

Shorne Marshes, Gravesend Kent DA12 3HU

Archaeological Desk-based Assessment

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Prepared by: L O'Shea-Walker

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Canterbury Archaeological Trust Ltd

92a Broad Street · Canterbury · Kent · CT1 2LU

+44 (0)1227 462 062 · admin@canterburytrust.co.uk · canterburytrust.co.uk

Registered Charity no: 278861 · Company Registered no: 1441517 (England)



SUMMARY

This desk-based assessment of land at Shorne Marshes, Gravesend, Kent DA12 3HU (TQ 68945 74227; Fig 1), was commissioned of Canterbury Archaeological Trust in October 2023 in view of proposed development of the site.

The report constitutes a rapid appraisal focused on the Historic Environment Record, map regression, satellite and aerial photography, and existing site records analyses, with provisional historical contextualisation. More details of the scope of this report are given in section 2.

On the basis of circumstantial evidence, archaeological remains, particularly of potential Romano-British, medieval, post-medieval and modern date, might be extant within the proposed development areas and could be disturbed or destroyed through development groundworks.

Further mitigation of the potential effects of development groundworks is likely to be a condition on planning consent.

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1. INTRODUCTION

- 1.1 This report presents a provisional desk-based assessment constituting rapid archaeological appraisal of land at Shorne Marshes, Gravesend, Kent DA12 3HU (TQ 68945 74227; Fig 1); it was commissioned of Canterbury Archaeological Trust (CAT) in October 2023 in view of proposed works within the site.

2. SCOPE OF STUDY AND CAVEATS

- 2.1 It is understood that the scope of this initial appraisal is of necessity limited by the context of its production. The research undertaken, verbally agreed with the client and in accordance with the *National Planning Policy Framework* (NPPF 2023), has treated only with readily available circumstantial evidence in order to provide an initial assessment of the potential extent, nature and significance of any archaeological evidence within and near each proposed development area (PDA).
- 2.2 The report includes analysis and interpretation of the Historic Environment Record (HER), National Heritage List for England (NHLE on-line), map regression, aerial and satellite photographs, and any existing site records analyses, with some provisional historical contextualisation where this might qualify archaeological data in a meaningful way through understanding the site's general history. It has been beyond the means of this project to pursue detailed questions requiring an in-depth study of primary documentary and cartographic sources at this stage. Only readily available maps showing significant topographical developments are reproduced.
- 2.3 A site visit was not considered a meaningful research activity in this case and has not been undertaken.
- 2.4 Both designated and non-designated heritage assets are considered in the report, for the purpose of providing additional context for consideration of the significance of potential archaeological heritage assets. This report is not expected to produce any detailed heritage statements pertaining to any extant and known heritage assets or their setting, or, for example, to provide any detailed historic landscape analysis or other research requiring specialist input, such as geoarchaeological, or Palaeolithic study. Such studies may form the basis of a developing mitigation strategy, and be requested as additional work by the Local Authority, but will necessarily form the basis of separate projects and funding.
- 2.5 The level of detail and scope of this assessment and report are sufficient for the findings of a rapid appraisal, pointing to the need for further study if likely/recommended. Any request of the client for further desk-based work should clearly demonstrate the benefits of such an approach, however, as opposed to actual fieldwork, for example, which would provide direct evidence, rather than more, and probably equivocal, circumstantial evidence.

2.6 An interim impact assessment is offered with this report. This is clearly based on the circumstantial evidence gathered from desk-based assessment. This interim impact assessment is chiefly offered as guidance to the client in terms of any potential for follow-on work. The interim impact assessment herein should not be considered or referred to as an 'impact assessment' *per se*, since we recognise that more fixed and specific detail of groundworks are required in order to compare with sufficient actual evidence from fieldwork for a full impact assessment. A further review point between this study and any follow-on fieldwork might indeed take the form of a standalone or add-on impact assessment, if and when a frozen design and particular strategy for development groundworks have been made available for consideration, and if sufficiently relevant, reliable, and detailed comparative data are available.

2.7 Relevant policy and research frameworks for the study are set out below as terms of reference.

3. POLICY AND RESEARCH FRAMEWORKS

3.1 This report has been prepared in accordance with national and local policy regarding heritage assets and with reference to research frameworks.

National policy

3.2 The NPPF sets out a series of core planning principles designed to underpin plan-making and decision-taking within the planning system. Paragraph 189 (NPPF 2023, 55) states that heritage assets are:

an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations.

3.3 By definition, the historic environment includes all surviving physical remains of past human activity. Heritage assets include extant structures and features, sites, places, and landscapes. Furthermore, the historic landscape encompasses visible, buried, or submerged remains, which includes the buried archaeological resource.

3.4 When determining planning applications, the following paragraphs (*ibid*, 56–8) are pertinent:

194. In determining applications, local planning authorities should require an applicant to describe the significance of any heritage assets affected, including any contribution made by their setting. The level of detail should be proportionate to the assets' importance and no more than is sufficient to understand the potential impact of the proposal on their significance. As a minimum the relevant historic environment record should have been consulted and the heritage assets assessed using appropriate expertise where necessary. Where a site on which development is proposed includes, or has the potential to include, heritage assets with archaeological interest, local

planning authorities should require developers to submit an appropriate desk-based assessment and, where necessary, a field evaluation.

195. Local planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal (including by development affecting the setting of a heritage asset) taking account of the available evidence and any necessary expertise. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal.

196. Where there is evidence of deliberate neglect of, or damage to, a heritage asset, the deteriorated state of the heritage asset should not be taken into account in any decision.

197. In determining applications, local planning authorities should take account of:

a) the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation;

b) the positive contribution that conservation of heritage assets can make to sustainable communities including their economic vitality; and

c) the desirability of new development making a positive contribution to local character and distinctiveness.

198. In considering any applications to remove or alter a historic statue, plaque, memorial, or monument (whether listed or not), local planning authorities should have regard to the importance of their retention in situ and, where appropriate, of explaining their historic and social context rather than removal.

Considering potential impacts

199. When considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance.

200. Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), should require clear and convincing justification. Substantial harm to or loss of:

a) grade II listed buildings, or grade II registered parks or gardens, should be exceptional;

b) assets of the highest significance, notably scheduled monuments, protected wreck sites, registered battlefields, grade I and II listed buildings, grade I and II* registered parks and gardens, and World Heritage Sites, should be wholly exceptional.*

201. Where a proposed development will lead to substantial harm to (or total loss of significance of) a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or total loss is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply:

a) the nature of the heritage asset prevents all reasonable uses of the site; and

b) no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; and

c) conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and

d) the harm or loss is outweighed by the benefit of bringing the site back into use.

202. Where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal including, where appropriate, securing its optimum viable use.

203. The effect of an application on the significance of a non-designated heritage asset should be taken into account in determining the application. In weighing applications that directly or indirectly affect non-designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset.

204. Local planning authorities should not permit the loss of the whole or part of a heritage asset without taking all reasonable steps to ensure the new development will proceed after the loss has occurred.

205. Local planning authorities should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.

206. Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites, and within the setting of heritage assets, to enhance or better reveal their significance. Proposals that preserve those elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably.

207. Not all elements of a Conservation Area or World Heritage Site will necessarily contribute to its significance. Loss of a building (or other element) which makes a positive contribution to the significance of the Conservation Area or World Heritage Site should be treated either as substantial harm under paragraph 201 or less than

substantial harm under paragraph 202, as appropriate, taking into account the relative significance of the element affected and its contribution to the significance of the Conservation Area or World Heritage Site as a whole.

208. Local planning authorities should assess whether the benefits of a proposal for enabling development, which would otherwise conflict with planning policies but which would secure the future conservation of a heritage asset, outweigh the disbenefits of departing from those policies.

- 3.5 A footnote to paragraph 200b reads: ‘Non-designated heritage assets of archaeological interest, which are demonstrably of equivalent significance to scheduled monuments, should be considered subject to the policies for designated heritage assets’.

Local policies

- 3.6 Applying the same general principles on a local scale, the Gravesham Local Plan Core Strategy (adopted September 2014) Policy CS20 (heritage and the historic environment) states the following (GBC 2014, 150–1).

5.16.10. The Council will accord a high priority towards the preservation, protection and enhancement of its heritage and historic environment as a non-renewable resource, central to the regeneration of the area and the reinforcement of sense of place. Particular attention in this regard will be focused on those heritage assets most at risk through neglect, decay or other threats. Securing viable, sustainable and appropriate futures for such assets at risk will need to be reconciled with the sensitivity to change that many present.

5.16.11 Proposals and initiatives will be supported which preserve and, where appropriate, enhance the significance of the Borough’s heritage assets, their setting where it contributes to the significance of the asset and their interpretation and enjoyment, especially where these contribute to the distinct identity of the Borough. These include: Gravesend Town Centre, its development as a heritage riverside town, and its setting; the Borough’s urban and rural conservation areas; and surviving built features and archaeology relating to the Borough’s maritime, military, industrial and transport history.

5.16.12 When considering the impact of a proposed development on a designated heritage asset, the weight that will be given to the asset’s conservation value will be commensurate with the importance and significance of the asset. For non-designated assets, decisions will have regard to the scale of any harm or loss and the significance of the heritage asset.

Research frameworks

- 3.7 The national and local policies outlined above should be considered in light of the non-statutory heritage frameworks that inform them. While the regional South East Research Framework for the historic environment is still in preparation, initial outputs are available

(SERF on-line) and have been considered in preparing this report, in order to take current research agenda into account.

4. LOCATION, GEOLOGY AND TOPOGRAPHY

- 4.1 The PDA is formed from two separate parcels of ground (hereafter named PDA East and PDA West) that form part of RSPB Shorne Marshes which lie to the east of Gravesend, on the Hoo Peninsula in north Kent. Shorne Marshes are bounded to the south by the disused Thames and Medway Canal, North Kent Railway Line and Hoo Junction, to the north by the Thames foreshore, to the west by the Metropolitan Police Specialist Training Centre and to the east by a further area of marshland (Higham Marshes).
- 4.2 Bedrock geology within the footprint of PDA East is shown as Thanet Formation sand, silt and clay, whilst within PDA West it is mapped as Lewes Nodular Chalk Formation, Seaford Chalk Formation and Newhaven Chalk Formation (BGS on-line). Bedrock geology within each PDA is overlain by superficial deposits of alluvial clay, silt, sand and peat (*ibid*).
- 4.3 Each PDA lies on low ground located adjacent to the River Thames on the edge of the north coast of Kent. Ground within the overall site of Shorne Marshes is relatively level and is located at a height of approximately 1m above OD.

5. DESIGNATIONS

- 5.1 Neither PDA affects or impacts upon any World Heritage Sites, Registered Battlefields, Historic Parks and Gardens or Protected Military Remains.
- 5.2 A single Scheduled Monument is located within close proximity to PDA East (Fig 2). It comprises Shornemead Fort (HER TQ67 SE63; NHLE 1484434) which was built in the 1860s as part of a scheme to remodel the forward defences of the Thames to protect the river route to London. It is located within 600m north-west of PDA East.
- 5.3 PDA West lies within 1.4km north-west and PDA East lies within 1km north of the Queen's Farm, Shorne Conservation Area (Fig 3).
- 5.4 Historic Landscape Characterisation (KHLC on-line) defines the land within each PDA as small rectilinear enclosures (type 5.1 and 5.3) located within reclaimed marshland (Fig 4).
- 5.5 A small group of Listed buildings is located within a 1.5km search radius of the PDAs. It comprises the following:
- East Court Farmhouse is an L-shaped farmhouse that dates to the eighteenth century (HER TQ67 SE1120; NHLE 1089045), located 1.2km south of PDA West.
 - Filborough Farmhouse is a timber-framed building of possible post-medieval date (HER TQ67 SE53; NHLE 1089020), part rebuilt/restored in the twentieth century, located 1km south of PDA West.

