is a potentially important and little-investigated area, that may provide evidence to improve current understanding of the 100-ft terrace deposits, and their archaeological content. Important deposits may extend up to 10m below the ground surface. | HIGH |
| 9 | 6.6. Earlier Middle Pleistocene terraces | 9a | Small patch of the northern edge of the Swanscombe 100-ft terrace, to the east of Ingress Vale and north of New Craylands Lane Pit. This may preserve evidence of a slightly younger phase of fluvial activity than is represented in the rest of the terrace. | HIGH |

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|----|--|----|--|-----------|
| | | 9b | Patch of the Swanscombe 100-ft terrace at Northfleet, to the east of the mouth of the Ebbsfleet valley. This may preserve evidence of a slightly younger phase of fluvial activity than is represented in the rest of the terrace. | HIGH |
| 10 | 6.6. Earlier Middle Pleistocene terraces | - | Main outcrop of the Swanscombe 100-ft terrace, underlying much of Swanscombe, and including equivalent Ebbsfleet terrace deposits in the southeast part of this zone. These deposits have been intensively investigated in the nearby Barnfield Pit (see above, zone 6b), but otherwise only at a few sites in the southeast part of this zone (Ebbsfleet Academy, Eastern Quarry Area B, and the HS1 elephant site). Without doubt they contain a wealth of archaeological and faunal remains, probably with further hominin skeletal material. Important deposits may extend up to 10m below the ground surface, and can provide evidence to improve current understanding of the 100-ft terrace deposits, and their archaeological content. | VERY HIGH |
| 11 | 6.10. Eastern Quarry | - | This was a substantial Chalk quarry, active through most of the 20 th century. However, it is deeply extracted across the entire quarry footprint, which is thus of NONE Palaeolithic (or other archaeological) value now. A major project of back-filling and housing development is currently in progress. | NONE |
| 12 | 6.9. Dry valleys and vales | - | Bean-Greenhithe dry valley, cutting northward towards the Thames through Pleistocene terrace deposits and into the underlying bedrock, which is mostly Chalk. The sides of the dry valley have been quarried for Chalk in places. Colluvial infill of mostly Last Glacial and Holocene date is preserved along the base of the vale. | LOW |
| 13 | 6.13. Higher ground to south of Swanscombe | - | This area comprises high unquarried ground to the south of Eastern Quarry, with the bedrock being Tertiary deposits: Thanet Sand, Woolwich Beds, Blackheath Beds and (at the highest parts) London Clay. Patches of "Plateau Gravel" were also shown in early geological mapping. The zone is dissected by the heads of dry valleys, mostly descending to the north, and infilled by colluvial slopewash deposits. Residual and reworked Palaeolithic artefacts may occur. Despite the lack of chronological control, any such artefacts could not have moved far (if at all) from their original discard location. They would, therefore, provide a valuable record of hominin presence at this high point in the local landscape. | LOW |

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| 14 | 6.3. Valley slopes, lower | - | Lower part of the east-dipping slope forming the west bank of the mouth of the Ebbsfleet, near its confluence with the Thames, overlain by a thin veneer of slopewash, which probably interdigitates with Holocene alluvium at the base of the slope. Any Palaeolithic artefacts would have been reworked from up-slope, giving them little value. | LOW |
| 15 | 6.7. Later Middle and Late Pleistocene deposits | - | Isolated "islands" of unquarried deposits preserved within the quarried and partly-relandscaped area to the west of HS1 and Ebbsfleet International station. These comprise fluvial and slopewash deposits rich in faunal remains dating to MIS 8-6, and also including palaeo-landsurfaces with undisturbed early Middle Palaeolithic (Levalloisian) lithic evidence in places, all overlain by a thick blanket of younger slopewash sediments dating to MIS 6-5. | HIGH |
| 16 | 6.7. Later Middle and Late Pleistocene deposits | - | An area of unquarried fluvial and slopewash deposits dating between MIS 8 and MIS 4, including horizons with Palaeolithic (Levalloisian) artefacts and a range of faunal remains. It may contain rare (within the Lower Thames region) evidence of the MIS 5e (Ipswichian) interglacial. This zone is now sealed below car-parking for Ebbsfleet International. | HIGH |
| 17 | 6.4. Valley slopes, higher | - | Higher part of the east-dipping slope forming the west side of the Ebbsfleet valley, almost entirely quarried out for Chalk (the exception being the footpath from Swanscombe to Northfleet), and now substantially re-landscaped | LOW |
| 18 | 6.13. Higher ground to south of Swanscombe | - | This area comprises a strip of unquarried high ground to the south of Swanscombe, just to the north of Eastern Quarry. It is formed of Tertiary (Palaeocene/Eocene) deposits, with the surface mostly being firm clay shelly clay of the Woolwich Beds. The surface dips north and the Tertiary bedrock is overlain by slopewash deposits that dip and thicken northward, merging into (or being a lateral equivalent of) the Upper Loam at Barnfield Pit. | LOW |

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|----|---|---|--|--------------|
| 19 | 6.11. Head of the Ebbsfleet valley, west | - | The western flank of the Ebbsfleet valley, upstream of Springhead, with the ground sloping up to the west from c. 15m OD, rising to 35m OD in the southwest corner. Geological mapping shows Thanet Sand bedrock, dissected by small dry valleys descending to the northeast, infilled with colluvial/slopewash deposits. There may be small and unrecognised outcrops of Middle Pleistocene Ebbsfleet terrace deposits in this zone. They would, however, be unlikely to contain Palaeolithic remains due to the lack of a local flint raw material source and poor preservational conditions for organic material. | LOW-MODERATE |
| 20 | 6.2. Late Glacial river-banks | - | Late Last Glacial river-side landscape in the lower-lying floor of the Ebbsfleet valley floodplain, gently buried by Holocene alluvium. Late Upper Palaeolithic remains likely to be widespread and well-preserved on sealed palaeo-landsurface below the alluvium. | HIGH |
| 21 | 6.7. Later Middle and Late Pleistocene deposits | - | This zone has been shown, at its western end, to contain slopewash and fluvial deposits with artefact and faunal remains dating to MIS 8-6. The majority of this zone remains uninvestigated, but it is thought likely, based on similarities in its topographic situation and geological mapping, to contain similar, and similarly important, evidence to zone 15. | HIGH |
| 22 | 6.7. Later Middle and Late Pleistocene deposits | - | This zone remains entirely uninvestigated. However, based on its topographic situation, it is thought likely to contain unmapped remnants of fluvial and slopewash deposits dating to MIS 8-6, which may well contain archaeological and faunal remains. | HIGH |
| 23 | 6.5. Thames/Brook Vale watershed | - | Ridge of higher ground forming the watershed between the mainstream Thames and the Brook Vale arm of the Ebbsfleet valley. No records of Pleistocene deposits or Palaeolithic remains, but the area is of landscape interest, blocking the eastward continuation of the Thames in the period when the Swanscombe 100-ft terrace was formed. | LOW |
| 24 | 6.12. Head of the Ebbsfleet valley, east | - | This area comprises the spur of higher ground between the Ebbsfleet and Brook Vale arms of the forking Ebbsfleet valley, mostly above 20m OD, but below the high point of Pepper Hill. This area is of LOW Palaeolithic potential. Thanet Sand bedrock outcrops close to the ground surface, and various previous investigations have shown no sign of any Pleistocene deposits or Palaeolithic remains. | LOW |

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| 25 | 6.6. Earlier Middle Pleistocene terraces | - | Small patch of palaeo-Ebbsfleet terrace deposits to the south of Northfleet, at the western side of the summit of Pepper Hill, and thought to be equivalent to the main Swanscombe 100-ft terrace. These provide valuable evidence of the MIS 11 landscape, and have also been shown to contain Lower Palaeolithic flint artefacts. | HIGH |
|----|--|---|---|------|

2 Later Prehistoric period

2.1 Introduction to the Later Prehistoric

The later Prehistoric covers the period following the last glaciation, when humans began to re occupy Britain, right up to the Roman conquest in AD 43. During this time Britain came to resemble more or less its current form, particularly regarding its topography and the coastline/sea levels. It is also the period during which people made the change from nomadic hunter gatherers to sedentary farming communities. By the end of the later Prehistoric, proto-towns had even emerged. There were substantial advancements in technology including the first use of ceramics and metal working, as well as developments in social organisation and economy. Many of these changes were driven by increasing contact with the continent. Conventionally, this expanse of time is divided into four-periods; the Mesolithic, Neolithic, Bronze Age and Iron Age. Although these remain useful sub-divisions of this long period of time, many of the most significant changes straddle their boundaries, for example the first use of iron for making tools occurred in the later Bronze Age, while stone tools were also used throughout the whole of this period. Generally, the sedentary life seen in the latter part of this period, increasing from about 4,000 BC, produced more plentiful and varied archaeological evidence but the first part of the period is mainly visible through the discovery of stone tools and on rare occasions *in situ* features and finds.



Figure 2.1: Artist's impression of the later prehistoric landscape along the river Ebbsfleet (courtesy High Speed 1 Ltd / OWA)

Within the study area, the discoveries include scatters of artefacts, some of which were discovered *in situ*, as well as features representing areas of occupation and activity alongside some examples of waterlogged remains. A large portion of the evidence comes from the Ebbsfleet valley and its immediate environs. This may in part be due to the quantity and quality of the archaeological investigations undertaken there, and it is also likely that the largescale removal of the archaeological horizons as a result of Post-Medieval quarrying elsewhere in the study area is a factor. Another factor may be the increased potential for the survival of environmental evidence and organic artefacts within wetland environments such as parts of the Ebbsfleet valley compared to dryland sites. It is also possible however, that a preference for this location was real and access to the resources the river Ebbsfleet would have provided may have made the area attractive to the communities that occupied the area throughout the later prehistoric period.

2.2 Geology and Landscape

Detail about the superficial deposits and underlying geology within the study area is provided in the preceding chapter. To summarise, the geology is predominantly Chalk bedrock with areas of Thanet Formation (fine grained sand) over the Chalk towards the southern end of the study area, where the ground rises. These are, in some small areas, overlain by the Lambeth stratigraphic group (clays and sands) both of which are found commonly across the London basin. Channels cut into the bedrock reflecting the course of the Thames throughout the Pleistocene are filled by a series of deposits that includes gravels usually referred to as Boyn Hill/Orsett Heath as well as the Floodplain gravels. This is again discussed in greater detail in the Palaeolithic chapter. The Ebbsfleet valley, which contains the river Ebbsfleet – a tributary to the River Thames, cuts transversely through the Pleistocene deposits infilling the Thames channels and into the underlying Chalk bedrock. It is itself filled with the Pleistocene gravels which were both water-lain deposits (fluvial silts); as well as colluvial and solifluction deposits. Overlying all of these are a series of complex alluvial, colluvial, fluvial, and estuarine deposits which accumulated throughout the Later prehistoric period.

In contrast to the preceding Palaeolithic period, the later prehistoric landscape, at least in its latter stages, was much more like the landscape as it is today. At a local level, the late Pleistocene landscape of the Thames was one dominated by a braided channel floodplain. This gradually changed into a meandering channel floodplain during the early Holocene when there would have been relative landscape stability with the development of woodlands (Bates & Whittaker, 2004). The Ebbsfleet valley runs north-south roughly centrally through the study area and Brook Vale joins it from the east approximately 1.5km downstream from Springhead. Borehole data has revealed that the confluence of the river Ebbsfleet and the Thames would have moved across the floodplain over time and that there were two basins, one deep basin close to the confluence of the Thames and another shallower inner basin

slightly further upstream. A chalk promontory or spur extended from the western slopes of the Ebbsfleet valley at the junction of the two basins which would have existed as an area of higher ground overlooking the Thames floodplain throughout much of the later prehistoric period. The peninsula formed by the meander of the Thames at the northern end of the study zone, would have existed as a floodplain with variable levels of inundation dependent on the rising and falling sea levels. Away from the floodplains and river valley, the prehistoric land surface will have changed throughout this period as a result of a variety of factors which include sea level changes and colluviation, but generally the ground would have been (and still is) undulating with dry valleys and there is a gentle rise towards the south, to a high point of approximately 100mOD along the southern boundary.

During the Mesolithic period, fluctuations in the sea level would have led to large changes in the landscape, particularly in the areas close to the Thames and in the base of the Ebbsfleet valley. At the start of the Mesolithic, the river Thames was a fresh water tributary to the Rhine that flowed out through the straights of Dover into the Atlantic. Its floodplain would have stabilised during this time, with relatively dry areas and the growth of vegetation between and around the river channels. Towards the end of the Mesolithic, sea level rise would have led to the expansion of wetland environments. Evidence of an influx of brackish waters has been found in several deposit sequences in the outer basin dating to 5480-5070 cal BC and 4370 – 4240 cal BC (Anderson-Whymark, 2020). The pollen suggests open scrubby deciduous woodland around the watercourses and floodplains with an understory of grasses and ferns during the earlier part of this period, with reed swamp environments with some alder and willow later in the Mesolithic. It is likely that the wider landscape would have had more closed deciduous woodland throughout the whole period (Anderson-Whymark, 2020). It is recognised that woodland clearance started in the Mesolithic and there is evidence elsewhere in the UK for this, there is however, very little evidence of any human impact on the landscape of the study area at the time.

This wooded landscape would have continued into the Neolithic period. Trees and shrubs dominate the pollen assemblage with oak, lime, elm and hazel again suggesting a cover of deciduous woodland. There is however some indication of small clearances, possibly for domestic animals on areas of higher and drier ground (Wenban-Smith *et al.*, 2020). At the Ebbsfleet valley bottom, within the river and close to its banks, the peat deposits dated to the neolithic period provide evidence for plat growth across the floodplain. This coincides with a suggested phase of estuary contraction, and it is likely that through the Neolithic there were more areas of usable land at the valley bottoms than there were in both the preceding late Mesolithic period and succeeding Bronze Age (Long *et al* 2000). Pollen from the peat indicates freshwater alder carr, along with marsh/fen and an understory of ferns and sedges.

In the late Mesolithic there is possible evidence for small locally set fires whilst in the Neolithic there is some evidence for small clearances on areas of higher ground. Woodland cover away from the valley bottom decreased significantly at the beginning of the Bronze Age. Woodland cover of about 80% in the early Neolithic had reduced to about 50% by the middle Bronze Age (Wenban-Smith *et al*, 2020). The landscape is likely therefore, to have comprised more open grassland on the higher ground and dry valley slopes with arable cultivation and some areas of oak and hazel woodland. Evidence for colluviation in the early Bronze Age around the slopes of the lower Ebbsfleet valley provides further evidence for woodland clearance in this period and thereafter (Stafford *et al*, 2020). By the middle to later Bronze Age much of the land surface that had emerged in the Neolithic would have flooded as there is evidence of an expansion of brackish water conditions into estuarine channels due to rising sea levels (Bates and Whittaker, 2004). In the Early Bronze Age, the evidence suggests the presence of a tidal river with mudflats and fringing saltmarsh, fen and reed swamp environments, on the floodplains and at the base of the Ebbsfleet valley. By the late Bronze Age this had spread up the Ebbsfleet valley and reached the area of the inner basin beyond the chalk spur (Stafford *et al.*, 2020).

These processes continued in the Iron Age and the continued rise in sea level meant that the water in both the inner and outer basins reached their highest levels by the end of this period, and most of the Ebbsfleet valley bottom and Thames floodplain would have been wetland. Peat dated to the late Bronze Age/early Iron Age by radiocarbon (835–770 cal BC) contained a pollen spectrum that indicates that substantial woodland clearance had occurred in the landscape surrounding the Ebbsfleet valley by this time. Thus, an open landscape dominated by grassland/pasture with some localised arable activity is suggested.

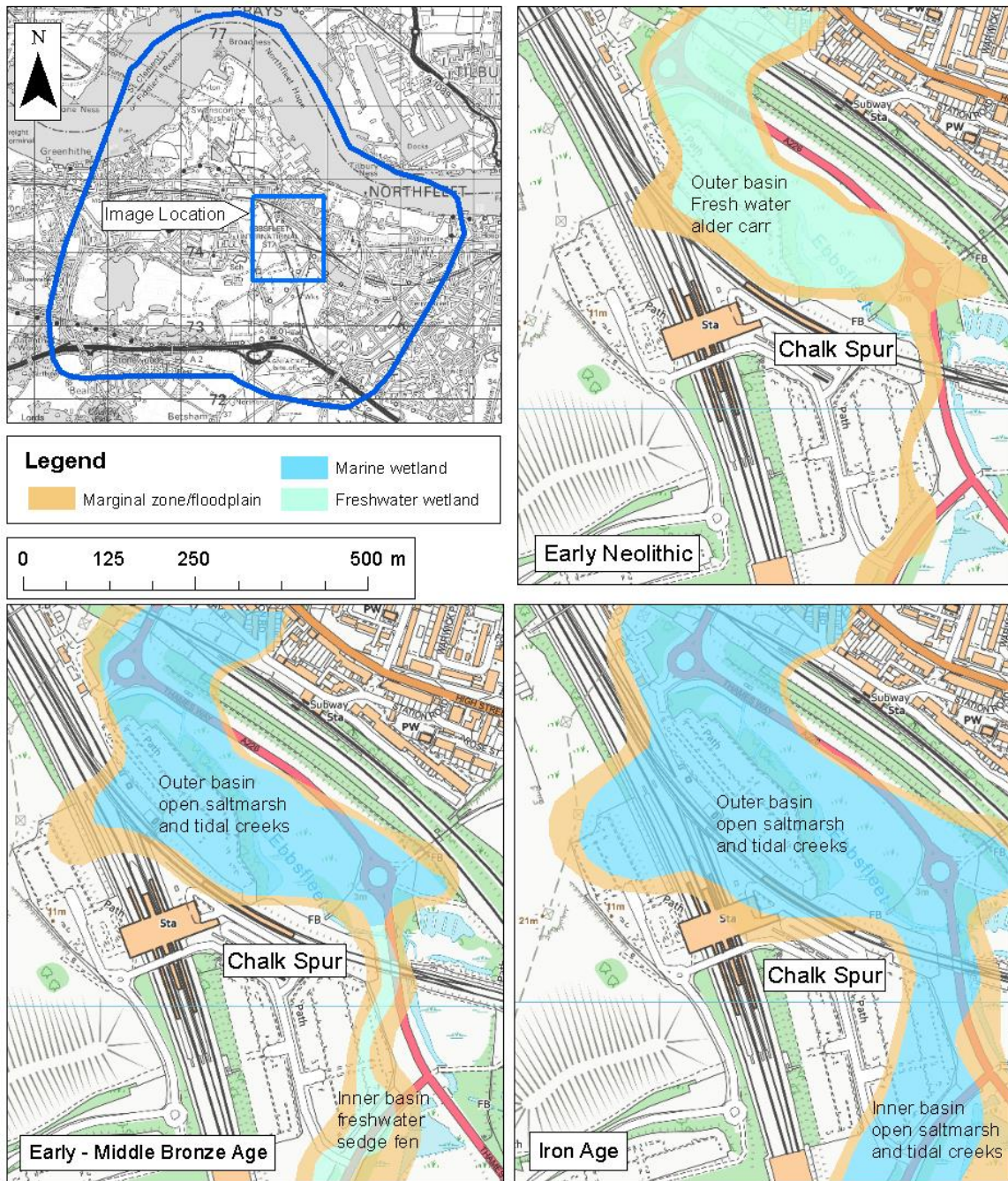


Figure 2.2: Changes in the Ebbsfleet valley through the later prehistoric period.

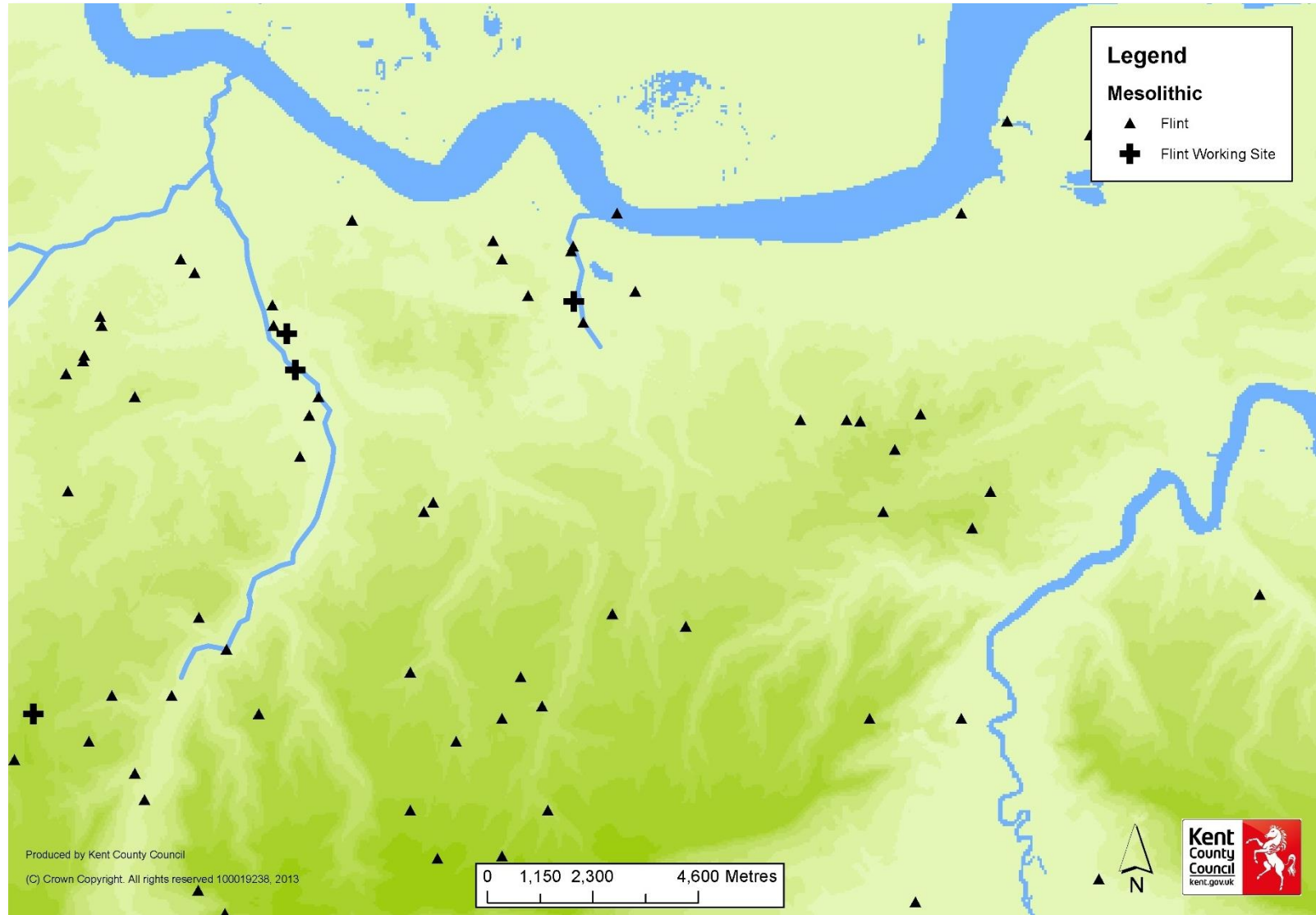


Figure 2.3: Summary map of Mesolithic data from north-west Kent

2.3 Mesolithic c.9,500 BC – 4,000 BC

The start of the Mesolithic period was marked by a period of warming that followed the final glaciation in the Palaeolithic. At the start of this period, the landscape of Kent would have been very different to today. Britain was joined to the Continent by an expanse of land exposed by the low sea levels that existed until around c.6,500 BC when it was eventually breached and the final submersion of Doggerland in c.6,000 BC as sea levels rose. (Garwood, 2011). This would have meant the large-scale loss of whole landscapes including many areas that would have been previously occupied. The Mesolithic period would have seen many changes for the people that occupied Kent, partly as a result to these climatic and landscape changes. In the earlier part of the period, c.9,500-6,000 BC, the population would have been highly mobile with seasonal residence systems that would have covered very large areas and supported large game hunting across open grassland. In the later part of the period, c.6,000-4,000 BC, hunting was more focussed on woodland game and there was intensive exploitation of plants and marine resources across relatively fixed territories (Garwood, 2011). Throughout both the early and the later parts of the Mesolithic, access to good hunting grounds, the rivers, coast and woodlands would have all shaped movement, as did the need to acquire flint for the manufacture of tools. New stone tool technologies were developed early in the Mesolithic including microliths, used as blades and tips in arrows, saw edged blades and axes (Barton, 1991). Many of these new tools seem to have been designed for working wood, and it has been suggested that woodland clearance began in this period (Champion, 2007).



Figure 2.4: Howick House, reconstructed Mesolithic hut site in Northumberland (Photo © Andrew Curtis (cc-by-sa/2.0))

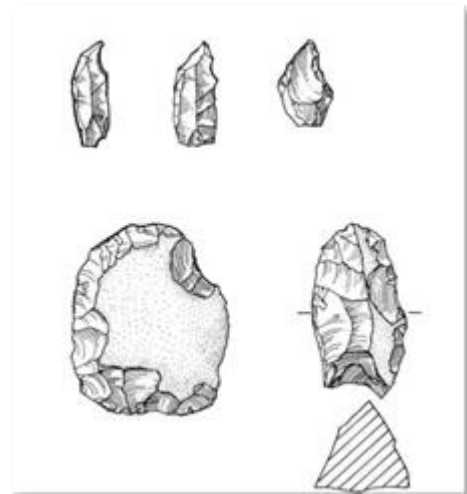


Figure 2.5: Mesolithic flints from below the Chestnuts megalithic tomb, Addington

Some well-preserved Mesolithic sites are known in Britain, examples include the building and exceptional finds at Star Carr in Yorkshire and the hut remains at Howick in Northumberland. Such sites are, however, relatively rare and the archaeological record for this period is largely limited to the discovery of flint tools, often recovered as residual finds in later contexts. The study area and its immediate vicinity is no exception, with the probable Mesolithic paddle discovered at Swanscombe (now lost) being an extraordinary and isolated find (Champion, 2007). The relative scarcity of finds in the immediate vicinity of the Ebbsfleet is consistent with wider distribution in Kent, in which finds are relatively numerous on the Lower Greensand, with fewer finds on the Chalk (Harding, 2006). Though relatively rare, some sites have produced Mesolithic material.

Within the study area, most of the evidence for Mesolithic activity comprised either single finds or small assemblages of flint in residual contexts. Perhaps the most interesting, and certainly the largest assemblage discovered in the study area was also recovered during works associated with HS1, this time at Springhead. Here, a coherent assemblage of 755 Mesolithic flints (TQ 67 SW 308) was recovered from the lower portion of the colluvial sequence. The assemblage includes evidence for the primary production of blade cores with some refitting sequences which suggest that while the assemblage was not *in situ*, it retained some integrity. This site then, appears to have been the location of a specific part, the initial stages, of the process of producing flint tools. Though it is not known on how many occasions the area was visited, it could be seen as having been occupied as part of a logistic pattern of movement - the pattern of movement that was intended to exploit specific known resources (Anderson-Whymark *et al.*, 2020). Some other notable examples include the early discoveries made in Barnfield Pit (TQ 57 SE 85) which included a scatter of retouched blades and flakes, together with cores, tranchet axes and scrapers, though the precise location and circumstances of their discovery is not known (Wessex Archaeology, 2004). A scatter of struck flint material (TQ 67 SW 192) was recovered from a watching brief on the construction of the Northfleet bypass. The assemblage included a fine axe known as a Thames pick of Mesolithic type, as well as a complete tranchet axe (Garrod, 1988). An investigation carried out close to Ebbsfleet International rail station in 1997 produced 9 pieces of struck flint (mostly flakes) (TQ 67 SW 1459) which were dated to the Mesolithic period (c. 5,300 BC) on the basis of radio-carbon dating of associated organic material (Oxford Archaeology, 1997). The Ebbsfleet river crossing site that was excavated during works associated with HS1 also produced a small collection of Mesolithic flint (TQ 67 SW 1807) which included a fabricator, a micro-burin, two bladelets, three chips, and an awl (Anderson-Whymark *et al.*, 2020).

Even though the study area lacks any entirely *in situ* artefacts or sites, the potential of the Thames valley to produce Mesolithic features and finds is well documented through discoveries at other locations. For example, on the north side of the river Thames, at Beam Washlands, Dagenham *in situ* scatters of early and late Mesolithic

flints were discovered, sealed by a layer of peat (Champness *et al* 2015). Nearer to the Ebbsfleet valley, a large scatter of late Mesolithic flint and burnt flint, perhaps derived from hearths, was found on the HS1 site at Tankhill Road, Essex in deposits again sealed by peat. (Bates and Stafford 2013; Leivers *et al* 2007). The presence of peat dating to the Mesolithic is noted in several locations within the study area, including at the base of the Ebbsfleet valley and on the Thames floodplain on the Swanscombe peninsula (TQ 57 NE 1080) (Wessex Archaeology, 2005). It is therefore quite likely that *in situ* artefact scatters and sites remain to be discovered in the EDC area too.

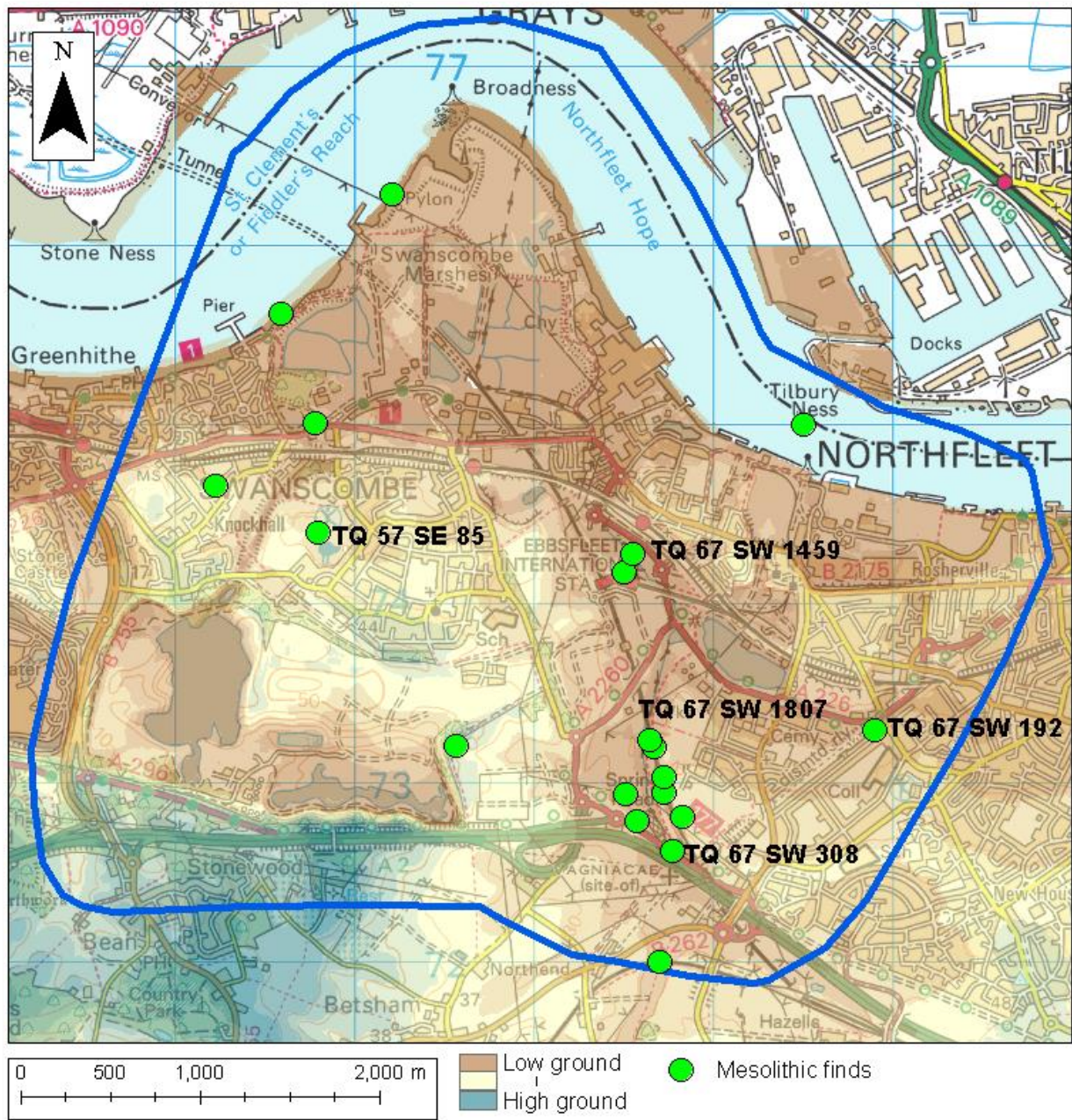


Figure 2.6: Plan of Mesolithic features within the study area, labels refer to features in the text

2.4 Neolithic c. 4,000-2,500 BC

There are many differences between the available evidence for the Mesolithic period, which is largely restricted to assemblages of lithic artefacts, and the Neolithic, where there is a far greater variety of both finds and features. The most striking aspects being the construction, in the early Neolithic, of a



Figure 2.7: Kits Coty, one of the Medway Megalithic burial chambers (Simon Burchell CC BY-SA 4.0)

range of funerary monuments and enclosures. Flint tools were still used, and worked flint provides the most common form of evidence for activity in this period. But alongside the flint, pottery is frequently recovered from Neolithic sites, usually in association with pits. The woodland clearance, which began in the later Mesolithic, was continued and though this was still only localised in the early Neolithic, it was extended following the development of arable and pastoral farming. The introduction of farming meant that the population became more attached to and dependent upon their local landscape. Despite this, evidence for settlement remains rare, suggesting that there was some continued mobility of occupation (Whittle, 1997).

The evidence shows that farming appears very early in the Neolithic (in around c.4050 BC) and there are indications that it was adopted quickly widely across Britain (Garwood, 2011). Studies in early Neolithic economy show however, that while farming was important, hunting and gathering of wild resources still played a role in food supply (Entwistle and Grant, 1989). There is little in the way of permanent settlement evidence for the Neolithic, but there are indications that certain sites formed central points within the landscape and these would have been visited and revisited over the years. Examples of such sites include the causewayed enclosures at Chalk Hill, Ramsgate, Orsett Heath in Essex and at Eastchurch on the Isle of Sheppey (Oswald *et al* 2001). There was also a change in the rituals and beliefs in this period, with a new importance attached to ancestors. This is clearly evidenced by the new range of funerary monuments which appear in the early Neolithic (from c.3750 BC) and that include the large and elaborate burial chambers – long barrows. The most important monuments of the Neolithic in Kent are two groups of long barrows centred on the Medway valley and the Stour valley. These

are still some of the most visible remains of the prehistoric period in the county and have been striking elements in their local landscapes since their first construction (Champion, 2007). The creation of these monumental structures is very interesting as it suggests increasing social complexity, particularly the causewayed enclosures as they are presumed to have a ritual and/or possible social function. Another example of a type of site which appears for the first time in the Early Neolithic and which also implies an increased social complexity at this time, are the timber longhouses. Though debate about the precise function of these structures continues, it has become increasingly accepted that all types of prehistoric architecture must be seen as being richly 'meaningful' to those who would have created and used them and these are no exception. Even if their interpretation is that they may have had a domestic rather than religious function, they are still the result of 'deliberate and explicable sets of social actions' (Garwood, 2011, 82). Two important and early examples of these structures have been discovered in Kent, on adjacent sites near Maidstone: White Horse Stone and the Pilgrim's Way. These are some of the earliest well dated Neolithic structures in Britain. The wider landscape of north Kent is an important one for this period. It has been suggested that the above-described changes attributed to the early Neolithic formed part of a process (Neolithisation) which started in 4050 BC in south east England, possibly initially the Thames estuary area specifically, and from there spread across Wessex into southwest and northern England by 3900 BC (Garwood, 2011).

The landscape immediately surrounding the study area however, lacks any evidence for these impressive sites and conspicuous monumental features. The nearest sites of note include a possible mortuary enclosure which was identified as a cropmark and was subsequently evaluated as part of the CTRL works at Tollgate (Bull, 2006) and the causeway enclosure on the other side of the Thames at Orsett Heath in Essex. This does not mean that there was no activity in the region as several sites have recorded Neolithic features and finds. Examples include a large, ramped posthole found on site G along the A2, c. 2.5km south-east of the study area. From this radiocarbon dates of 3640-3380 cal BC and 3630-3370 cal BC were obtained (Allen *et al.*, 2012). Pits containing Grooved Ware pottery as well as a possible Neolithic enclosure (TQ 57 SE 1052) were discovered during excavations on the A2/282 junction, c.2.5 km south-west of the study area (Simmonds *et al.*, 2011). Most other Neolithic sites in the region comprise groups of pits containing finds including those discovered at Blackdale Farm, located just over 2km to the south-west of the study area (TQ 57 SE 169) (Philp and Chenery, 2001). Additionally finds of Fengate-style Peterborough ware pottery were recovered during excavations at Darenth, just under 3km south-west of the study area (Philp, 1984).

Though, again the study area itself lacks any evidence for large scale communal or ritual monuments, several important Neolithic discoveries have been made. These are of added significance as the majority of the evidence that we have for Kent in this period is from upland chalkland areas, and the excavations at Ebbsfleet are the only

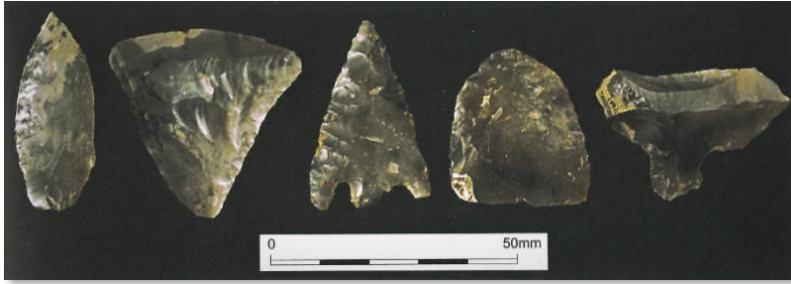


Figure 2.8: Examples of the Neolithic and Early Bronze Age worked flints discovered during the HS1 excavations around the Ebbsfleet valley (courtesy High Speed 1/ OWA).



Figure 2.9: Middle Neolithic Ebbsfleet Ware bowl discovered during STDR4 excavations (courtesy KCC/ OWA)

detailed investigation of a river valley site. The evidence should therefore be treated with some caution as it may not be typical of such locations. Among the most significant are two sites with Neolithic occupation levels, both located at the valley bottom on either side of the river Ebbsfleet (TQ 67 SW 1494 and TQ 67 SW 1051). Excavations in the 1930s exposed working floors from which the Ebbsfleet variety of Peterborough ware pottery was first recognised (Burchell and Piggott 1939). Further investigations carried out in the 1960s revealed a

series of heavy horizontally placed timbers at one of the sites, possibly representing a trackway (Sieveking, 1960). Both areas have now been protected as scheduled monuments.

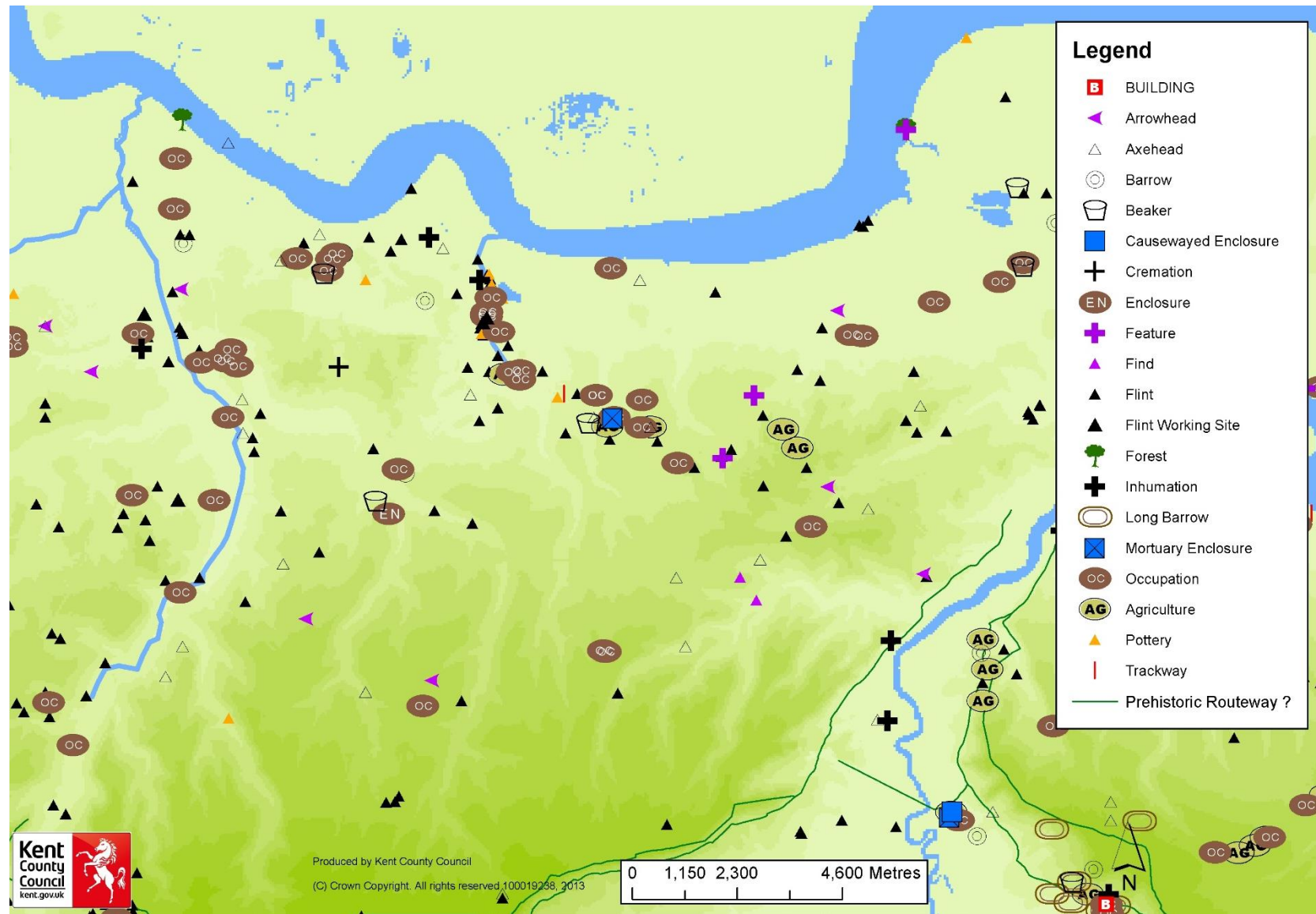


Figure 2.10: Summary map of Neolithic data in north-west Kent

Alongside these scheduled examples, several additional *in situ* flint scatters and deliberate deposits have been uncovered within the study area. On the eastern slopes of the Ebbsfleet valley, a large concentration of early Neolithic material including two leaf-shaped arrowheads and a fragment of a polished axe was discovered in the fills of a large tree throw (TQ 67 SW 1354). The limited amount of micro-debitage indicated that the material had been collected up and dumped into the hollow (Wessex Archaeology, 2008). *In situ* scatters or worked flint are known from several locations at the Ebbsfleet valley bottom, on the former floodplain. The largest assemblage (TQ 67 SW 1805) was located on a preserved land surface revealed during works associated with the South Thameside Development Route 4 at a site approximately 200m to the north of the Water treatment works and close to one of the scheduled sites. This produced 1606 worked flints with a large component of knapping debris in the assemblage. It is likely, however, that this scatter is not solely the product of knapping events as the distribution of flints suggests they were also used in cutting and whittling actions. A large number of unretouched flakes also seem to have been abandoned as refuse. 450 un-worked burnt flints were also discovered alongside the worked flint, indicating that the activity here also involved burning. The discovery of an Ebbsfleet Ware bowl (pictured above – Figure 2.10) (TQ 67 SW 400) during evaluation trenching to the north may suggest that this



Figure 2.11: Late Neolithic trackway discovered near Ebbsfleet (courtesy KCC/ OWA)

activity extended along the Ebbsfleet valley bottom (Oxford Archaeology, 2000). This site and others like it have been interpreted as relatively short-lived activity areas related to specific tasks, although the precise nature of the activity is not clear (Stafford *et al.*, 2020). A concentration of waterlogged weathered logs and poles (TQ 67 SW 1806) was revealed at the same site (though higher in the stratigraphic sequence so of a later date). These appear to have formed a part of a simple trackway with radiocarbon dates of 2870-2570 cal BC. It is possible that this was a later continuation of the trackway that was seen at the scheduled site, just 250m to the south, though this has not been confirmed.

In situ artefacts are generally infrequent occurrences and much of the rest of the evidence from the study area comprises scatters of artefacts, often in residual contexts. A small but significant assemblage of Neolithic pottery was discovered at the river Ebbsfleet crossing site (ARC ERC01) which was excavated ahead of works associated with High Speed 1. The assemblage includes 107 sherds that were largely recovered as residual material from later Bronze Age contexts (TQ 67 SW 1466). Residual early Neolithic material was also recovered during excavations at Springhead (ARC SPH00) to the south. A deposit within the colluvial sequence here contained an assemblage of 107 worked flints including broad blade and blade-like products that suggest an early Neolithic date. It is possible that the assemblage reflects knapping waste, and their fairly fresh condition suggests general occupation and activity on the higher ground on the flanks of the Ebbsfleet valley from where the colluvial deposits originated (Stafford *et al.*, 2020).

The available evidence demonstrates that the study area was used in the Neolithic, there is however, little to indicate permanent settlement or occupation. Rather, it appears to reflect a pattern of exploitation which involved relatively brief episodes of occupation, presumably to exploit specific resources. Thus, it shows a flexible and highly mobile aspect of the Neolithic settlement system (Safford *et al.*, 2020). The evidence appears to be focussed in areas adjacent to the river Ebbsfleet, suggesting a possible preference for this area and the resources it provided throughout the Neolithic period. The trackways highlight this point and suggest that the area was revisited on a sufficiently regular basis to make the construction and maintenance of such a trackway necessary.