- A Granary at Little Filborough Farm dates to the eighteenth century (HER TQ67 SE1112; NHLE 1089062), located 1km south of PDA West.
- A Barn to the north-west of Filborough Farmhouse dates to the eighteenth century (HER TQ67 SE1122; NHLE 1341481), located 1km south of PDA West.

6. ARCHAEOLOGICAL AND HISTORICAL EVIDENCE

6.1 An HER search (Figs 5–15) was ordered from the Local Authority (Kent County Council), as well as a list of reports of archaeological investigations not yet included in the HER. The HER and reports search covers a radius of 1.5km around NGR TQ 68945 74227. These records have been assessed in terms of their particular relevance to the PDAs and only significant evidence is cited in this report.

6.2 General historical context for archaeological findings is provided where applicable/ significant in terms of results, and a survey of published and unpublished maps (including geology and contour survey) has been undertaken.

6.3 No pertinent geophysical surveys were available. Only photographs, images or results showing significant features or topographical developments are reproduced, the findings incorporated with map regression, documentary evidence and archaeological sections of the report as appropriate, and fully referenced.

6.4 All results of analyses are presented below in synthesis and in order of chronology.

Negative archaeological interventions

6.5 A watching brief in February 2009 at Shornmead Marsh, during mechanical excavations for a pit for access for directional drilling, located approximately 630m north-west of the centre of PDA East, did not reveal any archaeological features (HER EKE10531).

6.6 Two desk-based assessments of land at Eastcourt Marshes did not identify any potential archaeological features within land lying in close vicinity of PDA West, save for the remaining elements of the Milton Rifle Range which was created in 1862 (HER EWX9136 and EKE9777).

6.7 A magnetometry survey along the route of the Grain to Gravesend gas pipeline revealed little evidence for archaeological activity; fourteen scattered responses were detected although none seemed to form any coherent pattern and most likely related to geological or other anomalies (HER EKE17318).

Prehistoric (c 500,000 BP – AD 43)

6.8 No archaeological remains or features of prehistoric or possible prehistoric date are recorded within the boundaries of, or in immediate proximity to either PDA. However, a large number of features have been recorded, many in the form of cropmarks, within the wider area of Shorne Marshes. Along with a sizeable collection of prehistoric artefacts, including flint implements and Iron Age coins, the presence of cropmarks and excavated

archaeological features suggests potential settlement and ritual activity of prehistoric date in the surrounding area.

- 6.9** Shorne Marshes is located within an area of floodplain with, according to current mapping (BGS on-line), superficial deposits of alluvium present within each PDA. Alluvial deposits can contain buried land surfaces and they hold great potential for the recovery of prehistoric artefacts and palaeoenvironmental remains, due to the presence of waterlogged conditions, ensuring good preservation of many materials, including those of an organic composition.
- 6.10** Eight boreholes were excavated as part of geoarchaeological investigations of the route of the Grain pipeline in 2007 (HER EKE12719). The investigations encountered deposits of Pleistocene and Holocene origin, located within close proximity of PDA East (see Fig 5).
- 6.11** Thirty-four test-pits were excavated as part of a palaeoenvironmental evaluation on the Isle of Grain, including within an area located 900m south-west of PDA East. The test-pits revealed the occurrence of extensive spreads of fluvial sediments belonging to a number of different river terraces across the study region (HER EKE13337).
- 6.12** The earliest evidence of archaeological activity within proximity to the PDAs is represented by the recovery of up to three Palaeolithic handaxes from Lower Higham (HER TQ77 SW96), as recorded by Roe (1968), one of them from a 'Grain Pit', the exact location of which remains unknown. However, a complex of pits once existed at Higham (now Lower Higham) in the late nineteenth and early twentieth century, and is the likely source of the handaxes.
- 6.13** Peat deposits of possible prehistoric date have been identified within the nearby area. A massive area of peat/organic clay has been recorded on the foreshore, in front of Shornemead Fort (HER TQ67 SE1053), and there are eroding peaty outcrops at Higham Saltings (HER TQ67 NE1008). Peat banks are recorded on the foreshore by Eastcourt Marshes (HER TQ67 SE1046), within vicinity of PDA West. A possible Mesolithic/Neolithic peaty outcrop, with brushwood remains, was identified near the former Shornemead Lighthouse (HER TQ67 NE1012), located to the north of PDA East.
- 6.14** Barrow Hill, Higham is reputedly a natural feature (HER TQ77 SW1) and a weathered outlier of Thanet Formation sand, although aerial photographs have suggested the presence of a very clear ditch around the feature, suggestive of the feature representing a Bronze Age barrow. However, the ditch may have been dug for drainage purposes and similar shallow ditches exist elsewhere on the marshes. The mound was reputedly excavated but no report mentioning the mound was produced. The Kent HER records that a crouched burial, with Porosphaera beads may have been found here (HER TQ77 SW11). The mound survives to an approximate height of 3m with a central truncation and other slight hollows in its sides.
- 6.15** A possible Bronze Age ring-ditch was identified at Lower Stoke during a watching brief on the Isle of Grain to Shorne pipeline in 2008 (HER TQ87 NW22; EKE10144).

- 6.16 Aerial photographs have revealed a large number of cropmarks within Shorne Marshes and the surrounding area. They suggest extensive activity, although some features may instead be of natural origin or relate to modern drainage activities.
- 6.17 The cropmarks include a group of nine ring-ditches, each between 10–20m in diameter, that possibly represent the remnants of Bronze Age round barrows (HER TQ67 SE87). Further possible Bronze Age round barrow ring-ditches have also been identified within the search area (HER TQ67 SE83, TQ67 SE108 and TQ67 SE109), including a single ring-ditch, c 9m in diameter, with a trackway to the north-west and a rectilinear enclosure to the south-east (HER TQ67 SE82).
- 6.18 Other cropmarks comprise a possible ring-ditch or enclosure fragment (HER TQ67 SE81) and cropmarks of a possible enclosure settlement at the south end of a double-ditched trackway of potential Bronze Age date, approximately 24m in length (HER TQ67 SE84).
- 6.19 A large Iron Age enclosure and a second rectilinear enclosure, both containing buildings, were identified during excavations in 2003 at Queen's Farm (HER TQ67 SE336; EKE12653). A large, slightly curving ditch was found on the east side of the excavation area. It was crossed by a causeway, flanked by post-holes, and may represent an entrance way into an enclosure. The enclosure itself appears to underlie Queen's Farm to the east. A four-post structure was found within the enclosure. A second Iron Age enclosure, rectilinear in form, was identified and was later laid out on a different alignment. Several pits appear to have been associated with this phase of activity. A second curving ditch, narrower in form, was possibly an eaves-drip gully of a roundhouse, c 7m in diameter.
- 6.20 Aerial photographs have revealed cropmarks of rectilinear enclosed settlement of possible Iron Age date (HER TQ67 SE103) as well as a possible field system (HER TQ67 SE115) and a trackway (HER TQ67 SE118). Other cropmarks of possible prehistoric, or later date include box-shaped cropmarks (HER TQ67 SE1008), linear cropmarks (HER TQ67 SE1009), plus a linear feature, possibly representing a late prehistoric trackway (traced for 175m in length) and fragments of a boundary or enclosure ditch, which were recorded to the west of Queen's Farm Road (HER TQ67 SE80).
- 6.21 Field walking along the route of the Shorne to Farningham gas pipeline uncovered a collection of prehistoric flints as well as later pottery sherds (HER EKE11483).
- 6.22 An archaeological evaluation in 2007 along the proposed Isle of Grain Gas Pipeline route revealed a number of discrete features of archaeological activity, some of which could be dated to the general prehistoric period (HER EKE10064; TQ77 SE176).
- 6.23 A series of prehistoric finds, as well as finds of possible prehistoric date, have been recovered from within the nearby area and comprise the following:
- A Mesolithic antler pick was found on Higham Marshes (HER TQ77 NW1009).

- A Neolithic leaf-shaped arrowhead was found at Queen's Farm during an excavation in 2003 (HER TQ67 SE335; EKE12653). Other struck flints were found as residual finds in later features.
- A late Neolithic/early Bronze Age flint implement, comprising a utilised retouched flake (HER MKE67212) was found at Higham during field walking in 2007 and a Neolithic flint implement (end scraper) was found at Higham during metal detecting (HER MKE95490); each find was recorded by the Portable Antiquities Scheme (PAS).
- Three Neolithic/Bronze Age flint scrapers have been included within the results of the Kent HER search (HER MKE101526, MKE101527 and MKE101530), however they have been recorded as having been found at Nonington, in Dover District and therefore appear to be an error within the database, although their grid references suggest a Gravesham location.
- A late Bronze Age founders hoard comprising lumps of bronze and socketed celts was found during gravel extractions around 1905–6 to the south of the British Uralite Company's Works (HER TQ77 SW23).
- A cow scapula, of possible prehistoric date, has been found in peat deposits (HER TQ67 SE1054).
- An unusual find of a third-century BC Greek coin was found in tidal deposits (HER TQ67 SE201).
- A collection of two gold (HER MKE67352 and MKE67362), one silver (HER MKE67361) and twelve copper alloy (HER MKE66818, MKE66819, MKE66820, MKE67348, MKE67351, MKE67353, MKE67354, MKE67359, MKE67360, MKE67371, MKE67372 and MKE67373) Iron Age coins were found at Shorne by metal detector in the 1980s and 90s, and recorded by the PAS.
- A further two Iron Age copper alloy coins (HER MKE67347 and MKE95492) were found at Gravesend by metal detector and recorded by the PAS.

Romano-British (c AD 43–450)

- 6.24** The marshlands in this part of north Kent are known to have considerable potential for surviving archaeological remains of Romano-British date. This potential is thought to mainly relate to the use of the area for pottery kilns and salt-working activities during this period. Roman-period finds tend to be found from lower deposits within the marsh area due to post-Roman flooding and silt deposition across the Hoo Peninsula. Therefore many Romano-British sites are likely to lie submerged and well below present ground surface.
- 6.25** A possible Roman-period kiln site, containing pottery and brick of first- to second-century date, was identified within the marshes during a watching brief in 1977–9 (HER TQ77 SW20; EKE4549) and Roman-period kiln wasters were recovered during pipe laying

and drainage works between Shorne and Stoke (HER TQ67 SE60; EKE4519 and 4521). Part of these works took place within PDA East with the kiln wasters recovered from the southern end of the site and the pottery kiln site located just south-east of the boundaries of PDA East.

- 6.26 A Romano-British occupation site was identified within the marshes during excavations in the summer of 1970 (HER TQ67 SE35; EKE4520), located roughly 700m west of the centre of PDA East. Pottery was found along with a layer of reddish clay which suggested the possible presence of a Red Hill type saltern site. A large amorphous mound was also identified here, measuring 60m by 90m, but is thought to be of later, medieval date. Roman finds from saltern sites are believed to be from earlier, lower levels of deposition and not associated with the mounds due to post-Roman flooding events across this area.
- 6.27 Pottery kilns have been identified elsewhere within the marshes. The site of a Romano-British pottery kiln, later reused as a rubbish pit, was discovered at Hoo Junction in 1926, but it was destroyed before it could be excavated (HER TQ67 SE28).
- 6.28 A pottery kiln was discovered in the nineteenth century, during the cutting of the North Kent railway (HER TQ67 SE29) and another pottery kiln is recorded as having been found near the railway alignment in 1861 (HER TQ67 SE30).
- 6.29 Finds associated with Romano-British settlement and a pottery production centre, dated to the first to early third century, were identified at Lower Shorne Field, during excavations in the 1950s (HER EKE3956; TQ67 SE8). Gravel extractions in c 1952 revealed evidence for ten kilns. Only one kiln was examined and this contained second-century pottery. Other kiln locations might have instead been rubbish pits. Late Roman burials of fourth- to fifth-century date were also recorded with nine graves identified, all aligned north-south. The site is indicative of a long period of Romano-British settlement, apparently associated with pottery production until the beginning of the third century, after which it became agriculture based.
- 6.30 Further Romano-British burials have been recorded in the nearby vicinity and include a group of Roman-period ceramics, comprising an urn, a flagon, a beaker, a vase and a cup of early second-century date, that were found on the Thames foreshore in 1964, to the north-east of the former Shorne Lighthouse. This group of ceramics formed evidence of a cremation cemetery, exposed along the river bank (HER TQ67 NE12).
- 6.31 Two Romano-British cremations, that contained pottery similar to those in locally produced kilns, were found during gravel excavations in c 1905–6 to the south of the British Uralite Company's Works, with more sherds of pottery found near the works site in 1924 (HER TQ77 SW23).
- 6.32 Further evidence of Romano-British settlement activity has been recorded at Lower Stoke where late Iron Age/early Romano-British ditches were identified during a watching brief on the Isle of Grain to Shorne pipeline in 2008 (HER TQ87 NW58; EKE10144). Within roughly the same area, an excavation in 2003 at Queen's Farm revealed evidence of a

rectilinear field system of Romano-British date (HER TQ67 SE337; EKE12653). Cultural material from the ditches was dated from the late first to the early third century.