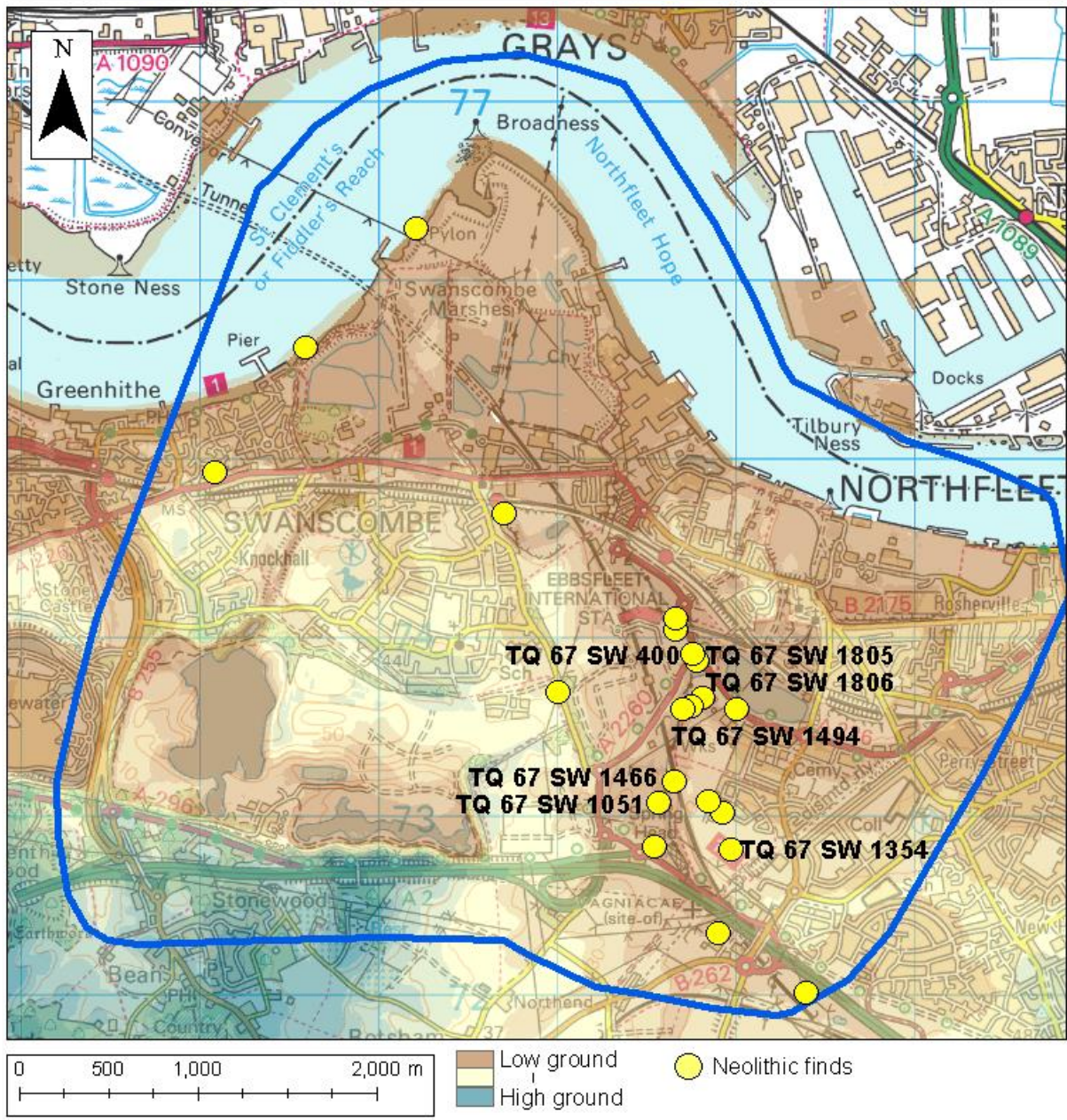


Figure 2.12: Neolithic features and finds in the study area labels relate to features mentioned in the text

2.5 Bronze Age c. 2,500-700 BC

The dates for the Bronze Age are under continual review as new perspectives on the rapid change during the second millennium BC are gained. This period is characterised by the development of more sedentary communities that, by the middle Bronze Age, built settlements which included groups of small round houses surrounded by paddocks, fences and enclosures. The scale of agricultural and craft production increased significantly as a rising population, alongside improvements in technology, allowed larger groups to work together to exploit their resources. The establishment of large and complex field systems is evidenced in the archaeological record of the middle and later Bronze Age, including numerous examples across Kent (Champion, 2007). The technology for refining metal was also developed in this period. Copper was being used in the latest centuries of the Neolithic and by c. 2200 BC bronze was being worked in Britain and over the next 1000 years, it gradually replaced stone as the main material for tools and weapons.



Figure 2.13: Early Bronze Age copper alloy flat axe, from Lydd, Kent (Copyright Trustees of the British Museum)

As new technologies and ways of living developed, there were corresponding changes for many of the other aspects of life that typified the preceding Neolithic period. Perhaps the most notable of these concern burial traditions. Barrows continued to be constructed in the early Bronze Age but there are significant differences in their form and the Bronze Age barrows often only contained a single burial (though later burials were sometimes inserted into the mound or its surrounds), which differed markedly from the earlier Neolithic long barrows which contained many individuals. By the middle and later Bronze Age, there was a decline in the construction of barrows altogether, with cremation burials more often found in isolated contexts or associated with field systems.

Although evidence for many of these changes is not widespread in the archaeological record of the landscape surrounding the study area, some interesting sites have been discovered. A good example is the middle Bronze Age settlement revealed during excavations associated with the A2, (site G) less than 3km to the south east of the study area (TQ 67 SE 355). This consisted of a ditched L shaped enclosure with an entranceway to the southwest, three clusters of post holes that indicate structures which may have included a possible round house, a fence line and what could be two-post drying rack-type structures (Allen *et al*, 2012). Another

settlement site was discovered at Cobham golf course (TQ 66 NE 109) further to the south-east (approximately 7km from the study area). This comprised a concentration of pits, postholes, ditches and an associated trackway of a likely later Bronze Age date (Davis, 2006). Evidence for a late Bronze Age field system comprising boundary ditches and an associated trackway was discovered at the A2 activity park, less than one kilometre south-east of the study area (TQ 67 SW 625) (Dawkes, 2010).



Figure 2.14: Double beaker burial from Northumberland Bottom (courtesy High Speed 1/ OWA)

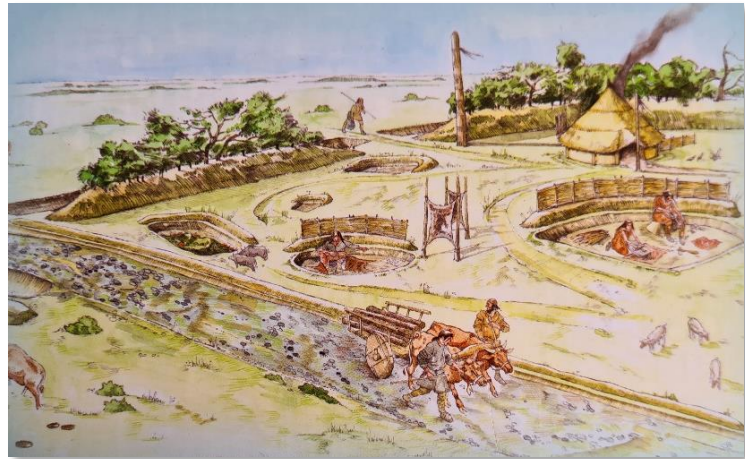


Figure 2.15: Artists reconstruction of Middle Bronze Age settlement at A2 site G looking west (courtesy Oxford Archaeology)

The cremation burials that were discovered alongside the ditches at this site (TQ 67 SW 623) provide good examples of the mid-late Bronze Age tradition of associating burials with field systems. Further Bronze Age burials have been uncovered at several locations in the region including a grave containing skeletons associated with beakers (TQ 67 SW 542) which was discovered at Northumberland bottom, approximately 2km south-east of the study area. A possibly slightly later cremation was discovered at the same site within a collared urn (Askew, 2006). Another example of grave goods accompanying an inhumation burial was uncovered at Whitehill Road, Southfleet, situated 2.5km to the south of the study area, where a double-ditched barrow was uncovered (TQ 56 NE 98). The grave which was cut into the fills of the inner ditch contained an inhumation burial with 21 amber beads, no doubt originally forming a necklace (Bull, 2006). The skeletal remains revealed within the gravel pit at Galley Hill, known as the 'Galley Hill Man' (TQ 67 SW 41), may have also dated to the Bronze Age (or possibly Neolithic) period. These are just a selection of the sites which have revealed archaeological material and features dating to the Bronze Age but they clearly show that many aspects of Bronze Age life have been reflected in the archaeological record of north-west Kent.

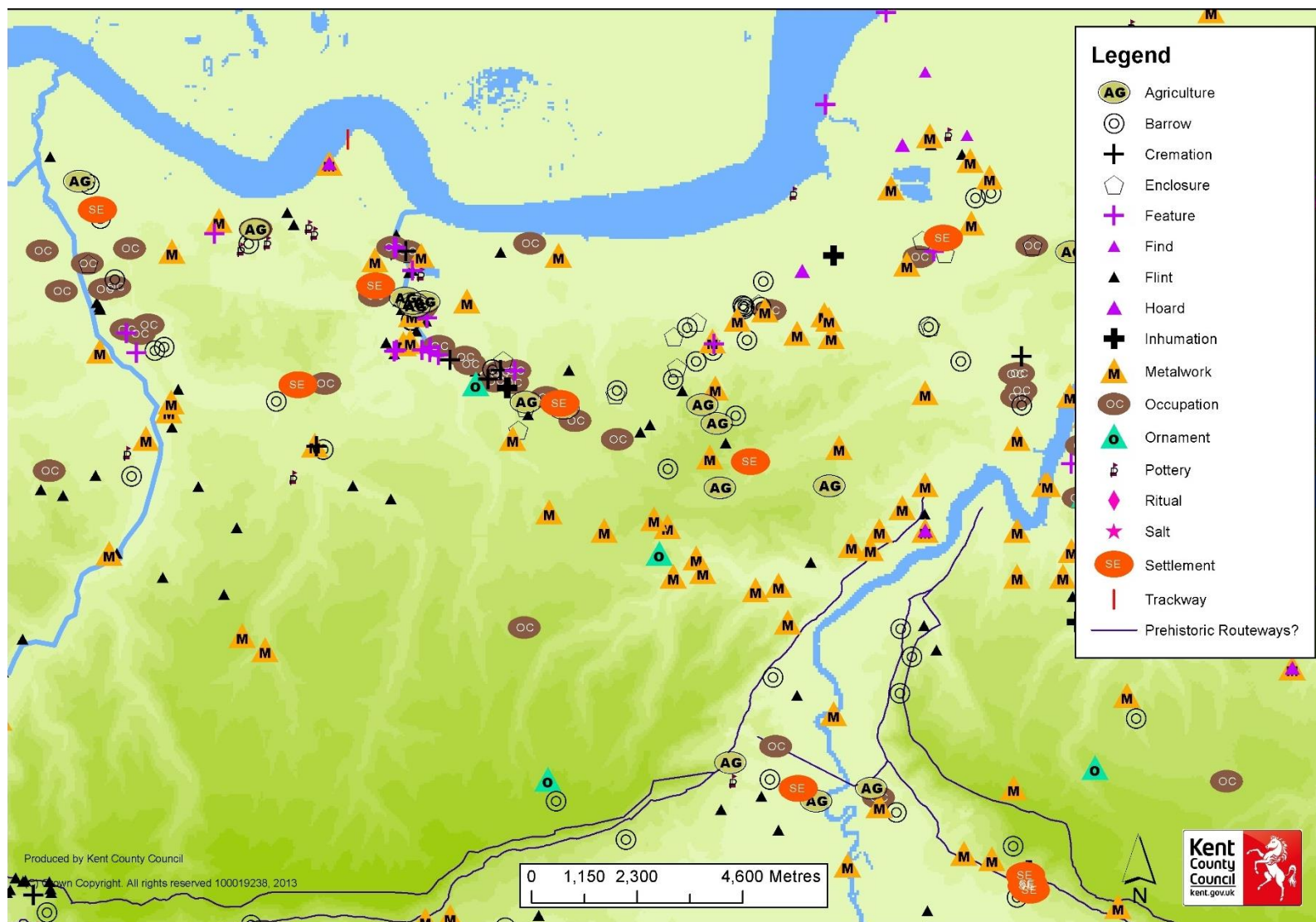


Figure 2.16: Summary map of Bronze Age data in north-west Kent



Figure 2.17: Excavation of Whitehill Barrow – south facing view (courtesy Museum of London Archaeology)

2.5.1 Early Bronze Age

Much of the early Bronze Age evidence from the EDC area was gathered from the excavations associated with the construction of the High Speed 1 rail link and the South Thameside Development Route 4. For the early Bronze Age, as with the preceding Neolithic period, the evidence largely comprises clusters of pits or flints with a focus on the area surrounding the river Ebbsfleet. A group of seven early Bronze Age pits (TQ 67 SW 310) were located on the chalk spur on the western side of the Ebbsfleet valley, in the area later occupied by Northfleet Roman villa. Further to the west, at the site of Ebbsfleet International station, another cluster of three pits (TQ 67 SW 302) was uncovered. Their fills contained abundant burnt flint which produced C14 dates of 1670-1490 and 1690-1510cal BC. Another cluster of seven pits associated with a scatter of worked flint (TQ 67 SW 1466) was discovered upstream, approximately 800m south of the chalk spur. Samples taken from the fills of these pits produced dates spanning the late Neolithic to middle Bronze Age. An interesting group of features (TQ 67 SW 1465) was excavated near to this pit cluster. This comprised a central pit with associated gullies and postholes which suggests some form of structure, possibly associated with heating water (Stafford *et al.*, 2020).

Another area of early Bronze Age activity was discovered during excavations ahead of residential development at Northfleet (known as Springhead Quarter) (Wessex Archaeology, 2008). The evidence for this activity comprised two groups of pits (TQ 67 SW 1668 and TQ 67 SW 1669) containing dump deposits and burnt organic remains which incorporated a large quantity of worked flint including a broken arrowhead, scrapers, flakes and broken flakes and beaker sherds. Clay lined pits (TQ 67 SW 1672) were also discovered, again these contained worked flints and sherds of beaker pottery, alongside a cremation burial (TQ 67 SW 1673) and a group

of post holes (TQ 67 SW 1670) possibly representing a tripod structure measuring c.4m by c.5m (Wessex Archaeology, 2008). Overall, non-funerary early Bronze Age features remain rare in Kent and so the features discovered within the study area are important (Stafford *et al.*, 2020).



Figure 2.18: Example of a clay lined pit at the Springhead Quarter Site (courtesy Wessex Archaeology)



Figure 2.19: Excavation of Bronze Age timber structures at Ebbsfleet (courtesy High Speed 1/ OWA)

2.5.2 Middle and Late Bronze Age

A variety of features represent different types of middle and later Bronze Age activity within the study area. Two small groups of ring ditches have been discovered, probably representing the former sites of barrows. The first was located close to the spring at Springhead and comprised two intercutting ring ditches (TQ 67 SW 1556 and TQ 67 SW 1557) with the possible remains of a central, urned cremation burial in the earlier of the two. They were associated with large deposits of burnt material and flint from a burnt mound as well as around 1000 very fresh fragments of worked flint indicating knapping events. The position of these features, close to the springs, may indicate that this location had a ritual significance at this time. The second group also comprised two ring ditches (TQ 67 SW 295), these being located on the chalk spur in the vicinity of the Northfleet villa complex. A spread of cremated bone was uncovered in the fill of one ditch and two further cremations lay in the vicinity. One was cut into a nearby linear feature and the other, which was located slightly further to the west in an area today occupied by Ebbsfleet International train station, comprised a shallow pit containing redeposited pyre debris (TQ 67 SW 1550).

In an area adjacent to these features, close to the Ebbsfleet valley bottom, a number of wooden structures have been recorded along the wetland edge (TQ 67 SW 289), perhaps representing a prehistoric route way linking areas of drier ground. One structure comprised a double row of large oak timber piles. Their size suggests that they could have supported a walkway, or a bridge traversing the ancient watercourse (Hayden *et al.*, 2020). In an area approximately 550m north of Ebbsfleet Station, excavations on the lower Ebbsfleet valley floodplain recorded further Bronze Age timbers (TQ 67 SW 1803). These were of a late Bronze Age date and consisted

of a series of small wooden structures, possibly designed torevet the northern edge of the channel (Hayden *et al.*, 2020).

A good example of the field systems characteristic of the middle and later Bronze Age is to be found in the study area.

The Springhead Quarter excavations uncovered a minimum of six large enclosures (TQ 67 SW 1356) constructed in a NNW-SSE alignment with an associated

droveway (TQ 67 SW 1674), post holes representing fence lines (TQ 67 SW 1676), cremation burials (TQ 67 SW 1677) and occupation evidence including pits (TQ 67 SW 1675). Further excavations at the North Kent Community Church site also revealed part of the same field system extending to the north (Wessex Archaeology, 2012). It therefore occupied a large portion of the eastern slope of the Ebbsfleet valley, over 6 square kilometres. In addition to the above discussed features which have been discovered across the study area, a number of worked flint assemblages have also been recovered from both stratified and un-stratified contexts. These include a small scatter of 81 worked flints with a proportion of micro-debitage and irregular waste suggesting knapping events, located immediately north of the chalk spur (Hayden *et al.*, 2020). Another assemblage was found south of the chalk spur at Northfleet water treatment works (TQ 67 SW 538) (CAT, 2008). The assemblage of around 700 flints from the colluvial sequence at Springhead has been assigned a broad late Neolithic to early Bronze Age date and though this is not associated with datable features, it suggests activity within the vicinity (Stafford *et al.*, 2020).

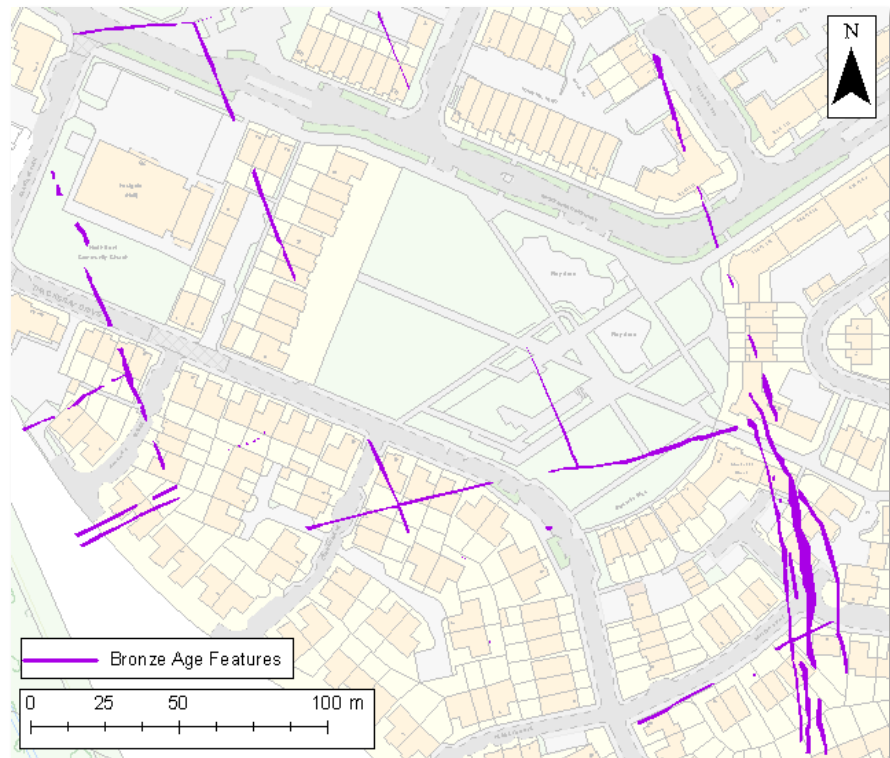


Figure 2.20: Bronze Age field system and droveway at Springhead

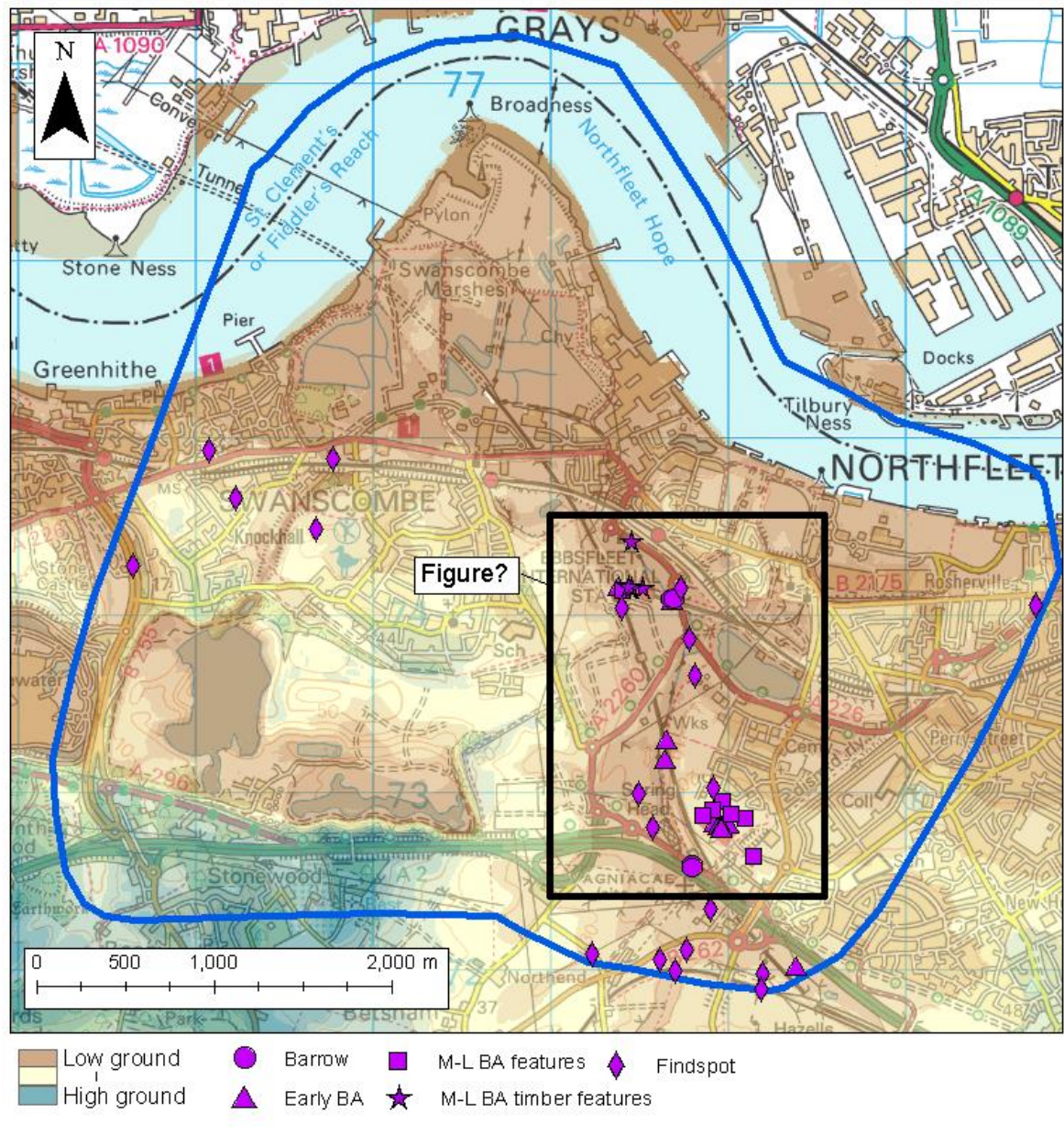


Figure 2.21: Bronze Age features and finds within the study area

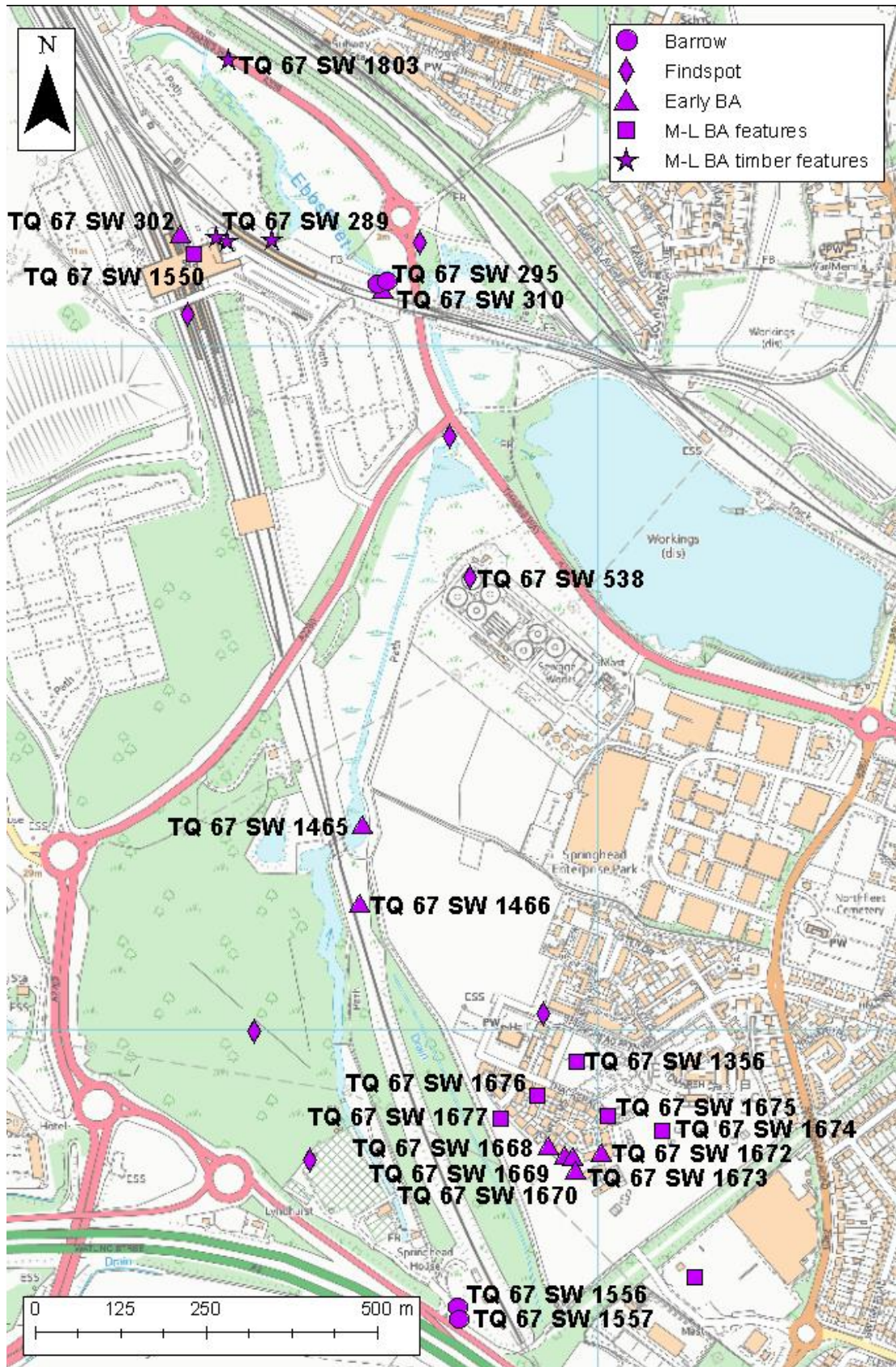


Figure 2.22: Bronze Age features in and immediately surrounding the Ebbsfleet valley – labelled features relate to those mentioned in the text

2.6 Iron Age c. 700 BC - 43 AD

The Iron Age is so named because it was the period during which iron began to replace bronze as the main metal used for tools and weapons (though there is some evidence that iron was used on a limited scale late in the Bronze Age). In



Figure 2.23: Iron Age coin discovered at Springhead (© The Trustees of the British Museum)

addition to these bronze and iron objects, flint was also still utilised (though less regularly) and objects of bone, wood and pottery are also frequently recovered from Iron Age sites. The main form of settlements were farmsteads and small villages which often comprised a few round houses surrounded by enclosures and sometimes larger field systems. During the later Iron Age however, a wider range of settlement types developed alongside these farmsteads, including new and more complex forms such as hillforts, which were defended hilltop settlements, and oppida, which were proto-towns that served a variety of political, social and economic functions. These new developments in settlement types reflect the increased economic and social complexity of late Iron Age society. Clear territorial divisions were established, reflecting social differentiation and political centralisation that was in part, due to increased connections with the continent, and aided by the prestige imported goods such as wine and gold (Champion, 2007). One major change during this period, an idea adopted from the continent, was the introduction of coinage which began in Kent in the second century BC. The cross-channel contact increased in the last century of the Iron Age, especially following Caesar's campaigns of 55 and 54BC. This brought with it further change, including among other things, the appearance of fine ceramic tablewares and bronze vessels, new ways of dining and socialising, the development of continental styles of local pottery and changes in burial rites (Biddulph *et al.*, 2011).

The archaeological record for the early and middle Iron Age in Kent is relatively sparse, particularly in west Kent where evidence for settlement is generally quite rare. In contrast, there is a lot of evidence for activity in the late Iron Age. This is certainly the case for the region beyond the study area where several settlements emerged in the later part of the period. Within the vicinity of the study area sites include Northumberland bottom and along the A2, (TQ 67 SW 554) approximately 2.3km to the east. Here, an enclosed settlement was revealed along with a trackway, a large field system, and evidence for farming (Askew, 2006). Slightly further east, at Tollgate, further Iron Age evidence has been uncovered, including some examples of early – middle Iron Age features comprising storage pits (TQ 67 SE 356) (Bull, 2006). Occupation evidence was also uncovered on the east side of the modern

town of Northfleet. Excavation at Hillside, Gravesend, revealed an enclosure and chalk quarries set within a field system, dated by pottery to the 1st century BC and the first half of the 1st century AD (TQ 67 SW 68) (Philp and Chenery, 1998). Overall, the evidence for the area seems to reflect a landscape of small farming communities which ties with Julius Caesar's view of *Cantium*, as an area 'thickly studded with farmsteads' (Bello Gallico, 5.12). In the wider landscape different types of settlements are also apparent. For example, a substantial late Iron Age settlement, possibly an oppidum, has been suggested by the evidence from Rochester (Andrews, 2004). The coin moulds from the site imply that it was an important centre, possibly with a mint (Harrison 1991, 48).

The archaeological record is similar for the study area. There is a lack of early and middle Iron Age activity, some of the few notable features being two small structures made of stakes and positioned at the base of the Ebbsfleet valley. One of these consisted of an arc of five stakes and has been interpreted as a possible water fowl trap, though this is not certain (Stafford *et al*, 2020). After an apparent absence of occupation and activity in the earlier Iron Age, in the middle, and certainly by the later Iron Age, the area appears to have been repopulated, and several areas of activity are known. Excavations carried out on the higher ground on the eastern side

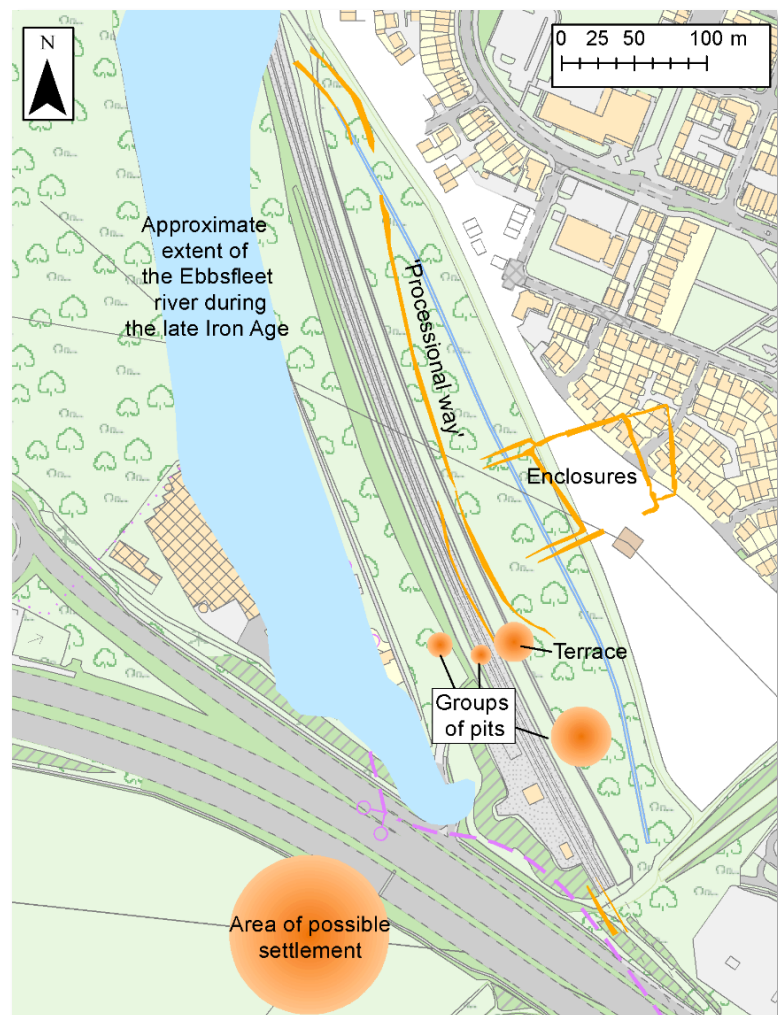


Figure 2.24: Late Iron Age features around Springhead

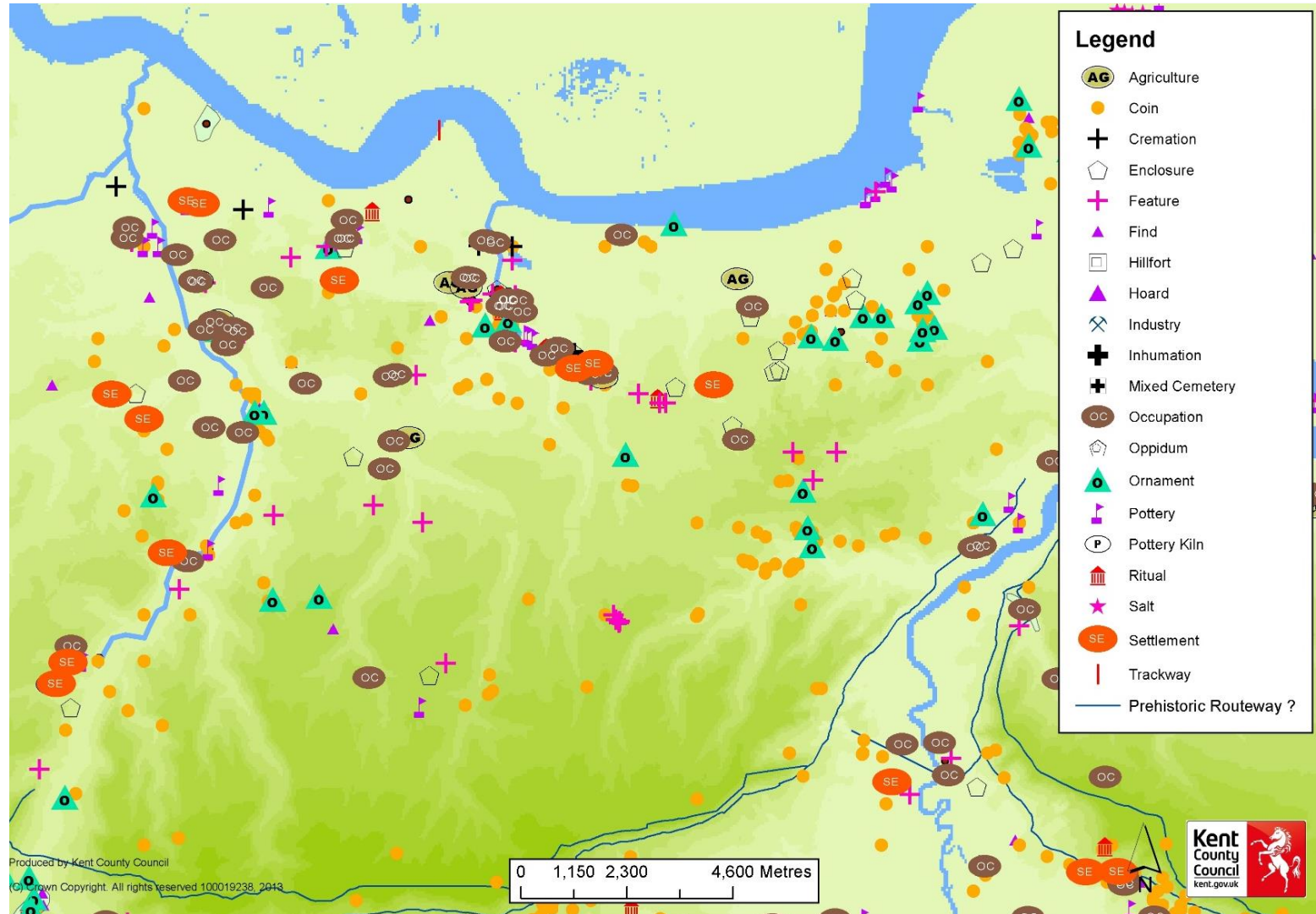


Figure 2.25: Summary map of Iron Age data in north-west Kent

of the Ebbsfleet valley, near Springhead, have revealed a series of middle to late Iron Age enclosures (TQ 67 SW 1385 and TQ 67 SW 323) and pits (TQ 67 SW 1679) with finds that indicate low-level domestic activity in the vicinity (Wessex Archaeology, 2008). Towards the west, at Stone Castle, near Greenhithe, excavations revealed a settlement dating to the 1st century BC (TQ 57 SE 292) comprising enclosures, pits and field systems, with a possibly granary (Pre-Construct Archaeology, 2009). An area of activity has been found to the south of the Roman activity at Springhead, where parts of several ditches and gullies as well as pits were recorded (Harker, 1980). Close to this activity, and possibly associated with it, were a group of further ditches and pits (TQ 67 SW 420) along with a middle Iron Age burial (TQ 67 SW 522) which were discovered at Pepperhill (Biddulph, 2006).

Although the settlement evidence is dominated by small scale farmsteads in the region, this is not the only type of evidence that has been uncovered in the study area. It seems that activity at Springhead in the Iron Age had a strongly ritualistic aspect. It is possible that the spring at the head of the Ebbsfleet had a ritual/religious significance as early as the Bronze Age (discussed above) but veneration at the spring appears to have increased significantly from the last quarter of the 1st century BC. Though many of the archaeological features from this late Iron Age period have been difficult to interpret, there is a collection of features to the east of the Ebbsfleet valley and around the spring which seem to have had some association with a ceremonial use of this part of the landscape (Williams, 2003). A trackway or 'processional way' defined by a pair of parallel ditches (TQ 67 SW 1384) was constructed close to the crest of the slope on the eastern side of the Ebbsfleet valley. This extended over a distance of 450m, running parallel with the river Ebbsfleet from a point on the slope overlooking the spring at its southern end, to the banks of the river downstream to the north. At the point where it overlooks the spring there was a terraced area (TQ 67 SW 1566) which has been interpreted as a possible viewing or feasting platform designed for the observation of the rituals that were carried out at the spring below (Andrews, 2011). Further evidence for veneration at the spring comes from the distribution of the finds, particularly coins, which appear to have been purposefully deposited near or within it (Schuster, 2011). Other features which may form part of this late Iron Age ritual landscape include a series of structured deposits that were discovered within pits near the terraced area (TQ 67 SW 1387) and a possible enclosure close to the head of the Ebbsfleet (TQ 67 SW 1386). It has even been suggested that the ritual activity at Springhead in the later Iron Age may have been the focal point in this landscape, around which the farmsteads were grouped (Biddulph, 2011).

2.7 Later Prehistoric Research Questions

The South-East Research Framework (SERF 2019, <https://www.kent.gov.uk/leisure-and-community/history-and-heritage/south-east-research-framework>)) exists to set the research agenda for the archaeology of south-east England (defined for SERF as Kent, Surrey and East and West Sussex). The Greater Thames Research Framework (GTRF, 1999 revised 2011 https://archaeologydataservice.ac.uk/archives/view/gtrf_na_2011/overview.cfm) carried out a similar function but was focused on the Thames Estuary. Both provide a chronological and thematic overview of the state of current archaeological knowledge for those regions and identify numerous research questions that need to be answered. Many of these are relevant for the study area and some that are particularly significant are presented below together with those identified by the review of evidence presented in this chapter.

2.7.1 Mesolithic

The Mesolithic appears to be under-represented in Kent and south-east England in general. Many of the research questions presented in SERF and GTASC apply to the study area but one worthy of particular focus may be:

- Targeted prospective survey of valley edge, flood plain and periglacial landforms to recover further palaeoenvironmental sequences and establish derived regional models for environmental change (SERF Upper Palaeolithic and Mesolithic C.1.3)

In addition, the most significant Mesolithic site in the study area discovered so far is that at Springhead. It has been suggested that the very large collection of flints could represent repeated visits to the site and that this may be the pattern of Mesolithic activity in the region. Can further research into the artefacts recovered so far, or additional Mesolithic discoveries in the Springhead area reveal more about this?

2.7.2 Neolithic

The Neolithic chapter of the SERF is currently under preparation, but draft research questions were prepared for the Research Agenda conference. Some research questions are nonetheless suggested by the evidence review presented above.

- Can further assessment of the Ebbsfleet scheduled monuments reveal more about the form and function of the sites? what was the true purpose of the laid timbers?

- What was the purpose of the presumed trackway along the Ebbsfleet? What can it tell us of the environment at the time?
- What was the pattern of human activity in the area during the Neolithic? Migration or settlement? Could the study area have formed part of a larger 'territory' that included other types of landscapes?
- Can the results from this river valley location aid predictive modelling, prospection and excavation techniques for identifying and studying sites in sub-alluvial, sub-colluvial and marine contexts?
- Can this area provide information about the nature of subsistence economies and the importance of farming particularly in a river valley location?
- How does the River Thames in this location and the River Ebbsfleet fit into the study of Prehistoric routeways?

2.7.3 Bronze Age

Many of the research questions presented in SERF and GTASC apply to the study area, but one worthy of particular focus may be:

- There is enormous potential for research into past land use by exploiting the resources of the modern coastal zone of the Thames Estuary and the estuaries of the smaller rivers, such as the Medway, Stour, Rother, Adur and Arun [and Ebbsfleet], which may all contain surviving evidence for previous episodes of human activity (SERF)

Additional research questions suggested by the evidence review above include:

- Is there evidence for early bronze activity in the study area that goes beyond the pit clusters described in the text? What evidence of continuity from the Neolithic is there?
- Did the spring at Springhead have a ritual significance in the Bronze Age? Can further evidence of this be found?
- Can further evidence of the proposed Ebbsfleet trackway be found? What further can be learned of the Bronze Age environment from this feature?
- How extensive was Bronze age land division in the study area? Can evidence of this be found away from the Ebbsfleet?

2.7.4 Iron Age

Many of the research questions presented in SERF and GTASC apply to the study area. Some additional research questions suggested by the evidence review above include:

- What is the nature of the activity in the early Iron Age?
- Was the feature discovered in the river Ebbsfleet truly a fowl trap? If not, what was it?
- How extensive was the late Iron Age land division in the study area? Can the field systems and enclosures identified be linked to settlement areas?
- What role did Springhead play in the Iron Age? Was the activity here ritualistic in nature and if so, what was its character? Was there continuity of belief (in terms of the fertility/childbirth focus) from the Iron Age to the Roman period?

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3 The Roman period A.D. 43-409

3.1 Introduction to the Roman period

After Julius Caesar's expeditions to Britain in 55 and 54 BC, the country finally became part of the Roman empire

following the invasion in AD 43, driven by the political ambitions of the Emperor Claudius. Prior to the formal incorporation of Britain as the north-western outpost of the

empire, it had already enjoyed strong trade links with the continent. This is clearly represented in the material culture of the late pre-Roman Iron Age, particularly in southern Britain, which shows a clear Roman cultural and economic influence. Strabo, a Greek philosopher and geographer who lived at the time of the Caesarian expeditions, suggested in his work *Geographica* that Britain paid more in customs and duties than could be raised by taxation if the island were conquered.

Kent played a key role in the invasion and subsequent integration of the province into the empire. It is likely (though not definitively confirmed) that the initial landing spot was at Richborough, where a military base was established. In around AD 80 to 90, a 25m high marble-clad arch was erected at Richborough, overlooking the harbour, a statement of Rome's power and an imposing sight for all new arrivals. The first of what was to become many Roman roads running through Britain was established at Richborough. This road, now known as Watling Street, ran through Canterbury and Rochester on its way towards London. It became an important link in the Roman trade network, with Canterbury developing as a node from which various branch roads eventually linked it to Reculver (Regulbium), Richborough (Portus Ritupis), Dover (Portus Dubris) and Lympne (Portus Lemanis). The roads in Kent were of particular importance in this network, with the Kentish coast providing the shortest crossing point to the continent. This network allowed the county to become widely settled; communities were predominantly involved with farming, with some

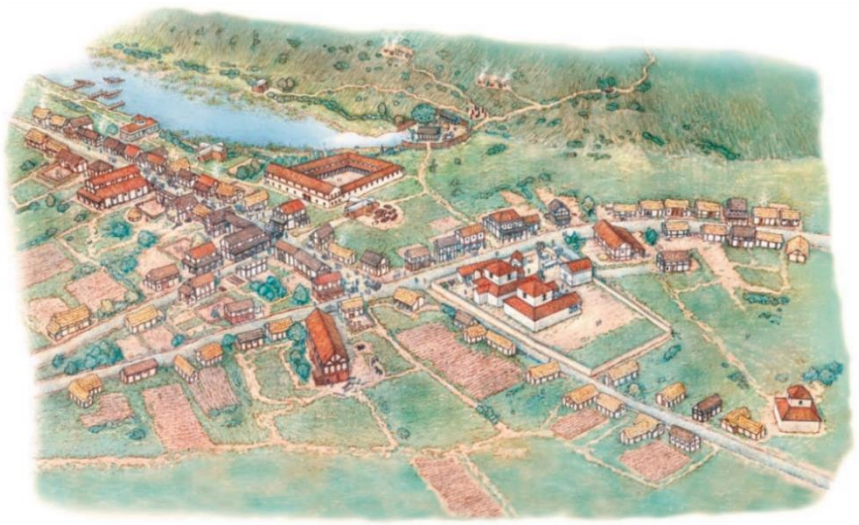


Figure 3.1: Artists impression of the Roman settlement at Springhead (courtesy Donato Spedalieri)

areas of industrial activity particularly iron production in the Weald and salt and pottery production in the north.

To gain a better understanding of the study area in the Roman period, its place in the wider region must be appreciated. The construction of Watling Street early in the Roman period created an impetus for development and linked what had been a series of valley-based communities in the later prehistoric period to a broader network of interlinked settlements (Millett, 2007). The nearest large urban centre to the settlement at Springhead would have been Rochester (*Durobrivae*) which was located approximately 14.5km to the east. Dartford, c. 8km to the west, was also the possible site of a small town (Hutchings 2001). The Thames estuary was a particular focus for industry with numerous pottery kilns and salt processing sites known from the region including examples at Cooling and Cliffe (Monaghan, 1987). In the central and western parts of the county, particularly in the Medway and Darent Valley, there is a notable concentration of villas. The villa at Darenth Court farm, c.3km to the south east of the study area is one of the largest known in Roman Britain (Philp, 1984). The 7km stretch of valley to the south of Darenth villa contains the villa sites of Horton Kirby, Franks, Farningham, Eynsford and Lullingstone (Booth, 2011). These are not the only examples in north-west Kent, in the area surrounding Watling Street to the west of Rochester there are several more including Chalk, Cobham, Wilmington. Though many villa sites have been investigated within the region, they were by no means the predominant settlement type. Farmsteads would have outnumbered villas sites and one of the most important developments in the study of Roman Britain in the last few decades has been the greatly increased number that have now been excavated and reported (Allen and Smith, 2016). Farmsteads (including open, enclosed and complex types) now outnumber all other settlement types put together in all parts of southern England, and for some parts account for up to 80% of the record (in the London Basin for example) (Allen, 2016). Within the proximity of the study area there is Northumberland Bottom which also includes some high status Roman burials, Hillside, Fawkham Junction, and the A2/A282/M25 junction, among other sites. A pattern of farming communities supported by a larger nucleated settlement for reasons such as (but by no means limited to) trade has been suggested for parts of Kent including areas surrounding Dartford and Maidstone. It seems likely that the settlement within the study area would have been connected to this wider landscape of rural farmsteads, production sites and villa estates in this way, and some have gone so far as to argue that Springhead may have formed a major regional centre (Booth, 2011).

The landscape for this part of Kent at the end of the Iron Age and throughout the Roman period would have been largely cleared of dense woodland. The pollen evidence from excavations at sites within the study area indicates an open environment of short (perhaps grazed) grassland alongside areas used for agriculture. Some managed deciduous woodland (evidence of primarily oak and hazel has been seen in the charcoal analysis) was possibly located on the valley

sides and hilltops (Barnett, 2011). Marshy wetland environments would have existed in the marginal areas along the banks of the Ebbsfleet river and near the Thames floodplain. Analysis of the pollen from the waterfront at Springhead suggests some open woodland, long grass and scrub occurred in these locations. The Ebbsfleet river would have been much wider than it is today, it seems likely that it was navigable by small boats at least, right up to the spring. At least two basins forming small, tidally influenced lakes, are known to have existed along its route (in positions close to Northfleet Villa). The area now occupied by the Swanscombe peninsula formed part of the river Thames flood plain in the Roman period. The brackish conditions which developed along the floodplain in the later prehistoric period would have continued into the Roman period and the area was dominated by estuarine channels and saltmarsh systems.

The evidence for Roman activity within the study area is of both regional and national significance. It includes the remains of a substantial villa, a roadside settlement, cemeteries, including an impressive walled example, and a major religious centre at Springhead that developed from a late Iron Age ritual site. This sanctuary included the remains of at least seven temples (and possibly as many as ten) most of which were positioned within a walled temple complex. It is highly likely that the spring at the head of the river Ebbsfleet would have given the site its ritual significance. This is something which is known to be the case at many sites across Roman Britain, the temple of Sulis Minerva and Roman baths at Bath in Somerset being a good example. An important settlement developed around this religious site, and its Roman name *Vagniacis* is encountered in the *Antonine Itinerary*, a register of stations and distances along the roads of the Roman empire. The name is thought to derive from British roots and is taken to mean 'the estate of, by, or at the marshy place' (Rivet and Smith 1981). Part of the network of Roman roads crossing the county ran through the study area. A section of Watling Street ran east to west across the southern boundary of the study area. Junctions between this and various minor roads leading north towards the Thames and south towards the Weald have also been discovered. Between these larger centres of settlement and activity, there would have been smaller sites including farmsteads, defended locations, cemeteries and small-scale production sites in the study area, of which examples have been excavated on several occasions. Archaeological investigations since at least the 19th century have revealed evidence of Roman life in the study area. These investigations continue today and have been particularly complemented by recent large-scale excavation associated with major infrastructure projects such as the channel tunnel rail link, A2 works and major housing developments. Despite this, there are still many parts of the study area where the evidence is not as comprehensive, and where remains may still exist that could enhance our understanding of how the Romans used this landscape.

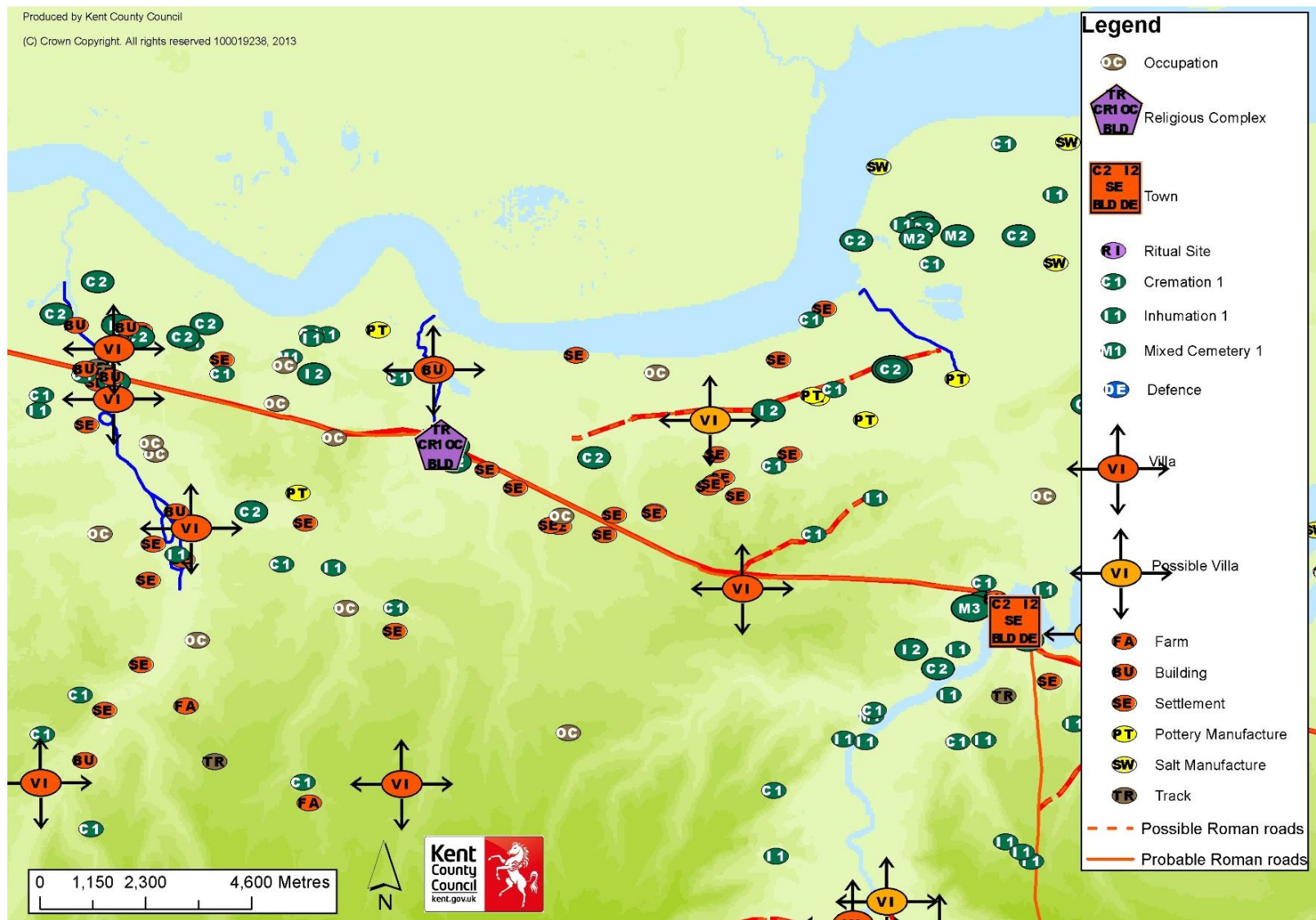


Figure 3.2: Summary map of Roman data in north-west Kent

3.2 Religion and Ritual.

3.2.1 Springhead Sanctuary

The Roman remains at Springhead are of international importance as a rare example of a Roman ritual centre. Excavations, particularly those associated with road construction and with the Channel Tunnel Rail Link, have exposed a large portion of the area surrounding the head of the river Ebbsfleet at Springhead revealing a concentration of temples and shrines surrounded by a small community.

It seems possible that the spring at the head of the Ebbsfleet had a ritual/religious significance as early as the Bronze Age (see chapter 2) and their veneration appears to have increased significantly from the last quarter of the first century BC. A similar level of ritual activity may have continued into the early Roman period. Brooches appear to have replaced coins as the main votive offering at the spring in the second half of the first century AD as they appear in very large numbers, too many to be explained by accidental loss (Schuster, 2011). There also appears to be continued use of the area on the slopes overlooking the spring where two further viewing or feasting platforms were constructed (TQ 67 SW 1445 and 1146).

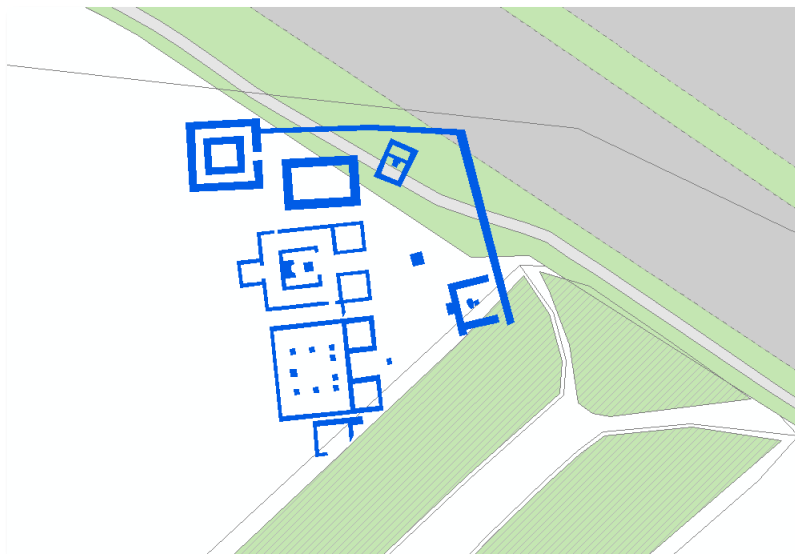


Figure 3.3: Layout of excavated temple structures in relation to the modern line of Watling Street (A2)

It was not until the late first and early second century AD that the construction of buildings relating to the sanctuary appears to have really begun and it was during this time that we see the formation of an important temple complex at Springhead. Excavations have revealed at least 7 temples or shrines alongside an array of associated features including altars, plinths,

pits with structured deposits, lean-to structures and ovens spanning the late first to late fourth centuries. These were all within a walled enclosure located on south side of Watling Street, approximately 100m to the south of the spring in an area which is now protected as a scheduled monument (Penn, 1965). At least one of the temples was present by the last decade of the first century (TQ 67 SW 1738). This was redeveloped in the early to mid-second century, when a shrine (TQ 67 SW 1755) and a lean-to building containing ovens and burials (TQ 67 SW 1760) were also constructed (Penn 1959, 1960 and 1964). There was a major phase of

redevelopment and construction at the complex in the later second and early 3rd century AD the first temple was raised on a platform and another temple was added (TQ 67 SW 1752), similar to the first – also on a raised platform and connected to the southern side of the first via a wall. Alongside this, a small rectangular temple was built on the north side of the first (TQ 67 SW 1754) and an imposing gate house/small temple (TQ 67 SW 352) was built along the eastern enclosing wall (Penn 1958 and 1967). Overall, by the third century the temple complex would have had an imposing and ‘impressive architectural arrangement that must have had a significant visual impact upon those people travelling along Watling Street from the east’ (Biddulph, 2010, 210). The lay out of the complex is of interest as it does not appear to relate to either the position of the road or the Spring. All apart from two are neatly arranged in line orientated north-south with an entrance on the eastern side facing the gate. The only excavated building to have been constructed after the mid-second century was a masonry structure (TQ 67 SW 1753) of unknown size and form (though possibly another temple or shrine) positioned to the south of the other temples (Penn, 1958). The peak in activity for this complex, therefore, appears to date to the mid-second century. Its use continued, though declined, throughout the third and fourth centuries but by the later fourth century there is evidence that the temples were being used for alternative purposes (i.e metalworking) and had fallen into disrepair.

In addition to the southern temple complex, structures were added to the area immediately surrounding the spring suggesting its continued use for religious purposes throughout the second and third centuries. Construction of a temple overlooking a pool at the head of the spring (TQ 67 SW 1391) and a portico structure (possibly an associated temple or shrine) to the north-west (TQ 67 SW 1401) took place sometime early in the second century (Biddulph, 2010). In the later second century, another temple was constructed at the spring, this time on its western bank (TQ 67 SW 1384) close to Watling Street but facing away from it. Demolition deposits showed that this temple remained in use for about a century, coinciding with the decline in activity at the other temples to the south. The final structure with a supposed ritual function within the landscape immediately surrounding the spring is a small roadside shrine (TQ 67 SW 1420) located at the junction of Watling Street and a branch road. A coin assemblage spanning AD 260-402 discovered within the shrine suggests that it was constructed in the third century and used throughout the third and fourth centuries (Andrews, 2010). It appears therefore, that though much of the sanctuary and temple complex had fallen into disuse by the later fourth century, some devotional practices continued.



Figure 3.4: Detail of the sanctuary and settlement around the river Ebbsfleet

The above discussed features clearly demonstrate cult worship of some kind within the study area. Several suggestions have been made about the nature of the cult based on the evidence from this and comparable sites. Overall, the finds assemblage which includes for example, figurines and a fine example of a 3-sided red ceramic incense burner, has been described as 'typical for what may be expected for a temple site' but the distribution of some finds types could be indicative of particular types of worship (Schuster, 2011). There is a concentration of



Figure 3.5: Examples of Roman brooches discovered at Springhead (courtesy High Speed 1/ OWA)

both brooches (noted above) and bone pins within the spring at Springhead, finds which may be associated with fertility and childbirth, particularly the pins (Rouse, 1902). A point which may support the fertility/childbirth cult interpretation, is the high number of neonate/foetal burials which have been recorded within the study area, with a particular focus on the areas with a high ritual significance (discussed in detail be low). Another theory, that Springhead was the site of a healing cult, may also be supported by the neonate burials. There is evidence to suggest that pregnant women came to healing temples in the Roman period for help with childbirth, and though birth was forbidden within the temples themselves, specific buildings were constructed for this purpose (Dillon, 2002). It is possible that the temple located on the western banks of the spring could have fulfilled this purpose at Springhead. It is separate from the main complex (though connected via roads), there is a concentration of pins located within its immediate vicinity, and at least 5 neonate burials were discovered in and around the structure (McKinley, 2011). Some of the small finds also support healing cult theory; several objects comprising models of body parts were located within the main temple complex, a distinctive feature of healing shrines (Rives, 2007) and a concentration of medical instruments from within one of the properties at the roadside settlement may point to the presence of a resident physician (Schuster, 2011). Finally, and perhaps the most telling piece of evidence are the spring themselves which are known to be a focus for healing cults across the Roman world (Rives, 2007).

Although most of the evidence for religion and ritual practices in the Roman period comes from a small area surrounding the head of the Ebbsfleet, there is also evidence elsewhere within the study area. Examples include a possible shrine within a walled enclosure uncovered 1.6km to the north-west of the spring (TQ 67 SW 222) and a possible ritual shaft (TQ 57 SE 10) uncovered by workmen during quarrying at Greenhithe, c. 3.6km north-west of the spring. It is possible that ritual activity was carried out all along the Ebbsfleet valley right up to the river Thames and also across the wider landscape, albeit probably not on the same scale as at Springhead. There may be more features awaiting discovery within the study area.

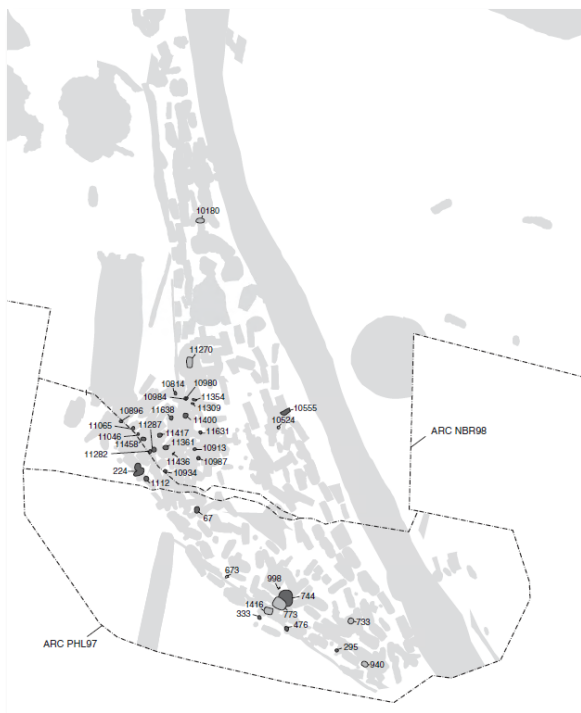


Figure 3.6: Plan of Pepperhill Roman cemetery (courtesy High Speed 1/ OWA)

3.2.2 Burial and cemeteries

The largest cemetery that appears to have served the population at Springhead, and possibly the wider countryside, was located close to Pepper hill (TQ 67 SW 417), approximately 0.5km to the south-east, on the eastern side of the road that ran north towards the town. The site was excavated in 1997 and 1998, again ahead of works associated with the channel tunnel rail link, and a total of 597 graves were revealed (Biddulph, 2006). It is therefore an important site and is unrivalled within the region in terms of its size and range of funerary practices. Inhumation appears to have been the predominant rite throughout the life of the cemetery, with some 326 graves excavated, but 235 cremations

were also discovered. An unusual aspect of the cemetery was the presence of a *busta* which is a form of pyre where the cremated remains fall into an underlying pit. Aside from a single early Iron Age burial, the first large-scale use of the cemetery appears to be contemporary with the development of the sanctuary and settlement at Springhead and has been dated to c. 50BC to AD 120/130. Use of the cemetery continued throughout the second and first half of the third centuries (though less intensively) but had declined almost to the point of abandonment by the later third century (Biddulph, 2006). Thus, its fate appears tied to that of the town, a strong indication that the cemetery served the population that resided there.

Though Pepperhill had the largest concentration of burials, it is one of many cemeteries within the study area and, in particular, the landscape immediately surrounding Springhead. Perhaps one of the most notable is the walled cemetery

(TQ 67 SW 89), now a scheduled monument, located to the east of Springhead, less than 200m from the Pepperhill Cemetery. It is in what would have been a very conspicuous position, along the south side of Roman Watling Street as it approached the town from the east Kent coast. It is one of several walled cemeteries located along the road and this location may have been a way that wealthy or leading families chose to display power (Jessup, 1959). This site has been investigated on several occasions, the earliest and most substantial excavations was in 1801/1802 (Rashleigh, 803). This, and more recent

investigations, have revealed a total of eight individuals (including two children) all arranged in an organised and symmetrical fashion within a central stone-butressed mausoleum. This in turn was surrounded by another much larger walled enclosure, enclosing an area nearly 16000sq. metres. There were some exceptionally rich grave goods, one of the richest collections ever found in Roman Britain, which included a stone sarcophagus, 2 lead coffins, 2 large glass urns, gold armlets and a ring, a gold forehead pendant and a pair of elegant woman's shoes decorated with gold leaf (Davies, 2001). The dating evidence is based on these finds and points to a late second century or early third century date and may suggest that all the burials were laid out at one time. The walled cemetery seems therefore, to have been in the nature of a family/group memorial, perhaps for the residents of Northfleet Villa to the north (Biddulph, 2010) The differences between this cemetery and the one uncovered at Pepperhill are obvious and stark. These differences, in position, scale and their associated grave goods along with their proximity yet separation from one another, and their overlapping dates, suggests the presence of distinct social classes existing side by side at Springhead (Davies, 2001).

Smaller cemeteries, or small groups of burials, have been revealed on several occasions in the landscape surrounding Springhead. Some examples include another possible family group which was discovered within a small enclosure on the east side of a metalled road (TQ 67 SW 176). The group consisted of at least six burials, three inhumations and three cremations with grave goods that point to a date of AD70-100 (Philp and Chenery, 1997). Two possible burial groups exist to the north-west of the main settlement area. Both appear to be small and were discovered during evaluation trenching. The first comprised at least 3 inhumations (TQ 67 SW 1796) some of which may have been within coffins (Wessex Archaeology, 1997) while the other comprised 23 discrete features suggestive of the presence of buried vessels (Wessex Archaeology, 2005). On the other side of the settlement, towards the south-east, five inhumation graves were uncovered (TQ 67

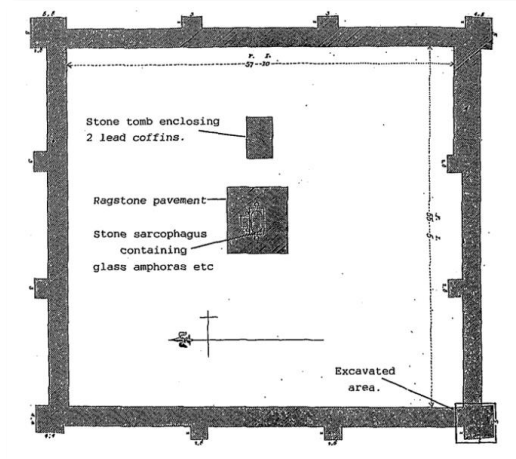


Figure 3.7: Plan of the Roman walled cemetery (Malcolm Davies, courtesy Kent Archaeological Society)

SW 1665) in what may have been a small, dispersed, roadside cemetery some 25 m back from the street frontage (Andrews, 2010). Slightly further afield, approximately 2km south-east of Springhead along the A2, further cremation graves have been uncovered (Oxford Archaeology, 2008). The finds, including bronze vessels, indicate that these were very high status and comparisons may be drawn with the walled cemetery discussed above as these lay within enclosures and were clearly located to impress those who were travelling along Watling Street.

Isolated burials are also known from the study area, both within the roadside settlement and the wider landscape. An inhumation of a young adult (TQ 67 SW 1628) was revealed at one of the properties fronting the branch road at Springhead (property three) (Andrews, 2010). Another inhumation, this time within a tile cist (TQ 67 SW 56) was discovered c.1.5km to the north-west of the Roman settlement (Williams, 1956). This was c.150m from a cremation (TQ 67 SW 1717) discovered at Swanscombe Community School during excavations in 1999 (MoLAS, 1999). Both may be associated with the enclosure that was also discovered at the school (discussed above). Cremation burials have been found even further from the settlement, in two locations approximately 400m from one another and c. 3.5km to the northwest of the Springhead (TQ 57 SE 56 and TQ 57 SE 11) close to the Thames floodplain. These may have been associated with the Roman enclosure which has been identified at Ingress Abbey.

As noted above, it has been suggested that the springhead ritual complex was especially dedicated to healing and childbirth. The foetal or neonate burials which have been discovered in high numbers, largely in or around the sanctuary, are therefore of particular interest. These occur both as individual burials and in groups. Many were recorded during excavations at the temple complex, including 18 within its boundary ditch (Penn, 1964). More recent work has revealed around 80 more distributed in a variety of contexts (McKinley, 2011). Concentrations have been noted in the areas of particular religious significance, especially around the spring. Burials are rarely found at Roman ritual sites and so it is suggested that these burials are part of a deliberate ritual practice. The available evidence shows that very wide variety of burial practices were used in the study area during the later Iron Age and Roman periods. These burials tell us much about the lives of the Roman population. They tell us about their material culture and wealth differentials as well as the beliefs of the inhabitants.

3.3 Communication

3.3.1 Roads

The presence of Roman Watling Street at the southern boundary of the study area (TQ 86 SW 132), is key for understanding the development and use of the landscape throughout the Roman period. It may also have provided an additional impetus, beyond the site's religious significance, for the growth of the Springhead complex. It

is likely that the road was established early in the Roman period, possibly as early as AD50, and it may in some locations have followed the line of a pre-existing routeway. It passed through the study area as it linked Rochester and the Medway crossing to the east and the Darent and Cray crossings to the west, and from there on towards London. Several sections of varying widths have been exposed during excavations in the study area. Works on the A2, carried out in the 1960s, identified where the road zig zagged at a shallow angle around the head of the Ebbsfleet, along the northern side of the temple complex, where there was evidence of successive repairs and resurfacing suggesting a long period of use (Penn, 1965). Another section was also noted c.200m to the north, close to Springhead nurseries, during the works associated with the CTRL. The road changed direction again at this location to continue towards London and Dartford. The remains of the road had been heavily truncated but ditches were apparent on both sides (TQ 67 SW 1622) and, where the metalling did survive, it showed a road which was up to 7.5m in width (TQ 67 SW 1398) (Andrews, 2010). Today the line of the Roman road is partially reflected in the modern line of the A2, though it appears to have survived as a trackway before the road was laid. Photographs of late 19th century or early 20th century date show a track labelled Roman Road running through the trees of Swanscombe Woods (V Smith 2022 personal communication 22nd September)

The CTRL excavations also revealed a junction between Watling Street and a branch road (TQ 67 SW 1621) which appears to have been constructed at the same time and that led to the north towards the river Thames. The exact line of this branch road is not known as much of the area has been quarried away, but if it continued straight, it may have met with the possible ritual enclosure c.2km to the north (TQ 67 SW 222). It is also possible that this was the main route between Watling Street and the Villa at Northfleet. A metalled road (TQ 67 SW 1427) orientated north-east to south-west was discovered to the west of the villa and this may have connected the villa complex to this branch road. It is also possible that the branch road continued on, further to the north and west, following the south banks of the river Thames where Roman activity is also known (see below), though so far there is no evidence so far to support this idea.

Another road (TQ 67 SW 138) has also been uncovered heading toward south-west from the line of Watling Street at Springhead, towards the Weald. This has been encountered during excavations at a garden centre (Philp and Cherney, 1997) then again alongside the cemetery at Pepperhill (Biddulph, 2006). It is possible also that it forms a continuation of the road running south from the temple complex (TQ 67 SW 1750) that was uncovered in the 1960s (Penn, 1965). Evidence from the Pepperhill cemetery site suggests that this road pre-dated the main use of the cemetery, and so must have been laid out early in the Roman period, possibly by the mid-first century AD (Biddulph, 2006). This was therefore a second route-way contemporary with the construction of Watling Street. Overall, it appears that the development of Watling

Street forms part of a much wider programme of road building that was carried out in this landscape early in Roman period to connect the settlements in this region.

3.3.2 Water

Roads were, of course, not the only method used to transport people and goods through this area in the Roman period. There is also good evidence for the use of the river Ebbsfleet at this time, and the river Thames as well. There is evidence to suggest that the river close to the spring had been cleared and dredged in the early Roman period. A compact layer of gravel had been laid down on the western bank, while the head of the Ebbsfleet had been revetted with flint, both possibly to provide a landing place for vessels (Andrews, 2010). The properties at the roadside settlement which backed onto the western bank of the spring river had direct access to the river and there is some evidence for formalised development and use of the waterfront here. At property 4 for example, a possible quayside platform was uncovered (TQ 67 SW 1635) represented by a series of post holes which extended into the river 3m from the assumed line of the water's edge. The river linked the Springhead settlement area with Northfleet villa to the north where there is further and more substantial evidence for the use of the Ebbsfleet, in the form of a substantial oak quay and associated riverbank revetments (TQ 67 SW 1797). It was constructed in the second century and may have been one of several riverside structures positioned along the Ebbsfleet. It is clear that this waterfront was used for loading and unloading people and goods from small boats, and it has been suggested that the complex at Northfleet may be best understood as a small harbour



Figure 3.8: Artist's reconstruction of the quay at Northfleet Villa (created by Peter Lorimer, courtesy High Speed 1 Ltd / OWA)

rather than as a conventional villa, therefore making its position along the Ebbsfleet of primary importance for its continued development and use throughout the Roman period (Millett, 2007). One other more tenuous piece of evidence for the use of the Ebbsfleet comes from the position of the late Iron Age processional way (TQ 67 SW 1384). At the

northern end of the way there was a shallow embayment where the Ebbsfleet was wider and 'it is possible that visitors arrived by boat disembarking here and then walking southwards along the processional way' (Biddulph, 2010)

Overall, it is clear that a variety of communication routes were used to move through this landscape throughout the later Iron Age and Roman periods. There will have been many reasons for the need to connect this area to its wider landscape. The use of these routes within the trade network of the wider area is discussed below but it is also likely that they were used by pilgrims who were attracted to the area by the presence of the sanctuary and temple complex. The distances that these pilgrims may have travelled is not known, but the site is certainly of regional significance and its position on a routeway from or towards the Kent coast may be telling. The possible presence of a *Mansio* or guesthouse (TQ 67 SW 348) within the settlement also indicates travellers from further afield than the immediate locality. A study of evidence from other sanctuary sites in the western Roman provinces concludes that pilgrimage or 'sacred travel' existed in this region and it was 'comparable to the sort of pilgrimage found elsewhere in the ancient Mediterranean world' (Kiernan, 2012).

3.4 Settlement

The evidence for settlement dating to the Roman period within the study area is extensive and varied. Roman settlements include a nucleated/roadside settlement, various types of farmsteads and/or production sites



Figure 3.9: Artists impression of the roadside settlement at Springhead showing properties fronting onto the Ebbsfleet. (created by Chris J Stevens, courtesy High Speed 1/ OWA)

and a villa as well as some possible defended sites. These include some sites that show continuity from the Iron Age into the Roman period. Perhaps the best understood of these is the Roman settlement; *Vagniacae* which developed around the sanctuary at the head of the Ebbsfleet. The layout appears to have been largely determined by the location of the roads. The 12 properties which were identified during the CTRL excavations fronted onto either Watling Street or the branch road which led north, while those discovered to the south in the 1950s and 1960s also appear orientated towards roads though the evidence here is less clear (Penn, 1965). Most of them were established during the first century and survived into the

late second or early third centuries, though some continued into the fourth century. Each of the properties contained at least one structure, although these demonstrated considerable variety in terms of their size, composition and layout probably reflecting differences in their function.

The excavated buildings and associated features and finds are too numerous to discuss in detail here but a brief summary of the types of property and their use is valuable for gaining an understanding of the settlement. Alongside those used for ritual activities, several seem to have had industrial or manufacturing purposes with at least two probable bakeries (TQ 67 SW 1404 and TQ 67 SW 347), a possible brewery (TQ 67 SW 1409), evidence of iron working in multiple buildings (TQ 67 SW 1763 and TW 67 SW 1738) including a building interpreted as a smithy (TQ 567 SW 1417), and at least one pottery or tile kiln (TQ 67 SW 1766) (Penn, 1965). Agricultural activity is also represented by an aisled barn positioned along the branch road (TQ 67 SW 1422), the possible use of the bakeries for grain storage (TQ 67 SW 347) and by the presence of features such as corn drying kilns (TQ 67 SW 1649 and TQ 67 SW 1765). There is also a collection of features including pits, possible buildings and kilns (TQ 67 SW 1589) representing further agricultural activity of an early Roman date positioned just to the north-east of the main settlement area. A bathhouse and the partial remains of an associated building interpreted as a *Mansio* or guesthouse (TQ 67 SW 348), have also been discovered close to the temple complex. It is possible that many of these properties also had a domestic function, housing those who worked in the bakeries or shops, but only one building has been uncovered that has been interpreted as a purely domestic structure (TQ 67 SW 1414). Some of the features which have been discovered in and around the settlement are not fully understood and their purpose or function warrants further investigation and research. An example of this is a ditch which was discovered to the south and west of the settlement during excavations carried out in the 1960s (TQ 67 SW 358). This ditch was substantial, approximately 3m across and 2.7m deep and was early, likely 1st century and possibly predating much of the sanctuary complex and Watling Street. It has been tentatively interpreted as having a military function, possibly as a short-lived fort or supply base (Detsicas, 1983). Overall, it seems that although Springhead was an important religious centre, the settlement surrounding it was also noteworthy with evidence showing that a variety of activities were carried out there. Nevertheless, although other buildings would have existed outside the investigated areas, it seems unlikely that the settlement is large enough to be described as a town and it is perhaps better considered as a roadside or small nucleated settlement (Allen and Smith, 2016).

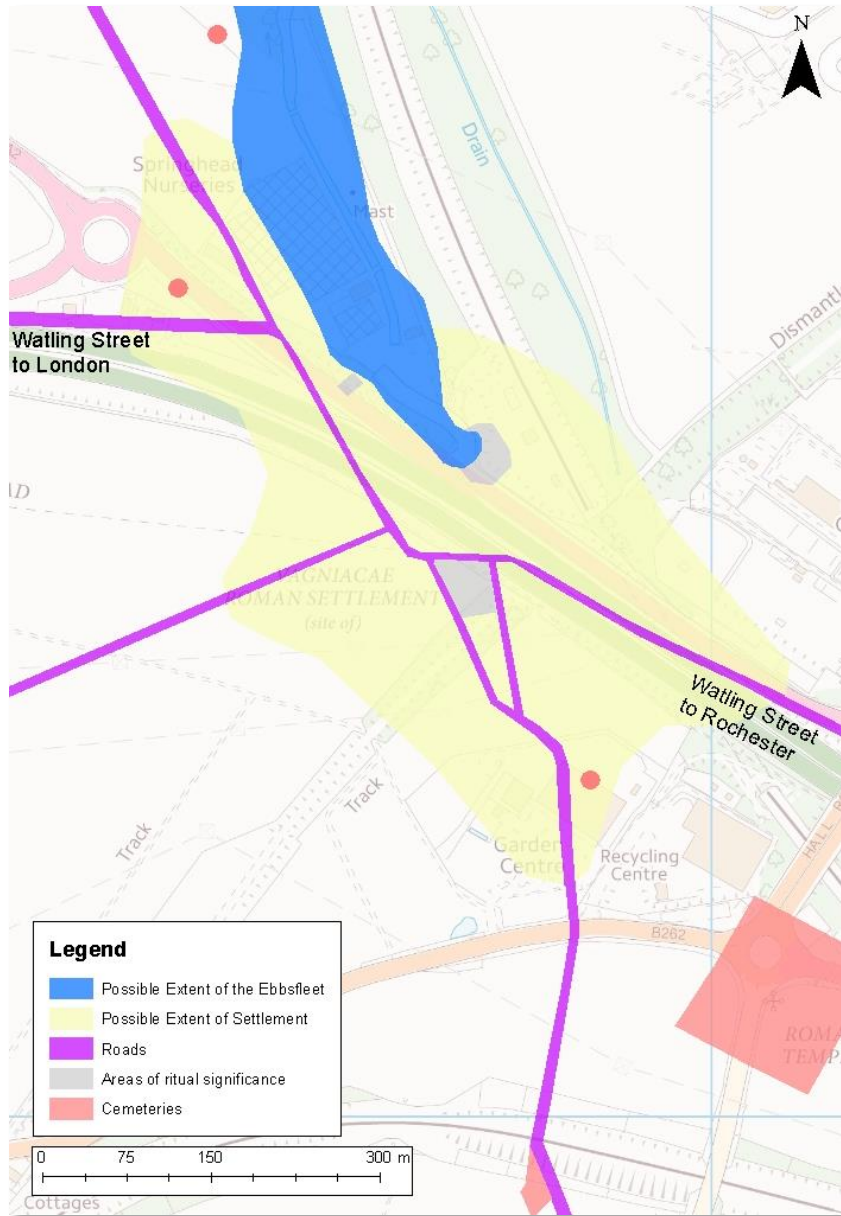


Figure 3.10: Approximate extent of settlement at Springhead



Figure 3.11: Roman features located at Ebbsfleet Academy



Figure 3.12: Plan of Roman features discovered at Springhead roadside settlement site

Northfleet Roman villa (TQ 67 SW 38) is positioned almost centrally in the study area, on the south-western side of the river Ebbsfleet c. 600m south-west of the river Thames and 2km north of the Springhead settlement. The site and its immediate environs has been subject to extensive archaeological excavations, beginning in 1913 (Steadman, 1913) but also during CTRL work. The first phase of activity dated to the late first century, and included the construction of a timber hall (TQ 67 SW 1425) which may pre-date the main villa building and could



Figure 3.13: Plan of Northfleet villa (courtesy High Speed 1/ OWA)

have stood alone as a farmstead from which the villa complex developed, as is the case at other villa sites (Allen and Smith 2016). This early timber structure was replaced in the second century by an aisled barn (TQ 67 SW 1426) that was used for a variety of functions that appear to have changed over time. The complex continued to expand and develop with the addition of a bath house (TQ 67 SW 1423) on the northern side of the barn in the second century, and the construction of a second aisled barn to the west in the early third century (TQ 67 SW 1424). The clear use of these structures for agricultural and industrial purposes is discussed in further detail below, but it is possible that they would have also had a domestic function, perhaps in an upper storey, with those who worked on the villa estate also residing there. A quayside (TQ 67 SW 1799) and associated waterfront infrastructure was also developed. This was positioned on the northern side of the buildings and was extended in the late Roman period, possibly at the same time a malting oven was added to the complex (TQ 67 SW 1800). The villa itself (TQ 67 SW 1795) was partially revealed early in the 20th century. It is not as well understood as these ancillary buildings and the dating evidence is not precise. Steadman's plan appears to show the east wing measuring c. 6m by 21m containing three rooms, an L-shaped corridor or lobby c. 3 m wide fronting the house, and a return that formed an entrance or porch. This house therefore, fits the description of row-type houses, including winged-corridor villas (Biddulph, 2011). The discovery of white marble *opus sectile* paving and fragments of Purbeck marble wall veneer or flooring at Northfleet suggests that the villa was a high-status structure. *Opus sectile* is known from very few richly adorned sites, including for example, Fishbourne Palace. A late first or early second century date has been suggested for the construction of the villa which may have continued to be used, together with some of the ancillary buildings, into the fourth century.

Archaeological investigations have also provided evidence that another area of activity was located a short distance to the west of the villa and connected to it by a

metalled trackway (TQ 67 SW 1427). This may have in turn connected with the wider road network in the area (discussed above). The activity here was roughly contemporary with the villa and the earliest evidence comprised a series of ditches and possible enclosures (TQ 67 SW 1514). By the mid-Roman period the area had become more complex with a series of smaller enclosed spaces and a trackway being established at the site. These features appear to have gone out of use by the end of the third century when there was a major reorganisation at the site that included the establishment of at least one (possibly two) large enclosures, several pits and an oven (TQ 67 SW 303). The evidence suggests that in the early Roman period this area formed part of a field system associated with the villa nearby, but by the middle to later Roman period the nature of the activity here seems to have changed, possibly taking on a more domestic function (Biddulph, 2011). This is supported by the finds which included a large assemblage of pottery similar to that discovered within the villa and dominated by dishes with a substantial quantity of decorated samian ware (Mills, 2011). Evidence for another site was uncovered just to the south of Northfleet Villa and close to the western banks of the Ebbsfleet. An assemblage of Roman finds including fourth century potsherds and iron nails were found in association with a 4.5m length of chalk wall footings (Philp and Kellaway, 1958). A substantial tank (TQ 57 SW 540) was discovered c.150m to the south of this occupation area, it is possible that these two features are related though the function of both is not clear. Overall, it appears that though the main hub of activity was concentrated around the villa complex, there is also evidence for peripheral associated activity which seems to intensify in the mid-Roman period.

In addition to Northfleet villa and its associated estate and hinterland, there are several examples of smaller-scale settlements or farmsteads from the study area. One example was investigated near the south-western corner of the study area, close to the line of Watling Street at Stone Castle quarry (TQ 57 SE 54). Here evidence suggests that a small farming community developed in the later Iron Age, was abandoned, and then re-occupied in the third quarter of the first century AD. Though no Roman buildings were discovered features including ovens and boundary ditches were uncovered and the evidence points to a small, unpretentious building, very likely of chalk and timber construction, occupying an area nearby (Detsicas, 1966). Further Roman occupation evidence (TQ 57 SE 292) including at least 13 ditches as well as post holes and pits was located just outside of the western boundary of the study area at Waterstone Park, Stone (Haslam, 2004). This may indicate an enclosed landscape associated with the nearby farmstead at Stone Castle Quarry to the south or may point to another farmstead at this location. There is less evidence for Roman occupation on the eastern side of the Ebbsfleet valley, but several sites are known just outside of the study area to the east. One of the best investigated sites is situated around the A2 and Northumberland bottom which is approximately 1.5-2km outside of the study area to the south-east. Here, evidence for a Roman settlement comprised a wide variety of features which included a series of ditches, enclosures, metalled roads, ovens, kilns, post holes and pits containing

domestic refuse dating from the first right through to the fourth centuries (TQ 67 SW 548). The activity here appears to have been agricultural in nature, with evidence of a corn drier and elements of a field system suggesting a possible production centre (Askew, 2006). Slightly further outside the study area, to the east at Gravesend, excavations at St Georges shopping centre revealed Roman features and finds suggesting occupation (Philp, 2002).

Some sites in the study area have been more difficult to interpret due to later truncation or the limited scale of excavation. One example includes a site located close to the edge of the Thames floodplain in the Roman period, where two very substantial ditches were uncovered (TQ 57 SE 175). Both contained Roman building material which hints at the presence of buildings of which later landscaping has removed all trace. The substantial nature of the ditches suggest that this was not just an enclosed farmstead and may in fact point to a defensive purpose. Taken alongside a pottery assemblage which has an early Roman date (c.AD 50 through to the late second century), this points to a possible military function for this site. It has been suggested that this site could have a connection with Claudius' crossing point of the Thames towards Colchester. Another theory is that its position on a high point overlooking the Thames Estuary with views towards Essex would have made it a good location for an encampment during the AD 60-61 Boudican revolt by the Iceni and Trinovantes, but these ideas remain unproven (Bruce, 1999).



Figure 3.14: Photo of the Malting oven at Northfleet Villa (courtesy High Speed 1/ OWA)

3.5 Agriculture and industry

3.5.1 Malting and brewing

Many of the settlement sites would have had elements relating to either an agricultural or industrial function. The site for which we have the largest quantity of evidence of this is Northfleet Villa. The structural, environmental and finds evidence discovered here point to a variety of production and agricultural activities but chief amongst these was a

producer of malt and ale, and the site probably provides the most complete picture of brewing in Britain (Biddulph, 2011). The structural evidence comes in the form of the water management features including wells and a variety of tanks and cisterns (TQ 67 SW 1535) with an early Roman date that would have been used for steeping, mashing and brewing the spelt wheat. Either of the two aisled barns (TQ 67 SW 1424 and (TQ 67 SW 1426). could have been used as a malting floor and the late Roman malting oven that was located between the buildings and the waterfront (TQ 67 SW 1800) presents clear evidence for the process. The environmental evidence

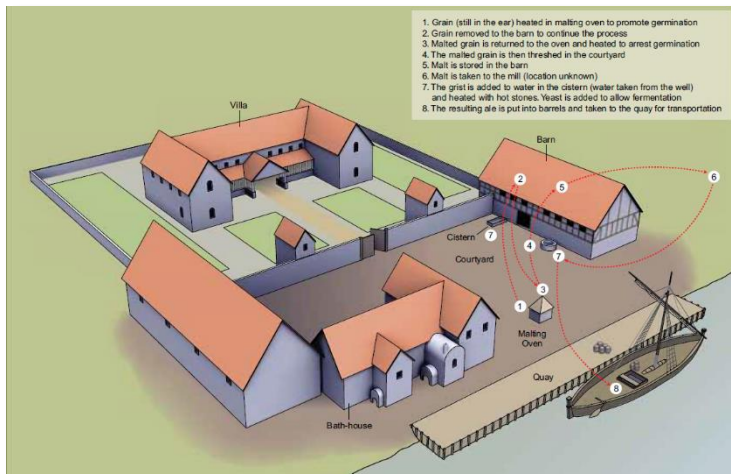


Figure 3.15: Schematic view of the villa complex showing the phases of ale production (courtesy High Speed 1/ OWA)

from the site is also compelling, ‘de-husking’ of the malted grain – a critical stage in the brewing process was seen in 17 of the 28 analysed samples. This density of archaeobotanical evidence is unprecedented in the British archaeological record and ‘strongly suggests that malting was carried out at a large scale at Northfleet Villa’ (Smith, 2011). It is likely that this was the principle economic activity at

the villa. Its’ position close to both the river Thames and Watling Street would have allowed trade with markets in Rochester and possibly London. It has been suggested that a military destination within the province, or even continental markets, are also possibilities and that the military scale of production lends weight to the idea that the estate was set up for the imperial government to supply the army, particularly in the later Roman period (Biddulph, 2011). Further possible evidence of malting and brewing comes in the form of the large tank (TQ 67 SW 540) that was discovered at a site less than 500m to the south of Northfleet villa. Though its function is not certain, it is similar to those discovered within the villa estate and it could have also been used in the brewing process. At Springhead, two of the properties contained evidence of malting (TQ 67 SW 1407 and TQ 67 SW 1418) and it is possible that a large building (TQ 67 SW 1422) which has been interpreted as agricultural, may have contained malting or drying ovens (Grimm and Worley, 2011).

3.5.2 Other Industry

Analysis suggests that some of the grain from the roadside settlement was intended for flour rather than beer. This would have been used for bread and two buildings within the roadside settlement have been tentatively interpreted as bakeries suggesting bread making for consumption and for sale was carried out at the site. One of these, (TQ 67 SW 1404) located between Watling Street and the waterfront, and therefore well positioned for transport of the baked goods, was identified on the basis of associated hearths, pot ovens, quern fragments and charred cereal (Biddulph, 2011). The second possible bakery (TQ 67 SW 347) was located on the south side of Watling Street, close to the main temple complex. The evidence suggests that originally the building contained a suspended floor, which indicates its use as a granary, and that it was converted into a bakery (with the insertion of the ovens) at a later date (Detsicas, 1983). This building was divided into multiple rooms,

and it has been suggested that the room which fronted Watling Street was used as a shop (Penn, 1957).