6.33 A large assemblage of both fineware and coarseware pottery sherds was found alongside a group of ceramic vessels in the area of the former Shornemead Lighthouse, on a possible Roman-period salt-working site that had weathered out of the Thames foreshore (HER MKE67466, MKE67467, MKE67470, MKE67472, MKE113248, MKE113249, MKE113250, MKE113251, MKE113252, MKE113253, MKE113254, MKE113255, MKE113256, MKE113257, MKE113258 and MKE113259). One of the vessels comprised a large storage jar (HER MKE67471), dated to c AD 175–300, which contained the cremated remains of a juvenile dog. Apparently this is a known occurrence in Kent where cremations of dogs are buried at salt working sites. Most of the ceramics were of second- to third-century date, although sherds of earlier and later date were also present. Associated finds included fragments of Roman briquetage, likely to have come from vessels used for the evaporation of sea water to make salt (HER MKE67473 and MKE67475), and a bone pin, dated to c AD 50–200 (HER MKE113247). All of the finds were recorded on the PAS.

6.34 A large assemblage of Romano-British finds have been recorded within Shorne Marshes and the surrounding area, including along the foreshore, although most are largely without context and have been recorded as scattered find-spots. Some of these finds are possibly related to Roman-period occupation at Higham Creek (HER TQ77 NW20), located 1.4km north-east of PDA East. They comprise the following:

- Sherds of second-century Romano-British pottery, including Samian ware, were found within a deposit of alluvial clay near a land drain at Shorne Marshes, at a depth of about one metre (HER TQ67 SE59). Some of the sherds were water-worn.
- An assemblage of pottery, of mainly first- to third-century date, was found along the foreshore at Higham Saltings and by Shornemead Fort, largely eroded from the saltmarsh (HER TQ67 SE1057, TQ67 SE1059, TQ67 SE1062, TQ67 NE1009, TQ67 NE1010, TQ67 NE1011, TQ67 NE1014 and TQ67 NE46).
- An assemblage of both fineware and coarseware pottery sherds, as well as incomplete ceramic vessels of late first- to early fifth-century date, have been recovered from the Shorne and Higham areas during metal detecting, mudlarking and fieldwalking activities, as well as by chance, and recorded by the PAS (HER MKE67312, MKE67313, MKE67314, MKE67460, MKE67461, MKE110607, MKE110596, MKE113240, MKE113241, MKE113242, MKE113243, MKE113244 and MKE113246).
- A total of twelve copper alloy coins, of mostly third- to fourth-century date, have been found at Shorne and Gravesend, by metal detector and recorded on the PAS (HER MKE66890, MKE67132, MKE79581, MKE79582, MKE79583, MKE79584, MKE79585, MKE79586, MKE95498 and MKE79610). Another coin, an imitation coin of Claudius, was found at East Court Farm in 1984 (HER TQ67 SE39).

- Other finds include an incomplete sedimentary rock whetstone that was found, by chance, from an estuarine deposit of likely Roman date (HER MKE67315) at Higham and recorded on the PAS.

Anglo-Saxon (c 450–1066)

- 6.35 There is limited Anglo-Saxon evidence in the nearby locale, with the focus of activity likely located at Lower Higham and Chalk.
- 6.36 An early sixth-century Anglo-Saxon cemetery was identified during gravel excavations in c 1905–6 to the south of the British Uralite Company's Works (HER TQ77 SW23). Several Anglo-Saxon graves were identified. Grave goods from the cemetery included six bronze brooches, dress pins, buckles, a knife, a speculum, spear heads, a bucket of oak with bronze fittings, reused Roman coins and a saucer brooch. The settlement to which the cemetery belonged was possibly '*Bulan ham*' which is one of the bounds named in a grant of land at Higham by Offa to the Archbishop of Canterbury in AD 774. A second Anglo-Saxon cemetery is recorded towards Lower Higham Road (HER TQ67 SE99), although there are few details on the HER.
- 6.37 Several rows of wooden posts near Shornemead Fort (HER TQ67 SE1060) and a row of parallel wooden stakes in the saltmarsh at Higham Saltings (HER TQ67 SE1061) could be as early as Anglo-Saxon in date, although the HER indicates they could also be as late as modern.
- 6.38 Other evidence of Anglo-Saxon activity is recorded as find-spots only and comprise the following:
- An early medieval (c 800–1100) silver finger ring (HER MKE66748) was found at Higham by metal detector in 1998 and recorded on the PAS, in a location roughly 360m south-east of the centre of PDA East.
 - An early medieval (c 750–1000) copper alloy strap-end (HER MKE67030) was found at Green Farm, Higham by metal detector and recorded on the PAS.
 - An incomplete, stitched leather eleventh-century 'foot bag' type, possible turnshoe (HER MKE113245), dating to 942–996, was found during mudlarking at Shorne and recorded on the PAS.
 - A penny of *Coenwulf*, c 820, was found at East Court Farm in 1984 (HER TQ67 SE96).

Medieval (c 1066–1540)

- 6.39 Areas of nearby settlement in relation to each PDA, as recorded in *Domesday* in 1086, were Chalk, located to the south of PDA West, and Beckley, located to the south-east of PDA East. The largest settlements in this period lay farther afield at Higham and Lower Higham to the south-east, and also Milton to the west.

- 6.40 Chalk is recorded as a settlement in *Domesday* under the name *Celca*. Lying in the hundred of Shamwell with a recorded population of twenty-four households in 1086, it is listed as having a church and occupied by fourteen villagers, six smallholders and four slaves (*Domesday on-line*, sv Chalk).
- 6.41 Beckley is recorded as a small settlement in *Domesday* under the name *Bichelei*. Lying in the hundred of Shamwell, on the edge of marshland, with a recorded population of three households in 1086, it is listed as occupied by one villager and two smallholders (*Domesday on-line*, sv Beckley). Prior to the construction of the Uralite Works and quarrying activities, settlement at Beckley possibly existed into the 1920s or 30s, but seems to have been entirely removed following gravel extractions at Beckley Hill.
- 6.42 The marshland areas of the Hoo Peninsula are dominated by probable salterns; earthworks and soil marks associated with salt production that were common in coastal and estuarine localities. Although salt-working activities may have been present in the local area since the late prehistoric and Romano-British periods, salterns were more commonplace in the medieval period and include a range of features connected with the collection and evaporation processes, of which the most visually distinctive are the oval or kidney-shaped middens of waste material which may cover areas of 2ha or more. The principal features of a medieval saltern are the remains of a series of low platforms, pits or tanks dug into the marsh clay and adjacent mounds. These mounds are the result of large-scale salt manufacturing where brine was extracted from salt-rich sediments, concentrated and evaporated using a process known as sleeching. The discarded waste material from the process built up around the production area into a sizeable mound, often with a hollow in the centre where a hut stood. They often occur in clusters around former and surviving tidal water-courses within the marsh. Many of these mounds were subsequently utilised as sheepfolds, sheep washes and stock refuges in the post-medieval period because of their slightly elevated position in the readily flooded marshes.
- 6.43 A potential salt mound or saltern of medieval origin, with associated banks and possible evaporation channels, has been identified close to the eastern end of PDA East (HER TQ67 SE1255), and a group of salterns have been identified within Shorne Marshes, roughly 800m–1km west of the centre of PDA East (HER TQ67 SE301 and TQ67 SE1022), as part of a landscape project in 2009–12 (EKE15020 and 15021).
- 6.44 Other possible salt mounds and salt workings have been identified across the marshes (HER TQ67 SE302 and TQ67 SE1014), and include a very large amorphous mound, c 90m by 60m, surrounded by drainage ditches, which could form the remains of a medieval saltern mound located within an earlier Romano-British site (HER TQ67 SE35).
- 6.45 An excavation in 2003 at Queen’s Farm revealed a medieval farmstead of late thirteenth- to mid fourteenth-century date (HER TQ67 SE338; EKE12653). Three structures were found, evidenced by beam slots and post-holes. One building was c 21m by 14m and contained a central pit lined with chalk blocks, and a sunken room at the southern end, also lined with chalk blocks. Adjacent to this building was a second structure that measured 10m by 7.5m; within it were two hearths and a chalk-lined well. The third structure was 6m by 4.5m and contained no internal features. To the west of

the structure there was an area of burning and a gravelled surface lay to the east. A number of associated refuse pits, ditches and clay quarries were identified and dated by pottery to c 1275–1350.

6.46 Other evidence of medieval activity is recorded as find-spots only, mostly found by metal detector and during mudlarking activities, from Shorne, Gravesend and Higham (as recorded on the PAS) and comprise the following:

- A medieval cast lead alloy figure of a cockerel, probably a brooch or a mount, dated c 1350–1500 (HER MKE67133).
- A medieval D-shaped silver buckle, dated c 1100–1500 (HER MKE67198).
- A medieval English copper alloy jetton, dated c 1280–1345 (HER MKE79587).
- A medieval cast copper alloy animal bell, dated c 1450–1600 (HER MKE79607).
- A medieval copper alloy strap fitting or mount, dated c 1300–1500 (HER MKE79608).
- A medieval silver short cross penny (HER MKE79611).
- A medieval copper alloy folding strap clasp, dated c 1300–1450 (HER MKE95478).
- A distorted medieval copper alloy domed thimble, dated c 1400–1600 (HER MKE95479).
- A length of shaft from a medieval copper alloy candlestick, dated c 1400–1700 (HER MKE95480).
- A medieval copper alloy strap fitting or mount, dated 1350–1450 (HER MKE95487).
- An incomplete medieval vessel, dating to c 1200–1500 (HER MKE113239)
- Other finds comprise a medieval bronze armorial plaque of gilt with enamelling, found at East Court Farm in 1914, bearing the arms of England and dated to the thirteenth/fourteenth century (HER TQ67 SE95).

Post-medieval (c 1540–1900)

6.47 Edward Hasted (1797, 442–56) described the parish of Shorne as follows.

‘THE PARISH of Shorne is about three miles in extent each way. The high road from London to Rochester runs thro it, westward of which are the hamlets of Lower Shorne and Shorne-green, where the ground is low and flat; southward of the road it rises up to the village of Shorne, through orchards and small enclosures of elm trees.....The soil of this parish is in general a loam, rather fertile, which is still more so as it extends northward nearer to the

marshes, where it is mostly a smooth plain surface; the air of this parish is not reckoned the most healthy, owing to its exposure and nearness to the large tract of marshes adjoining to the Thames. In 1796, a battery, mounting four twenty-four pounders, was erected in this parish, adjoining to the sea wall, for the better protection of [t]his river.'

- 6.48 His description of the parish of Chalk (*ibid*, 457–71) is also pertinent here, given its close proximity to Shorne Marshes.