Metalworking is another craft for which there is evidence at the settlement. A large quantity of smithing slag and a group of crucible sherds recovered from one of the properties have led to its identification as a smithy (TQ 67 SW 1561) and evidence for metalworking has been identified in several other buildings, including one of the temples in the main temple complex (TQ 67 SW 1738). Early excavations associated with the construction of the A2 produced evidence for pottery production in the form of kilns (TQ 67 SW 1495) located c300m to the north-east of the Settlement (Jessup, 1928). Further excavations associated with later works on the A2 revealed evidence of possible shops (TQ 67 SW 351) including one which has been interpreted as a possible samian ware shop by the presence of a kiln and high quantity of samian sherds (TQ 67 SW 1773). Overall, the evidence points to the roadside settlement at Springhead having been a centre for small-scale production and distribution of a variety of goods which included, but may not have been limited to, beer, bread, pottery and metal items. It is likely that these goods were intended for not only its inhabitants but also for passing travellers and pilgrims. There is further evidence for small scale industrial or production activity in the study area. Metalworking debris/waste alongside smithing hearth bottoms (three complete and several fragmentary) was discovered during excavations to the west of Northfleet Villa (Biddulph, 2011). Examination of cable trenching south of the Roman settlement revealed evidence for crop processing (TQ 67 SW 336) and ironworking (TQ 67 SW 335), including pits and finds of slag, and items such as blacksmiths tongs (Boyle and Early, 1998).

3.5.3 Agriculture and animal husbandry

Agricultural activity is less visible in the archaeological record, secondary evidence comes in the form of processing sites that include driers etc., finds of items such as the possible coulter discovered at Northfleet (Schuster, 2011), or from the bone assemblages which include animals used for traction. The settlement at Northumberland Bottom provided evidence for agricultural activity throughout the Roman period (animal bones, cereal grains and chaff) but in the later Roman period the evidence suggests



Figure 3.16: Roman iron hoe discovered near Springhead (courtesy High Speed 1/ OWA)

a move towards a focus on crop processing, perhaps suggesting that the site became more of a specialised production centre rather than a simple farmstead (Askew, 2006). Study of the environmental evidence may tell us the crops that were used at the investigated sites; with spelt wheat, emmer and barley discovered in the samples taken from Northfleet and Springhead. While such evidence cannot determine where the crops were grown it has been argued that the cereal crops are likely to have been cultivated locally utilising the drier, base-rich soils (Smith, 2011).

A study of the animal bones that have been discovered provides strong evidence for animal husbandry across the region. The assemblages discovered at Northfleet Villa and at the roadside settlement include all parts of the carcass. This shows that the animals were probably butchered and processed at these locations rather than being brought in from production sites elsewhere. There are slight differences between the assemblages at these two sites however, perhaps suggesting differing roles. The presence of bones from young and neonate animals at Northfleet shows that the cattle, horse, sheep/goat, and pig were probably bred and reared at Northfleet with its consumers perhaps living at Springhead (Grimm and Worley, 2011). Older animals were also seen in the Northfleet assemblage which indicates their use for traction and the production of dairy products. Alongside this environmental evidence, some of the features uncovered within the landscape surrounding the settlements also point to its use for rearing livestock. Boundaries with a possible Roman date, likely representing a field system or enclosures for livestock, have been uncovered in numerous locations (e.g at Ebbsfleet Green: TQ 67 SW 1792 and TQ 67 SW 1791) and several of the settlements discussed above also had evidence for the division or enclosure of the landscape surrounding them. The features uncovered immediately to the west of Northfleet Villa show part of what may have been a large and complex system of boundaries and enclosures that may have been used to control .

3.6 Research Questions for the Roman Period

The South-East Research Framework (SERF 2019, <https://www.kent.gov.uk/leisure-and-community/history-and-heritage/south-east-research-framework>)) exists to set the research agenda for the archaeology of south-east England (defined for SERF as Kent, Surrey and East and West Sussex). The Greater Thames Research Framework (GTRF, 1999 revised 2011 https://archaeologydataservice.ac.uk/archives/view/gtrf_na_2011/overview.cfm) carried out a similar function but was focused on the Thames Estuary. Both provide a chronological and thematic overview of the state of current archaeological knowledge for those regions and identify numerous research questions that need to be answered. Whilst there are no specific research questions in the two frameworks to which the study area can make a particular contribution, there are many questions

which are nonetheless of relevance. In addition to these the evidence review presented above suggests a number of specific questions of importance.

- The Roman landscape east of Rochester seems to have been extensively developed and exploited, in contrast to that to the west (including the study area) which is much less so. Is this true?
- What role did Springhead play beyond its ritual function? Was it an agricultural, industrial and administrative centre too?
- How was the Thames frontage used in the Roman period? where exactly was it located? Where were the points of access in this period?
- Were the Swanscombe Marshes exploited in the Roman period? Is there any evidence of pottery or salt manufacture as in other north Kent marsh areas?
- Can we learn more about the Roman road network in the area, within which Springhead seems to have been a notable hub.
- Why does the main road have such a pronounced change of direction?
- Can the ritual centre at Springhead be better characterised by further study of the small finds recovered there?
- Are there other areas of ritual significance in the study area, both close to the Ebbsfleet and further afield?
- Can the cemetery sites in/near the study area be conclusively linked to the nearby settlements?
- Can the extent of the Roman settlement be more accurately defined? And how much of it lies outside of the Scheduled area?
- Is there any further evidence for the presence of an early Roman fort/supply base?
- How should the site at Northfleet be regarded - as a villa or a harbour or production site? How extensive were its connections with regional production and consumption sites?
- What can we learn about small-scale rural settlement in the area? How extensively was the landscape in the west of the study area used?

Of Chalk and Water: an archaeological characterisation for the Ebbsfleet Valley and surrounding communities

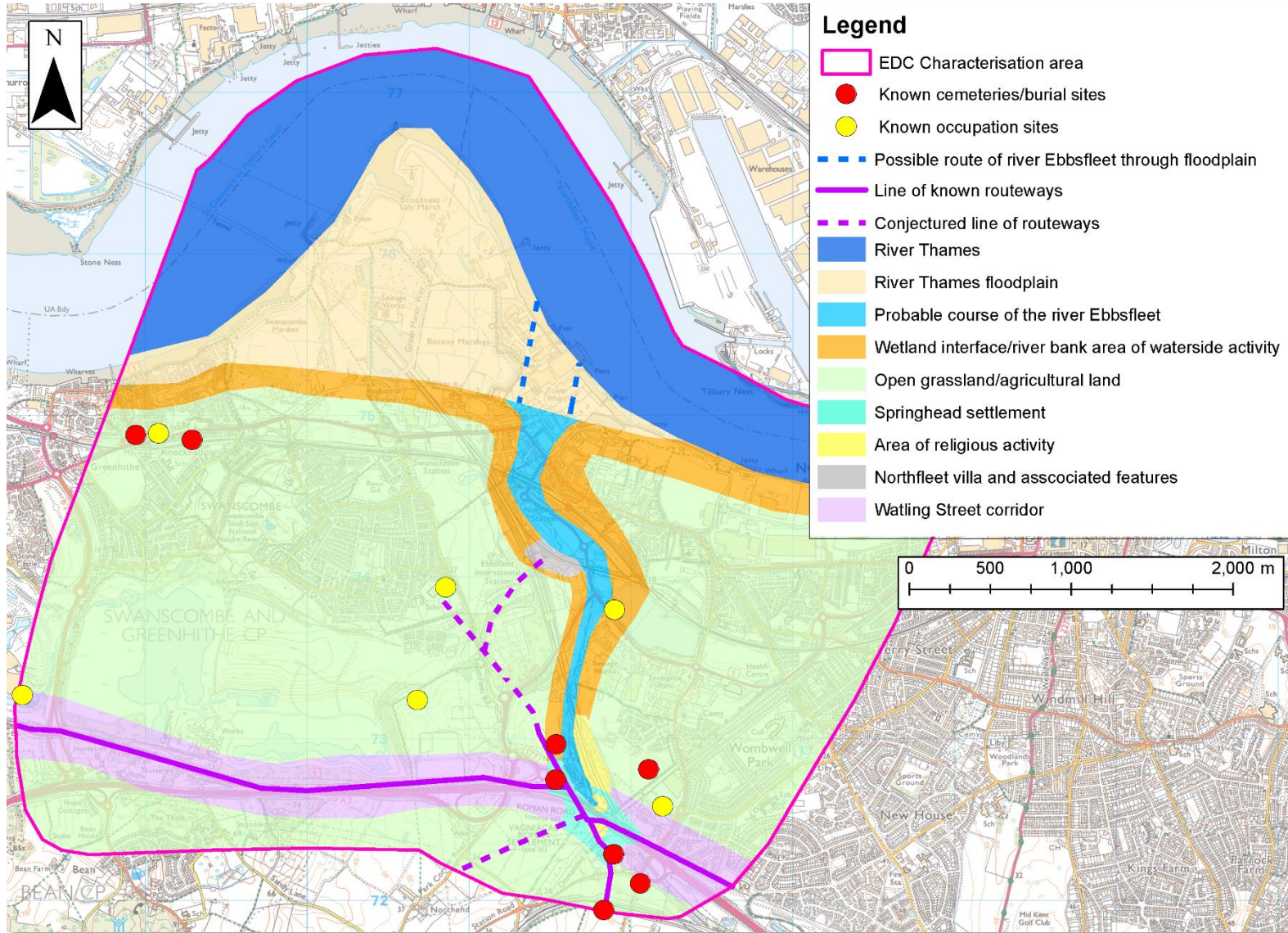


Figure 3.17: Roman Character areas

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4 Anglo-Saxon Period A.D. c.410-1066

4.1 Introduction to the Anglo-Saxon period

Kent has produced a wide variety of archaeological evidence for the Anglo-Saxon period and has some of the earliest written sources in England. The county played an important role in the transition from Roman Britain to Anglo-Saxon England and the nature of this transition has been one of the most debated topics in current archaeological and historical research. One theory is of mass migration in the 5th century, mostly from northern Germany and southern Scandinavia, of people from Jutish, Angle and Saxon tribes.

Another is an 'acculturation' process, perhaps involving only the physical movement into Britain of warriors and perhaps other elites. Whatever the processes were, the 5th and 6th centuries saw a series of radical changes that allowed the kingdom of Kent to become a significant political force (Welch, 2007). Initially, 'Kent' was restricted to the area east of the river Medway but expanded westwards to contain multiple large estates and occupy an area roughly similar to the modern county before the end of the 6th century (Everitt, 1986). This distinction may in part be due to the physical barriers which existed in the landscape, such as the river Medway and the Weald. The early separation between east and west Kent continued in some respects however. This is perhaps evidenced by the establishment of a separate Bishopric for the region, based in Rochester (Brooks, 1989). Differences are also evident in the archaeological record, particularly in the burials and their associated finds for the first few centuries of this period. West Kent examples generally shared characteristics with much of the rest of south-east England. East Kent, by contrast, had a distinctive Kentish material culture that represented a fusion of Scandinavian and Frankish styles. Through the 7th and 8th centuries Kent had two Kings (an eastern and a western one). This dual kingship, and its many royal and political twists, weakened Kent and culminated in a very unsettled period during which there were many attacks on the region. Rochester, for example, was destroyed in AD 676, when Aethelred, King of Mercia, ravaged Kent and the kings of Wessex wreaked



Figure 4.1: 7th century gilded silver and garnet disc brooch from a grave at Springhead (courtesy Wessex Archaeology)

further damage on the town in AD 686 and 687 (Lawson and Killingray, 2004). In the 7th and 8th centuries Kent was dominated by Mercia and in the 9th century by Wessex. By the time of the Norman Conquest Kent was a prosperous part of a unified English state.

This period saw a reorganisation of land holdings and, though it is likely that Roman estates existed in the landscape upon the arrival of the Anglo-Saxon incomers, a new pattern of estates were set up, many controlled by the king and his family as well as the church (Riddler, 2004). The estate centres have been identified through a study of historical sources alongside the archaeological evidence and it has been suggested that these considerable land units enjoyed a breadth of natural resources from a mix of topographical regions (Everitt, 1986). The estates were situated within 'lathes' which were the primary subdivision of the county and the original provinces of the kingdom of Kent. These lathes were later divided into 'hundreds' (sometime in or just before the 10th century) which were developed throughout the Anglo-Saxon and the later Medieval periods to form land divisions that remained largely unaltered until the 19th century. Each hundred had a central meeting-place where meetings to discuss judicial, security and tenancy matters took place (Lawson, 2004). This information about land division and ownership throughout the Anglo-Saxon period has been passed down to us through a series of historical documentary sources known as charters. An Anglo-Saxon charter is typically a formal document recording a king's grant of land or privileges to a religious house or layman. The earliest surviving charters were drawn up in the 670s, and the corpus extends in unbroken sequence thenceforth to the Norman Conquest (Keynes, 2017). Another very useful resource for the study of the Anglo-Saxon period is the Domesday Book, which, although it was written after the Norman conquest, provides a detailed picture of settlement patterns and population levels at the end of the Anglo-Saxon period.

Cemeteries are the most commonly discovered site type for this period in Kent, this is largely due to the fact that settlement evidence, for example, is often ephemeral and difficult to find or identify whereas burial evidence, often in the form of large and rich cemeteries, is ubiquitous. These cemeteries are, however, far rarer in west Kent than in the eastern part of the county, with 19 known examples as opposed to 77 (Richardson, 2005). Generally, they are located on high ground and promontories, frequently commanding views over valleys. In the western part of the county there is a relative concentration of cemeteries along the Darent valley, including several in and immediately surrounding Dartford (O'Brian and Mustchin, 2015). In the earlier cemeteries, (those dating to the 5th-7th centuries) the burials were often found with grave goods. The objects interred alongside the burials vary considerably, factors such as wealth, status and sex of the individuals would have had influence over the items included. Many burials have been discovered with items of personal adornment including saucer and disc brooches or necklaces with beads of amber or glass. Weapons burials are also a relatively common occurrence and items including knives, shields spears and swords have been located alongside many Anglo-Saxon

graves. These finds provide an outstanding resource for examining the origins and evolving social structure of Kent's population (Welch, 2007).

Anglo-Saxon settlement sites, unlike cemeteries, are not common discoveries in Kent, but this is likely due to their nature (sometimes short lived and often comprised just simple timber structures) rather than to an actual absence of settlements. A number of factors seem to have influenced their position in the landscape. The link between Roman roads and early Anglo-Saxon settlement patterns has been noted and most sites are located within 1.2 km of either a Roman road, a navigable river or the coast (Brooks, 2003). There also appears to have been a tendency to re-use Roman sites. It is likely that this is because the Anglo-Saxon settlers prized the same landscape features for their settlements as their Roman predecessors (e.g access to water or high ground etc.) rather than suggesting a continuity of settlement, though in some locations, particularly the large and important towns or fortifications such as Canterbury, some Roman remains were re-used and the status of the settlement was maintained (Rady, 1991). The settlements are commonly represented by small groups of sunken featured buildings, and sometimes also rectangular timber buildings alongside features such as pits, middens and trackways. These sunken featured buildings seem to have been introduced to lowland Britain from the Continent at the beginning of the Anglo-Saxon period (Welch, 2007).

Though most of the settlements were small and rural, some larger settlements would have existed in the county, including known examples at Canterbury and Dover. For west Kent, the presence of a significant early settlement within the walls at Rochester is implied by the important cemeteries in the vicinity as well as the establishment of a separate bishopric of Rochester for Justus in 604 (Blair *et al.*, 1999). By the early 9th century Rochester was under the control of Wessex and was a defended market town (OE *burh*) and trading centre (OE *wic*), with one of the most productive mints in England. Other settlement sites would have existed in the landscape surrounding the study area. The number of cemeteries around Dartford is a strong indication of settlement there and, though no buildings have been uncovered, occupation deposits containing 7th century pottery and other finds were uncovered next to the river Darent 500m north-east of the parish church (Kent County Council, 2004). It is also possible that Gravesend may have been the site of Anglo-Saxon activity. Early Anglo-Saxon pits, possibly used for the preparation of meat, were discovered at the Gravesend and North Kent Hospital during an excavation in 2004 (PCA, 2004). The church was an important aspect of life in the later Anglo-Saxon period, they form a key element to some of the later Anglo-Saxon settlements and were some of the first structures to have been built using stone. Kent has some of the earliest Anglo-Saxon churches in England, with some dating from c. AD 600. By the Norman Conquest, around 400 churches, organised as minsters and dependant churches, had been established and many Medieval churches have an Anglo-Saxon predecessor (Carder, 2004).

The study area, which may have straddled the Anglo-Saxon estates of Dartford and Northfleet, contains many features that provide evidence for varied activity from the 5th century onwards. This is unsurprising given its favourable location near the Thames estuary and the Roman routeway of Watling Street. These features include a series of early to middle Anglo-Saxon sunken featured buildings, early to middle Anglo-Saxon cemeteries, evidence for industrial activity in the form of crop dryers and an important example of a watermill as well as the churches at Swanscombe and Northfleet.

4.2 Landscape and Environment

Most of the evidence that we have for the landscape and environment in the study area during the Anglo-Saxon period comes from the analysis of the alluvial deposits at the base of the Ebbsfleet valley which was undertaken as part of the CTRL/HS1 works. On the floodplain itself, the tidal creek and saltmarshes which are evident in the Roman period, continued into the first half of the Anglo-Saxon period. By the latter centuries however, the salt marshes appear to have been replaced by freshwater reed swamp. This is evidenced by a peat deposit at the top of the alluvial silts (Andrews et al., 2011). Away from the valley bottom and floodplains, it is likely that the environment would have differed little from its appearance in the Roman period. Woodland clearance looks to have continued though it is likely that some small, wooded areas remained; tree pollen represents approximately ten percent of the analysed pollen assemblage. Evidence from the large quantity of waterlogged timbers that have been discovered in the study area may also indicate the presence of woodland within the vicinity. Both mature oak as well as hazel and field maple roundwood have been discovered (varying in age between 2-10 years) suggesting that historic woodland as well as managed woodland was utilised for construction in the area, and also the use of different aged trees may also demonstrate deliberate management by coppice rotation in the region (Hardy and Andrews, 2011). Overall however, the environmental assemblage indicates a relatively open landscape, dominated by grasses and with evidence of an increase from the Roman levels of arable farming with cereal pollen being common.

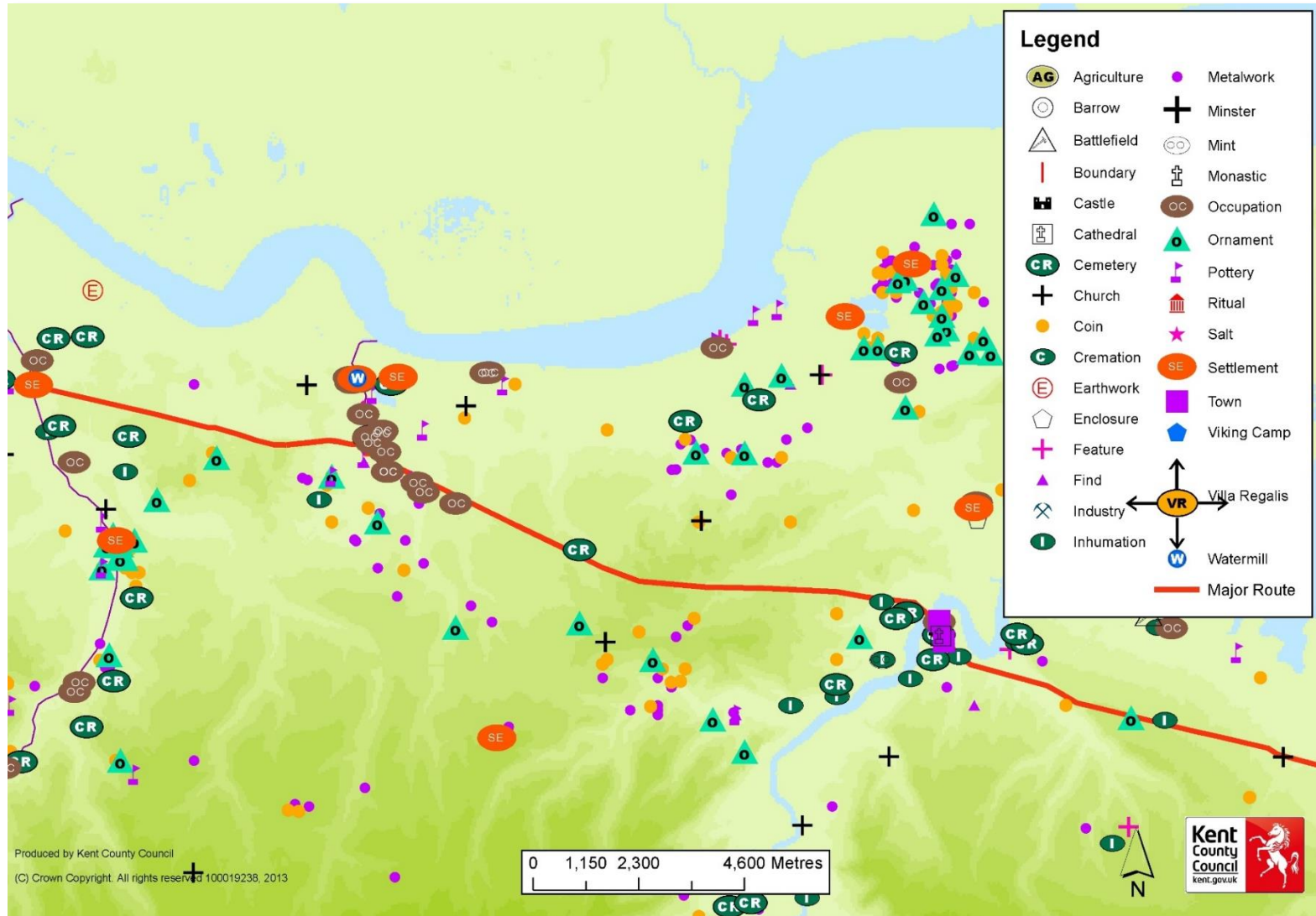


Figure 4.2: Summary map of Anglo-Saxon data in north-west Kent

4.3 Settlement

4.3.1 Early to middle Anglo-Saxon settlement

Settlement within the study area seems to have been relatively sparse, particularly when compared to the busy preceding Roman period. Most of the activity appears to have been clustered around the Ebbsfleet valley. This may, in part, reflect the fact that this is the area that has been most thoroughly

investigated, but the pollen assemblage also supports reduced activity, as it provides much less evidence for disturbed soils than was seen in the Roman period assemblage (Hardy and Andrews, 2011). A total of 13 sunken featured buildings have been uncovered within the study area. Typically, the remains for this type of structure comprise a shallow rectangular pit with a flat base and a central post hole at either end which range in size from around 2m by 1.5m to c.4.5m by 3m. The examples within the study area were located along or close to the river Ebbsfleet, mostly at the base of the valley. Two were situated near Springhead, the first (TQ 67 SW 1447) lay close to the springs while the second (TQ 67 SW 1471) was situated c.630m to the south-east, close to Watling Street and was associated with pits and a gully (Hardy and Andrews, 2011). It is possible that settlement also continued beyond the limits of the study area further to the south-east, along Watling Street. Excavations associated with the A2 widening scheme revealed another sunken featured building (TQ 67 SW 560) and late Anglo-Saxon ditches (TQ 67 SW 532) less than a kilometre to the south-east (Allen *et al.*, 2012). Further sunken featured buildings are located to the north of Springhead, including two that were discovered close to the eastern banks of the river Ebbsfleet (TQ 67 SW 1706 and TQ 67 SW 1809) during excavations in 2008 (Wessex Archaeology, 2008). These were again associated with pits (TQ 67 SW 1449) and gullies (TQ 67 SW 557) which contained finds that included both locally produced and imported European forms of pottery, as well as high concentrations of land snails and cereal grains (Wessex Archaeology, 2008). The remaining 9 structures were grouped in an area around Ebbsfleet International Station at Northfleet. Five were in the vicinity of the Roman villa complex (TQ 67 SW 1450, 1522, 1523, 1525 and 1526) and four in areas investigated to the west, beneath the area occupied by the railway modern station and the railway tracks (TQ 67 SW 482, 1527, 1528 and 1529). All the buildings have a roughly similar form and size, though one (TQ 67 SW 1527) was clay lined which



Figure 4.3: Example of a reconstructed sunken featured building (courtesy *dun_deagh* (CC BY-SA 2.0))

may suggest a differing or specialised function. They all appear to have an early to middle Anglo-Saxon date, between the late 5th or early 6th and the early 7th centuries. It is not known however, how many of these existed at the same time and it has been suggested that the buildings at Springhead are later than those at Northfleet (Hardy and Andrews, 2011).

Overall, the features uncovered suggest low density occupation and activity in the study area from the middle of the 5th century until the early 7th century. This stretched for at least 3km along the Ebbsfleet Valley within the study area and possibly beyond it along Watling Street, to the south-east. Access to the river Thames and Watling Street (which was still used in the Anglo-Saxon period, though it was of less importance than during the Roman period) would have made this an attractive area for settlement. It is also likely that the site of a villa, even after a few decades of dereliction, would still represent a conveniently cleared settlement platform. The settlement appears to have been quite dispersed along the Ebbsfleet valley and it is not clear how many of the structures were occupied at any one time. Studies have shown that the lifespan of sunken featured buildings ranged from between 10-50 years and so it is therefore, very unlikely that all those revealed in the study area were contemporary (Hamerow, 2002). It has been suggested that the activity near Springhead, along the Ebbsfleet valley and at Northfleet takes the form of a shifting linear settlement, and the absence of either re-building, other infrastructure elements, or long-term rubbish disposal may imply a more transient population (Hardy and Andrews, 2011).

4.3.2 Later Anglo-Saxon settlement

As for the early Anglo-Saxon period, settlement evidence for the later period is focused on the Ebbsfleet valley. Evidence includes a group of pits (TQ 67 SW 1485) and four corn dryers, all with a probable late Anglo-Saxon date. Two of these corn driers (TQ 67 SW 1478 and TQ 67 SW 1685) were located 150m from one another, on lower eastern slopes of the Ebbsfleet valley overlooking the springs at Springhead and have been dated based on the associated finds to the 9th century AD (Andrews et al., 2011). The other two (TQ 67 SW 1701) were positioned slightly further upslope, approximately 300m to the east and were associated with the pits, which were possibly used for storage of the dried corn (Wessex Archaeology, 2006). Though these features do not provide direct evidence for later Anglo-Saxon settlement, they certainly imply activity in the region and it seems likely that associated settlement may be located nearby, possibly in the un-investigated areas to the east.

Alongside archaeological evidence, historic documentary sources are an important resource for studying settlement sites. The Domesday Book, which dates to 1086 and records data about the manors and their tenants in chief including information

about mills, arable land, churches and woodland, is particularly useful. Two manors within the study area are recorded in the Domesday Book, Swanscombe and Northfleet, both of which had a church, and a mill is also recorded at Northfleet (Williams and Martin, 2003). Though this document is later Medieval in date, it suggests that some form of settlement had been established at these locations during the Saxon period. It seems unlikely that the Northfleet mentioned in the Domesday is that represented by the sunken featured buildings discussed above, more likely it represents settlement to the east close to the church of St Botolph. Unfortunately, there is little archaeological evidence to substantiate this and the extent and form of the Saxon settlements at Northfleet and Swanscombe is not known.

4.4 Churches

Two churches within the study area are mentioned in the Domesday Book and have Anglo-Saxon origins; the church of St Botolph in Northfleet (TQ 67 SW 1131) and the church of St Peter and St Paul in Swanscombe (TQ 67 SW 36). St Botolph's, which a GI listed building, is located just under half a mile south of the Thames, opposite Tilbury Ness. It originated in the 10th century and, though it was heavily restored in the Medieval and Post-Medieval periods, there is still some extant Anglo-Saxon material. This comprises a set of long-and-short quoins at the south-west corner of the nave between the tower and the south aisle which have been dated to 950-1100 AD (Richmond, 2000). The church of St Peter and St Paul is located on Swanscombe Street, roughly centrally in the study area, near the recreation ground and cemetery. It is also a GI listed building. Most of it dates to the Medieval and Post-Medieval periods, with re-used Roman building material, but the lower part of the tower has a late Anglo-Saxon date. During an archaeological watching brief carried out in the graveyard of the Church, its Saxon origin was highlighted by the discovery of the remains of an infant at the base of the northern side of the church tower (TQ 67 SW 1708). This was indicative of Late Anglo-Saxon practice whereby un-baptised children were sometimes buried against the church walls. It is thought that they believed that when rain fell on the church roof it would turn into Holy Water, then run off and baptise the infants in the ground (PCA, 2009). Though these churches are a clear indication of late Anglo-Saxon activity within the study area, they appear to have been relatively isolated features in the landscape. Aside from the pits and corn driers discussed above, they are the only features suggestive of occupation in the late Anglo-Saxon period, though it is possible that ephemeral features have existed and escaped recognition, or there may be further features awaiting discovery in areas that have not been investigated.

4.5 Burial

Anglo-Saxon burials have been discovered on several separate occasions in the study area. The earliest discoveries were made during railway works in 1847 and quarry works in 1899-1900. These comprised a group of at least 26 burials which

probably belonged to a single, mixed-rite cemetery (TQ 67 SW 42). They were located at Northfleet, in the area of high ground known as Church Fields to the south and west of the parish church (Richardson, 2005). Both inhumations and cremations were discovered, accompanied by a variety of objects that included spears, shield bosses and handles and saucer brooches. A date of late 5th or early 6th century has been attributed to this cemetery and it is possible that it related to the settlement represented by the sunken featured buildings around Northfleet villa, as these were located just 0.5km to the west and were of a similar date.



Figure 4.4: Millifiori glass bead discovered with a burial at Springhead (courtesy Wessex Archaeology)



Figure 4.5: Group of burials within enclosure at Springhead (Courtesy Wessex Archaeology)

Much of the burial evidence for the study area was uncovered during more recent excavations. A large cemetery was uncovered on the eastern slopes of the Ebbsfleet valley, near Springhead. The cemetery was revealed in several parts, two groups of burials (the southern extent of the cemetery) were revealed during excavations associated with High Speed 1, carried out in 2000-2002 (TQ 67 SW 1454). The northern part (TQ 67 SW 1360) was revealed during evaluation trenching and the Springhead Quarter excavation undertaken between 2007 and 2008. The total number of graves was approximately 160. These were arranged in poorly defined rows and covered an area of about 80m east-west by 53m north-south. Some were enclosed within ring ditches and a group of 18 closely spaced graves were within a small linear enclosure with a ring ditch at its northern end. Many of the burials contained grave goods, the nature of which suggests the presence of multiple high-status individuals. Examples include amethyst necklaces, fine composite disc brooches and weapons such as spearheads, shields and knives. One exceptionally elaborate grave assemblage included a composite disc brooch, a millefiori glass bead, a number of other beads as well as two silver wire fittings (Wessex Archaeology, 2008). Unfortunately, the acidic nature of the soils has meant that the preservation of the skeletal remains was generally poor across most of the cemetery, though enough evidence has survived to indicate that most were in an extended

position, orientated east-west with feet to the east. The evidence also indicates a period of use covering the second half of the 7th century through to the beginning of the 8th century. It is therefore, later than the settlement evidence for the Ebbsfleet valley but may be contemporary with the Anglo-Saxon mill (discussed below) (Hardy and Andrews, 2011).

These cemeteries are important discoveries in west Kent where there are far fewer examples than in the eastern part of the county. The Springhead cemetery is also the richest mid-Anglo-Saxon cemetery to be identified in west Kent. It has been suggested that the high number of weapons and high-status burials may mean that it had a royal connection (Wessex Archaeology 2008). The lack of any known contemporary settlement within the vicinity could suggest that there is undiscovered settlement evidence elsewhere in the study area. It is also possible however, that any associated settlement was positioned further afield, which is proposed for some of the other late 7th century cemeteries in the region. For example, the cemeteries at Polhill, on the edge of the Darent valley to the west (Philp, 2002), and Holborough in the Medway to the east (Evison, 1956) are both 7th century in date and in neither case has any associated settlement been located.

4.6 Agriculture

The Anglo-Saxon economy was primarily agricultural in nature, and evidence of farming practices has been found alongside evidence of settlement in the study area. Assemblages of animal bones show that animal husbandry centred on cattle, sheep/goat and pig, with cattle bone most frequent at Northfleet and pig bone at Springhead. The data obtained for cattle also suggests that they were not only kept for meat but also contributed milk and were used for traction. The evidence for sheep/goat suggests that these animals were raised for meat, milk, and wool (Andrews et al., 2011). Grain samples indicate that spelt wheat continued in use into the 7th century though barley is particularly dominant in 6th / 7th century samples (Hardy and Andrews, 2011). The late Anglo-Saxon corn dryers discovered at Springhead alongside charred grain suggest crop processing on a relatively large scale within the study area. It is possible that they formed part of a centralised system of grain production, processing and trade/manufacture in the region.

4.7 Industry

The best evidence that we have for industry for the Anglo-Saxon period is from the well-preserved Anglo-Saxon watermill (TQ 67 SW 298) that was discovered close to Ebbsfleet international station during work undertaken there in 2001-2002. The mill was positioned along the southern edge of the river Ebbsfleet channel, at a point just north of a tidally inundated backwater which was used as a quay throughout the Roman period, close to Northfleet Villa. This tidal backwater was adapted to serve as a tidal mill pond, with water delivered through two pentroughs to feed two horizontal water wheels. This mill is of particular importance as it is the only example in

England of an *in-situ* pentrough, and in terms of the completeness of survival, and its design and construction, the mill at Northfleet is in many respects unique in the archaeological record of north-west Europe, it is also earliest known example of English engineering. (Hardy *et al.*, 2011). Though this was the only structure identified at the site, it seems likely that any associated structures, including storage facilities and the miller's residence was located to the south on the higher and drier ground. Dendrochronological dating indicates a construction date of AD 692 for the mill and it is likely that it was used for around 30 years (Hardy *et al.*, 2011). It is interesting to note that there was little in the way of domestic detritus in, or in the vicinity of, the mill and no evident contemporary structures nearby. The mill therefore, appears to have been a somewhat isolated element in the landscape which then begs the question, by whom and for who was the mill used? It has been suggested that it may point to the development of more centralised grain processing than typical small scale domestic processing (Hardy *et al.*, 2011). Blair has argued that a mill on an estate was a valuable fixed economic asset, arguably a secular equivalent to the fixed religious asset of the Church (Blair, 2005). Certainly, by the Medieval period laws were in place which required tenants to use their lords mill (Holt, 1988). The presence of the isolated mill here in the Ebbsfleet valley may mean that it formed part of the estate (later manor) of Northfleet and was used to mill the cereal produced by the tenants that worked across the estate.



Figure 4.6: Artists reconstruction of the Anglo-Saxon mill at Northfleet with its associated mill pond (created by Peter Lorimer, courtesy High Speed 1/ OWA)

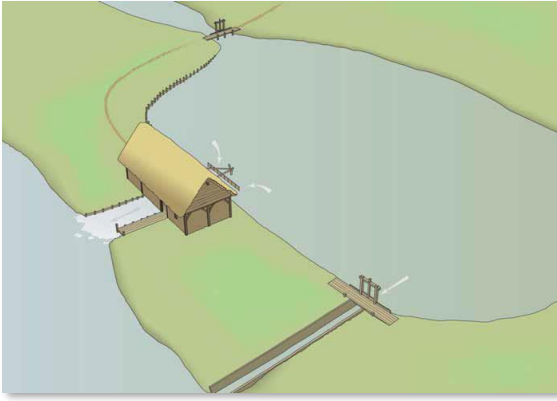


Figure 4.7: Schematic plan of the mill and its associated infrastructure (courtesy High Speed 1 / OWA)

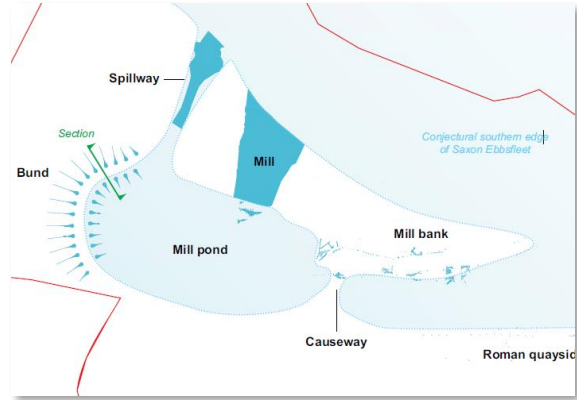


Figure 4.8: Aerial view of the location of the mill in relation to the Ebbsfleet channel (courtesy High Speed 1 / OWA)



Figure 4.9: Photograph of the pentrough timbers during excavation (courtesy High Speed 1 Ltd / OWA)

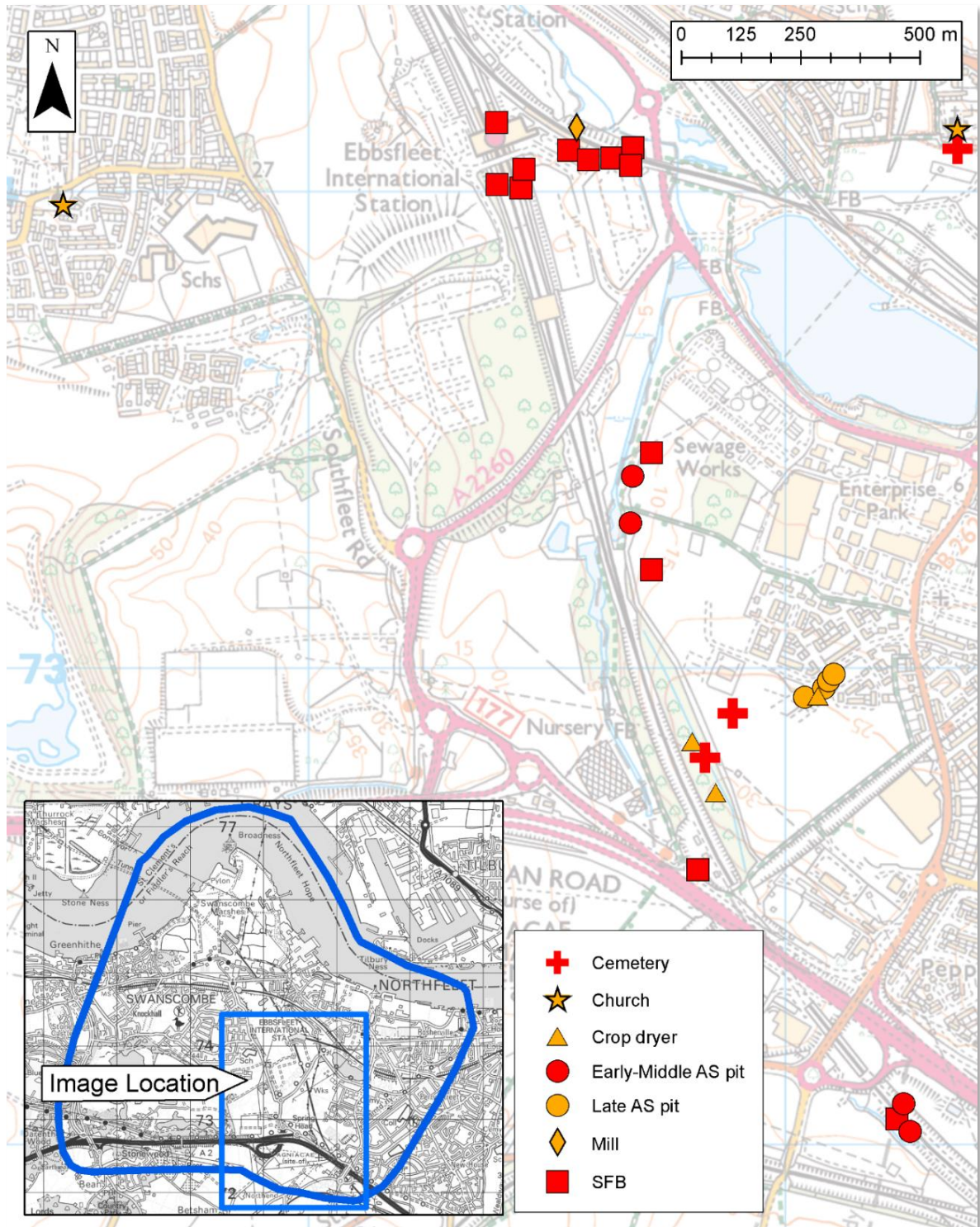


Figure 4.10: Location of Anglo-Saxon features along the Ebbsfleet valley

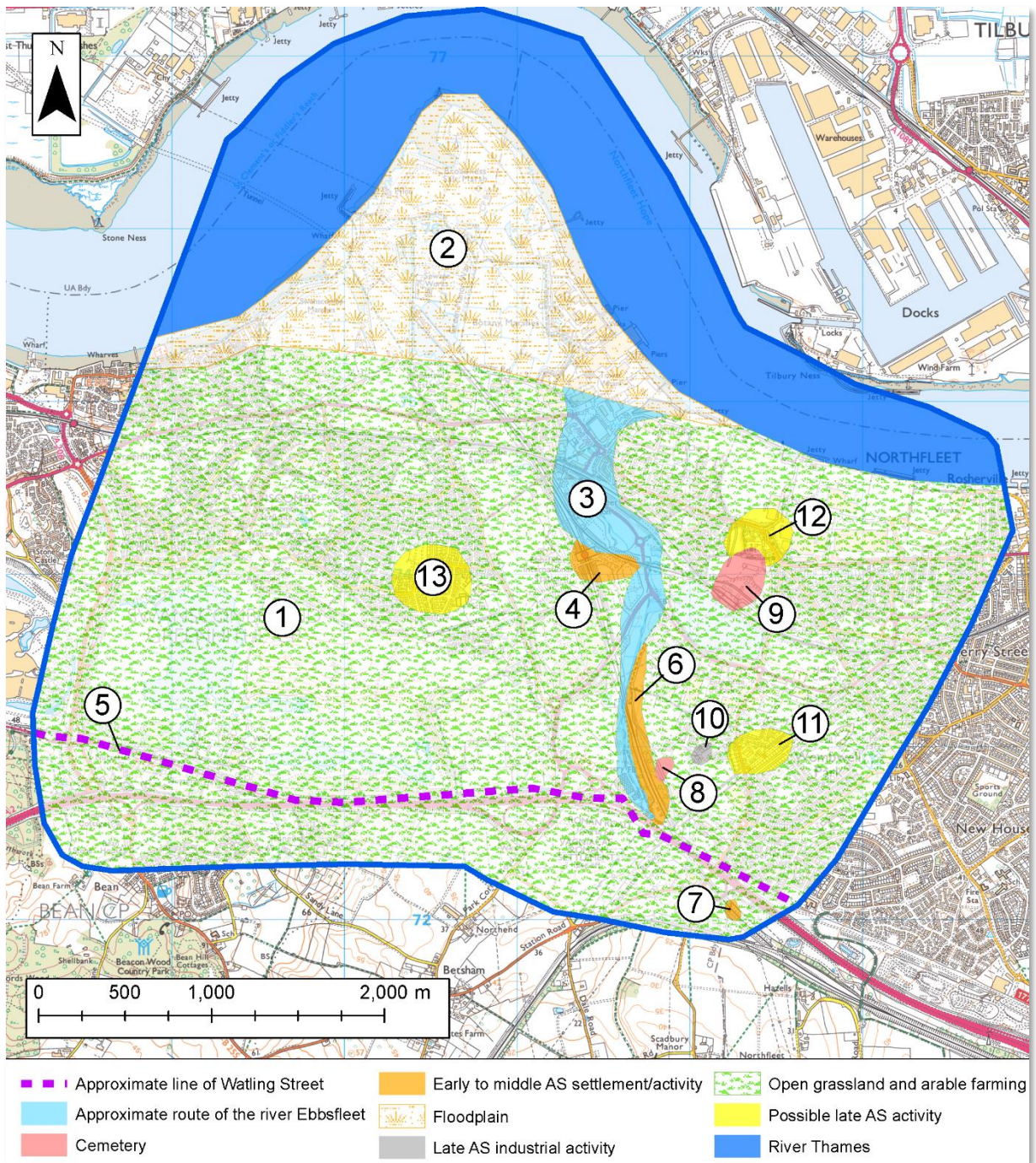


Figure 4.11: Anglo-Saxon character areas, numbers relate to table 4.1 below

| | |
|----|---|
| 1 | Open grassland and arable farming with up to 10% woodland. Some activity but no known remains |
| 2 | Low lying ground/floodplains saltmarshes with tidal creeks |
| 3 | Approximate location of the Ebbsfleet Channel and salt marsh and later reed swamp that would have surrounded it, including the tidally influenced inner and outer basin. |
| 4 | Area of early to middle Anglo-Saxon settlement around Northfleet, includes SFBs and the later mill |
| 5 | Approximate line of Watling Street - though this is a Roman feature it is likely that it was used in the Anglo-Saxon Period, though likely to a lesser extent |
| 6 | Area of early to middle Anglo-Saxon settlement/activity on the eastern banks of the Ebbsfleet and at Springhead, includes SFBs pits and gullies etc. |
| 7 | Area of early to middle Anglo-Saxon settlement/activity near Watling Street, possibly a continuation of the activity to the north, includes a SFB and associated features |
| 8 | Middle Anglo-Saxon cemetery at Springhead |
| 9 | Possible extent of early to middle Anglo-Saxon cemetery at Northfleet, possibly associated with the settlement nearby |
| 10 | Area of possible late Anglo-Saxon agricultural/industrial activity represented by corn dryers, pits and kilns |
| 11 | Tentative possible location of late settlement/activity associated with the industrial activity nearby (though no archaeological remains) |
| 12 | Tentative possible location of late Anglo-Saxon settlement/activity associated with the church of St Botolph (though no archaeological remains) |
| 13 | Tentative possible location of late Anglo-Saxon settlement/activity associated with the church of St Peter and St Paul (though no archaeological remains) |

Table 4.1: Anglo-Saxon character areas

4.8 Research Questions for the Anglo-Saxon Period

The South-East Research Framework (SERF 2019, <https://www.kent.gov.uk/leisure-and-community/history-and-heritage/south-east-research-framework>) exists to set the research agenda for the archaeology of south-east England (defined for SERF as Kent, Surrey and East and West Sussex). The Greater Thames Research Framework (GTRF, 1999 revised 2011 https://archaeologydataservice.ac.uk/archives/view/gtrf_na_2011/overview.cfm) carried out a similar function but was focused on the Thames Estuary. Both provide a chronological and thematic overview of the state of current archaeological knowledge for those regions and identify numerous research questions that need to be answered. Many of these are relevant for the study area and should be considered by those proposing research or archaeological work in the area.