'THE PARISH of Chalk is situated twenty-four miles from London; its extent, from north to south, is about two miles, and from east to west, a mile and an half. The southern part of it is very hilly, the northern, a level flat surface; the enclosures are in general large; the soil is fertile, being mostly a loam, with some chalk, though not much of it. It contains about seventeen hundred acres, forty houses, and two hundred and thirty inhabitants. The southern part is arable, the northern, marsh land, containing about two-thirds of the parish, bounded northward by the river Thames, and is called Chalk and Denton level, being under the direction of the commission of sewers, held for the purpose at Rochester. The high London road passes through it, on which, at the western boundary, is the village of West Chalk, usually called Chalk-street, where the road divides; that to the northward, by the edge of the marshes, through the hamlet of East Chalk, towards Higham, Cliff, and the hundred of Hoo; the other strait on to Rochester.

About a mile eastward, near the road, is the church, standing alone on the brow of the hill; below which, about a mile northward in the low country, is the hamlet of East Chalk, standing close to the marshes, which extend from thence to the Thames; its contiguity to so large an extent of marshes, to which its situation is wholly exposed, makes it accounted very unhealthy, and much subject to agues, particularly in autumn.'

- 6.49 Hasted's descriptions accurately describe the extent of marshland in this area of Kent and in his description of Shorne he mentions the location of a defensive battery at a site later redeveloped as Shornemead Fort.

- 6.50 It was during the early part of the post-medieval period when a programme of strategic, coastal defences were constructed across southern England. The possible site of the Higham Blockhouse (HER TQ77 NW149) is located to the north-east of PDA East, close to the Thames foreshore. It was built by Henry VIII in 1539 as part of a chain of coastal defences in response to the threat of foreign invasion, and was one of five blockhouses built along this stretch of the Thames in order to defend the approach to London and the dockyards at Woolwich and Deptford. It was decommissioned in 1553 and demolished in 1557–8. Nothing remains of the blockhouse and its precise location is not known although it may have stood on the west bank of Shorne Creek where it meets the River Thames. The blockhouse is shown on a 1588 map of the Thames defences by Robert Adam (not reproduced here).

- 6.51 A small number of Listed Buildings of post-medieval and eighteenth-century date are located nearby to PDA West (see para. 5.5), indicating some expansion of post-medieval settlement in the immediate locale, as evident at East Court and Filborough Farms.

6.52 Within the wider landscape, the main settlements during this period lay to the south-west at Chalk and also to the south-east at Higham, with the PDAs located within reclaimed marshland, utilised for agriculture but with defensive elements, occupied by scattered post-medieval farmsteads, several of which are recorded in proximity to the PDA:

- Outfarm adjacent to the Thames and Medway Canal (HER MKE83223); a loose courtyard plan with buildings to two sides of the yard, c 1800.
- East Court Farm (HER MKE84461); a regular U-plan courtyard farmstead, c 1700.
- Queen's Farm (HER TQ67 SE293); a regular multi-yard farmstead, c 1800.
- Filborough Farm (HER MKE84463); a regular courtyard farmstead with buildings to three sides of the yard, incorporating an L-plan element, c 1540.
- Outfarm to the south-south-west of Queen's Farm (HER MKE84464); a regular courtyard plan with buildings to three sides of the yard, incorporating an L-plan element, c 1800.
- Old King's Farm (HER MKE84465); a dispersed plan farmstead, c 1800.
- Outfarm south-south-west of Old King's Farm (HER MKE88513); a field barn, c 1800.

6.53 Shornemead Fort (HER TQ67 SE63), located to the north-west of PDA East, was built in the 1860s as part of a scheme to remodel the forward defences of the Thames and protect the river route to London. A concrete jetty by the fort is first mentioned c 1870 (HER TQ67 SE226). The fort, due to its partial demolition, offers a cross-sectional view of a Palmerston Fort (a group of forts and associated structures around the coasts of the UK and Ireland, built during the Victorian period due to concerns about the strength of the French Navy) with the potential for buried remains of earlier fortifications. A watching brief during groundworks at Shornemead Fort revealed evidence of the creation of an earthen ramp to the rear of the casemates (HER EKE12169).

6.54 An unidentified square feature near Shornemead Fort comprises concrete building rubble at the foot of the sea wall (HER TQ67 SE1015).

6.55 The first sea wall is likely to have been built in the medieval period, with renewed construction over subsequent years. The remains of an undated ditch and bank, several hundreds of metres long, forms a stretch of embankment that runs parallel to the foreshore, with a ditch towards the sea (HER TQ67 SE1007).

6.56 Two possible sections of old sea wall may survive as a hard surface or structure by Shornemead Fort, and measure 20m by 50m (HER TQ67 SE1056), with a bank of stones/small boulders (HER TQ67 SE1058).

- 6.57 The Milton Rifle Range at Eastcourt Marshes (HER TQ67 SE1185) was built in 1862 and consists of a succession of low earthen mound firing points, a target mound and marker's gallery as well as a weather shelter. PDA West is located within an area of this former nineteenth-century rifle range, with 'butts' located to the immediate west and east. The butts were modified in the 1890s and perhaps again later. Between the gallery and the target mound was a light tramway (now covered with a concrete path), to take damaged targets to a now vanished target repair shop to the south of the butts. About 150m south of the southern extremity of the range is an east-west orientated brick building with a pitched roof, which originated in 1862 as a weather shelter. The range saw continuous use and was used intensively for rifle practice during the First and Second World Wars, and mortar firing practice during the Second World War. It continued for military rifle training until around 1980 and perhaps afterwards, when there was certainly private use. The site is owned by the Royal Society for the Protection of Birds but it is now the firing range element of the Metropolitan Police Training Facility. Although the formation of the latter has involved some further modifications to the southern end of the butts and to some of the firing points, there are substantial survivals of the original range structures. Extant remains of the shooting butts form both the western and eastern boundaries of PDA West.
- 6.58 A drainage pattern in the fields at Shorne Marshes, within the Metropolitan Police firing range likely relates to land reclamation of possible medieval or post-medieval date (HER TQ77 SW1001). Other features recorded on the foreshore by Shorne Marshes include a circular embankment within the firing range (HER TQ67 SE1020).
- 6.59 A programme of archaeological monitoring and survey in 2013 at RSPB Shorne Marshes during the excavation of a 950m long security ditch in the vicinity of Shornemead Fort revealed evidence of shooting butts, with finds of bullets from a range of calibres of British Army issue, associated with an old rifle range (HER TQ67 SE1252; EKE16356). The remains comprised a low mound and the top of a concrete wall, as well as demolition deposits. The butts were opened in 1859/60 and became disused by the late nineteenth century when they were replaced by those at the adjacent Milton Ranges. The work also uncovered some post-medieval pottery and brick fragments.
- 6.60 A large cluster of circular part water-filled holes lie adjacent to the earlier firing range by Shornemead Fort and are likely shell holes of either nineteenth- and/or twentieth-century date (HER TQ67 SE1010). This area forms the north-western boundary to PDA East.
- 6.61 Features of post-medieval or modern date are located along the foreshore and mainly comprise remains of wooden stakes, beams and fence posts that are likely to relate to former enclosures and previous attempts to make firm platforms on marshland deposits. Wooden stakes are recorded close by to Shornemead Fort (HER TQ67 SE1055) and several rows of wooden posts are recorded running from the foreshore into the water to the west of the fort (HER TQ67 SE1047 and HER TQ67 SE1049), along with a wooden post structure (HER TQ67 SE1051) and angled stakes and rubble (HER TQ67 SE1050). Other wooden post features comprise a late post-medieval/modern mooring post located on

the foreshore by Shorne Marshes built of three square piles in a triangular setting (HER TQ67 SE1033).

- 6.62 Work began in 1809 on the Thames and Medway Canal (HER TQ67 SE20) which was originally intended as a means of avoiding coastal attacks on shipping. The canal would link the Thames River to that of the Medway, providing safe access between the dockyards of Deptford, Woolwich and Chatham, but it was an expensive venture and by 1840 the shareholders decided it would be more profitable to build a railway. Eventually a railway was built utilising the tunnel and the canal was cut into two sections. A stretch of the canal is located 250m south of the centre of PDA West.
- 6.63 Several of the associated swing and lifting bridges for the canal remain in place and are located within the search radius of the PDAs (HER TQ67 SE49, TQ77 SW53, TQ67 SE344 and TQ67 SE345).
- 6.64 The South Eastern Railway Company's North Kent Line (HER TQ57 SE277) was fully opened in 1849 and was constructed between the North Kent East Junction near London Bridge via Lewisham, Woolwich, Erith and Dartford to Gravesend. Beyond there it joined the 7 miles of line operated by the Thames and Medway Canal Company, utilising the tunnels it had built between Higham and Strood. It then terminated at the canal basin at Strood. The company wanted to extend its operation to Dover, but its plans were thwarted in 1855 by the London Chatham and Dover Railway (the Chatham Line), built by the East Kent Railway Company between 1853-8. A stretch of the railway line runs within 260m south of the centre of PDA West.
- 6.65 A single track railway from Hoo Junction on the North Kent Line to Port Victoria on the Isle of Grain opened in 1882, but never flourished (HER TQ77 SE1314). Passengers alighting at Port Victoria caught a ferry across to Queenborough to connect with the Dutch Steamers. The ferry ceased to operate in 1901 and in 1916, Port Victoria pier was closed due to decay. Only high freight receipts kept the line profitable after the First World War. Despite a double track branch line to Allhallows opening in 1932, the attempt to turn Allhallows into an attractive resort failed and the branch line closed in 1961. However, the opening of the Isle of Grain oil refinery in 1951 gave the line a new lease of life.
- 6.66 Milton Range Halt (HER TQ67 SE342) – a railway halt on the Hoo railway - was built in 1882 and closed in 1932.
- 6.67 The wreck of the British Ketch 'Triumph', wrecked 1881–5, is located to the north of Shorne Marshes, off the Thames foreshore (HER TQ67 NE54).
- 6.68 Other evidence of post-medieval activity is recorded as find-spots only, mostly found by metal detector and during mudlarking activities (as recorded on the PAS) and comprise the following:
- A post-medieval silver badge, dated to c 1780–1810 (HER MKE66749) was found at Higham, in a location roughly 360m south-east of the centre of PDA East.

- A post-medieval copper alloy spur rowel, with five Fleur-de-Lis points, dated to c 1600–1660 (HER MKE67477), was found at Shorne.
- A post-medieval copper alloy button decorated with punchlines and curves to form a star and crescents, dated to c 1650–1750 (HER MKE79580), was found at Shorne.
- A post-medieval silver shilling of James I, dated to c 1604–1625 (HER MKE79609), was found at Shorne.
- A post-medieval copper alloy object dated to c 1500–1700 (HER MKE95486) was found at Higham.

6.69 It is difficult to locate the position of the PDAs accurately on the Andrews, Dury and Herbert map of 1769 (Fig 16) as they form part of the extensive and mainly featureless Gravesend Marshes that lead into Higham Marshes and beyond to Cliffe. Settlement is recorded to the south, on slightly higher ground at Chalk.

6.70 The Mudge map of 1801 (Fig 17) is very similar, but with the addition of a ‘battery’ to the north-west of PDA East; this must be the battery as mentioned by Hasted in 1797 (see para 6.47). A group of farmsteads are shown to the south of marshland.

6.71 The First Edition OS map (Fig 18), surveyed in 1863, accurately plots the large area of subdivided marshland with many of the field boundaries presented on this map surviving up to the present day. The boundaries of PDA East were in place by this time and show the area as located within Shorne Marshes, with two sheepfolds located along its north-eastern perimeter. PDA West is located within Eastcourt Marshes. The area of marshland remains featureless other than for the routes of watercourses, including a major man-made watercourse comprising that of the Thames and Medway Canal (and associated towing path and bridges), constructed in the early 1800s.

6.72 The Second Edition OS maps (Fig 19), revised in 1895, show more detail, with PDA West forming part of the Milton Rifle Range. The associated shooting butts are located to either side of PDA West, whilst to the south-west are two buildings labelled as a ‘Shelter Shed’ and ‘Range Warder’s Quarters’. No features are shown within PDA West or PDA East. Saltings are marked to the north of PDA East.

Modern (c 1900–2000)

6.73 The British Uralite Factory (located c 630m south-east of the centre of PDA East) opened in Higham in c 1900 making pipes (HER TQ77 SW1070). Uralite (now called Actinolite) is a mineral related to asbestos that was used for products such as pipes and fittings, window boxes and chimney pots. The factory had its own railway siding and a station (Uralite Halt; HER TQ77 SW90) that opened in 1906 and closed in 1961. The works are now closed with some of the buildings remaining upstanding, but in poor condition.

- 6.74 The Third Edition OS map (Fig 20), revised 1907, shows no significant changes within either PDA, but it does accurately plot the location of Shornemead Fort and its associated features. Although hard to make out on the map, the location of '*Celtic, Roman and Saxon remains found AD 1906*' are marked to the south-east of Hoo Junction and approximately 870m south-east of the centre of PDA East.
- 6.75 Three beacons are recorded within the Shorne Marshes at Higham Saltings on the Third Edition OS map (HER TQ67 SE1036, TQ67 NE1004 and TQ67 NE1005), close to Shornemead Fort, one of which lies within 460m north of the centre of PDA East (HER TQ67 SE1036). In addition, a submarine mining establishment of late nineteenth/early twentieth-century date was centred in the marshes, about 100m west of Shornemead Fort (HER TQ67 SE210).
- 6.76 The Shornemead Fort Coast Artillery Searchlights are a pair of defensive electric lights in concrete housing that were built in c 1900, set about 25m apart on the riverbank, some 75m west of Shornemead Fort (HER TQ67 SE1152).
- 6.77 The former Shornemead Lighthouse, established in 1913, only survives as a large circular base structure (HER TQ67 NE1000) with concrete rubble and piling remains (HER TQ67 NE1003). The substantial remnants of an undated possible fishtrap basket by the former lighthouse survive as submerged remains (HER TQ67 NE1013).
- 6.78 Extracts from two 25-inch OS maps (Fig 21), revised 1932 and 1939–40, show no significant changes within either PDA nor across the wider area of marshland.
- 6.79 A number of anti-invasion features associated with the Second World War remain extant within Shorne Marshes, many of which are centred around Shornemead Fort and along the foreshore.
- 6.80 Features sited around the northern perimeter of Shorne Marshes include two octagonal Second World War pillboxes (HER TQ67 SE1199 and TQ67 SE1200) and a line of anti-tank pimples (HER TQ67 SE1256), located c 330m west-north-west of the centre of PDA East, are almost certainly *ex situ* and possibly from a nearby former road block.
- 6.81 A military concrete road (HER TQ67 SE1233), built as part of Operation Overlord, runs on a north–south axis from Shornemead Fort across the marshes, connecting the Operation Overlord embarkation hard (HER TQ67 SE1011) on the riverbank in front of Shornemead Fort with the road network of the hinterland. It was probably laid in late 1943. The concrete road forms part of the western boundary of PDA East. Former anti-invasion road block buoys, since destroyed, were located in the driveway to East Court Farm, Church Road (HER TQ67 SE1160), and also at Lower Higham Road (HER TQ67 SE1161).
- 6.82 Areas of hardstanding around Shornemead Fort, built during the Second World War, include an area laid for the launching of vessels off the beach (HER TQ67 SE1048); a square-shaped concrete feature, possibly representative of a war-time defensive platform or sea mark (HER TQ67 SE1052); a stone-slab causeway, built of timber, stone and concrete, that runs from the land to the river edge on the foreshore in front of

Shornemead Fort (HER TQ67 SE227); and a sub-rectangular concrete apron on the river edge in front of the fort that was constructed in 1943 for the loading of landing craft associated with the allied invasion of Europe in June 1944 (HER TQ67 SE1192).

- 6.83 The roof of Shornemead Fort was modified during the Second World War with an anti-aircraft battery installed at the eastern extremity of the roof (HER TQ67 SE1195), along with a Battery Command Post and Minewatchers Post (HER TQ67 SE1194). An emergency battery was situated to the east of the fort (HER TQ67 SE1150), located c 500m north-west of the centre of PDA East.
- 6.84 To the west of Shornemead Fort, further along the foreshore, is the site of a barrage balloon with submerged mooring in the Thames (HER TQ67 SE1021), located c 500m north-west of the centre of PDA West.
- 6.85 Within the middle of Shorne Marshes, the crash site of a Messerschmitt aircraft (HER TQ67 SE339; DKE21744), which crashed 31 August 1940, is located roughly equidistant between each PDA.
- 6.86 Other likely modern features recorded within Shorne Marshes include a jetty, visible only as two massive wooden squared posts (HER TQ67 SE1035), located c 250m west of Shornemead Fort, and a rectilinear feature, measuring 1.5m by 10m (HER TQ67 SE1034), located adjacent to the foreshore.
- 6.87 An aerial photograph from c 1940 (Fig 22) shows no significant changes within either PDA other than an area of flooding within PDA West. The rifle range to the west of PDA West is very clear. The concrete access road leading to Shornemead Fort and associated with Operation Overlord, forms part of the western boundary to PDA East and several wartime defences, can be seen to the north-west, around the area of the fort.
- 6.88 An aerial photograph from c 1960 (Fig 23) shows the presence of features across the wide area of marshland, some likely relating to former watercourses whilst others possibly relate to old boundaries and drainage ditches, as well as possible rectilinear and amorphous shapes that may relate to previous features. To the north-west of PDA East is an area pockmarked with a large cluster of circular features, thought to be associated with firing practice. Within PDA West, the area of flooding is more obvious and covers a large portion of the site.
- 6.89 An aerial photograph from c 1990 (Fig 24) shows livestock tracks across the area of PDA East and a number of sub-circular features are present across the marshland, perhaps associated with salterns, including at least two such features within PDA East. In proximity to PDA West, a circular, water-filled feature is shown to the north-east of the site, along with other smaller areas of flooding. A new sea defence appears to have been constructed along part of the coast, comprising an earthen bank and ditch. A rectangular area of development is shown to the south of the fort.
- 6.90 A 2003 satellite image of the area (Fig 25) is much clearer, but shows no significant changes. More water-filled features are evident on the 2007 satellite image (Fig 26).

6.91 Subsequent satellite images from 2015, 2020 and 2022 (Figs 27–9) show no major changes within the area or within either PDA.

7. INTERIM ARCHAEOLOGICAL IMPACT ASSESSMENT

7.1 The following *interim* impact assessment is clearly based mainly on the circumstantial evidence gathered from the desk-based assessment, and, along with resultant mitigation suggestions, is chiefly offered as guidance to the client on likely follow-on work. It should not be considered or referred to as an ‘impact assessment’ *per se*, since we recognise that more fixed and specific detail of groundworks are required in order to compare with sufficient actual evidence from fieldwork, for a full impact assessment.

Circumstantial archaeological evidence

7.2 The proposed development is for the creation of rills and scrapes for wildlife within the RSPB nature reserve, and will involve intrusive excavations, within each PDA, of up to 600mm depth.

7.3 Existing evidence suggests there is low potential for prehistoric archaeology surviving within each PDA, as there is limited evidence of prehistoric activity within close proximity to either site. Any such remains within each PDA would therefore represent a hitherto unknown archaeological location. However, a large number of cropmarks have been identified within Shorne Marshes, some of which are of potential prehistoric date, and the presence of alluvial deposits within the marshland increases the possibility for the recovery of potentially well-preserved prehistoric finds.

7.4 Existing evidence suggests there is moderate potential for Romano-British archaeology surviving within each PDA, particularly within PDA East given the presence of Roman-period material recovered from within the site boundaries and a general focus of recovered Romano-British material in proximity to PDA East. There is also considerable evidence for Romano-British activity in the wider marshland area, in particular evidence associated with pottery production and salt workings.

7.5 Existing evidence suggests there is very low potential for Anglo-Saxon archaeology surviving within each PDA. It is likely that the focus of Anglo-Saxon activity and settlement lay farther afield, to the south, south-west and south-east of Shorne Marshes, as very few Anglo-Saxon remains have been recorded within proximity to either PDA. Any such remains would therefore represent a hitherto unknown archaeological location.

7.6 Existing evidence suggests there is moderate potential for medieval archaeology surviving within each PDA. The Hoo Peninsula is dominated by probable medieval salterns, with several such features identified within Shorne Marshes, including within PDA East where a possible saltern has been identified close to the eastern site boundary. In addition, there is potential within each PDA for evidence of land reclamation activities, including the cutting of drainage features, which may be traced to as early as the medieval period.

7.7 Existing evidence suggests there is moderate potential for post-medieval archaeology surviving within each PDA, with moderate to high potential for evidence of activity associated with the mid to late nineteenth-century Milton Firing Range within PDA West. In addition, nineteenth-century and later activity associated with Shornemead Fort and the old rifle range may extend to within PDA East which borders an area of apparent former ammunition practice.

7.8 Existing evidence suggests there is low to moderate potential for modern archaeology surviving within each PDA. The Milton Firing Range was used as a training ground during both World Wars and up until 1980, so there remains potential for stray finds, particularly of spent ammunition, to exist within PDA West. Similarly with PDA East which is located in proximity to an area that saw modifications and the construction of additional defences during the Second World War. However, no wartime features are recorded within the boundaries of either PDA.

Potential existing impacts

7.9 Previous impacts to each PDA comprise the grazing and movement of livestock, the cutting of drainage and boundary ditches, and other flood-land management activities, particularly the latter within PDA West.

7.10 However, previous impacts are unlikely to have completely removed earlier archaeological remains potentially extant within each PDA.

Potential impacts

7.11 There is a chance that extant archaeological features, artefacts or ecofacts may be disturbed or destroyed by groundworks within each PDA. The destruction of preserved archaeology without proper record risks a major negative impact on the historic environment.

7.12 Further mitigation of the potential effects of development groundworks is likely to be a condition on planning consent.

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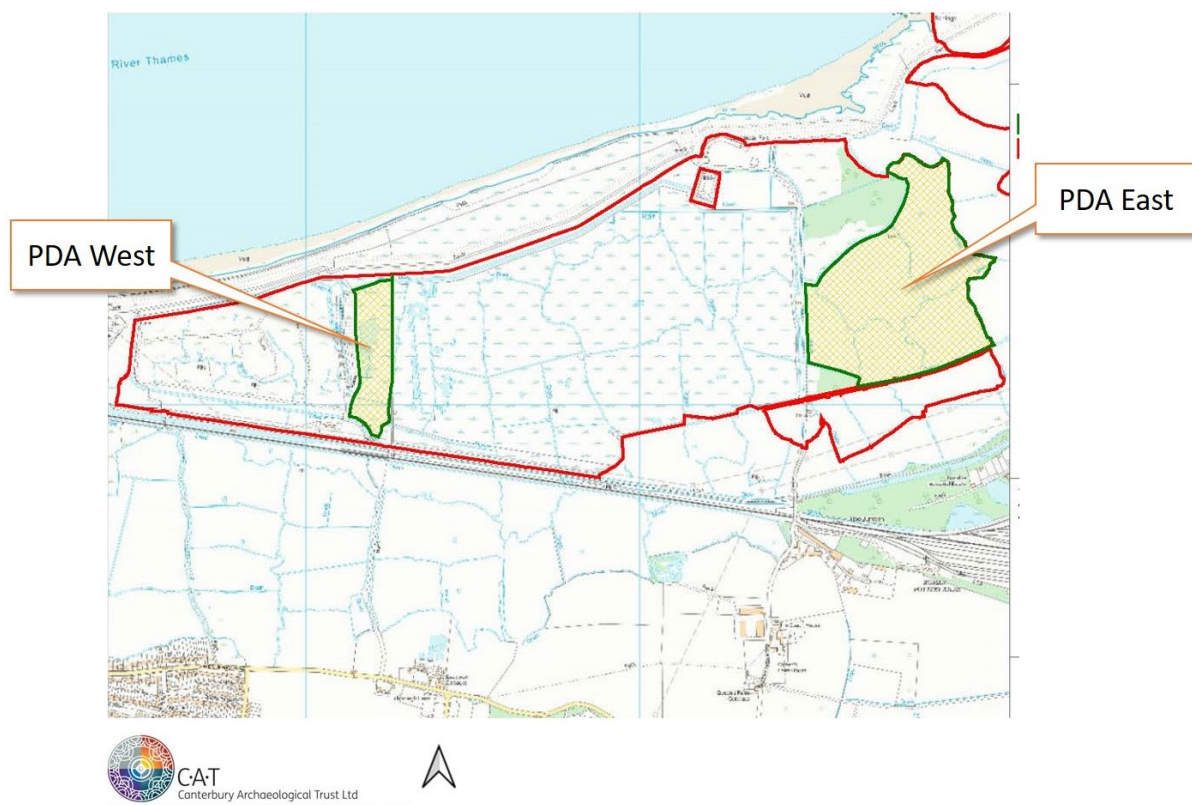