In addition, however, the evidence review presented above has also suggested some research questions.

- What was the settlement pattern in the study area in the Anglo-Saxon period? How can we better identify and examine settlement sites?
- Is the clustering of settlement evidence around the river Ebbsfleet meaningful? What was the settlement pattern elsewhere in the study area?
- What was the relationship between Northfleet villa and subsequent use in the Anglo-Saxon period?
- How large-scale was the crop processing in the study area? What does this tell us about settlement and exchange in the sub-region? Was there any settlement associated with the late Anglo-Saxon churches of St Botolph and St Peter and St Paul, i.e. within Northfleet and Swanscombe?
- Was the Saxon mill an isolated feature in the landscape?
- Is there any evidence for the exploitation of the river Thames foreshore in the Anglo-Saxon period?
- Can we better understand the populations represented in the cemeteries, for example can family groups or migrant communities etc. be identified?

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5. Medieval period 1066-1500

5.1 Introduction to the Medieval period

The Medieval period begins in 1066 when Duke William of Normandy invaded England, defeated King Harold and was crowned the King. What followed was a major reorganisation of the ruling elite as well as the redistribution of land and property. The Domesday Book which dates to 1086, is a very important resource for this period. It provides details about settlement sizes and quantities of livestock etc., and, although it was not primarily intended as a record of the population, it contains enough detail that good estimates can be made. It seems likely that the population of Kent was in the region of 70-75,000 people at the end of the 11th century (Lawson, 2004). Despite the Black Death which decimated the population in the middle of the 14th century, this number had increased to nearing 100,000 by 1500. The land division which had begun with the lathes and hundreds, (the provinces of the kingdom of Kent in the Anglo-Saxon period) was developed and expanded upon in the Medieval period and, by the end of the end of the 13th century, parish boundaries had been established which were altered little thereafter. A feudal system was established after the Norman conquest, through which the King would grant land to tenants in chief who would have 'held' this land in return for military allegiance. The church was an essential element of Medieval life as society was deeply religious. It was also intrinsically linked to the monarchy which granted very substantial estates to the various religious institutions, and it therefore had a key role in both the organisation of the landscape and the society throughout the Medieval period. The foundation of two cathedrals, Canterbury and Rochester underlines the importance of the church in the development of the county and by the end of the 13th century over 400 churches and minsters had been established, at least one associated with every Manor and Parish. Though the church remained dominant, landownership developed throughout the period, new families began to acquire land between 1150 and 1350, some of whom would go on to acquire gentry status in the 15th and 16th centuries (Sweetinburgh, 2004). Below what Everitt calls the 'independent manorial gentry' were the peasantry and townsmen, men of differing wealth whose landholdings varied both in terms of size and makeup but also in regard to tenure (Everitt, 1986).

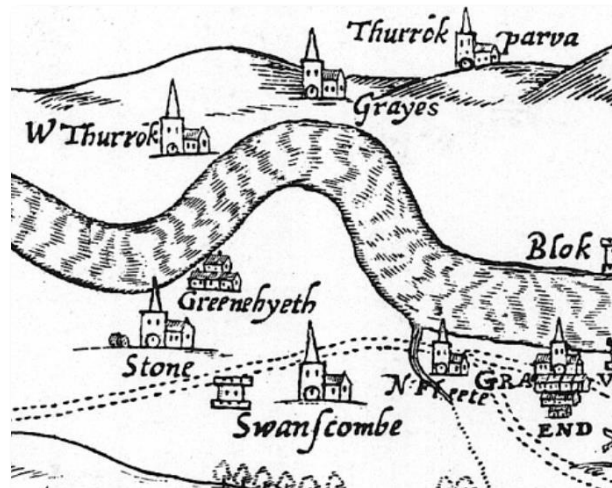


Figure 5.1: Extract from Symonsons map of Kent 1596 showing the study area and its surroundings

The evidence that we have for Medieval Kent is substantially greater than for previous periods as in addition to the archaeological record, there are a large quantity of documentary sources as well as upstanding buildings with a Medieval date. The documentary sources include the above-mentioned Domesday Book which is one of the earliest and most complete records of its type. There are also records of the construction and organisation of the churches, of charters granted, taxes collected, the establishment of markets and of grants of land and property throughout the period, alongside examples of correspondence between influential members of society including bishops, lords and kings. For the first time therefore, an understanding of archaeological features and finds may be supplemented by detailed historical documentary sources. Though there are examples of upstanding late Anglo-Saxon buildings in the county, the number increases significantly in the Medieval period. Most settlements which were established at this time have at least one surviving building, many have several.

The study area and its surrounding landscape was comparatively well populated throughout this period and some of the recorded settlements were within the largest 20% in England. This is likely due to a number of factors. One was the access to trade that its position in the Thames estuary would have granted. London increased in size, prosperity and importance in the Medieval period and was a very important trade centre with a merchant port by the 13th century, and a busy customs house by the end of the 14th century. It is also likely that the quality of the soils for agriculture was also a factor in the population density for the region. The lay subsidy (one of a series of Medieval taxes on crops and livestock etc.) records show that generally the more heavily populated areas are those more favoured agriculturally (Lawson, 2004). The region (west Kent) was divided into two lathes - Sutton at Hone to the west and Aylesford to the east, with the divide running almost centrally through the study area. The nearest major settlement was the walled town of Rochester which was an important religious centre and trade port. There were several settlements within the study area including Swanscombe, Northfleet and (just outside the study area) Greenhithe which went onto develop into Post-Medieval towns and villages, as well as others which were lost or abandoned. The Medieval settlements of Gravesend, Stone (which includes a 14th century castle) and Southfleet were also situated within the immediate vicinity of the study area.

Nevertheless, despite a wealth of historical data for the study area, there is in fact a relative lack of archaeological evidence and there are very few upstanding buildings. Many of the features have been disturbed or removed by the large-scale Post-Medieval and modern development and industrial activity which has occurred in the study area. An assessment and characterisation of the resource is therefore inevitably partial and incomplete. Despite this there is something which can be said about each of the Medieval settlements and, though in depth archival research has not been carried out as part of this study, information taken from documentary sources may also add to our understanding.

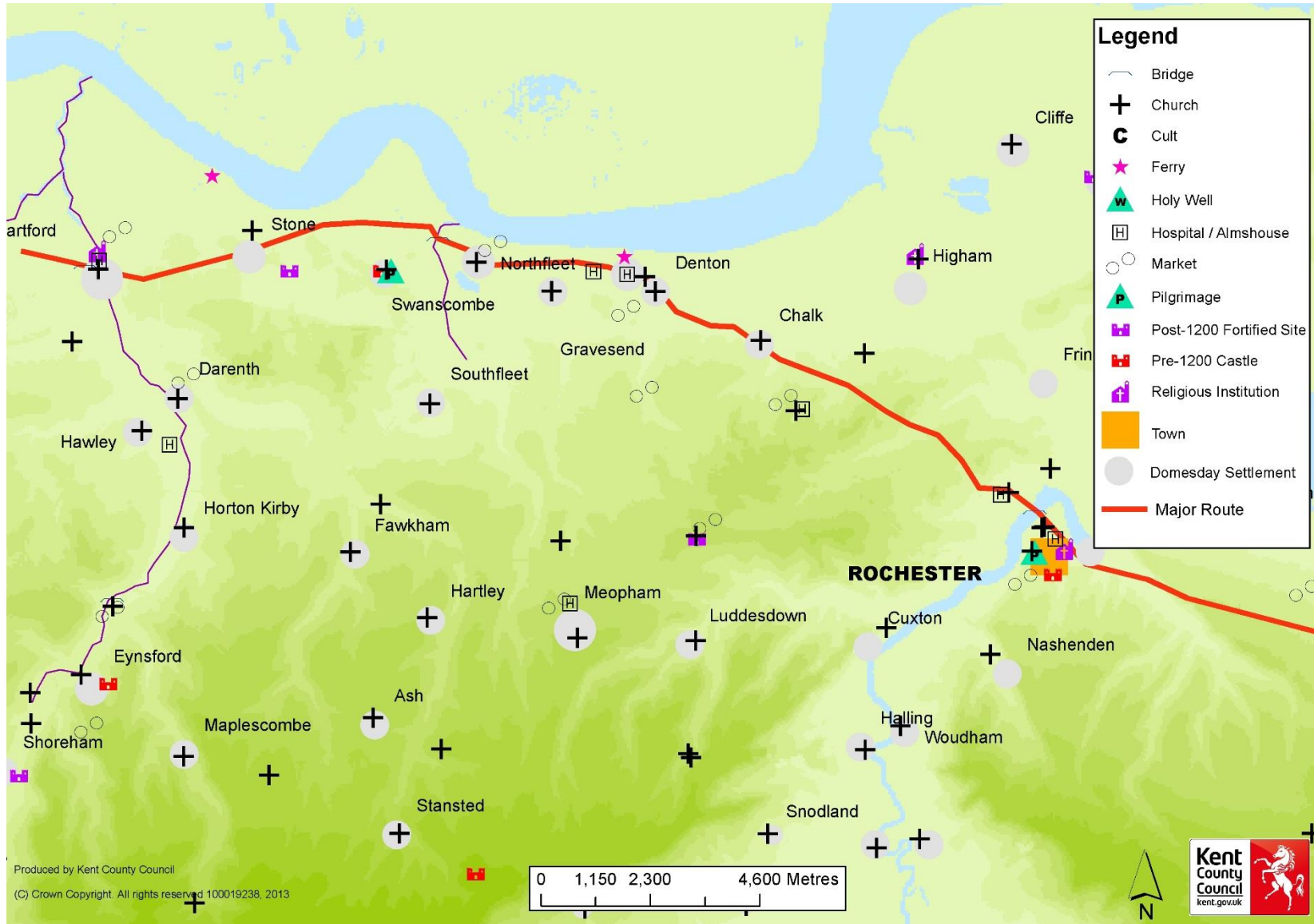


Figure 5.2: Regional map showing Medieval features in north-west Kent

5.2 Swanscombe

Swanscombe is a village, located almost centrally within the study area, on the western side of the Ebbsfleet valley. Today the settlement has spread and there is little separating it from Greenhithe to the north-west, and Northfleet to the east. Though there is little evidence for this area from the Anglo-Saxon period, it is likely that there was some form of activity at Swanscombe in the later part of the period, discussed briefly in the previous chapter. By the first decades of the Medieval period, this activity had developed into a relatively large settlement. This is clearly evidenced by its entry in the Domesday which records a population of 43 households, putting it in the largest 20% of English settlements. The Domesday also notes that it was held by Helto on behalf of the Bishop of Odo of Bayeux, that it was in Axton hundred within the lathe of Sutton and that it contained 14 ploughlands, 40 acres of meadow, 6 fisheries and woodland (Martin and Williams, 2003). References to Swanscombe appear in historical records with a number of differing spellings throughout the Medieval period. It was first recorded as *Swanes Camp* in Old English, then as *Suanescamp* in 695, *Svinescamp* in 1086 (The Domesday Book), *Swanescampe* in 1166 and then *Swanescombe* in 1292 (Glover, 1976). It is thought that the place name means 'peasants field' but Hasted notes a possible alternative origin and suggests that it is named after Swane the king of Denmark, who 'who having failed up the Thames, landed at Greenhithe; and marching from thence, encamped at this place' though there is little evidence to substantiate this theory (Hasted, 1797).



Figure 5.3: Medieval church of St Peter and St Paul at Swanscombe (Pam Fray CC BY-SA 2.0)

The only surviving upstanding Medieval evidence within the village, is the Church of St Peter and St Paul (TQ 67 SW 36) which is a Grade I listed building (Listed building reference 1085788). It is located, with its churchyard, on the south side of Swanscombe Street, directly opposite the modern cemetery. The church originated as a late Anglo-Saxon chapel, thought to date

to around 1050, but unfortunately little of this is visible within the present structure; the lower section of the south wall of the tower is the only remaining part. The rest of

the structure appears to have been added to and expanded throughout the Medieval period; there is 12th century work in the tower, the chancel has a blocked Norman window, and the aisles and clerestory were also added in the late 12th century. Much of the church is slightly later and it appears to have been enlarged and extended in the 13th and 14th centuries, with internal additions in the 14th and 15th centuries, including 14th century windows (Historic England, 2022) The church has a noteworthy history. Shortly after the Norman conquest Bishop Odo (who was given the Manor of Swanscombe by King William) took great interest in the church and presented it with a relic of Saint Hildefrith, the Bishop of Meux, who died in 680. This relic was thought to be endowed with miraculous qualities to ease suffering from melancholia and the church became a popular pilgrimage site on the way to Canterbury (PCA, 2009). In addition to what is known about the church from historic records and its surviving upstanding fabric, archaeological investigations have also been carried out in the churchyard during works associated with restoration work in 2009. This revealed 50 inhumation burials (TQ 67 SW 1707) including three with a Medieval date based on the fact that they appeared to be within anthropomorphic graves (body-shaped form with head and/or feet defined), which are indicative of Medieval burial practices (PCA, 2009). Today the churchyard is the location of the Invicta Monument which remembers the meeting between the men of Kent and the army of William Duke of Normandy in 1067. This is not the monuments' original location however, as it was moved here in the early 1960s during the construction of the A2 dual carriageway.



Figure 5.4: Extract from Andrews, Drury and Herbert's map of 1769



Figure 5.5: Extract from Hasted's map of 1797

Though the layout of the Medieval settlement at Swanscombe is not known, it seems possible that it would have been centred around the church (though examples of isolated churches serving dispersed settlements are known in Kent). Evidence to support this in the form of ditches with sherds of Medieval pottery and tile (TQ 67 SW 1709) were discovered during excavations immediately south-east of the churchyard (CAT, 1991). Swanscombe manor (TQ 67 SW 175) was also located within the immediate vicinity of the church, to the south on land now occupied by housing. A

building stood at this location until it was demolished in the 1960s, but this is thought to have been an 18th century replacement of an original Medieval building. Excavations carried out at the site in 1991 revealed the chalk and flint foundations of the Medieval manor (TQ 67 SW 1710). In places these were directly below the remains of the later manor house, implying that at least part of the 18th century building was built on the line of the pre-existing foundations (CAT, 1991).

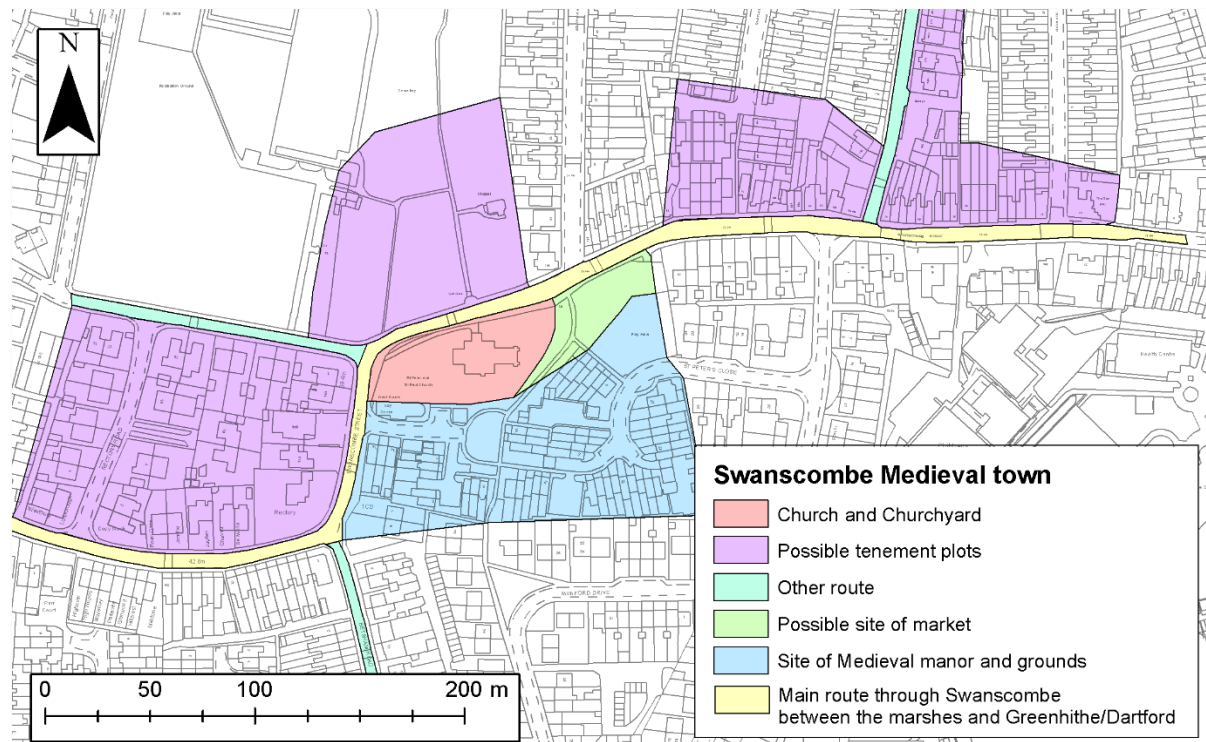


Figure 5.6: Possible plan of Medieval Swanscombe based on information taken from Post-Medieval mapping, Medieval buildings and archaeological remains

Swanscombe manor has an interesting history and has had close links to the monarchy for most of its life. It is first mentioned in the 11th century when, in 1086, the estate was owned by the Montchensie Family, who also owned the nearby manor of Hartly. In the 13th century Joan Montchensie married the half-brother of King Henry the III, William De Valance. Another royal connection came late in the period, when Henry VIII made a gift of the manor to Jane Seymour, thought to be the favourite of all of his wives. The manor has also been tied up in some significant disputes and was confiscated by the crown on several occasions. In the early decades of the 14th century, for example, Queen Isobella, the daughter of the king of France, raised an army on the continent and marched against her husband after he forcefully acquired the manor from Elizabeth Comyn. In 1425 the manor was acquired by Richard Duke of York who aspired to the crown, but the army he had raised to back him in this cause deserted him and he was then forced to flee to Ireland (DDAG, 1988).

The possible location of a defended site (TQ 67 SW 47) to which the place name *Swanes Camp* may refer, was located c. 500m to the south-west of the church and the manor. Originally the site was on an area of high ground overlooking the village, but the clay which formed the hill was quarried for use in the cement industry in 1928, destroying the site (Hogg, 1929). At the time of its destruction the feature comprised a circular ringwork approximately 50m in diameter (from its outer edge) with a gully and series of nine associated pits which were interpreted as possible structures or small quarry pits.

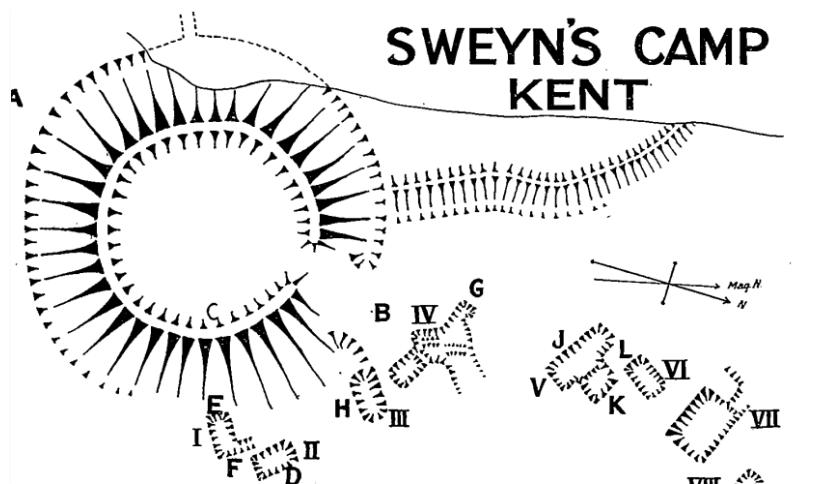


Figure 5.7: Plan of the earthworks at Sweyn's Camp before their removal in 1928 (courtesy Kent Archaeological Society)

fragments of a 15th century costrel were found in one of the pits with some fragments of iron (TQ 67 SW 1541). The surveyor at the time noted of the structure 'The circular earthwork is evidently a motte, and was probably crowned with a wooden castle [...] it is almost certainly Norman' (Hogg, 1929). There is also a description and plan of the feature in the Victoria County History of Kent. This highlights the fact that it is situated in a convenient spot for a defended site, on a tongue of high ground, with commanding views over the Thames and the south coast of Essex (Page, 1908). These early interpretations of this site are perhaps too definite and it has also been argued that it is unlikely that it represents a defended site and there are alternative interpretations of this feature. One such interpretation is that it may have been an earlier earthwork, possibly a large prehistoric ring ditch, though there is no evidence aside from its form and position to support this theory.

5.3 Northfleet

Northfleet is a small town on the eastern side of the Ebbsfleet valley, immediately west of Gravesend, along the banks of the river Thames. Settlement in the Northfleet area has migrated somewhat since the Roman and earlier Anglo-Saxon periods, when it was located on and around a chalk spur on the western side of the river Ebbsfleet. It is likely that the settlement in its current position was established in the late Anglo-Saxon period, and it grew from an area surrounding the Church of St Botolph. This was originally situated on a chalk hill with views over the Thames to the north and Ebbsfleet valley to the south. Much of the chalk has since been quarried and the church and its adjacent buildings stand on the edge of the cliffs overlooking chalk pits.

The place-name of Northfleet derives from the historic name of the River Ebbsfleet, which was the Fleet or *Fleot* in Old English meaning the water or stream. There is mention of Northfleet in several Anglo-Saxon charters and from these we know that it was part of a Saxon royal estate, held by a nunnery at Cookham, Berkshire, before AD 798 when its lands and some 60 families came into the hands of Aethelheard, Archbishop of Canterbury (Sawyer, 1968 - S1258). By the Norman conquest there was a reasonably large settlement, similar in size to Swanscombe with 36 villagers and again within the largest 20% of settlements recorded in the Domesday Book. The record for Northfleet in Domesday also notes that it was in the hundred of Tollingtrough within the lathe of Aylesford and that it contained 14 ploughlands, 20 acres of meadow Woodland for 20 swine a mill, a fishery and a church (Howard, 2003)

The Parish church of St Botolph (TQ 67 SW 1131) is a Grade I listed Building (Listed building number – 1054093) and is almost certainly the church mentioned in the Domesday Book. It is also recorded as *Northfleotes* in Textus Roffensis of c. 1089, and *Nordflicte* in the Domesday Monachorum of similar date (Douglas, 1944). It replaced a stone church of mid-10th century date which comprised a rectangular nave and a small square chancel and which stood in the same location. The south-west corner of the nave of the present church contains the earliest visible fabric, a set of six pairs of long- and-short quoins, a feature of mid-10th century Saxon architecture (Taylor and Taylor, 1980). In the 13th century everything except the tower was rebuilt in an early English style. The church acquired its present form as one of the largest parish churches in Kent in the 14th century when the nave (1330) and the chancel (1370) were built, a north aisle added and the south aisle rebuilt. It also has some Medieval interior details which include an early rood screen of c. 1300 and is said to be the earliest screen in the county (Rochester Diocese, 2000).



Figure 5.8: St Botolph's Church, Northfleet. Copyright Roger Smith (CC BY-SA 2.0)



Figure 5.9: Long and Short quoins

There would have been a cluster of dwellings and other associated buildings surrounding this church throughout the Medieval period. The manor house, which was held by the see of Canterbury until 1538 when it and the advowson of the vicarage was conveyed to Henry VIII, was located to the north-west of the church alongside its farm and tithe barn (Kent County Council, 2004). Many Medieval settlements would also have held markets, and documentary evidence points to the presence of a market in Northfleet; in 1201, King John granted Archbishop Hubert the right to hold a yearly fair at the manor over ten days in the middle of May, and a market is recorded 1303–4, held by archbishop of Canterbury (Eyre and Spottiswoode, 1837). It is not clear where this would have been held in Northfleet and there is no record of a market building, but an area just to the east of the churchyard, where the roads from Dartford, Rochester, Gravesend and the Thames foreshore converged, is a typical position site for an early market (Ulmschneider and Pestell, 2019). An alternative position may be in an area to the south east, east of what is now Dover Road, which was labelled 'market field' on 18th century mapping. Unfortunately, aside from the written sources, there is no evidence



Figure 5.10: Medieval building (31 the Hill) opposite church of St Botolph, Northfleet



Figure 5.11: Extract from 1727 plan of Northfleet court estate showing 'Market Field on the north side of Dover Road

for these buildings which were likely removed by Post-Medieval development and industrial activity such as the quarry works. It is often the case that churches are the only upstanding Medieval features to remain within towns. In Northfleet, however, there is one other Medieval structure located within the immediate vicinity of the church. This is the Grade II listed structure at 31 the Hill (TQ 67 SW 1081) which is probably the remains of a 15th century open hall house (Listed Building number 1081096).

Alongside the church, the Domesday Book also mentions a mill at Northfleet. It is likely that this was located along the river Thames (rather than being a continuation of the Anglo-Saxon mill located on the river Ebbsfleet). In 1438 the mill appears to have been in the care of John Darrell, who rented it to the Rochester Bridge Wardens at an annual rental of £1 6s. 8d. payable to the archbishop as lord of the manor, but the rental was relinquished in 1452 (Roskell et al, 1993). A mill pond (TQ 67 SW 1471) comprising a brick-lined, tank some 15m long by 6m wide through which the Ebbsfleet river still flows, presumably via a culvert, is located along the shore (Historic England, 2017). The mill pond is thought to have served a tidal mill of possibly late-18th century date but with Medieval origins, it is possible that this is the mill to which the historical records refer.

A historic town survey which draws together all of the archaeological, historic documentary sources alongside information from upstanding structures was undertaken for Northfleet (KCC, 2004). This survey identified several areas of differing Medieval activity, including tenement plots and the probable site of the market and manor, the results are replicated in Figure 5.11 below.

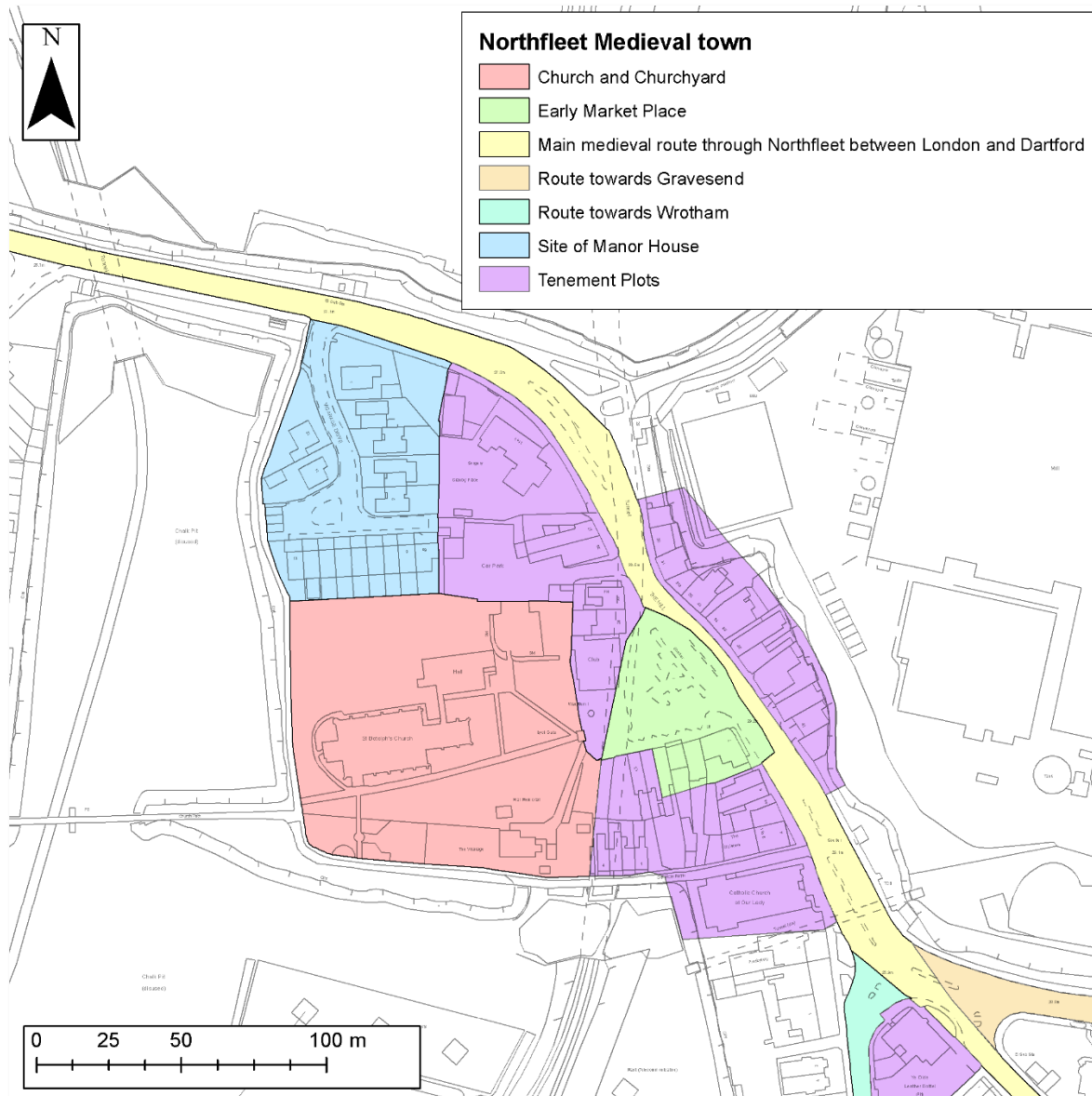


Figure 5.12: Medieval layout of Northfleet, information taken from Northfleet Historic Town Survey

5.4 Greenhithe

Greenhithe, which is a village just outside the north-western boundary of the study area, along the banks of the river Thames, is not mentioned in the Domesday Book, in fact the site does not appear in historic documentary sources until the 14th century. It is first mentioned in reference to repairs made to Hadleigh Castle in Essex in 1369 which used chalk from 'Grenehuth' (TNA:PRO E 101/464/12). It is clear therefore, that industrial activity was carried out in the study area from an early period and seems likely that the establishment of a settlement here was primarily due to the connections afforded by its situation on the river Thames as well as its access to resources such as chalk. Indeed, this appears to have been an important aspect of the settlement into the Post-Medieval period, as Hasted notes that Greenhithe, which was just a hamlet at the time, had 'several wharves for the landing

and shipping of corn, wood and other commodities [...] the greatest traffic arises from the chalk and lime' (Hasted, 1797). The settlement expanded throughout the Post-Medieval period and today merges with the neighbouring settlements, including Stone to the west and Swanscombe to the south-east.

The hamlet contained a notable estate, the Ingress estate, parts of which still exist today, (though large portions of the grounds are now part of a modern housing development). The present house and gardens are of a late Post-Medieval date (TQ 57 NE 93), but the original structure was established in the Medieval period. This was at some point before the late 14th century as in 1363 the manor was given by Edward III to the priory of Dartford and was used by a community of Dominican nuns (Hasted, 1797). The estate was let by the convent to Robert Meriel of Swanscombe on a lease at an annual rent of £10, with Richard Grove as tenant. This included the "liberty to dig and carry off chalk there to the amount of one acre in length and breadth." At the suppression of the convent in the reign of Henry VIII the estate came under the control of the crown. The lease was renewed to Martin Meriel by Edward VI (Parry and Parry, 2022). Little is known about the form of the Medieval manor, but it is believed to have been demolished and re-built on several occasions (possibly as many as five). It is supposed to at one time have been constructed of stone from the Old London Bridge (Historic England, 2022)

5.5 Rural settlement and activity

In addition to those Medieval settlements that developed into Post-Medieval and modern villages and towns, there are also small rural settlements that developed into little more than farmsteads, or, in some cases were abandoned and lost completely. A good example of this is the settlement of Wingfield Bank which was located to the south of Northfleet, in an area now occupied by the Pepper Hill Electricity Sub Station. Documentary sources note the presence of a settlement known as Wenifalle at this location from the 12th century onwards. The first mention of it was in 1199, when the Archbishop of Canterbury and his clerk 'freely and without any dispute gave up to the use of the monks (of Rochester Priory) the tithes (amongst other landholdings in Northfleet) of Wenifalle' (Hasted, 1797). It continued to appear with differing spellings (Winefeld/Wyndfeld) in sources throughout the 13th and 14th centuries (Wallenburg, 1934).

The site has been investigated archaeologically on several occasions, first in 1999 (Hardy and Bell, 2001) and then again in 2007/2008 (Oxford Archaeology, 2008). These investigations revealed Medieval activity (TQ 67 SW 258), which appears (based on the pottery evidence) to have been established in the late 11th or early 12th century and continued into the 13th and perhaps 14th century. At least one structure was identified, which together with a series of field boundaries and an enclosure, represents some of the earliest activity at the site. It comprised a modest building of timber and earthen construction roofed with thatch or wooden shingles and

measuring 10m by 4m internally, orientated NNW-SSE. There was no evidence to clarify the function of the building though the hearth points to a domestic use. Another possible building is suggested by a line of postholes close to the northern edge of the site and it is possible that further buildings of a slightly later 12th century date were located under the footprint of a pylon at the site (Hardy and Bell, 2001). The later Medieval phase saw a redefinition and apparent expansion of the land division with further ditches extending north, two gullies and a large waterhole. (Oxford Archaeology, 2008). The settlement appears to have been agricultural in nature. All major domestic animal species were represented in the animal bone assemblage with cattle probably being the most numerous, and the presence of charred plant remains provides evidence of cereal processing. A mixed agricultural regime is therefore likely. Evidence that rabbits were eaten was also uncovered. These were a recent introduction to England in this period and would have been a relatively expensive food. Overall, though the dwelling was small and simple, a relatively comfortable standard of living is suggested. This may be a reflection of the prosperity associated with the site position along the Thames estuary or it could indicate a more prosperous establishment outside of the area of archaeological investigation (Hardy and Bell, 2001). It is not known why the settlement was established here though the orientation of the field system and its proximity to the line of Watling Street, may suggest that the road had a role to play. It is also possible that the fate of the road, which declined in use at this location, favouring a route via Gravesend and was just a track in the later post medieval period, may be associated with the loss of the settlement here.

Examples of Medieval buildings that started life as rural farmsteads or dwellings but which have since been engulfed by expanding towns and villages are regular occurrences in the study area. There is an example of this to the south of Northfleet. The Old Rectory House (TQ 67 SW 1078) which is a Grade II* listed building (listed building number 1081093) is an early 16th century timber-framed hall house. Originally this was a rural dwelling surrounded only by associated agricultural buildings and a possible farmhouse but as the industrial activity of the Post-Medieval and modern period expanded, the settlement became surrounded. Today the building stands within a modern commercial development. It is likely that a similar explanation is true for Murrells (TQ 67 SW 1127), which is a Grade II Listed Building (listed building number: 1346410) located at Perry Street, Northfleet. It is a timber framed L shaped dwelling with a south wing that has a first floor oversailing on brackets and gable, with a possible early window on the first floor (Historic England, 2022). Some timbers within the roof of the hall and the cross wing have been dendrochronologically dated to 1410 (Vernacular Architecture Group, 2007). It is not known whether other contemporary buildings existed in the immediate vicinity during the Medieval period, though none remain. It is certainly possible as there are records referring to Perry-Street dating to the first decades of the 16th century (NA C 1/352/53). Whether this was an isolated dwelling or in a small rural settlement, by the later Post-Medieval period it had increased in size and by the early 20th century it

formed part of the expanding settlement of Northfleet. Another possible example is Alkerden manor farm (TQ 57 SE 1119) which has been largely lost (just the barn - originally the farmhouse and probably 17th century survives), was the reported site of a separate manor formed through infeudation in around 1250. This was situated in a rural location to the west of the historic settlement at Swanscombe, at a valley bottom below the hills. With the expansion of both housing development and the industrial activity in and around Swanscombe, this once rural manor and later farmstead became enclosed. It was still worked as a farm until the late 1990s/2000s but it was eventually partly demolished to make way for quarry works (Cotswolds Archaeology, 2017).

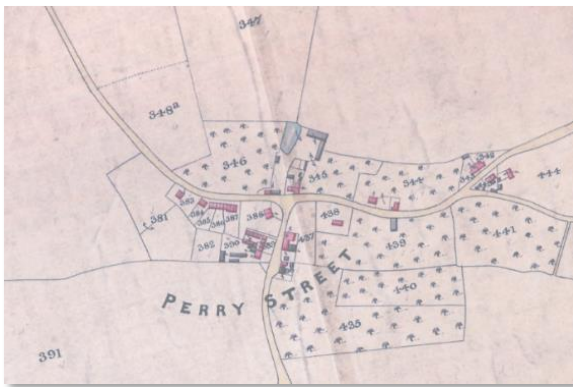


Figure 5.13: Late Medieval dwelling of the Old Rectory House in Perry Steet taken from Tithe map of c.1840



Figure 5.14: Late Medieval dwelling of Murrells taken from Tithe map of c.1840



Figure 5.15: The Old Rectory (photo Kent County Council)



Figure 5.16: Murrells (photo Kent County Council)

Other evidence for rural activity within the study area comes in the form of isolated archaeological features which have no apparent association with known settlement sites. The field systems which were uncovered ahead of development at Springhead are a possible example of this. Several ditches (TQ 67 SW 1684) representing a

large field system alongside N-S trackway and an E-W funnelled driveway were revealed on the eastern slopes of the Ebbsfleet valley (Wessex Archaeology, 2008). These features have not been securely dated and it is possible that they are contemporary with the settlement at Wingfield Bank located c.500m to the south-east, though a provisional late Medieval date has been suggested. Similar evidence has also been uncovered on the western side of the Ebbsfleet valley, ahead of development at Ebbsfleet Green. Investigations here located a number of Medieval pits, (TQ 67 SW 1786) gullies (TQ 67 SW 1789) and land boundaries (TQ 67 SW 1793) that were interpreted as representing Medieval agricultural activity (CgMs, 2017). Two sections of a Medieval ditch were also discovered during the HS1 works to the south (TQ 67 SW 1456). These were again located on the western side of the Ebbsfleet valley, close to Springhead and were associated with sherds of 13th century pottery (Hardy and Andrews, 2011). These Medieval ditches clearly represent some kind of activity in the region, likely this is agricultural in nature, and it is possible that they may be connected with the former sites of small settlements or farmsteads which have not been uncovered archaeologically and were not significant enough to have left a documentary record.



Figure 5.17: Plan of Medieval tile kiln discovered at Springhead (courtesy High Speed 1/ OWA)

1457) were uncovered as part of the HS1 archaeological investigations. The feature, which was located on a slight promontory c.750m west of Springhead Nursery, appeared to have been isolated, though it is possible that other, more ephemeral, remains went un-recognised or lay outside the area subject to investigation. Based on the nature of the kiln and associated tiles, a late Medieval date was suggested (Hardy and Andrews, 2011). Dene holes, which are essentially chalk mines, are another indication of small-scale industrial activity. In 2008 a Medieval dene hole was exposed within the study area, during housing development west of Springhead Road, Northfleet (TQ 67 SW 537). The Kent Underground Research Group visited the site and recorded a small double-trefoil dene hole, probably of 12th century date (LeGear, 2008).

In addition to agricultural activity, small scale industrial/craft activity has also been recorded within the study area. The partial remains (part of the stoke hole, flue and chamber) of a Medieval tile kiln (TQ 67 SW

remarkably consistent. They are invariably located at peripheral, yet visible and accessible locations very often along major traffic routes and boundaries (Coolen, 2013). Historically there were few defined routes across the marshes although the 'Manorways' (giving access from a manor or village to marshy common land) provided routes across Swanscombe Marshes. One of these led out to a ferry across the Thames to Grays, and this was used from Medieval times as a pilgrim's route to Swanscombe Church and the shrine of St Hildefirth (Gardiner, 2014). It is possible that this would have been the major traffic route by which the gallows was placed.

5.7 Communication routes

Watling Street had been the major routeway through the study area from at least the Roman period, with various lesser routes branching from it to the north and south. By the middle to later Medieval period however, the situation appears to have changed and the stretch of Roman Watling Street between Dartford and Rochester had fallen out of use as the main thoroughfare. It appears to have been replaced by a new route that ran from Dartford via Swanscombe to Northfleet, Strood and Rochester (now the A226) (Hiscock, 1968). Several reasons have been suggested to explain this, firstly that by the 13th century the Ebbsfleet had silted up sufficiently for a new road route – linking the settlements along the south coast of the estuary – to be realised by a bridge. The fact that the river Ebbsfleet was no longer navigable would also have meant that the Thames was no longer accessible from Watling Street as it passed Springhead. Another factor was the development of the settlement at Gravesend and the establishment of a ferry at some point before 1293, which travelled between London and Gravesend, meaning that travellers from the continent would require access to the town (Hiscock, 1968).

In addition to this route, there would have been many others running through the countryside between the settlements, and historic mapping shows that by the Post-Medieval period the landscape was crossed by a complex network of roads. It is likely that at least some of these were Medieval in origin. The example that ran from the ferry across the marshes to Swanscombe has been discussed above. Archaeological investigations undertaken ahead of the development of the HS1 route revealed an example of a Medieval trackway (TQ 67 SW 1455). This was recorded over a distance of almost 150 m on the west side of the Ebbsfleet. It ran parallel to the edge of the Ebbsfleet for much of its length and then turned to the west and rose up the gentle slope of the valley side at its north-western end. A number of horseshoes recovered from the surface of the trackway have been assigned a probable 14th century date, on typological grounds. It is not known where this routeway led or to where it connected but it has been suggested that one explanation for its existence may be that it provided easy access to the springs, an important and readily available source of fresh water for both domestic use and for watering animals (Hardy and Andrews, 2011).

5.8 Conclusions

By the start of the Post-Medieval period in c1540 the landscape was quite different from the end of the Anglo-Saxon era. The region has gone from a sparsely populated and largely unenclosed landscape, to a fairly well-developed area, with several new 'urban' centres. Much of the rural environment was divided and enclosed within field systems, and the areas of surviving woodland were utilised and managed. Industries based on the rich natural resources, as well as the good communications with the rest of Kent and London that the area provided, were developed. Some of this industry (such as chalk quarrying) went on to dominate the character of the study area throughout the later Post-Medieval period. In addition to the new hamlets, villages and towns, several small rural settlements/farmsteads also emerged at this time, some of which survived and expanded, while others were lost. A new network of tracks and lanes that crossed region and connected settlements with one another and the wider landscape were also set up, many of which laid the foundations for the road layout that still exists. These changes were all spurred on by the expanding population, something which was seen across all of Kent but particularly in areas such as the one here studied, with its good connections and its rich agricultural soils. Overall, although there is little evidence within the archaeological record, the Medieval period was one that was filled with relatively large and important changes.

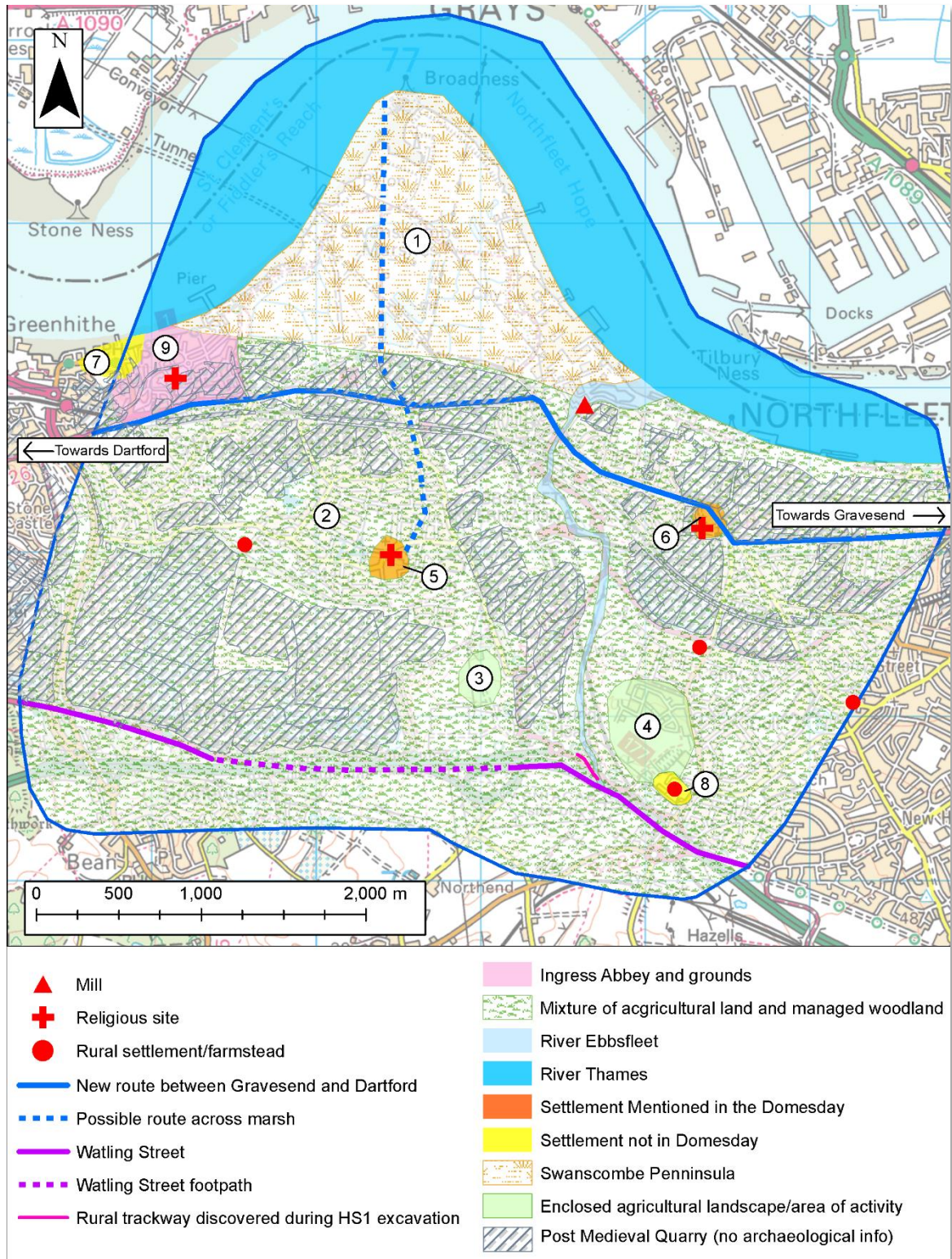


Figure 5.19: Medieval characterisation of the EDC area – numbers relate to table below

| | |
|-------|---|
| 1 | Swanscombe Marshes – Brackish though mostly drained marshland with some (communal?) grazing and peripheral features (such as gallows) and industrial activity (salt working |
| 2 | Rural Activity – mixture of arable farming, grazed land, managed woodland with some small-scale craft and industrial activity and dispersed rural settlements. |
| 3 & 4 | Enclosed agricultural landscapes – areas of known agricultural activity based on archaeological investigation, it is likely that many more such areas existed but have been removed by later quarrying. |
| 5 | Swanscombe - possible extent of Medieval settlement surrounding the church and the manor |
| 6 | Northfleet – possible extent of Medieval settlement surrounding the church and manor |
| 7 | Greenhithe – possible extent of Medieval activity at Greenhithe including hamlet and waterfront features |
| 8 | Wingfield Bank – Site of lost settlement though full extent was not revealed during excavation and the site may be more extensive and complex |
| 9 | Ingress Abbey – possible extent of abbey and associated grounds based on later Post-Medieval mapping. |

5.9 Research Questions for the Medieval Period

The South-East Research Framework (SERF 2019, <https://www.kent.gov.uk/leisure-and-community/history-and-heritage/south-east-research-framework>)) exists to set the research agenda for the archaeology of south-east England (defined for SERF as Kent, Surrey and East and West Sussex). The Greater Thames Research Framework (GTRF, 1999 revised 2011 https://archaeologydataservice.ac.uk/archives/view/gtrf_na_2011/overview.cfm) carried out a similar function but was focused on the Thames Estuary. Both provide a chronological and thematic overview of the state of current archaeological knowledge for those regions and identify numerous research questions that need to be answered. Many of these are relevant for the study area and some that are particularly significant are presented below together with those identified by the review of evidence presented in this chapter.