Fig 1. Location of the PDAs



Fig 2. HER search of 1500m radius from NGR TQ 68945 74227, showing detail of results for Scheduled Monuments (SAM) and Protected Military Remains (PMR)

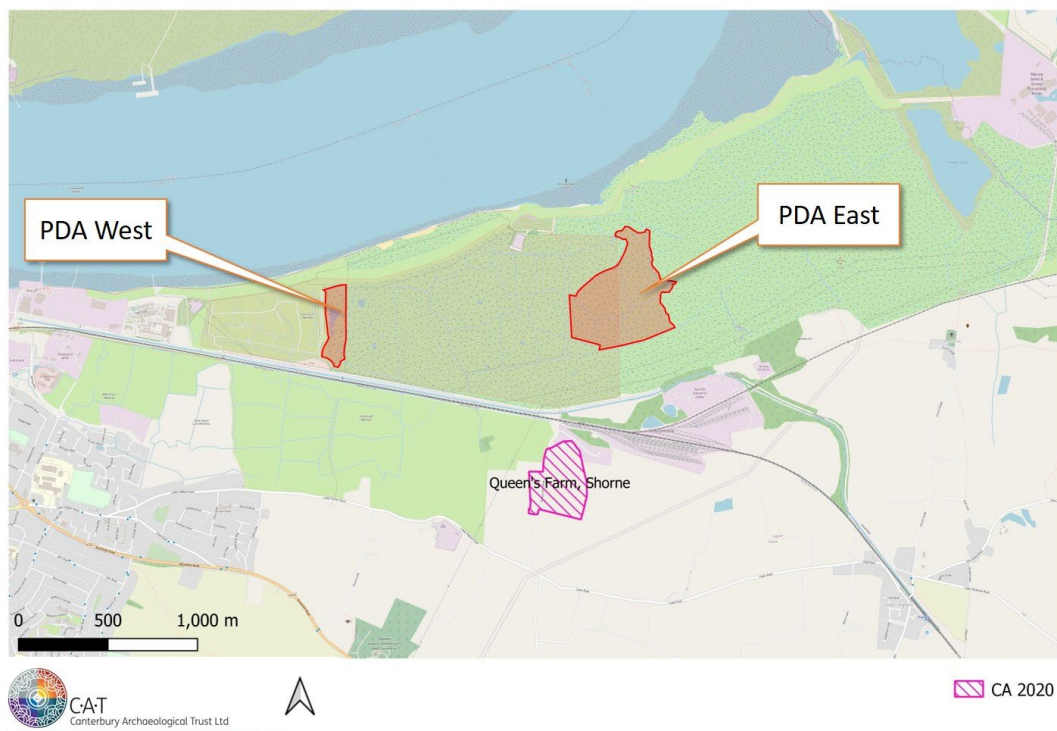


Fig 3. HER search of 1500m radius from NGR TQ 68945 74227, showing results for Conservation Areas

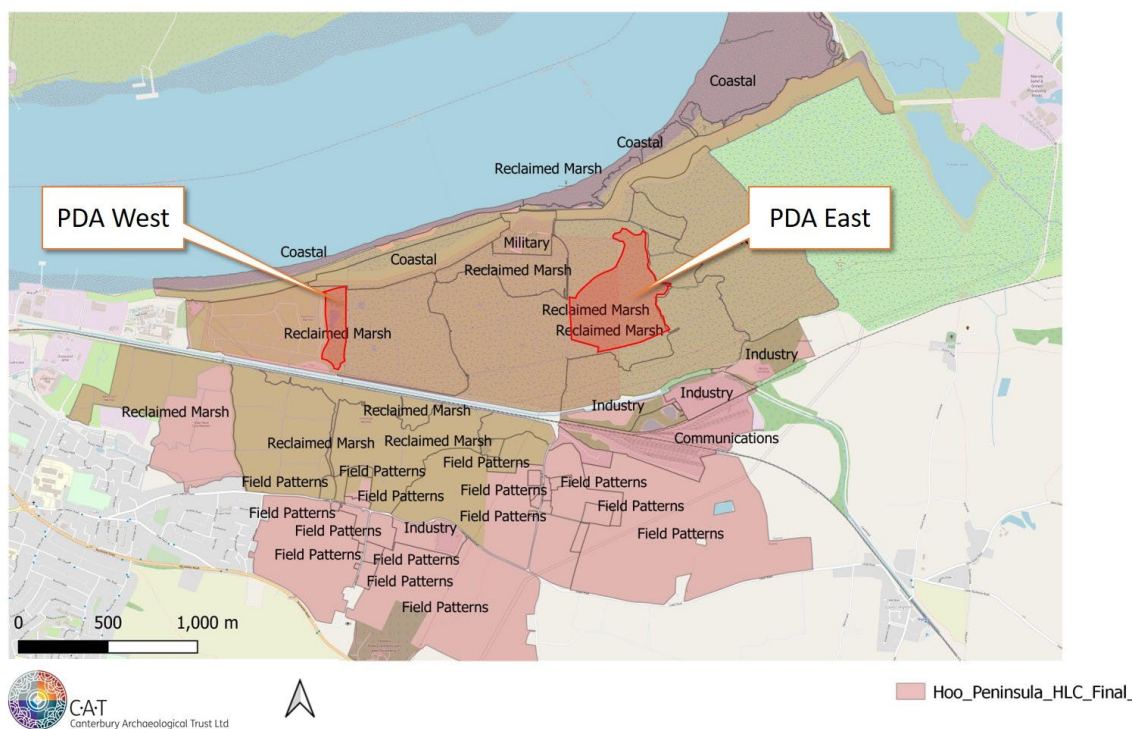


Fig 4. HER search of 1500m radius from NGR TQ 68945 74227, showing detail of results for Historic Landscape Characterisation

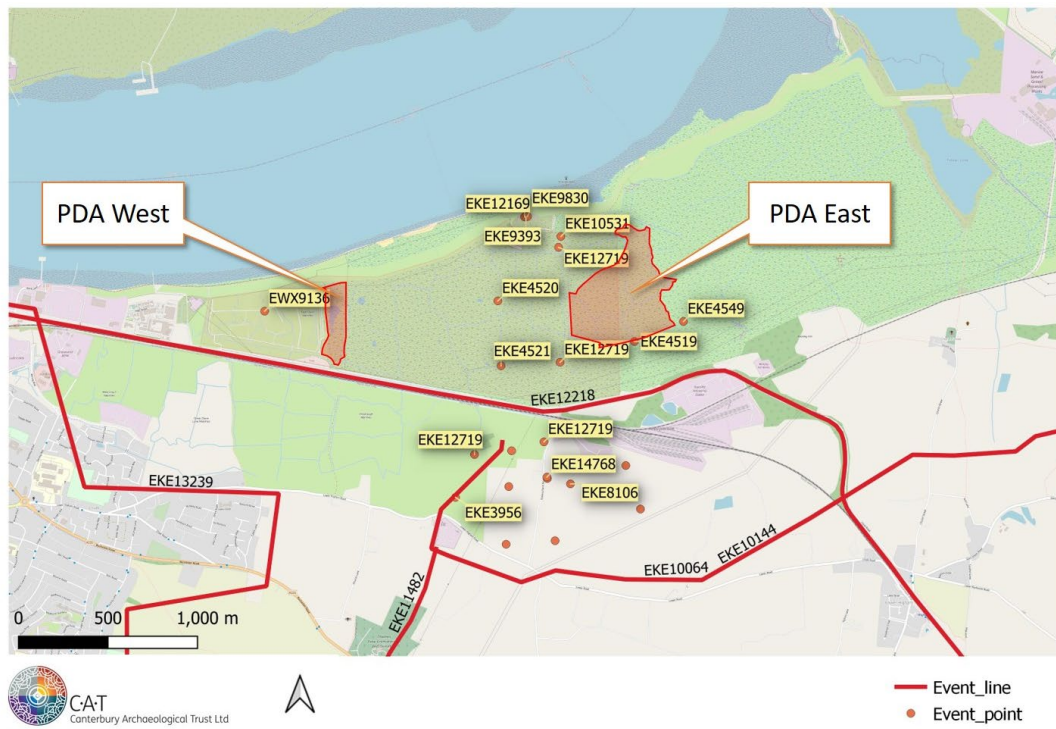


Fig 5. HER search of 1500m radius from NGR TQ 68945 74227, showing results for archaeological Events (lines and points)

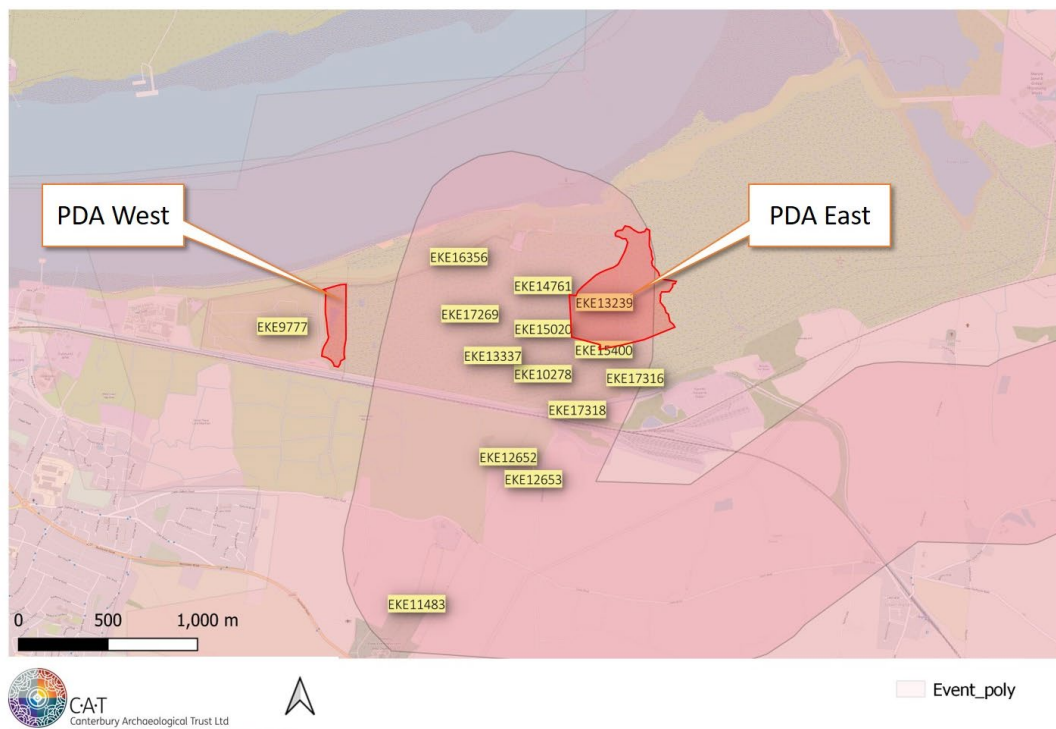


Fig 6. HER search of 1500m radius from NGR TQ 68945 74227, showing results for archaeological Events (polys)