- Is there any further evidence for pilgrimage via the Church of St Peter and St Paul in Swanscombe (for the relic of Saint Hildefrith, the Bishop of Meux)?
- Can more information about this church be gathered from relevant archive sources in France?
- Can more detailed documentary research add to our knowledge of the Medieval settlements in the area?
- Evidence for the development and layout of the Medieval settlement at Swanscombe, including the Manor and the market.

- Evidence for the development and layout of the Medieval settlement at Greenhithe
- Was the evidence at Wingfield bank part of a larger lost settlement?
- Are there further lost rural settlements within the landscape?
- Is a better understanding of the development of the road network possible?
- What, if any, role did industrial practices have in shaping the development of settlement in this region the Medieval period?
- Is there evidence for ship building in Northfleet?
- Medieval use of the Swanscombe Peninsula – is there any evidence for industry, routeways or other activity on the marshes?

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Manorial Documents register for Northfleet:

<https://discovery.nationalarchives.gov.uk/details/c/F288019>

Manorial Documents register for Swanscombe:

<https://discovery.nationalarchives.gov.uk/details/c/F288167>

6. Post-Medieval to Modern Periods AD 1540 – 2020

6.1 Introduction

The increasing importance and growth of London in terms of international trade and political power over the period was to mean that settlements along the river Thames benefitted from their proximity to the nation's capital. Whilst the role played by different areas evolved over time, it is possible to identify a range of key influences and trends within the study area. These included the exploitation of chalk reserves as a natural resource; agricultural production for the metropolitan and local markets; and the domination of water-borne transport. Whilst road and rail would have become increasingly important as alternatives to the river for accessing markets, the Thames remained a major transport artery and generator of employment in its own right.

Lime-making and the exportation of chalk were key industries that carried through from the Medieval period and were of increasing importance. These industries had a dramatic impact on the riverside, particularly at Northfleet and Greenhithe even before the invention of Portland Cement in the 1840s. The subsequent expansion of the cement industry to meet both domestic and international demand intensified those impacts. From that point onwards, the voracious appetite of the industry, the need to exploit other mineral resources such as sand and ballast, and brick making to support rapid urbanisation, would fundamentally transform the area. Worked-out quarries on the riverside were subsequently used to locate a range of other industries and activities that were heavily reliant on water-borne transport or direct access to the river. The growth and expansion of the cement industry into the 20th century resulted in chalk and clay being exploited further inland. Old quarries in some areas were backfilled with overburden as deeper chalk reserves fed the more modern plants in increasing volumes. The industrial communities that grew up in between tended to be inward looking, with populations that were largely employed locally, self-sufficient and that developed very strong local identities.

The principal settlements grew on the remaining areas of higher ground, interspersed with deep pits and faced with abrupt changes in level. Residual areas of woodland or worked out pits were places where nature thrived and local children played. Areas of farmland remained as a diminishing resource as the quarries encroached over time.

The result of this process is that it is difficult today to appreciate the pre-industrial topography of the area. The countryside that once existed here and was part of everyday life for generations has disappeared - taken away on the back of a lorry. It is also worth noting however, that some of the largest scale quarrying, for example at Eastern Quarry, only took place in the 1970s so the pastoral landscape of

Swanscombe park and wood is still held in living memory. Now that the traditional industries have largely gone, regeneration is taking place and a new sense of place or identity is in the process of being forged. In so doing, ensuring integration and ownership by both existing and new communities will be key and the understanding and appreciation of the rich heritage of the area and the contribution it can make to place-making is an important part of this process.

6.2 Topography and natural resources

It is likely that the landscape of the area had changed relatively slowly during the preceding periods, despite quarrying for lime production since the Roman period. Between the 1540s and 1940s, however, and particularly from the mid-19th century, there were significant changes to the topography, resulting from the progressively extensive and deep quarrying of the chalk to produce lime, Roman and Portland Cement. In addition, the overlying beds of clays (London Clay), Thanet Sand and gravels (Boyn Hill Gravels) were used for various purposes including brickmaking and as ballast.

More advanced agricultural cultivation led to the erosion of soil from the chalk slopes and into the Ebbsfleet valley and down the dip slope. Cuttings, tunnels and embankments were constructed for roads and railways. The form and extent of the Swanscombe peninsula also changed during this period with erosion to the west and deposition to the east and it is likely that this impacted on the flow and form of the Ebbsfleet. Work continued to manage the Thames wetlands and the Swedish scientist and traveller, Kalm, writing in the late 18th century described the levees along the banks of the Thames, which are likely to be remnants of innings dating from at least the Medieval period (Evans, 1953). Kalm describes flood defence banks, up to eighteen feet higher than the surrounding meadow, which were protected on the river side by driven piles of timber (some being old ships timbers) behind which was dumped chalk and flint (Kalm, 1748). Through the banks were lockable sluices to control water flow.

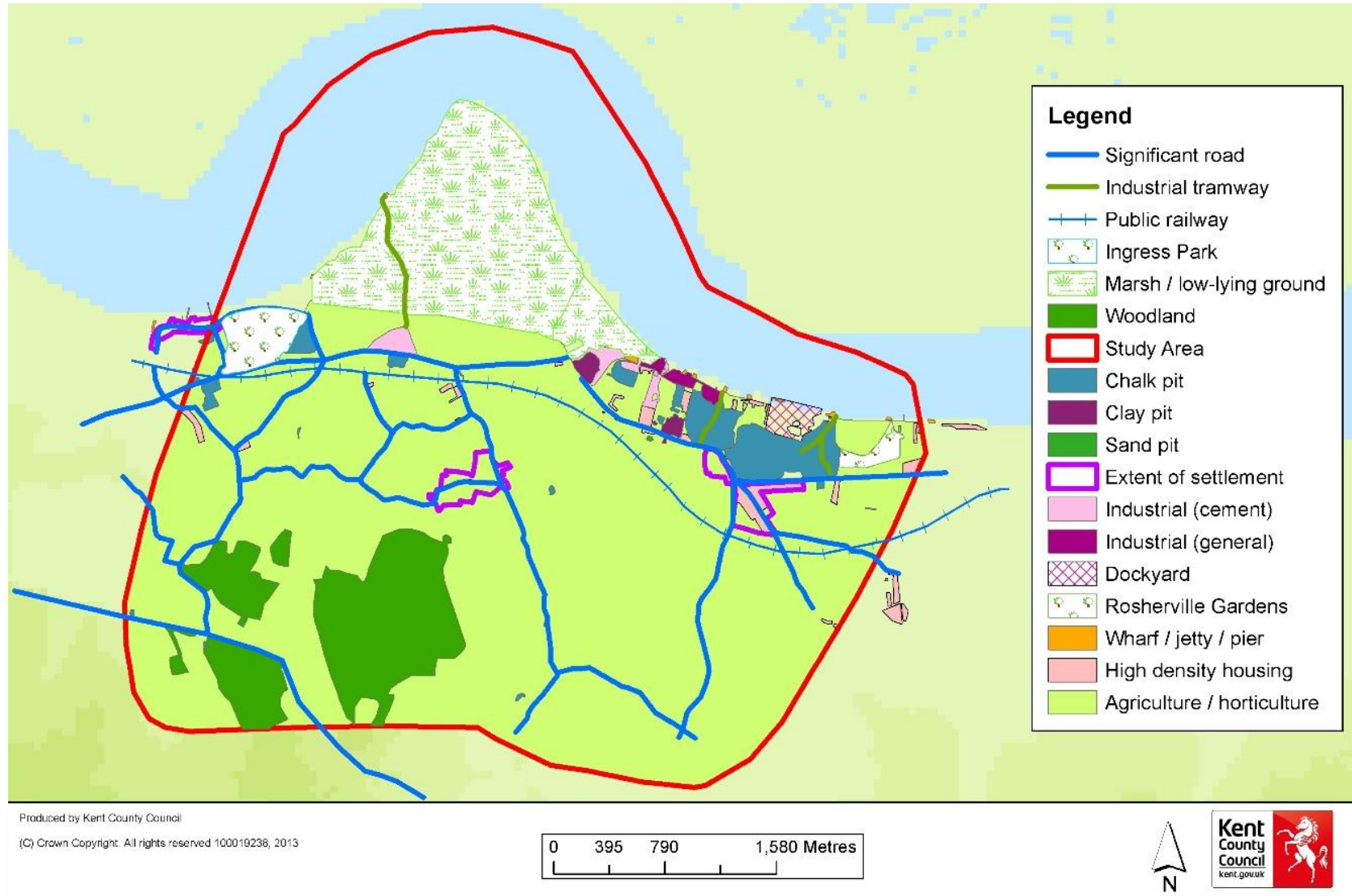


Figure 6.1: Characterisation of the Study Area based on the 1st edition Ordnance Survey 25'' map (1862-1875)

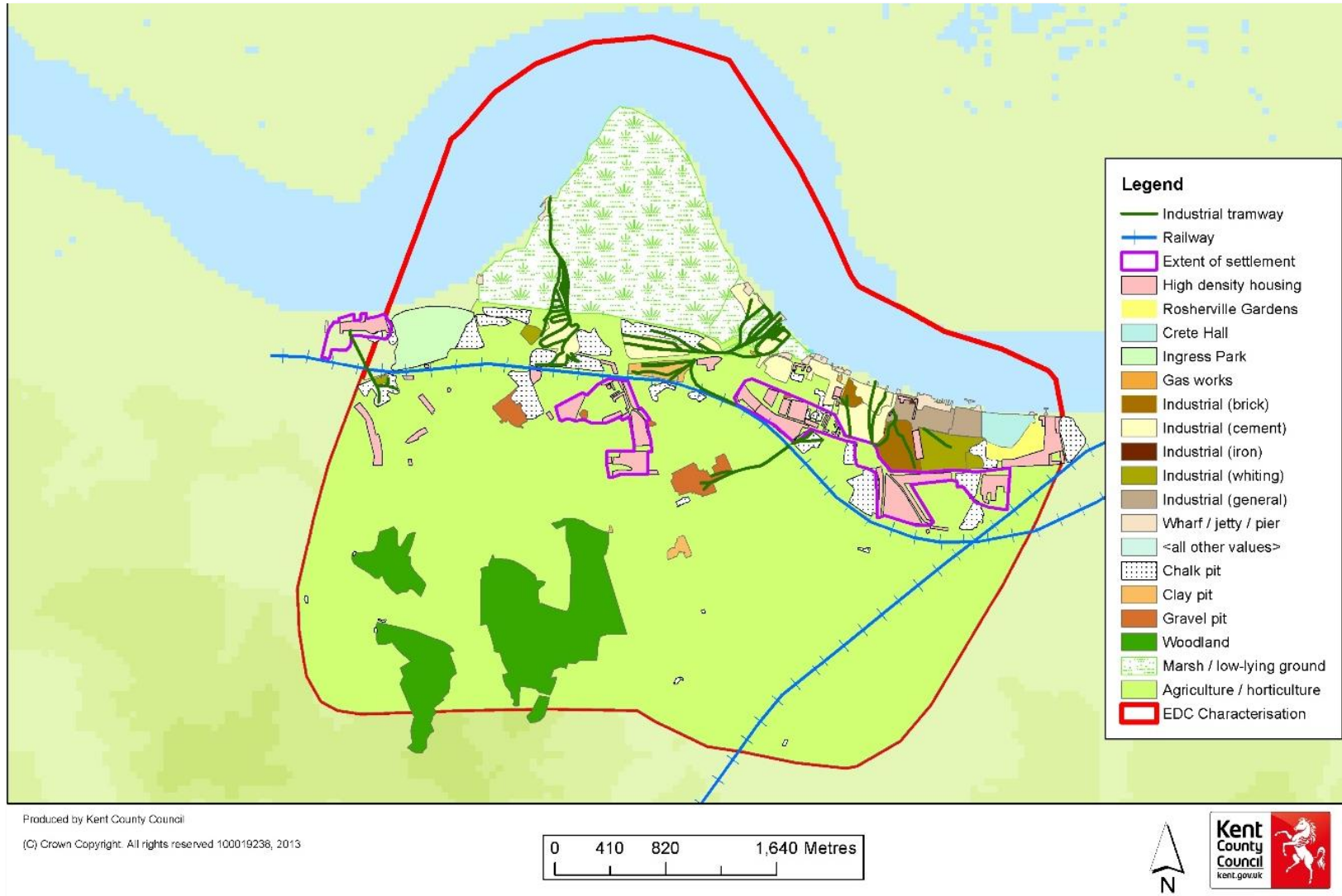


Figure 6.2: Characterisation of the Study Area based on 2nd edition Ordnance Survey 25" map (1897-1900)

LiDAR images of Swanscombe Peninsula [<https://houseprices.io/lab/lidar/map>] illustrate how little original land surface remains, as so much has been raised. Aerial photos record where areas were dug out and backfilled quickly (and more quickly than is recorded by OS mapping). This included the Milton Road pit (now Broomfield Road Playing Field, Swanscombe) and the pits either side of Craylands Lane, Swanscombe, which were backfilled with Thanet Sand overburden from the Alkerden Quarry and moved by conveyor belt. Much of the Ebbsfleet Valley was also backfilled from the early 1970s onwards, mainly with Thanet Sand overlying chalk reserves in Eastern Quarry. This was moved by lorry using a Bailey Bridge constructed over Southfleet Road, a little to the south of the conveyor belt that had fed the Northfleet (Bevan's) cement works with chalk. These are just some of the examples of the significant changes to the topography of the area during the last centuries.

6.3 Communications

The pre-Turnpike road system is crucial in understanding both urban and economic development, the potential through-traffic to support service industry and the start point for the later improvements which often distorted the earlier network (Barber, 2019). The importance of the pack-horse for carrying loads should not be underestimated for the early Post-Medieval period – such routes did not need wide roads or bridges. The early 18th century saw the beginning of investment into the road network with the construction of Turnpike roads and the improvement/construction of bridges, fords and ferries at river crossings. Many of the Turnpike roads are still in use and even though modern widening along with other improvements, has often meant original features, from road make-up to milestones and toll cottages, have been swept away, they are essential for our understanding of the system (Barber, 2019).

The majority of people would not have travelled far during their lives and even then, it would have been mainly on foot. Carrying goods or tools around locally might well have been done by hand cart – including conveying the dead for burial. Travel would have been expensive and arduous and only the relatively well-off would have been able to afford a horse or carriage. There were working vehicles on farms or used by carters etc. but even travel by stagecoach would have been beyond the price of most people. Those travelling down from London would normally have come by boat to Gravesend via the Long Ferry. They would then have either continued their journey by boat or stagecoach, including for example, to Tonbridge with improvements to the Wrotham Road in the 1820s. Travelling the 34 miles between Canterbury and Gravesend in November 1661 took 10.5 hours (7am – 6.30pm) at a speed of 3.2 mph and in winter the roads would often have been impassable due to snow and mud (Gerhold, 2005).

Until the coming of the railways in the 19th century, communications via the river Thames in the north and the London Road turnpike were important with linking routes running north to south. Watling Street did not exist as a through-route through Swanscombe Park Wood until it was opened in November 1924. The building of the A2 in the 1920s involved the digging of the Swanscombe Cutting which was later made wider and shallower in the 1960s when the road was dualled.

The Ebbsfleet had historically provided access inland, but by the 16th century a mill is recorded at Robins Creek following acquisition by the Crown (TNA E317/Kent/47, E315/151/7 (1562) and C1/792/6 (1533 – 1538)). There is also the reference to a 1528 lease from the Archbishop of Canterbury requiring rebuilding (Boulay, 1964). This would have prohibited river passage. By the 16th century at least, the Ebbsfleet valley and river would have formed a boundary within the study area with east-west communications limited to the London Road or what would then have been a country lane running east from Park Corner on the line of Watling Street.

The A226 London Road, following an historic routeway running roughly parallel and about 500m south of the Thames, linked the historic settlements of Greenhithe, Swanscombe and Northfleet with Dartford to the west and Gravesend to the east. The Ebbsfleet could be crossed at the Stone Bridge (county bridge) and by way of a raised embankment/turnpike, which would also have acted as a flood defence, the survival of elements of which is uncertain. The 19th century saw a significant increase in road construction and development due to increased industrial activity associated with the chalk quarrying. Prior to 1800-1801 with the building of New Road, the Overcliffe and the new London Road, east-west coach traffic would have travelled south of Gravesend via the Dover Road/Old Road West and Old Road East route due to the difficulty of passing through the town (Hiscock, 1968).

As well as east-west movement, the numerous tracks and roads south into the Weald and north down to the Thames foreshore, continued to be important and became more formalised. Northfleet continued to develop around the junction of roads from the south and south-east, which linked historic settlements such as Betsham, to the river. Before the railways the river Thames was the most important method of communication with ferries at Swanscombe on the peninsula and from Greenhithe. The Greenhithe ferry is mentioned in papers from the middle of the 16th century (The National Archives E321/32/48 (1536 - 1554); E321/19/79 (1544 - 1554); and E321/35/18 (1547 - 1553)) and the Swanscombe ferry would have conveyed pilgrims going to St Peter and St Paul's Church to visit the shrine of St Hildefirth in the Medieval period (G Baker *pers comm*). The Greenhithe ferry is thought to have only ceased to operate when the Dartford Tunnel opened in 1964 (Tucker, 2010 and G Baker *pers comm*).

The growing industrialisation of the area coincided with the construction of the South Eastern Railway (North Kent Branch) line, which was put through in the mid-19th

century. It ran in a tunnel under the London Road at Greenhithe and a cutting to Galley Hill and then on an embankment over the Ebbsfleet to Northfleet Station and then along the valley edge south of Northfleet and under Leather Bottler Lane and the Old London Road west of Boorman's mill before continuing to Gravesend (Hiscock, 1984). The existing Northfleet Station (TQ 67 SW 197) was rebuilt in 1891. The original railway line and station opened in 1849 (see <https://www.kentrail.org.uk/Northfleet.htm>). The Electric Telegraph was put through at the same time as the railway line and it is likely that at this time the semaphore telegraph system at Telegraph Hill, Bean (part of the Swanscombe Manor Estate before the 19th century) would have gone out of use. Swanscombe Halt was moved in 1930 with the original Halt, opened in 1908, at Craylands Lane ([Swanscombe \(kentrail.org.uk\)](https://www.kentrail.org.uk)).

The London Chatham and Dover Railway (Gravesend Branch) was constructed in the late 19th century and linked to the main line between Swanley Junction and Strood. It was taken out of service in the 1960s, but parts of it still survive as a green corridor within the south-eastern corner of the EDC area. More recently the Channel Tunnel Rail Link was constructed in the late 20th century, including a spur to the North Kent line. The coming of the railways had an impact on social mobility, rural movement to towns and areas of work along the Thames with associated development of housing and infrastructure. London could be accessed by train for those who could afford it.

In the later 19th century, the Gravesend, Rosherville and Northfleet Tramways, later the Gravesend and Northfleet Electric Tramways (TQ 67 SW 633) operated from 1883 initially as a horse drawn service, it was converted to electric in 1902 and ran until 1929. A tram depot (TQ 67 SW 634) was built, south of the North Kent Line in Dover Road Northfleet, the basement of which was reinforced to create an air raid shelter for 50 people during WW2.

Omnibus services would also have operated from the late 19th century onwards. Cook Bros. operated a half hourly service between Gravesend Clock Tower and Huggens College, Northfleet from 1898 for a through fare of 2d. In 1908, John Westacott Gunn of Manor Farm, Swanscombe began running a motor bus service into Gravesend from Swanscombe. Gunn is reputed to be the first farmer to begin regular deliveries to the London markets by motor lorry (Gravesend Reporter 5 March 1898 and Kent Messenger 19 June 1920).

The area was characterised in the later 19th century and throughout the 20th century by numerous train and tram lines supporting a range of industries and in particular the cement industry, where railways and tramways serviced the plants both to carry chalk and clay (Stovel and Kidner, 1990). Much of this industrial infrastructure has now been lost. An example of other industries with rail infrastructure was the Bowater's papermill site at Northfleet which was set up to manufacture newsprint. *By*

the turn of the 20th Century, the company was operating as a newsprint wholesaler based in the City of London under the auspices of "W. V. Bowater & Sons". A pre-war boom in newspaper circulation saw the company purchase, in May 1914, the site of a redundant dockyard, where it proposed establishing its first paper mill for the production of newsprint. Of particular interest to this section is, of course, the extensive railway system commissioned at Thames Mills, Northfleet, the complexity of which can be appreciated in the provided diagram. This system was linked to the Southern Railway's branch line to Gravesend West Street by a ¾-mile-long single track, a junction being formed at Rosherville Sidings. The connection with Thames Mills reused a tunnel through the chalk ridge underneath London Road, originally bored for the railway network of the defunct Red Lion Cement Works. In addition to Thames Mills, the single track also linked the Gravesend West Street branch with the London Portland Cement Works. The latter had been commissioned in 1868 under the name "Messrs. J. C. Gostling & Co", becoming the "London Portland Cement Company" in 1876 after a takeover. The works were situated on a large site just west of Thames Mills, the two being separated by allotment gardens.

As was seemingly standard in the paper manufacturing industry, Thames Mills' railway network was operated under the "fireless" locomotive principle. Traditional steam locomotives, which burnt coal (and, in some cases, wood or oil) to boil water, posed the risk of hot ash setting light to the finished product. Additionally, they also generated considerable exhaust emissions, which were problematic for industrial sites with poor ventilation, and their boilers risked exploding if the water level dropped below the minimum required level. Conversely, fireless locomotives were equipped with a cylindrical reservoir, into which pressurised steam could be pumped from a static boiler, and these were risk-free from explosion. Fireless locomotives still possessed pistons and connecting rods, as per standard engines, but produced no harmful emissions and, per unit, had lower purchase and maintenance costs. (https://www.kentrail.org.uk/bowaters_northfleet.htm (accessed 24/07/2022 11.33).

Radiating tracks across Swanscombe Marshes, such as Green Manor Way, which are of Medieval origin still survive to this day (National Archives reference LRRO 67/103 & 104). Wormwood Wall, which was the western track leading to Bell Wharf was in part superseded by the development, in the mid-19th century of a tramway (TQ 67 NW 99), first shown on the 1st Ed OS map leading from the J. B. White cement works to Bell Wharf, which over time expanded to link all the surrounding extraction pits with the main complex, and the nearby mainline railway. The 1833 Swanscombe Manor Estate sales plan seems to show what looks like a tramway running from Frost's works to Bell Wharf. The total length of track laid is not known, but it reached over 2km inland. Most of the system has now gone, but several of the tram tunnels remain, as well as derelict sections of trackway. In places the route of the tramway can be traced and a section of it leading to Bell Wharf has been reused and resurfaced as an access road and used by the Channel Tunnel Rail Link.

Immediately to the north of the reservoir east of Bean there was a clay pit (559871 172391). To the north a footbridge was built in the 1960s across the Swanscombe Cutting (TQ 67 SW 1335). The footbridge, which is now listed Grade II, was built when they dualled the A2 in the early 1960s and before the cutting was altered there were large concrete foundations in the banks where a bridge, carrying a tramway passed between the clay pits and the Alkerden Clay Plant (G Baker *pers comm*).

6.4 Settlement – towns, villages and hamlets/historic farmsteads

From the mid-16th century through to the early 19th century the study area can be characterised as a landscape of dispersed rural settlement between Greenhithe in the west and Northfleet in the east with Swanscombe in the centre. Regionally, Dartford and Gravesend were influential, as well as Grays, across the river in Essex, and all within the orbit of London. By at least the late 18th century, and probably from the late Medieval period, hamlets had developed at Milton Street, Perry Street and along the High Street west of the historic core of Northfleet and at the junction of Vale and Springhead Road to the south. The built character of each of these settlements varies and would have been dependant on a number of factors including age, available materials and the wealth of the residents. There is a noticeable use of materials associated with the cement industry, such as flint and cement, for many of the buildings in the study area. By the early 19th century, the Thames 'shore' from Ebbsfleet east towards Gravesend, was dotted with houses, some perhaps seeking to emulate the impressive landscape at Ingress Park. These houses including Orme House, Howard House and Grove House amongst others, were to enjoy a relatively brief existence before being replaced by the expanding industries of the 19th and 20th centuries. Orme House was one of the older houses and was demolished in 1872. Howard House (TQ 67 SW 83) was early 18th century in date and initially occupied by the lime-maker Francis Mackreth. It was demolished in the 1950s. Grove House (TQ 67 SW 1198) was an example of the new houses being constructed in the mid-19th century by the emerging group of industrialists, in this case James Wyatt, one of the foremost makers of Roman cement. Grove House survived the industrialisation and was used as a WW2 Battle Headquarters for Defended Locality DL48 and was then associated with the surviving nearby Drill Hall, which still stands. Grove House was demolished in the 20th century.



Figure 6.3: *Ingress Abbey (1833) Photo by DAVID ILIFF License CC BY-SA 3.0*

Greenhithe (largely outside the study area) was an important settlement benefiting from its location on the Thames and relative proximity to the road between London and Dover. It was the location for naval training, ship building and repairs. The site of Ingress Abbey had seen significant quarrying during the Post-Medieval period and Hasted, writing in the late 18th century commented on there being several wharves for the landing and shipping of coal and wood at Greenhithe, with the greatest traffic resulting from chalk extraction and lime production. Ingress Abbey was an impressive riverside residence well before it was rebuilt by James Harmer in the 1830s. Several residents were involved in the lime trade, including exploitation of reserves to the south of the village. The later development of the house and gardens at Ingress Abbey are discussed under the later section on ‘religion’.

Swanscombe, like Greenhithe in the borough of Dartford and the civil parish of Swanscombe and Greenhithe, was an historic settlement but still relatively small by the start of the 19th century. The settlement at this time comprised the Rectory, which was demolished in the 1960s at roughly the same time as the bungalows on Rectory Road were built. The Rectory was a 19th century replacement for the original parsonage that is recorded on a plan of 1810 lying to the north in an area which is now a cemetery. The trees that once ran down through Swanscombe Park, until they were lost to Dutch Elm disease in the 1970s, marked the edge of the glebe and presumably a very old field boundary. To the east of the Rectory was the church and cemetery of St Peter and St Paul (TQ 67 SW 36) the boundaries and extent of which

survive today. To the south of the church lay Manor Farm, by the 19th century, a regular multi-yard farmstead with barns, oast houses and the farmhouse. It is the likely former site of Swanscombe Manor (TQ 67 SW 175). There was however a mansion house further to the east down Swanscombe Street, believed to have been part of a larger dwelling occupied by the Weldon family in the 16th – 17th century. Only the oast house, immediately south of the churchyard appears to be extant and has now been converted to flats. To the east of the church along the north side of Swanscombe Street (formerly Swanscombe High Street to distinguish it from High Street, Galley Hill), there were about a dozen buildings, including the Blue Anchor public house, set within what appear to be the remnants of at least ten Medieval house plots. Some of these boundaries can still be traced in the present-day property and street boundaries. Three buildings were located along the east side of Church Road, north from the junction with the High Street and along the east side of Stanhope Road and Southfleet Road. These latter buildings, including the infants school east of Southfleet Road were lost to gravel quarrying in the 20th century. Swanscombe Lodge, on the east of Stanhope Road was spared from quarrying but was demolished in 1984. An impressive, detached residence (formerly Belle Vue) still stands on Stanhope Road, overlooking the Ebbsfleet Valley.

Development of the farmland south of Swanscombe appears to have started in the mid-20th century, firstly west of Betsham Road and south of the High Street where the 1930s former Swanscombe School/Sweyne CP school stood. Now the site of the present-day Ebbsfleet Academy. A Prisoner of War Camp (Ministry of Works Camp 154) stood at the junction of Keary Road/Swanscombe Street. After the war, it was used to house local people.

Development to the north of the High Street was well underway in the later 19th century west of Stanhope Road. Constrained by quarries to the east and north, development filled the land between Stanhope Road and the hamlet at Milton Street by the early 20th century. This area included a football ground with pavilion, west of the cemetery extension in the later 19th century before the area became more formalised in the early 20th century. The football ground of 1892 was on land then owned by the church. Swanscombe Parish Council purchased this and other land to the west over towards Milton Street in around 1909 and Swanscombe Park was opened in 1932 as part of an unemployed worker scheme to build a 'better and brighter Swanscombe'. This was following the creation of the Swanscombe UDC in 1926. As part of this, a swimming pool was built in Knockhall on London Road, following a local referendum.

Medieval Northfleet continued to develop during this period with some later Medieval buildings surviving. They include 31 The Hill (TQ 67 SW 1081) which has pre-16th century origins and is Grade II listed. The Coach and Horses public house (Grade II TQ 67 SW 1080) is of 17th century date and with 7 The Hill (Grade II TQ 67 SW 1082) of 18th century date. At the beginning of the 19th century, Northfleet was a

compact village centred around the triangle of land on The Hill east of St Botolph's church. The triangle of land was the market place at the entrance to the church. A pub called The Dove used to stand there and it was the site for markets and fairs. Surviving buildings from this period include 1 and 2 Granby Place (with gate piers) (Grade II TQ 67 SW 1086) and Ye Olde Leather Bottel (TQ 67 SW 1076) at the junction of London Road and Springhead Road. This surviving historic area is designated as The Hill Conservation Area. Already by the late 19th century this historic core of Northfleet, and its road system, was an island, effectively surrounded by chalk quarries on all sides. The presence of the Ebbsfleet, the railway and quarrying, restricted urban development in the 19th and early 20th century to the strip along The High Street (A226) as far west as Stone Bridge and in pockets to the south and north, where land had not been quarried, and east along the southern side of London Road (B2175) and along the Dover Road (B261). On Council Avenue were the old headquarters of the Northfleet Urban District Council, which took over the surviving house, once owned by Thomas Sturge, the cement manufacturer. Previously, the offices were on The Hill next to Granby Place in a building later occupied by the Co-op. The UDC used land behind the offices in Council Avenue to build council housing (G Baker *pers comm*).

The land east of Northfleet had been extensively quarried for lime production from at least the early 19th century. At the time of the 1st Ed. OS mapping, a network of railways is recorded from the quarry faces north of the London Road, running past lime kilns east of Calleybank (a surviving block of land famous for its flagstaff) to a wharf. By the late 19th century, the quarry was used as a brickworks and to the east the Portland Road terrace of c.40 houses with a Methodist Church had been built within the former quarry but entirely demolished during the mid-20th century. The former Methodist Church is recorded (TQ 67 SW 1267). Just to the east a new town was planned at Rosherville in the 1830s but failed and the area developed as a pleasure garden (see below under Recreation and Leisure section).

The reclaimed marshland and salt marsh of the Swanscombe peninsula had no permanent settlement nor did the downland in the south. East of the Ebbsfleet the landscape was dominated by the hamlet at Perry Street and farms at Brook Vale, Wombwell Hall and Wingfield Bank. West of the Ebbsfleet the landscape was dominated by farmsteads at Swanscombe Manor Farm, New Barn Farm, Swanscombe Court Lodge Farm, Galley Hill Farm, Crown Farm (Milton Street), Alkerden Manor Farm, Knockholt Farm (Knockhall Road), and Western Cross Farm. Immediately to the west, in what is now St Clements Valley, land was farmed from Stone Castle. A number of these farms were originally manors and of some antiquity but subdivided over time.

In the 18th century Ingress Abbey was a six-bay mansion surrounded by walled gardens, parterres and avenues and in the grounds there were follies, including the Cave of the Seven Heads, the South Tunnel and the Flint Cave. In the later 18th

century Lancelot 'Capability' Brown was employed to landscape the parkland to the north-east of the estate, the approach to the house through the grounds, and the sloping of the ground towards the house. The parkland appears to have spread eastwards towards Swanscombe with other follies such as Lover's Arch and the Flint Alcove constructed as well as re-siting the kitchen garden. Greenhithe and its parkland appear on the 1769 'A Topographical Map of the county of Kent' by Andrews and Dury showing an H-shaped main house with formal gardens and tree-lined avenues. In 1799 the estate was bought by William Havelock who partially demolished the house after 1815. A garden bridge is said to appear on an 1810 Salvage Map. The extent of the estate in 1819 when under the control of the Crown as part of John Rennie's abortive Royal Naval Dockyard scheme survives in the National Archives (reference MPE1/728). In 1833 James Harmer, Alderman of the City of London, rebuilt Ingress Abbey, possibly reusing some elements of the earlier house in the east wing, and also built The Grange, the East Tunnel and laid out a flower garden. Harmer was a famous lawyer of the period who had represented the victims of the Peterloo Massacre in Manchester in 1819 but had most of his fortune from owning the scurrilous Weekly Dispatch newspaper. For the latter, he was blocked from becoming Lord Mayor of London, concentrating his energies on local politics in Gravesend and speculative development in the form of the Milton on Thames new town project. The character of Mr Jaggers in *Great Expectations* is believed to be partly based on him. The Ingress Abbey Estate was left to his daughter in 1853. Parts of the parkland were sold off after 1903 and Ingress Abbey Paper Mills are shown to the east of the park on the 1909 Ordnance Survey map. During the First World War Ingress Abbey was used as an army hospital and by 1922 both house and grounds were purchased by the Thames Nautical Training College. Ingress Abbey and its garden buildings became dilapidated but the house was listed at Grade II in 1970, the stable block in 1982 and the known garden buildings were listed in 1997. Re-development of the site began in 1997. (Capon, 2012).

Cliff House and Nelson House were two substantial family houses of at least mid-19th century date, set in gardens and lying adjacent to Ingress Hill close to the junction with Knockhall Road. Shown on the 1st Ed. OS. Cliff House, and three other houses on the north side of Ingress Hill were demolished in the early 20th century because of quarry expansion up to the London Road. Nelson House was later called Riversdale (TQ 57 SE 328) and was designated in June 1939 as a temporary mortuary for bombing fatalities. It was still so designated in 1943 but was demolished at an unknown date post war.

Northfleet Court and Hive House

It is difficult to determine what the full extent of the Northfleet Manor estate was by the 1540s. The estate originally came into the hands of the Archbishopric of Canterbury in 798 AD but subsequently transferred to the Crown in 1537/8. It remained in Crown hands until the execution of Charles I in 1649. Parliament then

sold the estate to John Brown in 1651. A survey and deed of sale for the Manor and a separate survey of the Northfleet Mill from this period survive in the National Archives (E320/H21 and E317/Kent/47). Following this, it would appear that the Manor returned to Crown hands on the Restoration in 1660. It is likely that by the early C18th, that part of the riverside forming part of the Manor lying between what is now Granby Road and Grove Road had become subdivided into two land holdings - the Northfleet Court estate and Hive House estate. Alongside these, there were a number of properties in separate ownership on what is now Northfleet High Street and bordering The Creek.

A plan in the British Library dated 1727 (Egerton MS 3021T: 1727) shows the extent of the Northfleet Court estate in the ownership of Henry Furness in 1727. This provides details not only of the extent of the Northfleet Court estate itself (379 acres) but also a breakdown of land uses (167 acres arable and pasture; 12 acres rough ground and brooks; 49 acres cherry orchards; 67 acres fresh marsh and 26 acres of saltings; along with other lands including inter-tidal marsh). The extent of lands held by Francis Mackreth and another lime maker named Maul to the east of what is now Granby Road (then a footpath) is clearly shown and how chalk was progressively being quarried southwards toward the road to Gravesend.

Northfleet Court in the 1720s was therefore quite an extensive landholding, with its central focus being the manor house sited at The Hill, Northfleet close to the church and south of what is now Granby Place. The site of Granby Place appears to have been either a small farmyard or stables/barns serving the main house. Lands in the ownership of the manor extended northwards to the River Thames and as far west as what is now Lawn Road. The farmland associated with the manor then extended southward to what is now Thames Way, where a drainage ditch appears to have originally flowed westward into the Ebbsfleet stream. Associated with the arable land on higher ground were extensive areas of marshland, on Northfleet level.

Later mapping of the area in 1810 in the National Archives (MR1/1351) shows that the land by a subsequent owner (John Calcraft of Ingress Abbey) had reduced to around 103 acres west of Springhead Road, north of what is now Thames Way up to Northfleet High Street – effectively the area now occupied by Blue Lake and Church Path Pit. To the north of what is now the High Street at this point, in the area lying between Granby Road and Lawn Road, the area was being excavated for chalk by 1810. The schedule to the 1810 plan shows most of this 42 acres owned by a Mr Sterling.

In terms of the evolution of this area, in the early C18th Northfleet Court would have been a substantial and prestigious land holding at the heart of the village. Whilst quarrying and lime working had encroached its eastern edge, the estate was predominately agricultural with extensive cherry orchards providing income. However, by the middle of the century and into the C19th the farm was being sub-

divided and areas sold-off, with the riverside becoming increasingly dominated by the lime trade. This process continued until Northfleet Court ceased to be an effective farming unit. By the time of the Tithe Map and Apportionment in 1838, Calcraft only owned around 20 acres of land in the area, let to an Ann Coombs.

By the time of the Tithe Map and Apportionment in 1838, Calcraft only appears to have held around just over 20 acres of land in total, of which 9 acres was arable and most of the rest meadow, served by a barn and yard on Springhead Road which no longer exists.

To the west of the Northfleet Court estate, either side of what is now the High Street, lay the Hive House estate. The 1810 plan and schedule cited above show most of the land as far as the foot of Stonebridge Hill being land as formerly owned by Francis Wadman but in the occupation of Samuel Bayly. It should be noted that this plan does not show Swanscombe Peninsula where it is likely that there was other land on the marsh that also formed part of the estate. Wadman had inherited the estate through family and marriage towards the end of the C18th, it having originally been granted to the Chiffinch family by the Crown in the reign of Charles II.

As part of the acquisition of lands to build the new Royal Navy dockyard on Swanscombe Peninsula, it would appear that the Crown purchased much of this land from Wadman in 1807. Wadman subsequently died in 1809, when his will was contested as he was considered an aged imbecile (nearly 100) and of filth and beggarly habits, living in a single room in London (see National Archives PROB 11/1506/32 and report of court case in Kentish Weekly Post or Canterbury Journal - Friday 03 July 1812)

The Dockyard scheme was abandoned in 1812 due to rising costs but the estate remained in Crown hands until at least 1820 (see National Archives 1820 plan at MPE1/727). It appears that one of the Wadman family owned a lime and chalk works adjacent to the land purchased by the Crown and tried to sell it to them without success in 1813 (see National Maritime Museum, Caird Library ADM BP/33A). The estate subsequently appears to have leased again by the Crown in 1816, advertised for terms of either 7, 14 or 21 years (The Chronicle August 31 1816).

Plans of the Hive House Estate and surrounding area copied in 1807 survive in the National Archives (MPE/1406). This may be from an earlier plan because it shows a building on The Creek as being 'Levett's House'. This may refer to William Levett, the gunflint merchant, who died in the 1790s. The plan also shows what is now College Road (One Tree Lane) in a form that suggests it was either new or about to be constructed to take Hive Lane away from the front of the Hive House mansion – this diversion was permitted in 1778 (Kent Archives Q/RH/2/5). The estate at this time also included the older Orme House, which stood on the riverside.

The 1807 plan shows a core area around Hive House itself laid out as parkland; the riverside settlement at Robins Creek, along with Orme House; areas of arable land on higher ground around the park and on the site of Huggins College/Wallis Gardens/Grove Road ('The Island'), with presumably areas of pasture/grassland on the slopes leading down to the Ebbsfleet Stream, and areas of marshland pasture on the road leading out to Swanscombe Peninsula. The plan also shows a small fort at the edge of the areas of chalk working, on land to the east of the Hive House park.

The 1820 plan of the Hive House Estate under Crown ownership (National Archives MPE1/727) shows much the same area as the 1807 plan but in greater detail, with marshland forming part of the estate to the north of Lower Road in Swanscombe. A smaller area on the marshes is shown as having been purchased from Samuel Bayly rather than Francis Wadman. The area immediately south and west of the Hive House park (including the area known as the Island west of College Road) is shown as in arable use.

Thomas Sturge is understood to have acquired some lime works in the area in the late 1830s. It is assumed that he purchased the remainder of the Hive House estate when it was sold in 1842. However, the Tithe Map (1838) and Apportionment indicate that Sturge owned most of this by that time and that it was mainly let to tenants (See Sales Particulars dated 1842 in Gravesend Library and for an interesting account of Sturge's life connected to whaling, the story of Moby Dick, the antislavery movement and cement manufacture see Mark Howard – *Thomas Sturge and his Fleet of South Sea Whalers* in *Journal of International Maritime History* vol 27(3) 2015).

As with the Northfleet Court estate, the lands around Hive House also appear to have become sub-divided over time and put over to other uses - including for the construction of the Knight, Bevan and Sturge cement works, chalk quarries, the development of the urban parts of Northfleet itself, and the Huggins College almshouses (see images of these on the Historic England website at [https://historicengland.org.uk/images-books/photos/englands-places/gallery/6349?place=Northfleet%2c+Kent+\(Place\)&terms=northfleet&searchtype=englandsplaces&i=0&wm=1&bc=5|6](https://historicengland.org.uk/images-books/photos/englands-places/gallery/6349?place=Northfleet%2c+Kent+(Place)&terms=northfleet&searchtype=englandsplaces&i=0&wm=1&bc=5|6)) (G Baker *pers comm*).

By the early nineteenth century historic mapping makes it easier to understand how the increasingly well-organised agricultural landscape was managed from approximately a dozen farms or hamlets, including those at Alkerden Manor Farm, where a barn survives (1791 map at Medway Archives – P362/28/1). It is likely that the barn at Alkerden Farm is the original farmhouse (Christoph Bull, Swanscombe in *Old Picture Postcards* p73).



Figure 6.4: Ingress Abbey Estate in 1819 (courtesy The National Archives)



Figure 6.5: A plan of Alkerden Farm, 1791 (Medway Archives Centre)

The site of Galley Hill Farm was quarried away and the church was built in the late 19th century. Stonewood Farm lay in the southwest of the study area and now in Bean parish but was part of the Swanscombe Manor Estate. The dispersed rural settlement includes the listed 17th century Grade II Blue House, a timber-framed jettied building lying c.50m east of Customs Place Farm (TQ 57 SE 1040). The fields around this farmstead were set as orchards in the early 19th century. Knockhall House is also a rare survival. As noted above the topography of the area has been so transformed in the last two hundred years that it is difficult to understand this former landscape. However, some rare examples of the pre-industrial landscape do survive, mainly in the south of the study area, south of the A2 and west of Bean Lane. Here, the former Upper Bean Farm, of which only a former field barn (MKE88542) survives is part of an area of historic landscape with some surviving field boundaries, little changed since at least the early 19th century. Outside the study area, immediately to the west lay the ditch and banked woodland (parkland) of probable Medieval date and surviving as woodland through to the present day. The field north of the A2 and south of Watling Street is a part of this surviving area of rural landscape and topography.

The hamlet at Perry Street includes three listed buildings (within the study area) 78 – 80 Vale Road, Northfleet (TQ 67 SW 1132 LB Grade II), Kingston House (TQ 67 SW 1074 LB Grade II) and the timber-framed Medieval Murrells (TQ 67 SW1127 LB Grade II). The Six Bells which is of 19th century or earlier date and still extant, is not listed.

Portland Cottages, Edith and Henry Cottages were laid out at Galley Hill in the later 19th century, possibly as cement workers houses and were in the original plans for Alma and Orchard Roads (C Bull *pers comm*) and the area around the present-day Orchard Road and Alma Road was the first re-developed of slums in the 1950s. The Portland Cottages terrace on the High Street remains and is not listed.

The area around Wombwell Park is an example of an early 20th century planned settlement with rows of semi-detached houses, set out on regular streets around the Wombwell Park recreation grounds and playing fields (TQ 67 SW 474). Pavilions still exist and/or have been extended. There is a listed George V pillar box on corner of Mitchell Avenue and Colyer Road. The 1901 planned settlement lay west of the site of Wombwell Hall, an interesting example of a site within the study area that saw much change during the Post-Medieval and modern periods, with at least three Wombwell Halls and it is possible that the remains of a Durndale Manor could be found on the site. Wombwell Hall was demolished in 1994. Today, only the Lodge, stable block and the old stone boundary wall are left to remind us of what once was.

"A Historical Walk Through Gravesend And Northfleet" published by the Gravesend Historical Society.

This period saw a significant increase in the number of shops and inns to service the growing urban and population. Corner shops were created to service the expanding domestic suburbs and there were more architecturally distinctive buildings such as banks and post-offices. As well as the quarries and factories, the cement industry had an impact on the landscape as terraced houses were built for the workers with their architecture often at odds to the traditional vernacular architecture. This impact is an important factor of the cement industry and in many places is a characteristic aspect of the area today (e.g. Northfleet High Street).