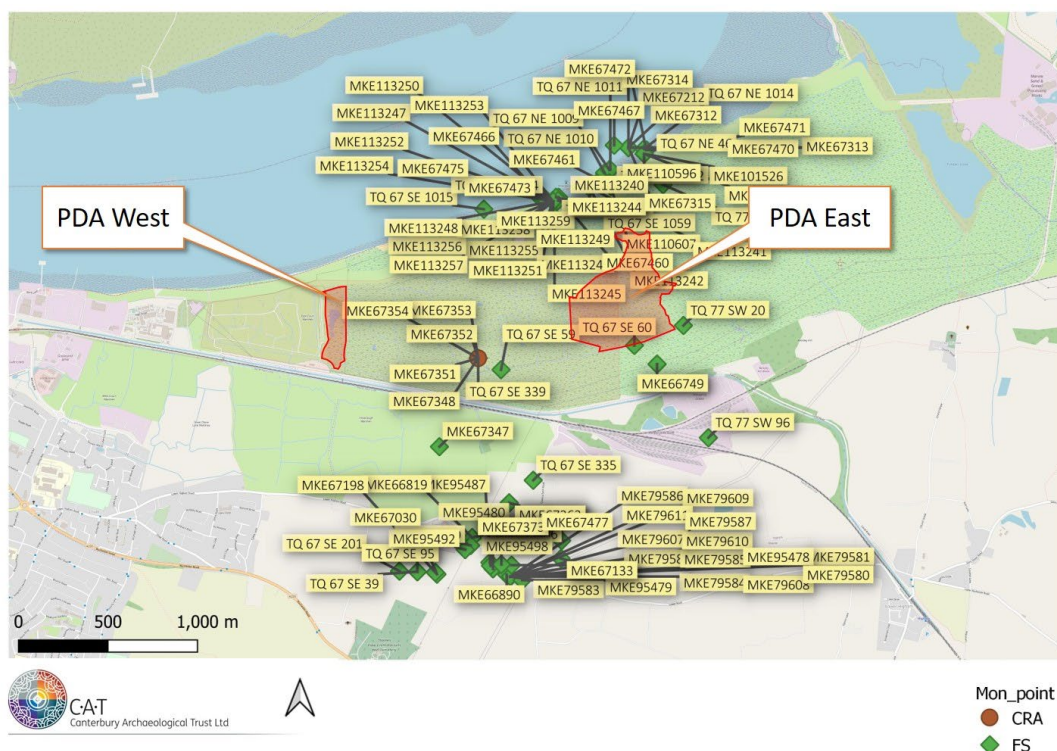


Fig 7. HER search of 1500m radius from NGR TQ 68945 74227, showing results for Monuments (points)

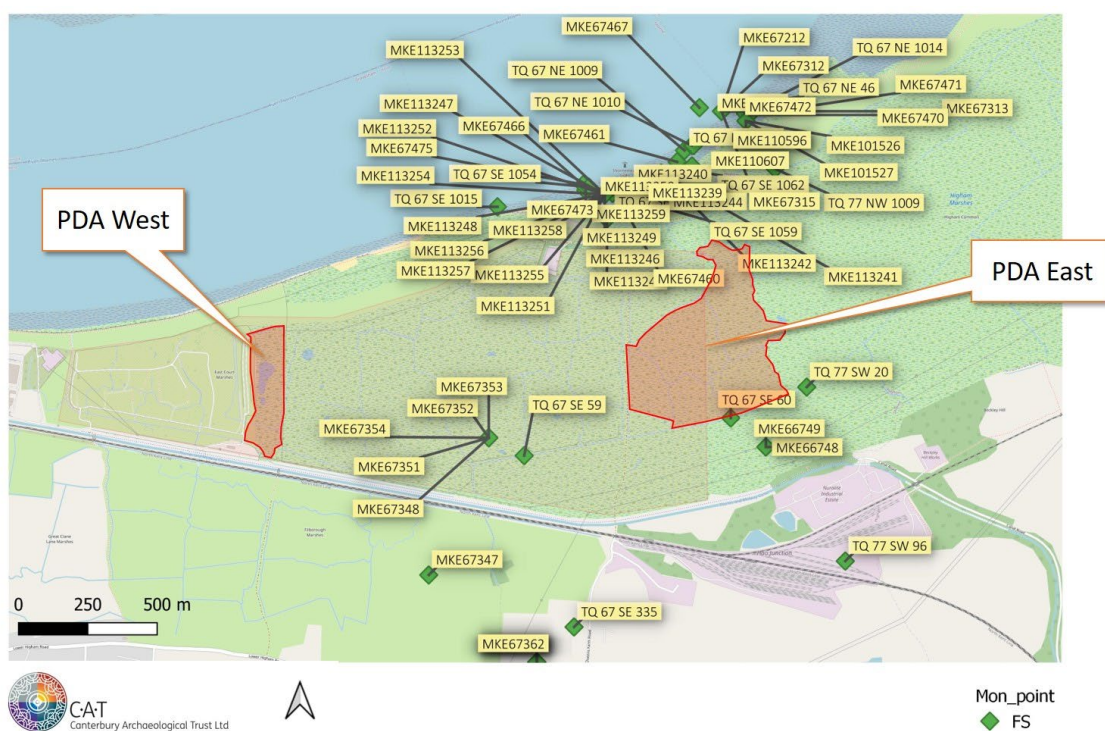
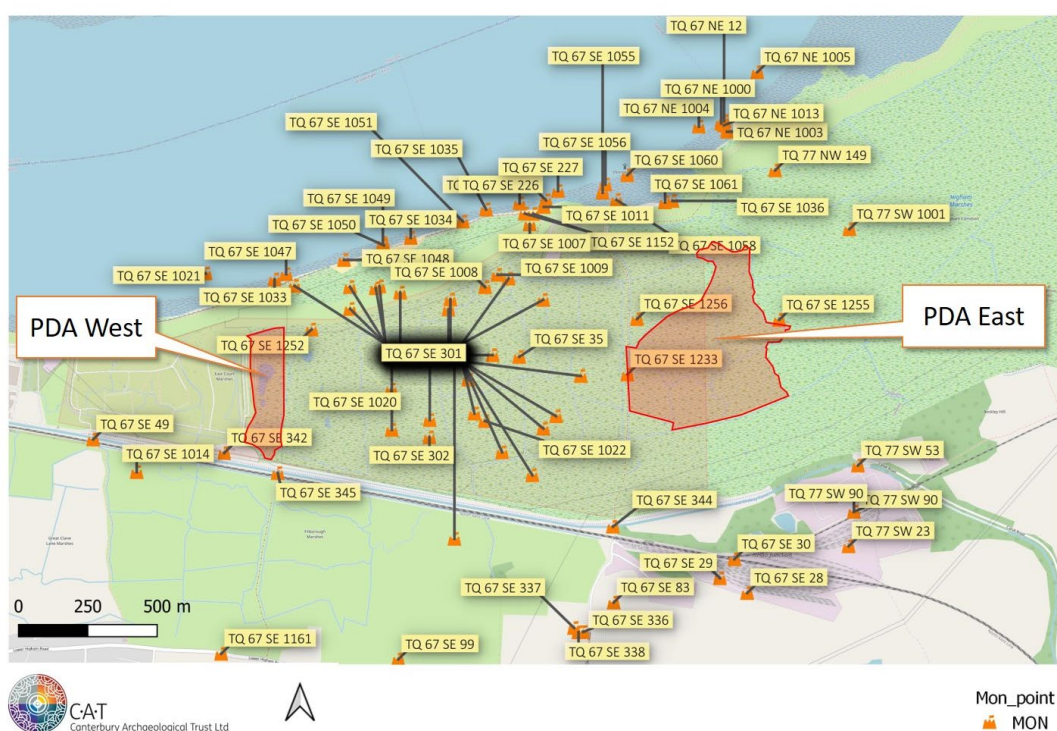
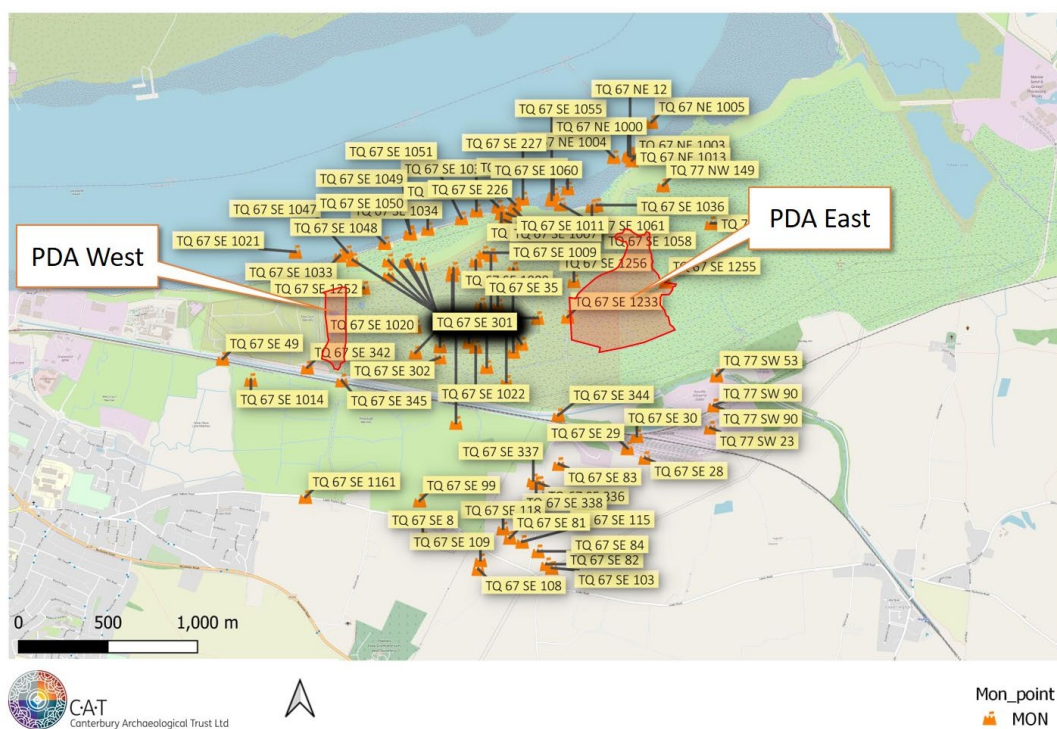


Fig 8. HER search of 1500m radius from NGR TQ 68945 74227, showing results for Monuments (points)



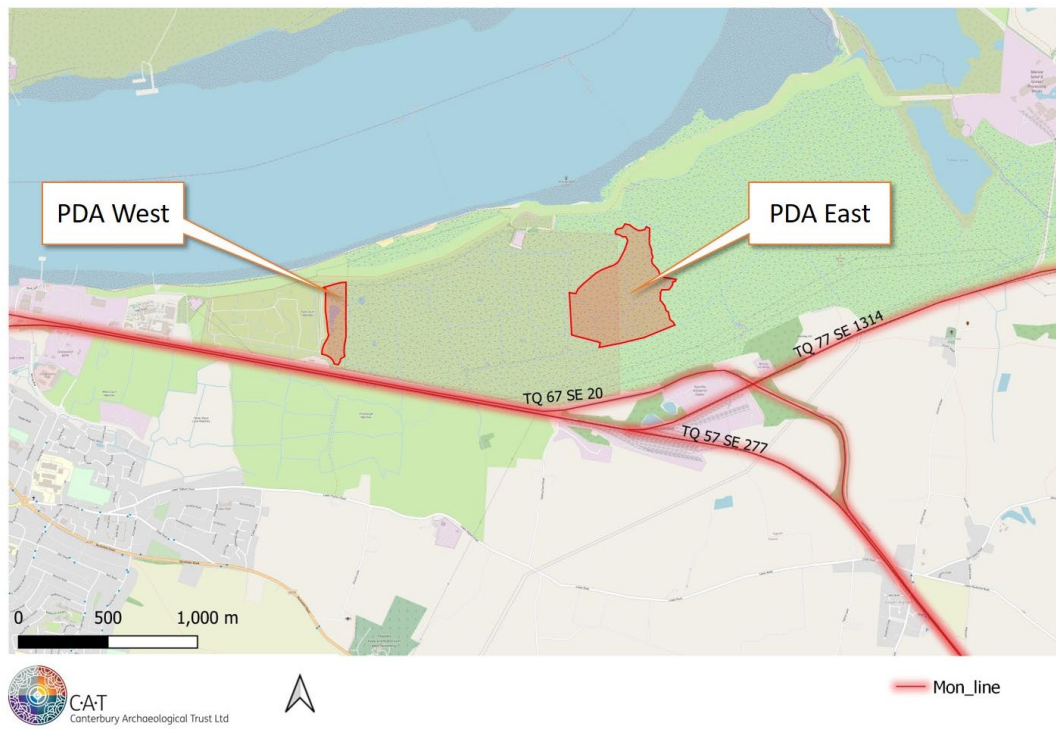


Fig 11. HER search of 1500m radius from NGR TQ 68945 74227, showing detail of results for Monuments (lines)