The census figures for population provide evidence for the pace of change throughout the 19th and 20th centuries and up to the present day. For example, Swanscombe (including Greenhithe) in 1801 recorded 76 individuals. Numbers increased dramatically from the decade 1851 to 1861 at a rate of c.1000 per decade until the mid-20th century. By 2020 Greenhithe and Knockhall Ward were recorded as having 10,380 individuals; Swanscombe Ward: 7280; Ebbsfleet Ward: 1120, making a total of 18,780. (*VCH Vol 3*) *Source of above statistics = Victoria County History of Kent Vol 3 (population table reproduced at <https://www.kentarchaeology.org.uk/Research/03/03/00/ix.htm>) and Vision for Britain website at <https://www.visionofbritain.org.uk/about>*

6.5 Agriculture

The variety of geology and topography of the study area allowed a range of different types of agriculture to develop during this period in response to scientific, technological and commercial opportunities. The proximity to an ever-expanding London, via the Thames, road and rail, as well as the supply of ships at Gravesend and from the 19th century the rapidly growing local population, meant that there was a ready market for produce from increasingly well-run agricultural holdings.

By the 16th century most land in this part of Kent was farmed as separate units with well-established enclosure and defined fields set within a landscape of established villages, hamlets and farmsteads. This was typical of the wider Kentish landscape, which with few exceptions was largely enclosed by the 17th century (Chalklin 1965, Baker 1965 and Green 1966).

By the late 18th century, the reclaimed marshland of the Swanscombe peninsula was used for growing grass for hay and for cattle grazing, with in some places the slightly higher ground being used to grow cereals. The Swanscombe peninsula had essentially four radiating blocks of reclaimed land, two either side of the main arterial track that led from south to north through the centre of the peninsula. Much of this historic landscape has been lost through land reclamation, although some parts in

the east of the peninsula have maintained their early 19th century parcel shapes, even where land levels have been altered. The basic network of paths and trackways remains legible as historic landscape features, even though the former saltmarsh north of the alignment of earlier defences has been land raised with waste materials such as cement kiln dust (CKD). The Manor Way/Lower Road route remains in part, although this has been severed by the alignment of the High Speed 1 railway and Lower Road has been stopped up at the Northfleet end. Public access over this area is served by a network of public rights of way and the England Coastal Path.

Old chalk pits were used to site haystacks (often of sainfoin used as animal fodder), with the hay stacked above two layers of flints with dry brushwood to create a damp-proof course below the haystack. In the 18th century the sloping sides of the chalk downs, where they were not being quarried away, were used as ploughlands for wheat, barley, oats, peas and vetch, set within fields bounded by hawthorn hedges or wattle fences with few or no ditches. Also, by 18th century soft fruit, beans and peas were supplied to the London market and around most farms and hamlets there were orchards of apple, pear and cherry. Wheat and hay crops (clover too) were grown between the cherry trees in the orchards with the cherries, as well as walnuts, destined principally for the London market. The land immediately around Swanscombe village, particularly the south-facing slopes, was used as gardens and orchards through till the late 19th century, when parcel by parcel, the land that had not been quarried was developed for housing. Fruit production was such that a jam factory was established at Manor Farm, Swanscombe to the south of Manor Road when run by the Gunn Family. The jam factory was destroyed by fire in February 1929 (Harvey, 1964 + Kent Messenger 23 Feb 1929).

The growing of hops would also have been quite widespread, particularly in Swanscombe where large areas of farmland remained into the 19th century. The 1791 plan of Alkerden Manor Farm shows hop gardens in the traditional form, with the plants supported by poles in the form of tepees rather than on a system of wires and strings and an early form of oast house can also be identified within the farm complex (not survived). Here and elsewhere, farmsteads can be identified with round oasthouses on 19th century Ordnance Survey mapping. This includes Crown Farm at Milton Street, where there were some large hop gardens in the 1840s. Of these, only one now survives in residual form at Swanscombe Manor Farm, later used as an old people's day centre but now converted into flats. The growing of hops would have involved a considerable financial commitment, given the need to prepare the ground and investment in both hop poles and the drying kilns (oasts). Returns to the farmer would have depended on the quality and quantity of the crop, although there would have been a ready market from both local and London brewers. Generally, returns were high with considerable interest shown in the local press on how the crop was going in *Hop Intelligence* reports. However, a long-standing issue with farmers would have been the tax imposed on hops whereby it was chargeable

on each sack irrespective of price. This would mean that taxation was high when crops were good and prices low whereas tax was low when crops were poor and prices high. Increased foreign competition served to undermine local production, with calls for import duties to be imposed in the early 20th century. A protest in Chatham in 1908 was led by a wagon from Swanscombe with a placard stating that in 1800 there had been 125 acres of hops in Swanscombe but that this had reduced to 5 acres (G Baker *pers comm* and Faversham Mercury 9 May 1908).

The Ebbsfleet Valley's water meadows continued to provide rich grazing and hay crops and by 1833 the Swanscombe Manor Estate sales particulars map (Kent Archives U285/E4) illustrates the extent of the Springhead watercress beds set up from 1805 (TQ 67 SW 348 and TQ 67 SW 276). These are of some importance as they were the first to have been set up by William Bradbury who is known to have been the founder of the watercress industry. The Watercress beds at springhead, the partial remains of which were discovered during the CTRL excavations, may therefore have been the earliest examples of artificial beds in Britain (Hardy and Andrews, 2011). This industry continued to flourish at Springhead until the early 20th century when the large scale chalk quarrying in the vicinity led to a reduction in the flow of the spring water. Willow beds were managed along the Ebbsfleet during the 19th century (as recorded on the 1st Ed. OS).

Numerous allotments were created for the expanding urban population, for example the relatively small area north of the London Road at Galley Hill. The main allotments were at Stanhope Road and others recorded on OS 25" series (Bull 2008 p22). They provided opportunities for people to grow their own food and they were often seen as a healthy outlet for workers, keeping them out of the pubs. The Swanscombe Parish Council would have been responsible for providing a supply of allotments following its formation in 1894. At a Parish Council meeting held in 1895, it was noted there were 70 people seeking allotments (Gravesend Reporter 20 July 1895). By the time of WWI there was an active Swanscombe and Greenhithe Food Production Society.

The area south of Watling Street, known since at least the 19th century as The Thrift, is indicative of scrubland, on the Thanet and Lambeth Group sands and surrounded in the 19th and early 20th century by extensive orchards before the development of Bean in the 20th century. In the south of the study area, only a fragment of the former Swanscombe Park woodland survives along the margin of Watling Street with the extensive 20th century chalk quarrying to the north. None of the former Mounts Wood, which lay to the west of Swanscombe Park survived the quarrying.

There is much research to be done on how land was organised in the mid-19th century by using Tithe apportionments and OS historic mapping. MAF68 agricultural returns for Swanscombe could be used to look at the areas most affected by mineral extraction and industry in the 20th century. The 1941 National Farm Survey returns

for Swanscombe and Wingfield Bank in Northfleet would also be useful sources (G Baker *pers. comm.*).

As a result of industrialisation and urbanisation, most of the agricultural character and historic farmsteads of the study area have been lost. The following are examples of some of the farms in existence in the early 19th century:

New Barn Farm was an outfarm off Southfleet Road, south of Swanscombe, with two elements comprising a single courtyard farmyard to the east joined by a track to two farm cottages to the west. Recorded on the HER as MKE84108 it was demolished in the 1982 (C Bull *pers comm*).

Galley Hill Farmhouse survived until the 1970s after the farmyard had been lost to quarrying in the late 19th century. It may have been replaced by a smaller unit at Manor Way Farm on the edge of the marsh (G Baker *pers comm*).

Ingress Vale/Gardens appears to have been a small market garden type establishment, on the site of the gardens that possibly once served Ingress Abbey.

Wingfield Bank (MKE84162), one of the main holdings in Northfleet, was a multi-yard historic farmstead which was demolished to make way for development in the 1990s. The site is now the car park of the Sainsbury Store and may have archaeological potential.

There was a farmyard at Brookvale (though historic mapping from the later 19th century indicates a house with driveway and stables) that serviced some of the land around the Rectory and to the west. Early OS plans show a Rectory Farm but the tithe apportionment only shows this as being associated with limited land holdings by that time. The old Rectory is early 16th century and may have been built to house the incumbent when Archbishop Cranmer disposed of the Northfleet Manor Estate to the Crown in the reign of Henry VIII. The Old Rectory was church property but almost certainly rented out as a farm for income and there were no rectors after 1573 (C Bull *pers comm*). The Manor House stood on The Hill, close to Granby Place. (G. Baker *pers comm*).

As the period progressed, more and more agricultural land was purchased for quarrying, industrial and urban development but historic mapping from the 19th century also records smaller chalk quarries which are likely to have been used by individual farms who produced the lime, in small flare kilns, for improvements to the more acidic soils. These small kilns became common in the 18th century, during a period of agricultural improvements. (Barber, 2019). Future research within the study area should seek to identify and map the location of 'dene holes' on the HER using historic mapping and/or archaeological work.

The Post-Medieval farmstead sites had and in some limited cases may still have, archaeological potential to understand the progress of farming, for example through study of animal bones, lost field boundaries and drainage, and in the layout of units within the farmsteads. There is the potential from archaeology to understand more about the early Post-Medieval changes and this would also apply to related industries including bakeries, dairies and butchers and brewing. There was a brewery in Swanscombe in Bird's Row (now Church Road) (C Bull *pers comm*). There was a reduction in number of local breweries in the later 19th and 20th centuries as rail transport allowed easier trade for major producers (Barber, 2019).

6.6 Industry, engineering and manufacturing

Whilst there are references to chalk cliffs at Greenhithe in the mid-15th century (G Baker *pers comm* - E210/9858 The National Archives) quarrying and lime production is thought to have been on a relatively limited and local scale until the 18th century, by which time historic maps and documents record large areas already quarried for chalk on the land between Northfleet and the river Thames (e.g. Andrews, Drury and Herbert's map of 1769, Kalm and Defoe (1724 etc.)). Chalk extraction and lime production is recorded by Hasted in 1797, employing a great number of 'labouring people', with the products, including the poorer chalk, being exported in lighters and hoys and taken principally to Essex, Suffolk and Norfolk for marling of fields and the better chalk or manufactured lime taken to London, other parts of the country and to Holland and Flanders. Gravel was also quarried for use as ballast (see below).

By the 1770s the numerous chalk pits between Northfleet and Gravesend were described by Kalm as being mostly quadrangular with perpendicular sides and up to 27m deep. By this date some chalk pits were already abandoned and filled with rubbish and overgrown, whilst some had been reclaimed as orchards (Kalm, 1748). Caves or cellars are recorded in the chalk, some used as dwellings for those working the lime kilns and quarrying. As well as the various uses of the chalk, the flint was knapped and sold for strike-a-light sets and paving and in the construction of buildings and walls. Kalm records how Northfleet church was almost entirely built from flint with stone used for corners, the tower, door and window frames. Gunflint manufacture was also an important industry within the area, with large quantities being produced to supply the military. Whilst this was organised at a domestic scale, there were a number of important gunflint merchants working out of the area.

Lime production had been the earliest of the significant industries of the area with lime kilns built in the quarried areas between the soot-blackened chalk cliff faces and the Thames. The kilns were fired with coal brought in by barge. The lime burning process in the 18th century involved the breaking off with a crowbar of large pieces from the sides of the chalkpits, which fell to the bottom of the pit with enough removed from the top of the pit to the bottom for burning for one or two weeks (Kalm, 1748). The chalk was broken down into lumps no larger than a clenched fist. The

chalk was then passed through a one and a half to two-inch sieve and the material in the sieve kept for use in the limekiln. The other material being too fine would put out the fire. The limekilns are described in the 18th century as brick built with four entrances at the base and the coal and chalk being placed in, in alternating layers. Kalm describes how women were employed to carry the broken chalk and coal to the kilns in willow baskets. The coal ash contributed to the binding property of the lime. Each kiln had three men and three women. Each woman carried three baskets; two by means of a yoke over the shoulders and one on the head. The kilns were said to run night and day with lime being raked from below and more fuel and chalk layers added above. It was reckoned that the chalk took three days to burn and pass through the kiln and be shovelled out of the bottom. Screens of brick with wooden boards above are described in front of the limekilns to protect them from too intense wind. The unslaked lime was then taken by cart to barges to the adjacent wharves and from there up to London to be sold. Limekilns were abandoned as the chalk quarry face moved south and new kilns built to reduce the time to carry the broken chalk to the kiln. For this arduous work the women earned the equivalent in 2022 of approximately five pounds a day, the men slightly more. [calculated from Kalm]. The estate map of Ingress Park (MPE1/728) illustrates that the area around the house had been extensively quarried as far south as the London to Dover Road by 1819 for such lime burning with the Badeslade engraving illustrating kilns here in 1719 (C Down *pers comm*).

6.6.1 Cement industry

Cement in the broadest sense is the builder's glue, sticking together bricks and stones to allow buildings and many other things to be constructed. Traditionally – and cement thus defined has been employed world-wide for several thousand years – cements were lime-based: chalk or limestone were dug and heated in specially designed kilns using whatever fuel was available, usually wood. At a temperature of about 900 degrees Centigrade, the raw material, chemically calcium carbonate (CaCO_3), breaks down, emitting carbon dioxide gas (CO_2) and leaving quicklime (CaO). When water (H_2O) is added, the result is slaked lime ($\text{Ca}[\text{OH}]_2$) and in that form the lime can be used for building, agriculture and other purposes. Adding water to quicklime causes an explosive exothermic reaction, hence the name 'quick' used in the sense of 'alive'.

The important point about Portland cement is that its raw materials combine chalk with clay (in chemical terms, calcium with silica and alumina) in a proportion typically about 3 or 4 chalk to 1 clay, and these were fired at much higher temperatures, at least 1,300 degrees Centigrade and up to about 1,450 degrees Centigrade. The first to recognise the enhanced benefits of adding clay to the raw materials was probably John Smeaton, in 1756-59 during his building of the third Eddystone Lighthouse, at Plymouth. Smeaton's experiments (not published until 1791) led him to prefer

cements made using lime and clay although in the circumstances he did not appreciate the wider significance of his discovery.

James Parker obtained in 1796 a patent for his cement which, although at first termed Parker's cement, became more widely known as Roman cement. Parker was then living at Northfleet and had operated a factory there since c1798, later to become Robins Works. This product employed as its raw material *septaria*, naturally-occurring nodules containing calcium, silica and alumina, all the chemistry required to make cement, therefore and which occurred widely along the eastern coastline from Kent to Suffolk. Digging it interfered with navigation and caused serious coastal erosion, so that the search for the equivalent raw materials on dry land became urgent.

This, more than anything, explains the success with which the nascent cement industry established itself in north Kent. Geologically, chalk and clay (river mud, marshland and dry land deposits) were accessible and widespread and, so far as chalk was concerned, large quarries already existed to supply ballast. The Thames provided transport for both the fuel required (coal from the North East) and to take the finished product to the huge market of London. When in 1824 Joseph Aspdin, a Leeds bricklayer, obtained a patent, for what he termed 'Portland Cement' (from its supposed resemblance, when set, to Portland stone) and to manufacture it in Kent, he was pushing at an open door. (text above kindly provided by Chris Down).

Looking at the development of the cement industry and its archaeology, in the wider context, the following summary by Preston from fifteen years ago for the South East Research Framework (SERF 2007) is useful and is quoted below.

The history and development of the cement industry internationally, nationally and in north Kent is complex. North Kent was the centre of experimentation and innovation, and with its raw materials, cheap water transport and markets became a leading centre for the production of Roman and Portland cement (ibid). A requirement for a strong hydraulic cement arose from the increasingly ambitious civil engineering projects from the late 18th century onwards. A major breakthrough was James Parker's 1796 patent for what became known as Roman cement. This was a 'natural' cement made from 'septaria', nodules containing chalk and clay in approximately the right proportions, which, when broken and fired in a kiln at 900 to 1200 degrees centigrade, and ground to a powder with mill stones and sieved, produced a strong cement. The 'cement stones' were initially obtained from the Sheppey shore, the Essex coast and by dredging between. Parker produced Roman cement at Northfleet, his works quickly passing into the hands of the Wyatts, and in 1846 to Maude, Jones and Aspdin. When Parker's patent ran out in 1810 the Roman cement industry spread in the Thames area with Francis at Nine Elms (1812), Samuel Sheppard at Faversham Creek (1816), the Wyatts at Millwall, and to other areas with similar 'stones', including 15 Essex (Harwich), North Yorkshire (Earle at Hull in

1826), the Isle of Wight (Francis' Medina cement), Dorset, Derbyshire, South Staffordshire (Wolverhampton) and Somerset (Bridgewater) (*ibid*).

With the relative scarcity of 'cement stone', experiments continued to create an 'artificial' cement in which the ingredients, chalk and clay, were mixed by the manufacturer. In 1822 James Frost patented 'British' cement, which he produced at Swanscombe from 1825, the works being bought by Francis and White (J.B) in 1833. In 1824 Joseph Aspdin of Leeds patented 'Portland' cement with a process which appeared to involve slaking lime before adding clay, but otherwise similar to Frost's process. The early 'artificial' cement was not a reliable product. There was vagueness about the proportions of chalk to clay, which was measured in barrow or cart loads at 5 to 2 or 3 to 1, and the mix was not burned to vitrify into a clinker, though generally burned at a higher temperature than Roman cement. There was little knowledge of chemistry in the industry and testing was rudimentary. Something approaching a reliable cement appears in the mid 1840s. In 1845, I.C. Johnson, the works manager at J B White, Swanscombe, utilised vitrified clinker to make a superior cement. William Aspdin claimed to have done the same in ca.1843, although Aspdin shrouded his activities in secrecy with a 20 feet high wall around his works and giving the impression that he was adding extra ingredients (perhaps even ground bones). The artificial cement industry spread to areas with suitable limestone or chalk and clay such as Buckinghamshire, Essex, Oxfordshire and Warwickshire, and to the North East to which colliers returned with chalk as ballast. A surge of cement works promotion in the 1850s was followed by business failures, for example the Wouldham Works, Kent, largely due to the inconsistency of the cement produced by rule of thumb methods. High costs incurred through (a) being labour intensive, (b) the inefficiency of power using low-pressure boilers and (c) the rising cost of coke, were a constant incentive to innovate. The first major step forward was the 1870 William Goreham patent for the wet grinding process, wherein after the washmill the mix was ground between horizontal burr stones using less water in the slurry, which could then be pumped to the next stage in the process. This was followed in 1872 by Isaac Johnson's patent 'chamber' kiln in which the hot kiln gases were channelled through a long chamber into which slurry was pumped to a depth of 8 to 10 inches to dry during firing, the dried slurry becoming the next charge to be shovelled directly into the kiln. The chamber kiln was modified by Batchelor to have shorter chambers of two or three drying floors, which took up less space, but needed tall chimneys to get sufficient draught.

These innovations were economical to use as they reduced the amount of labour required, made slurry backs unnecessary, eliminated the need for drying floors with separate coke ovens and made cement production less dependent on the weather. Together with new testing, for example briquettes tested for tensile strength (encouraged by Grant) and a greater understanding of the chemistry of cement which became widespread in the late 1870s, acceptable cement was marketed. The fortunes of the industry tended to follow the building cycle, and, as there was no bar

to new entrants to the industry, new firms were set up in times of boom. Some quickly failed, for example, on the Medway both Adams and the Reliance Cement Company at the Wickham Works, Strood, and J L Spoor at Borstal Manor. Attempts were made to economise through the introduction of a continuous burning process. Attempts to convert bottle kilns into shaft kilns met little success. The first successful shaft kiln was the imported Schneider kiln of 1898 which was to prove a less expensive alternative to the rotary kiln. Schneider kilns were employed at Halling Manor, Trechmann Weekes and possibly Lees on the Medway in the early 1900s. The Schneider kiln burned dried slurry and the works probably used tunnel driers. After 1913 rotary grates were installed to give a more regularly burnt clinker. The advantage was economies in labour and fuel.

Experiments with rotary kilns date from ca.1877 onwards by Crampton, Ransome and others. A kiln tested at Arlesey in 1887 proved a failure, and it was not until Hurry and Seaman patented their kiln in 1895 that there was a viable rotary kiln. Martin Earle at the Wickham Works erected their first rotary kiln in 1900, set up engineering works and eventually had a battery of 16 kilns, and the newly formed APCM took on the innovation in 1900.

The rotary kiln with its comparatively huge production capacities and economies was to transform an industry that was already suffering from overcapacity, cut throat pricing and foreign competition. There had, in the last years of the 19th century, been some small-scale movement towards mergers. The appearance of new technology in the form of rotary kilns, roller or ball grinding mills (usually imported), mechanical handling between the slurry store bins and the cement silos, machine chalk digging and improved packaging plant required capital at a time when conditions were less than buoyant. This led to a reorganisation of the industry with, firstly, the formation of Associated Portland Cement Manufacturers [Ltd.] (1900) of 30 firms, mostly on the Thames and Medway, and when this failed to solve the problems, of British Portland Cement Manufacturers [Ltd.] (1911-12) of a further 33 firms. These moves led to the closure of many of the small, obsolete works between 1900 and 1914 [while allowing a few favoured works, notably at Swanscombe, the capital to introduce rotary kilns (C Down pers comm)].

This, however, did not inhibit new entrants to the industry. The Batchelor brothers built kilns at Halling (ca.1910), Broads, the London builders merchants, opened works at Cliffe (1913), and Goldsmiths, the Tilbury barge owners, the British Standard Works at Rainham, Kent (in the same year). After WWI, the Kent Works, Stone opened in 1922, Holborough in 1924, while Rugby Portland developed the Halling works in ca.1938, with all but the latter eventually becoming part of APCM. After WWII, APCM continued the rationalisation policy by centralising to cut costs. This led to the building of the new Northfleet Works, opened in 1969, which was to replace Bevans (Northfleet), Alpha Works (Cliffe), Holborough, Johnsons (Greenhithe), the Kent Works at Stone, and the Metropolitan and Wouldham Works

in Essex. This was followed by the wholesale demolition and redevelopment of works sites and of the quarries (for example, the Western Quarry, Northfleet, ahead of the Bluewater shopping centre). [The new Northfleet Works opened in stages between 1970 to 1971, which allowed it to replace Bevan's (Northfleet), Alpha Wprls (Cliffe), Holborough. Johnsons (Greenhite), the Kent Works at Stone, and the Metropolitan and (a few years later) Wouldham Works in Essex, as well as further afield. This was followed by the progressive demolition and redevelopment of works sites and their quarries (for example Western Quarry, Northfleet, ahead of the Bluewater shopping centre) and Crossways Business Park, built on the sites of the Kent and Johnsons Works with other sites and Johnsons in particular, being redeveloped for housing. (C Down pers comm)].

*Our knowledge of the cement industry derives largely from the literature, the most important of which is summarised in AJ Francis' *The Cement Industry 1796-1914* (1977) whose 'notes and references and additional sources' gives an extensive but not exhaustive range of sources. [C Down also notes that Francis' work was continued by Peter J.Jackson, *Cement Manufacture by UK Companies 1914 to 1994*, Jopet, Rugby (1999), 841pp plus (xxiii)]. Other important publications include Gilbert Redgrave's *17 Calcareous cements, their nature, manufacture and uses* (1895), AC Davis' *A Hundred Years of Portland Cement, 1824-1924*, G and T Earle Ltd's *The Making and Testing of Portland Cement* (c1926), the writings of Charles Pasley RE, the autobiography of IC Johnson, H Osbourne O'Hagan's account of the formation of APCM in *Leaves from my Life*, Peter Pugh's *The History of Blue Circle*, and David Eve's *The Cement Industry In Kent* (2000: Kent County Council, unpublished). David Eve identified 125 cement making sites in Kent (boundaries of these often overlap), the bulk of which were on the Thames and Medway, an area that was a major producer of Portland cement into the second half of the 20th century. Of these there remain no Roman cement sites. Early Portland cement is represented at Northfleet by the [so-called] *Aspdin kiln....*'. C Down notes that there are no upstanding Roman cement sites but sub-surface remains may survive, for example around the Robins Creek area.*

Since 2007 archaeological work associated with the redevelopment of former cement works and quarries has added significantly to the record of the cement industry. Most recently the work at the former Bevan's site (now known as Harbour Village) has revealed the remains of kilns and associated infrastructure, including working tunnels to service the kilns, drying floors and slurry backs, dating from the mid-19th century to the early 20th century. These remarkable survivals were despite significant re-building across the site in the 20th century. Preston had noted in 2007 that 'from documentary sources we know on a macro level about the development and location of the cement industry, its personalities and technology, and its overall business history. What we do not know is a great deal of detail about individual sites and businesses. We know little about the layout of sites, construction of kilns etc, We

need to know more about the cement works and the communities in which they existed, and to investigate workers housing, facilities and welfare.

Preston noted the following research objectives:

1. More documentary research. There is possibly much information that can still be gathered from searching local newspaper collections and library and archive sources (among others Kent and Medway archives, Rochester Bridge Wardens, the Church Commission)
2. Schemes like Andrew Hann's Victoria County History project have potential. This might also provide a means of sharing information that is often held by individuals and unpublished. Co-operation between local historians, often 'amateurs', and 'professional' archaeologists might be fostered
3. The involvement of local historians, local history and archaeological societies, schools, and further and higher education institutions in a structured approach to research could provide an answer. (Students on Access courses, social science certificates and diplomas, and economic history degrees have to complete a dissertation as part of their course, and might be channelled in the direction of research into industrial history)
4. Easier access to archaeological reports and assessments, and information in general through the deposit of copies with the County Library or Archives would be helpful. There is a need for somewhere for people to publish their research which is accessible and cheap
5. Access to the archives of Lafarge and Cemex (or Rugby Portland) would also be helpful, though Blue Circle is rumoured to have shredded quantities of documents [access to plans enabled Ron Martin to report on the more modern layout of Shoreham Cement Works (Sussex Industrial History, 34, 2004)].
6. For further details on the cement industry see also the magisterial on-line work of Dylan Moore -
<https://www.cementkilns.co.uk/cement.html>HYPERLINK
["https://www.cementkilns.co.uk/cement.html"](https://www.cementkilns.co.uk/cement.html)

National Significance

Portland cement and its immediate product, concrete, is one of the world's most important manufactured construction materials, along with iron, steel, and bricks. Its contribution to world built development over the last two centuries cannot be overstated. Portland cement was patented in the UK in 1824 and brought to the point of practical commerciality by the 1840s, in north Kent. Nowhere in Kent or, indeed, the UK is there any meaningful tangible recognition of this, whether artefacts or otherwise, other than the Robins' kiln which is misattributed. Unlike the iron and steel industries, where the UK's world pioneering role has been acknowledged and preserved (Ironbridge Gorge, for example), cement has been almost completely overlooked.

6.6.2 The Swanscombe Cement Works

The Swanscombe Works was opened in 1825-26 by Frost and taken over by J B White, within a partnership in 1833 and solely in 1837, produced an artificial cement called British Cement before the development of Portland Cement in the 1840s. It was one of the largest cement producers throughout the 20th century and at its closure in 1990, it was the oldest cement producer in the world. There is a reference to Frost's steam engine in 1828 (Science Museum reference Good/A/1344).



Figure 6.6: Swanscombe Cement Works (copyright Historic England - NMR Aerofilms Collection. Britain from Above reference number EPW017658)

The Swanscombe Works were initially served by a tramway which ran north to Bell Wharf on the southern edge of the river Thames, which may have been the first line in the area, although there is the possibility of slightly earlier railways serving ballast quarries at Ingress Park, and the certainty of an early railway across the river, at Purfleet in Essex (c1805-07) The most remarkable feature of this railway, as it existed after the 1870s and probably when first built, is that its locomotives and rolling stock had outside flanges on their wheels, a feature almost unique in the world and completely unexplained. This line formed the works' main transportation

route for their finished product via river barges; at this time no use was made of the main line railway for goods transportation; indeed, when the main line railway was opened in 1849 no connection was made for decades. A whiting works was situated to the west of the main works (north-east of the site) with a narrow-gauge tramway to the chalk quarry pits situated near the cricket ground. As the chalk near the works became exhausted, further quarries had to be opened up, these were connected by tunnels through ground which could not be dug up for chalk owing to the presence of roads or buildings on the surface. Swanscombe Cement Works tunnels, recorded on the HER from west to east (TQ 67 SW 587), (TQ 67 SW 588), (TQ 67 SW 589), subsequently used as WW2 air raid shelters. The works' principal quarry pits lay between the London Road and the South Eastern Railway (Williamson, 2019).

There was a transshipment siding on the South Eastern Railway at Craylands Lane, but not certainly until 1873. It was a single track line built from the works to exchange sidings on a steep and curving route to a transshipment platform at which goods were transferred between narrow- and standard-gauge tracks. In 1928 the line was converted to standard gauge and realigned to make an easier connection with the main line railway. The works' tramway ran in a tunnel under the main line and Craylands Lane, built in 1876 and pits were opened south of the railway later extending for a considerable distance. Over 1927-29, the whole system in use around the works and quarries was rebuilt to a conventional standard railway gauge. This continued in full operation until Northfleet Works opened, when the remaining duties (for whiting and special cements) reduced traffic by 50-70% and allowed steam haulage to be replaced by diesel. That continued until about 1985 when rail use ceased entirely, the last years until closure in 1990 relying upon road haulage (C Down *pers comm*).

Cement manufacture ceased at the Swanscombe Works in 1990 but the whiting works, continued as OMYA Croxton + Garry Whiting Plant until 2003 when all associated buildings were demolished (*ibid*).

Of Chalk and Water: an archaeological characterisation for the Ebbsfleet Valley and surrounding communities

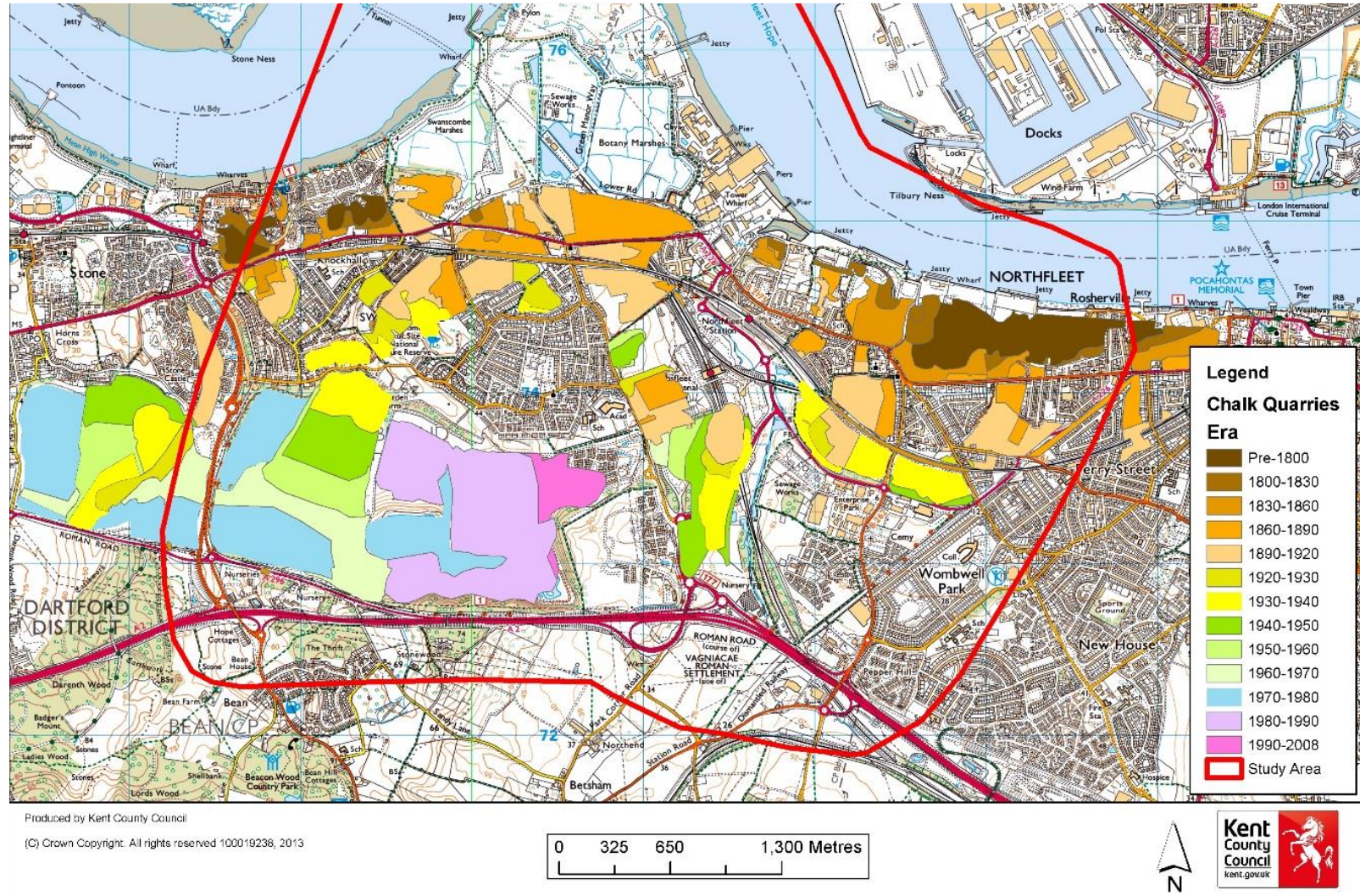


Figure 6.7: Chalk quarries in north Kent (data courtesy of Dylan Moore, "<https://www.cementkilns.co.uk/cemkilndoc036.html>")

6.6.3 Northfleet - Parker & Wyatt, Robins, Aspdin and Bevans

As at Swanscombe the landscape of Northfleet was transformed by the cement industry around the Ebbsfleet and east towards Gravesend in the 19th and 20th centuries. The Ebbsfleet had been used as a source of waterpower since at least Anglo-Saxon times (HER refs etc..). By the 18th century Hasted records a water mill, situated near the mouth of the Ebbsfleet, close to the river Thames. The exact location of which is not known. Already by the late 18th century Hasted records that the mill was being used for the making of a composition of stucco for buildings, most probably by the Parker and Wyatt Cement Works. James Parker having patented Roman Cement in 1797.

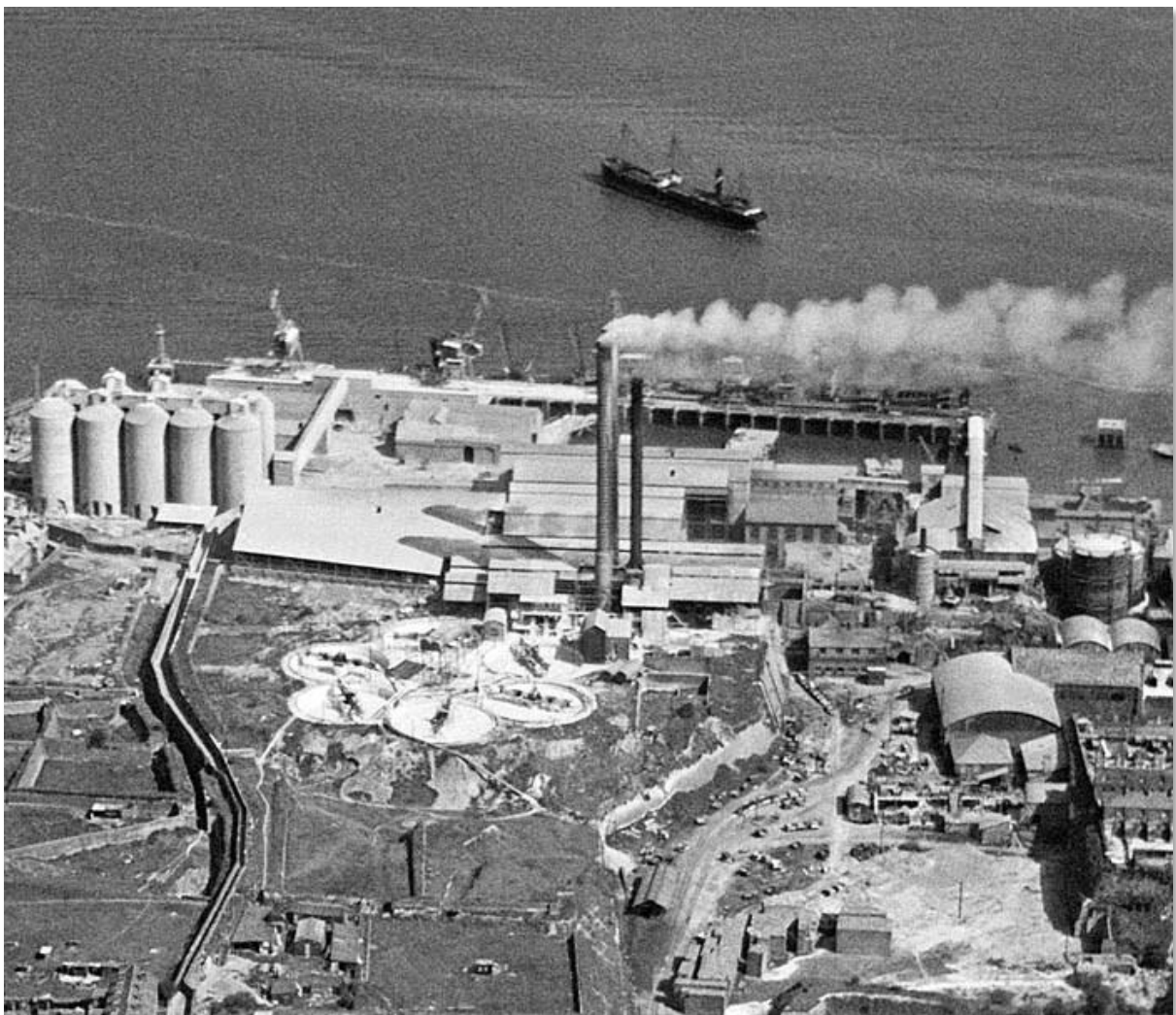


Figure 6.8: Bevans Cement Works 1927 (copyright Historic England - NMR Aerofilms Collection. Catalogue number 17642)

The 1841 Tithe Map and apportionment records a “Dwelling House beneath Factory Yard and Garden” owned by Henry Walter Wyatt, and there appears to be circular buildings consistent with being kilns. Next to this is a large body of water, recorded in

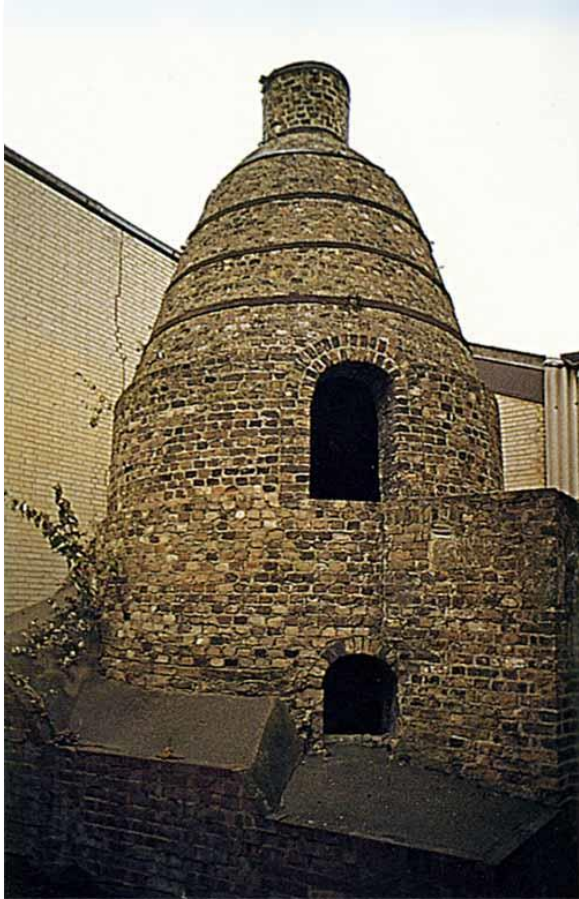


Figure 6.9: Robins' kiln (date uncertain).
Photo cementkilns.co.uk

the Tithe Apportionment as also being owned by Wyatt, which is now known as the Mill Pond, however, in 1841 this feature is much larger than it appears today. In 1846, the Parker & Wyatt site was purchased by Maude, Jones and Aspdin, although this partnership was short lived and by 1848 the works were acquired by Robins, Aspdin & Co.. The works were used to manufacture Portland Cement, which had been patented by Joseph Aspdin in 1824. His son, William Aspdin left Yorkshire for London in 1841 and initially set up a cement works at Rotherhithe, before taking over the Parker & Wyatt site in 1846 with partners Maude and Jones. The partnership was short-lived and in 1848 Aspdin set up a new partnership called Robins, Aspdin & Co. This partnership also proved to be short-lived with Aspdin removed in 1851 and the company dissolved after evidence of mismanagement of the company was identified. The cement works were then

owned by Robins & Co. and managed by R. A Gibbons. The cement works rapidly expanded in size and the 1865 OS map shows the mill, kilns and wash mills to the south of Robins Creek, along with the chalk pit to the south and wharf to the north. The original Parker & Wyatt site had also seen expansion too and the tidal mill continued to be used to grind clinker. A foundry building is also depicted. The amount of residential housing increased to meet the increased workforce for the cement industry for example, to the east of Grove Road there was a 'U' shaped terrace of properties, including two public houses (Huggins Arms and the Blue Anchor) and the Post Office directory for Essex, Herts and Kent from 1855, lists the occupiers at the Creek as including bakers, greengrocers and beer retailers.

The Robins & Co. works soon came into direct competition with the neighbouring Bevan's plant. Bevan's plant was established to the east of Robins & Co. plant in 1853, with help from William Aspdin, and it subsequently secured access to a proportion of the chalk lands in the surrounding area, limiting Robins & Co. access to the raw material. Despite this, the Robins & Co. Portland Cement works continued its manufacturing, and the 1897 OS Map shows the Portland Cement works much expanded in size with the mill to the south of Grove Road, larger and including the scheduled, so-called Aspdin's Kiln (figure 6.9 - also sometimes known as Robins'

Kiln) (TQ 67 SW 77), which whilst being the earliest surviving upstanding bottle kiln in north Kent, should not be attributed to Aspden personally (D Moor *pers comm*).

In 1900, the Associated Portland Cement Manufacturers Ltd (APCM) was created, with the aim of combining the largest cement manufacturing business in Britain into a single company. The APCM took over both Robins & Co. and the neighbouring Bevan's site. The Robins & Co. site was largely abandoned in 1910, with manufacturing instead concentrated within the Bevan's site. Extensive remains of the Bevan's works were exposed during residential development in 2021/22 (Wessex Archaeology, 2022). Not all the Robins & Co. site was decommissioned, however, and the 1932 OS Map shows the works to the south of Robins Creek still in use, albeit much reduced in size. The Bevan's kilns continued in operation until November 1970 after which silos and other facilities were repurposed to serve Northfleet Works.

As sources of chalk became more distant from the cement production facilities, tramways and associated infrastructures such as bridges and tunnels had to be created. Tramways are visible on historic OS maps of the area (e.g. TQ 67 SW 1699) from the end of the 19th century onwards. These connect to the chalk the quarries at Rosherville and terminate at a quay on the southern banks of the river Thames. The location of former tramways is recorded on the HER at (TQ 67 SW 1697 & 8) and (TQ 67 NW 1031). Clay was also brought in from as far away as an area near Shorne Woods, via a slurry pipe along Watling Street. The pumping station for this was discovered during the CTRL investigations in the area.

Quarrying removed agricultural land and changed the landscape and the impact of the cement industry could be dramatic. Boorman's Mill (TQ 67 SW 1492), a windmill for milling wheat and barley, ceased operating in the 1890's owing to the nearby quarry undermining the ground on which it stood. After the owner took successful legal action against the quarry company it was finally demolished in 1916. A watercolour in R. H. Hiscock's 'Boorman's Mill, Northfleet' by J.S. Kean from c.1900, shows the precarious position of the windmill with the quarry face immediately below.

The process of rationalisation of the Kent cement works which had begun in 1900 when APCM was formed reached its culmination in the late 1920s when four factories (Kent, Johnson's, Swanscombe and Bevan's) were each reconstructed to produce around 0.5 million tonnes from rotary kilns, and everything else was closed. Post WW2 APCM developed a series of modern regional factories around the UK and by the late 1960s the remaining un-modernised were mostly those on Thameside. It was decided to replace these with one giant new factory, the new Northfleet Works built from 1969 and opened 1970-71, fed from Eastern and Western Quarries and with clay piped from Ockenden in Essex to the Swanscombe washmills at Eastern Quarry. The Swanscombe Works remained open, producing whiting and specialist cements such as Colourcrete and Snowcrete. Western Quarry

was partially backfilled with Thanet Sand to create the development platform for the Bluewater Regional Shopping Centre.

Whilst the emergence and growth of the cement industry (alongside other industries) provided additional opportunities for employment and increased wages, there were downsides in addition to the long-term impacts on landscape. As cement production and the number of works increased during the 19th century, there were significant complaints regarding dust, smoke and odour. Odour was generated by the organic content of mud and clay dredged from the Medway and then burned as an ingredient of the slurry used in cement manufacture. Many of these complaints came from people like Samuel Charles Umfreville, who had inherited Ingress Abbey through marriage and opposed the industry due to the pollution caused. Smoke allegedly filled the valley between Greenhithe and Stone Castle up to the level of tree roots high on the bank, whilst the combined effect of emissions from the cement works had become a serious hazard to navigation on the river by the 1870s. Legal action ensued, led by Umfreville, which was opposed by the workers and cement manufacturers resulting in conflict over what sort of place the area should be - an industrial area or location for upmarket villa residences. Between 4,000 - 5,000 cement workers and their supporters met on Rectory Field, Swanscombe on the 22 August 1874. Other meetings followed in Gravesend and Dartford later that year and another in Northfleet on 5th October, preceded by a torch lit procession. Whilst Umfreville's legal action was withdrawn, John Bazley White and Co. agreed to meet the costs of both parties, suggesting that the manufacturers accepted that there was an issue. Following a report by the Royal Commission on Noxious Vapours in 1878, emissions from the cement works were finally controlled under the Alkali Acts (Royal Commission on Noxious Vapours 1878; Committee to Enquire into Navigation of the river Thames 1878/9; Baker 1990 and Bull 2008 p15-16).

In 1873 J C Gostling built their London Portland Cement works close to The Hill. Because of threats of legal action from the Vicar, they decided to build a 220 foot tall chimney to disperse the smoke. Unfortunately, it collapsed on the morning of the topping out ceremony killing around 8 people and injuring a lot of others. The company tried to blame the vicar but the inquest came in with a verdict of accidental death and it was rebuilt. The accident and inquest were covered in the Gravesend Reporter on the 4th, 11th and 25th October 1873. (G Baker *pers comm*).

6.6.4 Other industries

The clay over chalk provided a valuable resource for local brickmaking. Examples of sites of 20th century date include Branton's Brickfield (TQ 57 SE 162) south of Watling Street and probably in use between 1900 and 1920. Nearby were small pits shown on historic mapping. Lower Northfleet brickworks established in the 19th century immediately north of Northfleet. Brick-making in Northfleet also involved the importation of ash/rubbish from London by barge as there were complaints from

locals in the 19th century. Immediately to the east of the brickworks site in the later 19th and early 20th century lay the British White Lead Works and the Whiting Works in the quarry area later occupied by the Northfleet Power Station. The Whiting Works used chalk to produce paints and related products such as toothpaste and cosmetics. The works at Swanscombe were demolished in the later 20th century. The Swedish chemical engineer Carl Ekman was important in the early paper manufacturing at Northfleet (Bull 1987 p3 and 2008 p 19-20) establishing a works in 1886.

There was a small, short-lived ironworks at The Shore, on the site of what later became the site of the Crown Portland Cement Works (G Baker pers. comm) . An 'iron foundry' is recorded on the 1897 OS plan. Between 1854/5 this appears to have been leased out to the firm of Schlesinger and Wells, a partnership formed to make ammunition (ball cartridges) at the time of the Crimean War when they supplied the Turkish Army. It only appears to have been short lived and the partnership was dissolved in 1855. Schlesinger is in the 1851 census as living in London and described as a merchant but was probably in the iron founding business with Wells. The works featured in a long article in the Illustrated London News in 1854 (G Baker pers comm). Wells wanted two Special Constables to be sworn in to protect the premises. By that time, it was employing around 1,000 people, many of them women, packing the cartridges (G Baker *pers comm* and Kentish Independent, Oct 1854).

In 1906 the W. T. Henley Telegraph Works Company Ltd. (TQ 67 SW1004) was established at Cable Wharf and within the former site of Rosherville Gardens. Henley had started making insulated wire cables in the mid-19th century at Woolwich and the factory at Gravesend continued until 2008. The site of the W. T. Henley factory replaced a later 19th century tyre maker and a printing works.

To the west lay the Bowater's Papermill, established at the former Northfleet dockyard site (Pitchers) in 1914 to produce newsprint. Bowater's had significant rail infrastructure. Paper-making had started in the south-east in the late 16th century (Barber, 2019). With the introduction of chemical bleach, the paper-making machine and the steam engine, the reliance on clean water and waterpower was removed. In the 20th century, the potential for imported wood pulp on the Thames allowed for the development of significant factories in this part of Kent. The outbreak of war in July 1914 had stalled Bowater's plans for a mill at Northfleet and construction work did not commence until 1924 after the formation of Bowater's Paper Mills Limited in 1923. The relics of Pitcher's dockyard were removed for the construction of the works by Sir W. G. Armstrong, Whitworth & Co Ltd. The site became known as Thames Mills and started producing newsprint in 1926, being equipped with two papermaking machines. (ref. https://www.kentrail.org.uk/bowaters_northfleet.htm . Accessed 24/07/2022 11:19).

Further research is needed to understand the extent of the survival of the physical remains of these and other smaller industries within the study area. These could include leather, glass, gunpowder, bricks and tiles, pottery and clay pipes, chemical as well as the supporting trades for the cement industry such as coopers, carpenters, brick-makers and blacksmiths. For example, there was a smithy at Perry Street south of the Six Bells, recorded on historic mapping into the late 19th century. The last blacksmith in Northfleet was Newby's on The Hill. It closed in 1946. (C Bull *pers comm*).

The impact of industrialisation and de-industrialisation is fundamental characteristic of the study area with significant heritage assets surviving as well as archaeological potential for presently unknown assets. The built environment, including residential development for workers moving to the area for jobs within the various industries is also of significance (Hahn, 2007).

6.7 Maritime and shipping

From the 16th century to the present day the Thames continued to be a major route of communication and trade and a potential vulnerability requiring defence. Archaeological evidence for maritime trade is fragmentary because of continued change and development along the edge of the Thames, but infilled docks and wharves still survive.

Quarried gravel and chalk was sold as ballast for ships from Greenhithe from the 16th century, though there was an ongoing struggle to overcome the power of Trinity House in controlling the supply of ballast. Greenhithe was a major supplier of ballast for the Royal Navy based at Woolwich, Deptford and Chatham Dockyards in the period immediately following the Restoration in 1660 through to at least the early 18th century. Ballast was also sourced from Northfleet and Gravesend with a 1748 reference which records the owners of the wharves, and the wharves themselves, from which ballast was shipped. (G Baker *pers comm* and ADM 106/1057/334). The quarrying of chalk for ballasting empty vessels leaving London, effectively provided the opportunity to introduce a cement industry, with Swanscombe being one of a few that was not opened in a former ballast quarry. By the late 18th century, the old ballast quarries were a romantic tourist attraction (C Down *pers comm*).

There were ferries from Greenhithe and Swanscombe (see Communications above). There is little or no evidence for fishing apart from a few census entries where occupation is stated as fisherman. There was a Fisherman's Hill in Northfleet. The improvements to the London sewer system with outfalls at Crossness and Beckton effectively killed the river downstream until the 1960s, so that fishing would have largely been restricted to shrimping.

6.7.1 Ship Building

William Cleverley had started building 'His Majesty's Ships' at Gravesend in 1770 and the works at Northfleet (Northfleet Docks or Northfleet Dockyard (TQ 67 SW 1013)) were originally commissioned in 1788 by Thomas Pitcher, at the location now known as Bowater's Wharf. Very significant plans were made in the early 19th century to develop an extensive area of docks in the former chalk quarries east towards Gravesend but did not come to fruition. The plans were set out in a Prospectus for the Northfleet Docks and London Quays Company Ltd. with an estimated cost of £23m scheme (Advertiser November 17, 1972, based on original text by E C Watt for the East Coast Digest magazine published quarterly by the Greenwich Times). Northfleet Dockyard (TQ 67 SW 1013) covered an area of 18 acres and ran along the southern edge of the Thames for c.300m. The first ship was launched on 2nd November 1789 and the site grew to incorporate seven shipbuilding slips and a dry dock (c.120m in length) as well as numerous buildings and structures, including a saw pit c. 50m by 12m in size (recorded on the 1st Ed. OS mapping). The dockyard constructed numerous ships for the British Government during the Crimean War, in addition to sailing and steam vessels for overseas administrations and merchant navy shipping lines. All the ships built at the docks were of wood. The original proprietor, Thomas Pitcher, died in 1837 and one of his sons, William, took over the running of the business. He subsequently died in 1860, after which the dockyard ceased to operate. (https://www.kentrail.org.uk/bowaters_northfleet.htm). Up to 2,000 men from labourers to shipwrights had been employed in the yard and the closure caused considerable distress and hardship (Advertiser November 17, 1972). The last vessels to be launched were the *Spartan* for Greek owners and two Liverpool-Birkenhead ferries. During the dockyard's period of prosperity, a community had grown up around it and Thomas Pitcher had built Dock Row (shown on the Northfleet Tithe map) for some of his workers. There was a Post Office, a Methodist Chapel and several public houses there including The Shipwrights Arms, The Gunboat, The Staff of Life, The Royal Charlotte and the Half Moon. The docks had a castellated gateway. The 18th century engine house, used for hauling trucks, was used as a Nonconformist School (1820), a chapel (1828) and subsequently a bakery. Part of the site was for a short time occupied by an engineering firm and bicycle manufacturer afterwards, but the shell of the dockyard, complete with building slips, was still in existence at the time of Bowater's purchase in 1914. (https://www.kentrail.org.uk/bowaters_northfleet.htm).

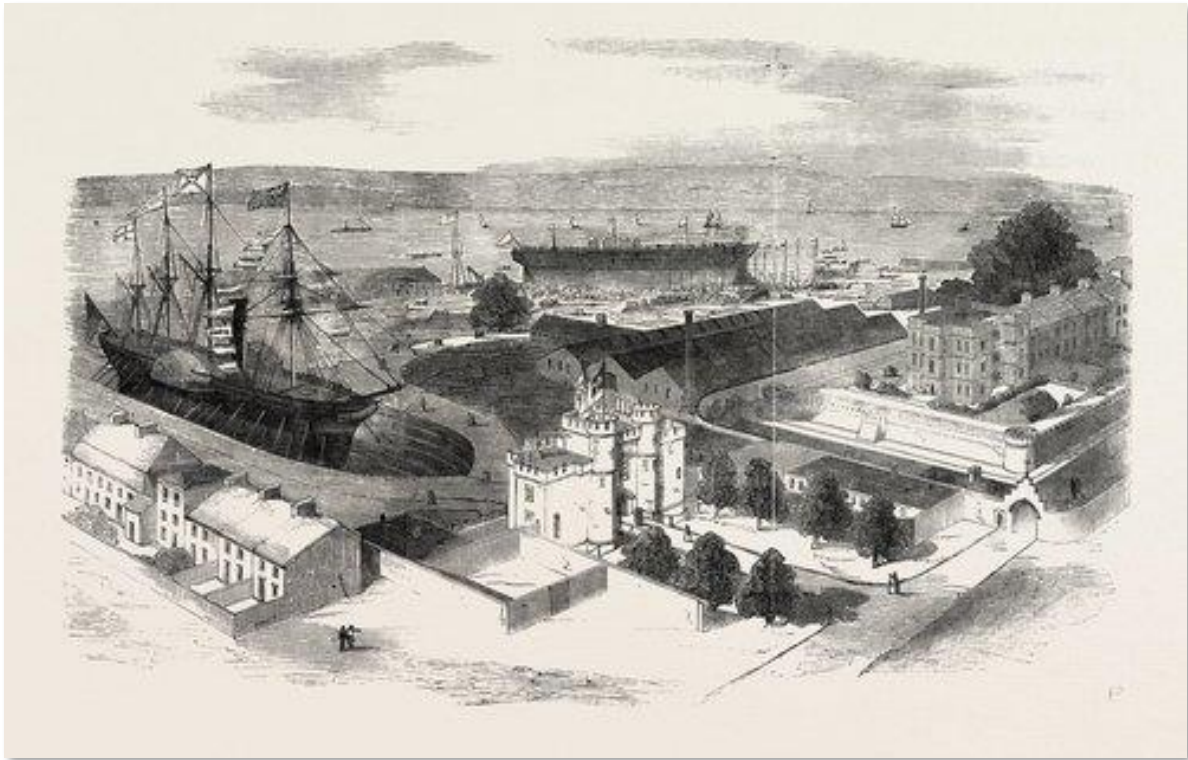


Figure 6.10: Northfleet Dockyard 1851

There is high archaeological potential for infilled docks, the slipways and remains of associated buildings and structures in the area north of Crete Hall Road.

There would have been numerous landing places along the Thames foreshore. Immediately north-east of the early 20th century Ingress Abbey Park wharf and pier (TQ 57 NE 1068) and stretching for over 300m, there are numerous timber posts, planks and surfaces, representing the remains of probable Post-Medieval or earlier wharves, sea walls and hards (TQ 57 NE 1007, 1078, 1079, 1081 and 1085).

The management and control of maritime activity is represented by the evidence for beacons or 'lighthouses' such as that identified from historic mapping at Broadness (where there is still a present-day example) (TQ 67 NW 1001).

North of the Ebbsfleet at Tower Wharf the 19th century cement works required a range of wharves, hards and piers, constructed on reclaimed, embanked and drained land. Illustrated on the Tithe map and 1st Edition 25" OS map (1862 – 1875) and the 2nd Edition 25" OS map of 1897 – 1900) are the Portland Cement Works (TQ 67 NW 1013) and Tower Portland Cement Works (TQ 67 NW 95).

Recent archaeological work at The Shore, Northfleet illustrates how important evidence for Post-Medieval river walls, docks and wharves survive and require study and protection. The wharf walls (TQ 67 SW 603) at Robins Creek preserve important

examples of early uses of concrete along with surviving dockside infrastructure such as rail tracks and crane bases.

Historic mapping illustrates that the shoreline around the Swanscombe peninsula has changed over time and this part of the study area has significant maritime archaeological potential. The mid-19th century Tithe map shows a greater extent of the Broadness area with a more defined and seemingly accessible tidal channel into Broadness Salt Marsh. Although now much silted up, the outer creek channel is still used for mooring boats. Historic mapping indicates that the western side of the peninsular has lost land during the last three hundred years whilst the eastern side has remained relatively stable with some increase as wharves have been extended north of the Ebbsfleet.

The HER includes data from around the Swanscombe Peninsula recording archaeological evidence for maritime activity including derelict vessels (either hulks or wrecks). Examples exist around Broadness creek (TQ 67 NW 1008 and 1009) where remains of vessels have been identified in the intertidal zone. A wooden vessel with metal fittings and likely to be of 19th or early 20th century date is recorded within the salt marsh, but presumably formerly within the creek at Broadness (TQ 67 NW 1023). In the Thames channel there are numerous wrecks, which testify to the busy trade and commerce along the river. They include the site of the wreck of the *Louisa*, a British spritsail, recorded lost in 1889 (TQ 57 NE 45). Also, around the shoreline of the peninsular are the remains of probable Post-Medieval wharves, slipways and mooring points. Examples include a now disused slipway (TQ 67 NW 1003) and a platform some 400m to the north on the edge of Botany Salt Marsh (TQ 67 NW 1027). To the west of the peninsular, part of a wooden track has been identified on the foreshore (TQ 67 NW 1022) but this may be earlier in date and more work is needed to identify and date these types of structures. A possible example of a landing place with associated trackway is illustrated on the 2nd Edition OS map at the edge of Northfleet Marshes, immediately north of the 19th century Portland Cement Works (TQ 67 NW 1005). The feature is illustrated as an oval area of rock (?), c. 70m in length, with a possible wharf at the high-water line. The immediate high-water line appears to be managed, judging by the straight-sided shorelines. Interestingly, the 1st Edition OS map of mid-19th century date, illustrated a rectangular pond (30m by 10m) with a sluice connection to the creek to the south. This may have been a feature associated with fishing, salt-making or some other industrial activity.



Figure 6.11: Swanscombe Peninsula (photo Ebbsfleet Development Corporation)

6.8 Military

This section draws heavily on the research of, and notes kindly provided by Victor Smith.

As the access to London, the significance of the Thames down to the estuary led to the placement of artillery and other defences to help secure the waterway against an advance of enemy naval forces upstream towards London. This could take the form of a raid or invasion, bombardment of riverside assets and property and, possible landings on the shore. Alongside the threat from foreign states there was also piracy. In 1380 a Franco-Spanish (Castilian) fleet entered the Thames and landed at Gravesend and Tilbury. In 1402, royal authority was granted for the provision of defences at East Tilbury. From the 16th century defence was expressed by the placement of cross-firing forts and batteries downstream. Within the study area, a proposed or actual Armada crisis artillery fire position (1588), for which no physical evidence appears to have survived, was located close to the riverside, c.400m east of where the Ebbsfleet joins with the Thames and is illustrated as a place of originating fire-lines on Robert Adams' map *Thamesis Descriptio* of 1588.

A small battery for two guns, constructed from the 1790s to the Napoleonic Wars, just in the rear of the river line and close to the site of the India Arms, was removed during the development of the cement works. This battery may have not been far from the proposed or actual Armada site and would have been manned by volunteer gunners. There are no traces remaining and understanding is based on several references in the manuscript Royal Engineer Letter books at the Royal Engineers Library and Museum in the Gravesend and Thames series, as well as in the personal historical research notes of the late Ken McGoverin (V Smith *pers comm*). These were modestly short-lived elements of the shoreline defences within this area. See also Bull, 2018 p10 for information on the Battle of Northfleet.

Although outside the study area the Gravesend Blockhouse is an example of Tudor defences which illustrates the geopolitical rift on the 1530s, characterised by a state of tension between Henry VIII and much of Europe. In 1538 an invasion was feared and this resulted in the inception of an ambitious English programme of defence construction at sea and on land, of which this artillery blockhouse was a key part. It is the only visible blockhouse from a network of five which, through the crossfire of their guns, guarded the river approaches to London against a hostile fleet. The Thames was a route for a large part of England's international trade and was, therefore, a vital national asset. The design of the blockhouse is important in expressing a new Continental approach to artillery fortification, in this case taken from a north-east European frame of reference, exemplified in a Treatise by Albrecht Durer (1527). This embraced the use of enclosed gun casemates, as at Gravesend, and other features. It is among the older buildings visible in Gravesham.

In 1648 there was an opposed crossing of the Ebbsfleet stream involving total forces of around a thousand, in the area of present-day Grove Road during, the Civil War. Parliamentary forces advancing from the west successfully dislodged the Royalists who were defending.

In 1806 the Royal Artillery horse artillery barracks were built in Northfleet, centred on the area which later became Shepherd Street (Smith, 1995). This site was one of many barracks during the Napoleonic Wars, most usually being a transit camp for troops moving /overseas or coming back. Once or twice, however, troops there provided labour for work at New Tavern Fort. From time to time the Thames was a place from which naval forces might be deployed but this needs more research. Ultimately, national defence relied upon sea power, from a number of naval bases, and the Kent, Thames riverside was crucial in this respect.

In the early 20th century, there was a training battery for the Royal Garrison Artillery (Territorials) around Lawn Road, Northfleet, with two 4.7-in. Breech Loading Quick Firing guns. When it was installed and when it was removed is not known and there are no traces recorded (V Smith *pers comm*). The war station for this was Coalhouse Fort.

Between the First and Second World Wars the development of the territorial army included the construction of the Grove Road Drill Hall and associated garage buildings as part of the industrial development adjacent to Robin's Wharf. The Grove Road drill hall, 1934. was for the TA for the defences of the lower Thames and at the entrance to the Medway for searchlight work. The Grove Road Drill Hall has a utilitarian barn-like design, unusual for the 1930s. It illustrates the importance of the cement-manufacturing industry within the local community with the key leadership involvement of the manager of the factory, the use of the facilities of the latter, and wholesale participation of factory workers. Drill halls spanned the military and civilian sectors, through being places for civilian soldiers and, from the interaction with the

local community, via social events which took place within them. The Grove Road drill hall and its surrounding site were in TA hands until at least 1960 and are still extant.



Figure 6.12: Henley Air Raid Shelter (photo Kent County Council)

Technological advances, strategic methods and deployments during the 20th century gave Kent Thameside other dimensions such as the threat from the air. Numerous barrage balloon sites are recorded around the industrial areas of Northfleet. (Smith, 2010) as well as a community air raid shelter, balloon barrage site, drill hall, decontamination centre etc. Protection for workers were created including those for the Henley factory. The Henley air raid shelter tunnels, built in 1939 (Smith, 2022) comprised tunnels in the chalk, some 55 feet below Fountain Walk at Northfleet was created as a refuge for 2,500 employees of the W.T. Henley Telegraph Works and its associated companies, whose Thameside premises were adjacent. The need for

physical protection reflected the increasingly destructive and existential threat of aerial bombing and of a national imperative to safeguard skilled industrial workers – and at some places elsewhere, the factory plant as well. As such, the survival of this complex evokes a memory of the determination of government, industry and people to survive the onslaught of the German air campaign and to win the war. The shelter incorporated the latest thinking in design and protective measures.

There were a number of WW2 defended localities within the study area, one of which was based on the drill hall in Grove Road. Not far from this at the side of The Creek is a small building adapted in WW2 with the provision of two loopholes.

In 1954 the WW2 Civil defence Control Centre in the basement of Northfleet Town Hall in Council Avenue, Northfleet, was reactivated and extended under the rear car park. The control centre was decommissioned in c. 1974 but the structures are still thought to be extant (V Smith *pers comm*). There was a Cold War Royal Observer Corps underground radiation monitoring post at TQ 608.734 in the 1960s. It was abandoned after becoming flooded.

There is a good representation of military sites on the Kent HER due to the work of Victor Smith. Below are listed some examples:

A mine watching observation post (TQ 67 NW 106) was established on the end of Bell Wharf on the northern extremity of Swanscombe Marshes during the Second World War, one of a network of such posts at 600 yard intervals along the bank of the river Thames to spot for the landing of air-dropped anti-shiping mines. Of unknown design, it probably originated in 1940 to be decommissioned by 1945. The end of the pier was demolished c. 2000).

At Pepper Hill there was a Second World War light anti-aircraft battery (TQ 67 SW 1300) for Vickers machine guns. Its date of origin is not known, but was probably 1940, perhaps being in place for a year or so. This was one of three AA sites, probably associated with defending the approaches to the Pepper Hill substation. The site is now a grassed space in a housing estate.

At Springhead there was a Small Second World War concrete underground air raid shelter (TQ 67 SW 567) under the former grass verge on the south side of the A2 trunk road. The purpose of the shelter at this location is unknown. It was first noticed by the surveyor in 1962 and was destroyed during the building of a second, southern carriageway in 1963/4.

There was a Second World War Battle Headquarters for Defended Locality DL31, at the Pepper Hill electricity Sub-Station, Northfleet. This anti-invasion defence was for the protection of the electricity substation, and probably originated in 1940. It would have been decommissioned by early 1944. There are no known remains. (TQ 67 SW 1181).

Defence around Northfleet during WW2 was significant with air raid shelters (e.g. in the basement of the Northfleet Tram depot TQ 67 SW 634). A little to the south was a Second World War surface air raid shelter (TQ 67 SW 1289) on the edge of playing fields on the SW side of Dover Road School, Northfleet. Provided c. early 1940 for the protection of the pupils of the school. It is a rectangular yellow-brick building with a flat concrete roof, containing three shelter rooms accessed from airlock entrances at either end of its long, northern elevation. It was decommissioned in 1945 and post-war became a school store and, in 2000, a museum for the school.

West of Northfleet towards Wombwell Park and Springhead there were numerous air raid shelters (e.g. TQ 67 SW 1326) a Second World War public air raid shelter on the SE corner of the junction of Vale Road with Colyer Road, Northfleet. It was a small concrete-lined trench shelter, built c. 1939 and decommissioned in 1945. It appears to have been demolished in about 1960 to make way for the construction of a new police station.

Much of the smaller scale defence structures have been lost, such as the Second World War air raid wardens post (TQ 67 SW 1189) on the north side of Waterdales, Northfleet. This was a small rectangular concrete structure with a flat roof. It succeeded the earlier post at the nearby Fleet Tavern (also in Waterdales) in 1940. It would have been decommissioned by 1945 and demolished by 1946.

Balloon barrages provided important aerial defences. One site (TQ 67 SW 1193) was located at the Northfleet Recreation Ground but no trace remains.

A second World War Decontamination Centre was established in late 1939 within an Isolation Hospital on the Recreation Ground off Springhead Road, Northfleet (TQ 67 SW 1247) but there is no record of date of decommissioning or demolition. (TQ 67 SW 191), WW2 minewatchers post. (Summary from record TQ 67 SW 1229) Second World War post on the edge of the Thames at the north end of Burch Road, Northfleet for observing the dropping of parachute mines into the river. It is a small brick structure with a flat concrete roof and a wide observation slit to its front. Dates of building and decommissioning are not known but are likely to have been 1940 and 1945. It is extant, although in a degraded state.



Figure 6.13: Northfleet minewatching post (photo Kent County Council)

At Red Lion Wharf (TQ 67 SW 1234) there was a dry dock for the construction of offshore forts, during the Second World War. The dock was adapted with a coffer dam and gates as a dry dock. Today there are no visible traces of the wharf or dry dock. Inland from the Red Lion Wharf was a WW2 construction camp (TQ 67 SW 223). Bowater's papermill had air raid shelters (TQ 67 SW 1372).

The site of a water tank (TQ 67 SW 1266) is recorded on Lawn Road and an extant WW2 air raid wardens post, built in 1939, on the eastern corner of the junction of Lawn Road, with Northfleet High Street. It is a small rectangular concrete building with a flat roof, built in 1939, decommissioned in 1945 and recommissioned for a time in 1956 (TQ 67 SW 1237) during the Cold War for training air raid wardens. It was unfortunately demolished before it could be statutorily protected.

6.9 Utilities and power generation

Relatively little is known about the provision of water supply and sewage treatment facilities prior to the mid-19th century. Provisions were local and as such tended to be variable depending on geographical location, with sources such as wells, village pumps, streams and ponds playing the dominant role. Historic OS mapping is helpful in recording the location of numerous wells, most of which are not on the HER although they do represent sites of archaeological potential as both in their own terms (construction and location etc.) as well as their fill. The use of local wells led to problems of public health, particularly in urban areas with rapidly increasing population (see below for Perry Street). As a result, a number of 'Improvement Acts'

were enacted in certain towns in an attempt to improve sanitary conditions. From the mid-19th century there was a rapid expansion of the provision of public utilities, particularly with the increased understanding of causes of disease brought about by advances in medical knowledge, the establishment of national Acts and municipal authorities. It was not just sanitation that improved, but the provision of gas, emergency services and electricity (Barber, 2019).



Figure 6.14: Northfleet power station, 1973 (photo P Terre CC BY-SA 3.0)

In the 19th century there were reports of poor sanitary conditions in the hamlet of Perry Street because of water pollution where cesspits were too close to wells in pervious geological strata leading to serious outbreaks of smallpox and other diseases (Gravesend and Dartford Reporter – Saturday January 13, 1872). Gravesend and Milton Waterworks Company was in existence by the 1870s to supply water to the entire parish of Northfleet. There is archaeological potential to understand more about changes in water supply, drainage, cesspools and disposal of water etc. in the later 19th century. Northfleet Sewage Works opened in 1932 (C Bull *pers comm*).

In the early 20th century, the Metropolitan Water Board built a reservoir south of Watling Street east of Bean (559871 172391) which still appears to exist. A well and pumping station were constructed to the east at a place now called The Cottage (560985 172442) and the two connected by underground pipe with an extant air shaft at (560609 172409).

An electricity substation was built at Pepper Hill and opened in 1931. It was protected during WW2. Northfleet Power Station (TQ 67 SW 209) was built 1956-62 and demolished in 1994. It represented a significant stage in power station design combining extensive fenestration with functional exterior. Station located at TQ 632 744, coal stock at TQ 630 742 (TQ 67 SW 1055) and ash dump at TQ 631 738. One of the two tallest electricity towers in the UK is located on the peninsula (paired with another on the opposite side of the Thames in Essex). The overhead power line was constructed in 1965 and consists of two 190m pylons.

As noted above there were water mills on the Ebbsfleet. Steam power was added to mills from the 19th century though as seen at Robins, waterpower continued to be used for the new technology of cement production in grinding clinker or chalk into the later 19th century.

Archaeological features associated with utilities and refuse disposal provide important information regarding material culture, diet, sanitation/water supply and environment. The Post-Medieval archaeological potential also lies within former quarries that subsequently became town dumps.

6.10 Administration, Law and Order

In the early 16th century, the region still retained a much broken down system of later Medieval feudalism. However, between AD 1520 and AD 1660 there was much change as religious ownership gave way to Crown and secular power and the development of the Church of England. Local administration by the early 18th century was still largely based on the hundreds, boroughs, market towns and parishes of Medieval origin though the national legislation of central government was more notable. After AD 1750 the main bodies of administrative organisation continued to be the hundreds and parishes. Justice was mainly administered through the hundred system while parishes were involved in a range of issues including provision for the poor and road maintenance. New systems of local government were beginning to be developed in the early 19th century, perhaps most notably the Poor Law Unions of 1834. Early workhouses, the forerunners of the post 1834 Poor Law Unions, were administered by the parish and quite widely spread. From the 1850s there was an increasing complexity in administrative and social organisation (Barber, 2019). These were mainly associated with national initiatives, often brought about by rapidly increasing urbanisation as witnessed in the study area because of industrialisation. Several administrative organisations were established, including rural/urban councils, school boards and sanitary authorities.

These changes in administration led to a wide range of purpose-built buildings in or around urban centres including town halls (Northfleet House was Sturge's House), schools (see later section), hospitals, cemeteries, police stations (Northfleet police station, built in 1866 and still stands in the High Street as Court Mews – C Bull *pers*

comm), courthouses, prisons and water/sewage works (see above). The rapid social change after AD 1850 helped develop a form of working-class consciousness which led to the development of a number of establishments including the temperance movement, co-operative societies and working men's clubs. The formalisation of the County Councils and Rural District Councils in the later 19th century, with numerous subsequent boundary changes, and the later establishment of District and Unitary Councils has resulted in the complex tiered system of today (Barber, 2019).

Within the study area a temporary military strongpoint and redoubt was established during the General Strike of 1926 (TQ 67 SW 1254), within a former chalk pit on the south side of Crete Hall Road, Northfleet, then being developed by Bowaters as a paper mill. The redoubt was formed from an existing brick or block walled building, enclosed for the emergency with a corrugated iron fence and barbed wire entanglements. Other parts of the factory site were defended by barbed wire and sentries, as part of measures to secure a strategic supply of paper manufacturing for the government, which feared the possibility of a revolution during the strike. The defences lasted only a few weeks and were presumably removed soon after.

6.11 Public services including education and health

The provision of early schools and their material remains has often been overlooked despite their frequency. With the advent of local authorities and central government acts numerous schools were built in the 19th and 20th centuries. Some, like the infant's school east of Northfleet were demolished to make way for quarrying.

Workhouses, prisons and to some extent certain hospitals can be seen as buildings of social control and surveillance. The increasing population in the late 18th to early 19th centuries created the need for more centralised systems of dealing with poverty, crime and health. The study of such buildings is therefore very important in understanding how authorities devised methodologies for coping with the problems. These establishments, which segregated men, women and children in both dormitories and exercise areas, demonstrate extreme social control and need to be related to the changes in industrial and agricultural employment which brought them about. (Barber, 2019). The early leaders in the cement industry were mainly non-conformist and promoted education in the British School tradition whereas the local clergy and more traditional forces were more in favour of C of E National Schools. JB White was non-conformist but his sons went more toward C of E, hence All Saints Church, Galley Hill. The Rev Thomas Henry Candy at Swanscombe in the 1870s was radical and supported the cement industry (for employment reasons provided they paid their rates). There is evidence of a later 19th or early 20th century isolation hospital, somewhere in the fields between Springhead Road and the Ebbsfleet Valley and shown on a map of 1907 (V Smith *pers comm*). In the 20th century the National Health Service was developed. This modified and greatly extended earlier paid and charitable provision, creating its own 'archaeology' and heritage. Old

hospitals were added to and then replaced, cottage hospitals were gradually phased out, district general hospitals eventually emerging, general practice doctors worked less and less out of houses and increasingly from bespoke surgeries (similar processes for dentistry) and there were more clinics and other provision. Local Health Authorities featured. Reorganisation of the NHS from the mid-1970s saw the emergence of Regional Health Authorities, Area Health Authorities and District Health Authorities and then phased further reorganisation of tiers. Social Service provision should also be noted. may be mentioned too. All this adding to the historic infrastructure of the EDC area (V Smith *pers comm*).

6.12 Church and religion

Although regionally, some Medieval churches and chapels were demolished during the early Post-Medieval period due to the Reformation and/or for economic reasons, the churches at Swanscombe and Northfleet, represent some of the most significant pre-industrial heritage assets of the study area and around which the communities developed and continue to exist. There were some additions to existing Medieval churches and rebuilding during the Victorian period. Changes varied from the insertion of new doors/windows, structural and totally new builds/rebuilds to changes in internal fixtures, fittings and decor. Internal changes included liturgical rearrangements, removal/defacing of anything seen as ostentation by the Puritans, and the monumental evidence for changing views to death and society. (Barber, 2019).

The Grade I listed church of St Peter and St Paul at Swanscombe (TQ 67 SW 36) is of probable Anglo-Saxon origins, re-using Romano-British building materials, with later Medieval elements. The church was heavily restored by Jabez Bignall in 1872-3 and repaired by him after a fire in 1902, reflecting the continued importance of the church at the heart of the much-increased community that resulted from industrialisation and urbanism. Post-Medieval changes to churches, such as the introduction of heating, are worthy of study in their own right before they are replaced.

The parish church of St Botolph, in the historic core of Northfleet, is a Grade I listed building. (TQ 67 SW 1131) with main construction periods between 1200 to 1709. From AD 798 the estate of Northfleet, with lands for grazing and pannage in Aylesford Common, was a possession of the archbishops of Canterbury. By the mid-tenth century there was a stone church on the same hilltop site where the parish church of St Botolph still stands. It consisted of a rectangular nave and a small square chancel. The surviving south-west corner of the nave is built of long-and-short quoining, a feature of mid-tenth century Saxon architecture. Most of the architecture is early 14th century with some 13th century and earlier work, except the tower which was rebuilt after a collapse in 1717.

The site at Ingress Abbey had been endowed by Edward III in 1363 to the nuns of Dartford Priory and they had used it until the 1530s as a farm and for chalk quarrying. After the suppression the crown granted it to John Bere of Dartford and in 1562 Queen Elizabeth granted it jointly to John Bere and Sir Edward Darbyshire. (Historic England, Designation consultation report 2012).

This period is marked by the rise of the non-conformist community and these new ideas saw the construction of various chapels and meeting houses, which became increasingly common after the mid-18th century. Some of these structures remain, for example the Independent Congregational Chapel, built at Ingress Vale in the 1860s, and extant (TQ 57 SE 12). These structures reflect, among others, Quaker, Baptist, Methodist, and Presbyterian communities. Many of these buildings have, however, been demolished or converted to other use with little/no archaeological survey work. Although nonconformist chapels and the new Roman Catholic churches (following toleration in 1829) had a major effect on village/town populations in industrial areas the effect in the South-East is less well appreciated (Barber, 2019). Other examples in the study area include the Congregational Church at Northfleet (TQ 67 SW 1219) which was built in 1850 and the Methodist Church on Wood Street. The former St Mark's was located on London Road, Rosherville (MKE104585) where the original church was built in 1855, with the cost and endowment borne by the Rosher family). It was of Kentish ragstone and Caen stone and had a vicarage which was also in ragstone and in a Gothic style. The vicarage was demolished in 1964 and the church in 1976 to be replaced by the present structure. (Ref. A historical walk through... Gravesend Historical Soc). All Saints Church on Perry Street opened in 1871 [ref.]. The Huggens's College Almshouses in Northfleet (TQ 67 SW 1563) were built in 1847 by John Huggens. They were demolished in 1968 and new retirement bungalows and chapel were built on the site. The Chaplain's house, originally a farmhouse, is all that remains of the former College. The original buildings are shown on the 1862-75, 1897-1900 and 1929-52 maps. A Cemetery Chapel was built at Northfleet. In the 20th century the Church of Our Lady of The Assumption was built 1913 – 1916. Replaced the former R.C. Church of Our Immaculate Mother and St. Joseph which is now used as a Buddhist Wat. <https://www.churches-uk-ireland.org/towns/n/northfleet.html>.



Figure 6.15: *Our Lady of the Assumption* (photo Clem rutter Creative Commons CC-BY 2.5)

6.13 Funerary practices (cemeteries and burial)

Although there has been little research in the study area for this period, cemeteries offer important opportunities for understanding social change through this period. The study of the body, clothing, coffin, associated gravestone and biographical data offers a useful tool for establishing details of burial practice for different elements of society at different times. (Barber, 2019). Larger burial groups in particular offer the opportunity to study Post-Medieval diet, demography and health. Cremation was legalised by the Home Office in 1885 and following the increased industrialisation and urbanisation of the area many cemeteries had to be expanded, for example the new cemetery and chapel at Swanscombe .

Monuments and memorials, for example in church yards as well as those in public and private spaces (e.g. the seated Britannia Bevans Memorial which is to be re-sited within the Harbour Village development) offer unique insights into many aspects of the period, such as displays of wealth, community and kinship. War memorials are located at Northfleet (a freestanding cross memorial for the First World War on the Hill at St Botolph's) and at Galley Hill Church, Swanscombe. A small stone memorial was also erected at Swanscombe Park in Gunn Road (an obelisk for the First and Second World Wars) in the 1980s. The maintenance and repair of monuments is important.

6.14 Leisure, recreation and sports

The traditional rural leisure pursuits were often the domain of the upper classes. The development of fox-hunting in the early 18th century could create changes in the landscape as new woodland, coverts and spinneys were established (Barber, 2019). More obvious is the provision of extra stabling and, particularly, kennels for the hounds on estates. In the study area, only Ingress Abbey and Wombwell Hall appear to have had stables in the mid-19th century.

It is not known at present whether other forms of hunting have also left traces in the study area, such as decoy ponds with their associated landscaping and drainage and fishing lodges.

Aspects of the late 19th and 20th century 'leisure industry' which were present in the study area include those at Rosherville Gardens and surrounding area (see below) which included hotels, piers, theatres, cinemas, cricket and football grounds, ?golf courses, swimming pools/leisure centres and historic sites.

Swanscombe Swimming pool opened in 1936 adjacent to the London Road west of Knockhall Road (TQ 57 SE 329). It was used during WW2 for numerous civil defence purposes. No longer extant.

More research is needed to understand which facilities were developed by municipal authorities from the mid-19th century and which were provided by the private industries. An example of the latter might be the former football ground at the Robins cement works off Grove Road. The increasing population, industrialisation and urbanisation of the 19th century and early 20th century, including London which was in relatively easy reach by river and rail and later by road, created a demand for locations for leisure time, sport and recreation. Recreation facilities (e.g. sports fields) were provided by local industry as part of an agenda, not only of 'enlightenment' but to encourage a happy and healthy workforce, coupled with the development of a kind of esprit de corps and, perhaps, loyalty to the firm. This was a national trend and was important within and across a community. In the study area there was, for example, the large Blue Circle sports fields and pavilion at the side of the Ebbsfleet, with cricket, football and tennis. There were others, including Bowaters playing fields. In WW2 several became company headquarters for the Home Guard, the pavilions being used for administration and the fields for part of the training. Ebbsfleet Park, next to the Ebbsfleet river, was opened on 12 May 1909 and closed in about 1971 due to pollution issues. The railway sidings for the Northfleet Cement Works were built on the site.

Football teams included Swanscombe United who moved to a new pitch at Rectory Field in 1892, where they beat Fulham 5 – 0 in the FA Cup four years later (G Baker *pers comm*). Ebbsfleet United play at Stonebridge Road at a ground founded in 1902

and which has an original wooden stand built in 1914. This was originally the ground of Northfleet United, who amalgamated with Gravesend to form Gravesend and Northfleet FC in 1946. They now play in the Conference South league as Ebbsfleet United and won the FA Trophy in 2008. Their largest crowd here was over 12,000 when they drew with Sunderland in the FA Fourth Round in 1963. An important surviving example of a venue provided for industrial workers is the Factory Club. Built in 1878 to designs by Parr and Strong for Bevan's cement (Pyramid Brand) as a recreational hall and rooms for the workers (TQ 67 SW 1073) and used during WW2 and a community reception centre.

The most significant recreational development in the study area was The Rosherville Gardens (TQ 67 SW 1002) which re-used the former chalk quarry. The pleasure gardens were laid out by H E Kendall in 1840s on south bank of Thames. In 1837 Roshier, an entrepreneurial chalk merchant, leased the large, excavated chalk pit for 99 years to George Jones, a businessman from Islington, who formed the Kent Zoological and Botanical Gardens Company. Gardens were laid out with a terrace, a bear pit, an archery ground, a lake, a maze, flower beds, statues, a lookout tower on a spur of rock and a winding path. The development included the building of Rosherville Pier (c.1837) which was conceived as part of the proposals for the planned development of Rosherville New Town, a speculative development by Jeremiah Roshier intended to capitalise on the success of the resort town of Gravesend. By 1841, the pier had been extended with the addition of a projecting landing stage, and until the early 20th century it served as a landing place for boats carrying day-trippers to and from London, many of whom came to visit the renowned Rosherville Gardens. Over the years it suffered a number of collisions and fires but was successively repaired and rebuilt until the early 20th century, when the closure of Rosherville Gardens and a further collision with a liner sealed its fate. By the mid-20th century it had reduced in size back to the original masonry structure; it now stands disused, and much-encased in concrete. (Williamson, 2022)



Figure 6.16: *Rosherville Gardens in 1841*

The gardens were a great success and during the mid-19th century regular newspaper adverts were placed promoting the rides, such as the Eagle and Falcon West End packets (boats), which ran regularly between London and Gravesend. In August 1847 a fete and gala were held at Rosherville Gardens in honour of the Duchess of Kent's birthday, which included a regatta, with boats sailing from Rosherville Pier. Success continued into the 1860s and by November 1864, extensive improvements to the gardens were underway. In 1861 a scheme was put forward by the Northfleet Docks Company for a railway, part of which would have commenced at or near the Rosherville Pier, terminating in a junction near to the booking office of Northfleet Station. In the event, this scheme did not materialise, and it was another twenty years before Rosherville was provided with a station (see below). Rosherville Gardens was put up for sale on October 8th, 1872, following the death of George Jones. Although Rosherville Gardens remained easily accessible by steamboat and also now by rail, the rise of affordable rail travel to other seaside destinations coupled with steamboat safety fears following the sinking of the Princess Alice paddle steamer in 1878, meant that success waned and in 1900 the pleasure gardens went bankrupt. In that same year the gardens, including the pier, were put up for sale. The gardens reopened in 1903 but continued to lose money and finally closed again in 1913, never to reopen. (ibid). Information boards are being placed around the Cable Wharf development to help explain the history of the site, including buried archaeological remains which include the bear pit. The excavated remains of pier gardens entrance foundations (TQ 67 SW 1383) and other

remains of former garden features etc. (TQ 67 SW 1374) have been recorded. Site of former Rosherville Hotel VAD Hospital during WW1 (TQ 67 SW 1379). Rosherville Pier (TQ 67 SW 1003)

6.15 Public houses

Many public houses recorded on historic maps no longer survive. These included public houses such as the Royal Chartlotte (named after the ship built at Pitcher's Docks at Northfleet) where musicals were performed. The George and Dragon at Galley Hill and an example of a public house used by workers in the cement industry, the Blue Anchor Inn Public House on Grove Road, which was replaced by a modern factory building in the 20th century. In Swanscombe's Craylands Lane The Rising Sun was a cement-works pub (still extant) and was known as the Top House, as there were two other pubs further towards the cement works, also in Craylands Lane, and known as the Lower and Middle Houses, both now demolished. In the former hamlets and villages older public houses still survive including The Six Bells at Perry Street. The Plough Inn at Stone Bridge on the junction of Grove Road and London Road is shown on historic mapping as having been a public house from at least the mid-19th century through to the mid-20th century. It is possible that elements of the historic building are still extant within the existing structure on site. The building is not on the HER and not listed (nationally or locally) and appears from modern aerial photography to have been much extended. However, the topography and setting of this building, at the junction with Grove Road, the hill descending from the east along London Road and out onto the flat ground of the Ebbsfleet Valley across which Stone Bridge and a ditched embankment carried traffic, can still be appreciated. The inn has what appears to have been a courtyard of stable to the rear (east) and below ground archaeological remains of these may survive.

6.16 Concluding remarks

In considering the significance of surviving heritage assets it will be important to understand their group and not just individual value as they tell the story of how the area has developed over time. This will be particularly important given that so relatively little of what once existed has survived within the study area through to the present day. The fact that much also relates to the Portland Cement industry and its significance in the industrial and commercial development of the UK from the mid-19th century onwards should also not be overlooked. In this context, surviving heritage assets have the potential to make an important contribution to place making within the Garden City and adjoining areas.

6.17 Research Questions for Post-Medieval and Modern periods

The South-East Research Framework (SERF 2019, <https://www.kent.gov.uk/leisure-and-community/history-and-heritage/south-east-research-framework>)) exists to set the research agenda for the archaeology of south-east England (defined for SERF as Kent, Surrey and East and West Sussex). The Greater Thames Research Framework (GTRF, 1999 revised 2011 https://archaeologydataservice.ac.uk/archives/view/gtrf_na_2011/overview.cfm) carried out a similar function but was focused on the Thames Estuary. Both provide a chronological and thematic overview of the state of current archaeological knowledge for those regions and identify numerous research questions that need to be answered. Many of these are relevant for the study area and some that are particularly significant are presented below together with those identified by the review of evidence presented in this chapter.

6.17.1 General

- Threats of loss before recording due to ongoing development
- The need for better access to grey literature reports
- Greater awareness of the research of individual historians and archaeologists
- Need for national and county level initiatives (this study if more work put in)
- Detailed enhancement of the HER to follow this study
- Additions to statutory and local lists
- Methods for local researchers to update the HER – volunteer studies (ongoing)

6.17.2 Landscape and farms

- An understanding of the multifaceted landscape is essential for conservation and heritage management purposes as well as interpretation. The region's HLC projects need to be completed, made more detailed, and synthesised.

6.17.3 Houses and estates

- To look at the impact houses of the royalty/gentry had on the local landscape, economy and social structure. This is particularly relevant for those estates that constrained development close to the Thames such as Ingress Park and Crete Hall

6.17.4 Rural settlement

- The development of the study area's villages and hamlets in the Post-Medieval period.
- Study of Post-Medieval modification to existing structures and better dating thereof.

6.17.5 Gardens

- The identification of designed landscapes in the study area and other areas of public amenity. One approach to this could be to carry out a project such as those conducted by the Kent Gardens Trust recently in Medway and Swale to review the historical origins and available documentation of green spaces.

6.17.6 Urban Landscape and settlement

- The relationship between towns and their hinterland (town/country) throughout the whole period, especially their changing role in the industrial period.
- The relationship between the extractive industries and the location and nature of domestic houses in the study area

6.17.7 Communications

- The development of the road network of the area and how it related to established routes eg Watling Street and to riverine communications nodes.
- The impact of railways on the landscape and townscapes of the study area

6.17.8 Technology

- The means by which the marshlands were managed in the Post-Medieval to modern periods
- The impact of the arrival of gas and electrical power in the study area
- The effect of de-industrialisation on the study area
- The location of surviving industrial archaeology features from the study area's extractive industry eg wash mills, grinding mills, engine/boiler houses, packing sheds, cooper's shops, locomotive sheds, tramways as well as housing and welfare of the workers
- The link between industrial-scale quarries and lime/cement works and the communication network
- Systematic recording of other quarries through historical and archaeological research. The majority of these need to be classified by form, establish the material extracted, their date and distribution.

Note:

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