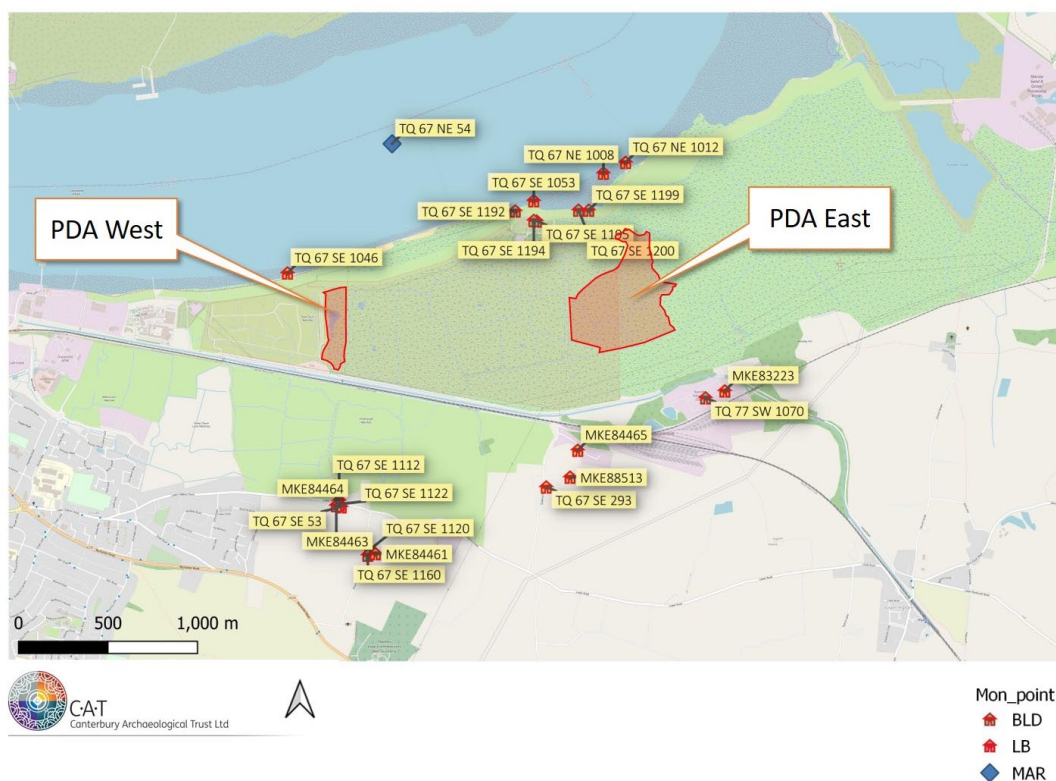


Fig 12. HER search of 1500m radius from NGR TQ 68945 74227, showing detail of results for Monuments (points)

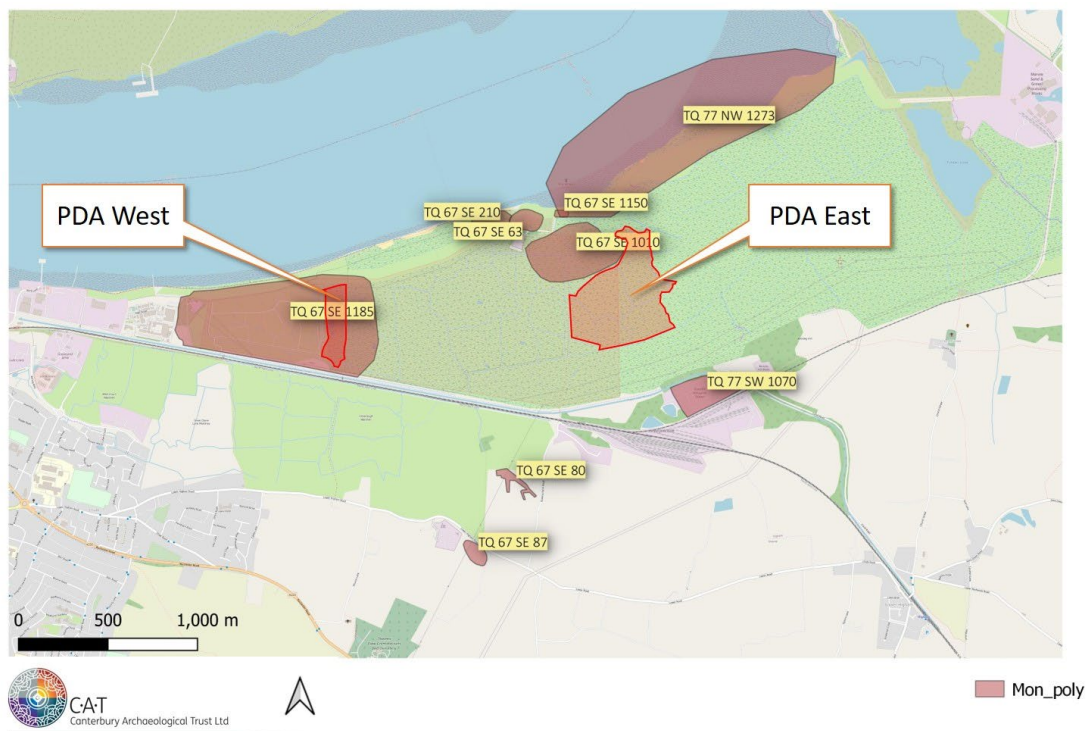


Fig 13. HER search of 1500m radius from NGR TQ 68945 74227, showing detail of results for Monuments (polys)

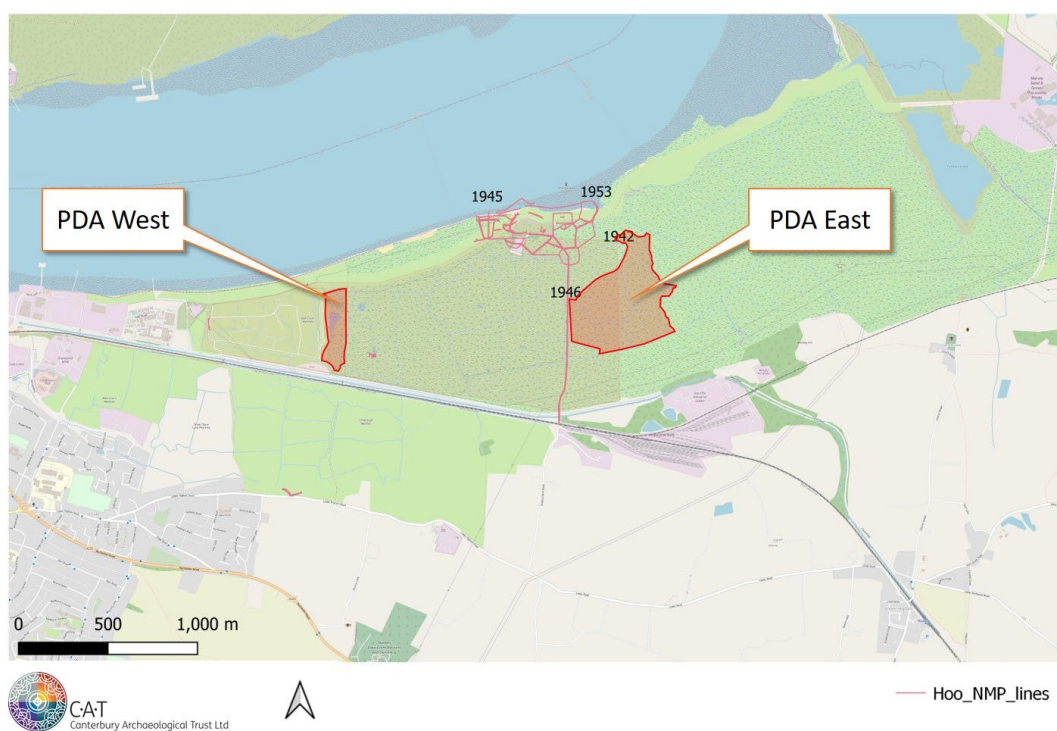


Fig 14. HER search of 1500m radius from NGR TQ 68945 74227, showing detail of results for National Mapping Programme (lines)

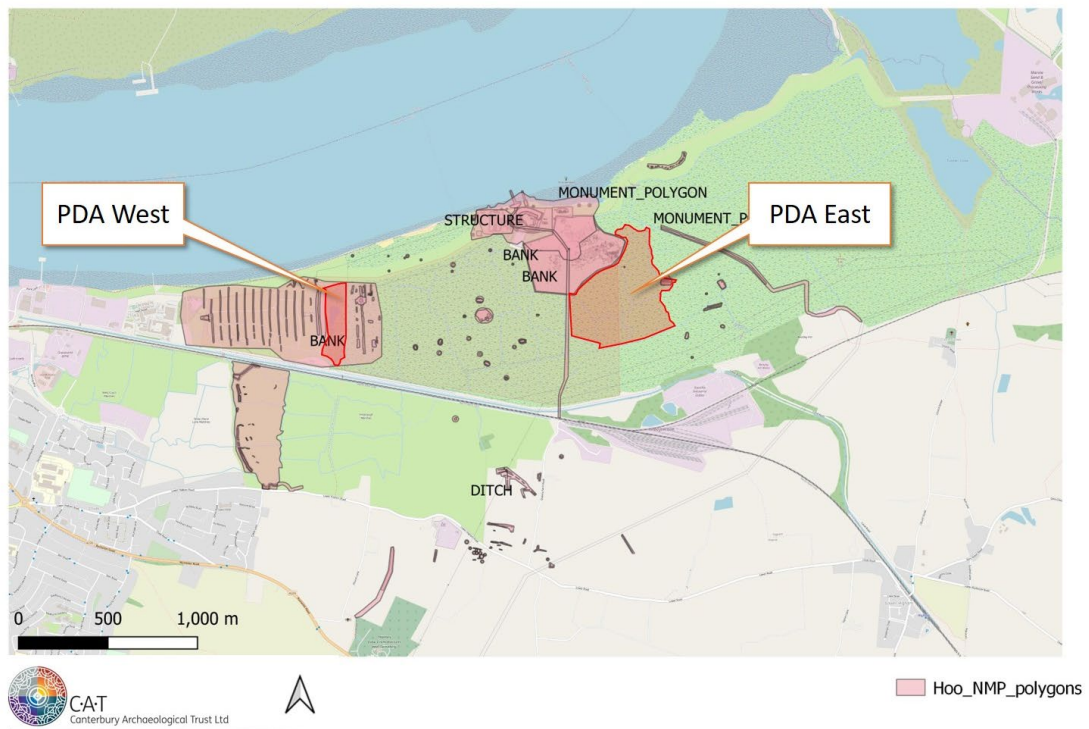


Fig 15. HER search of 1500m radius from NGR TQ 68945 74227, showing detail of results for National Mapping Programme (polygons)



Fig 16. Extract from the 1769 Andrews, Dury and Herbert map, showing the approximate location of the PDAs

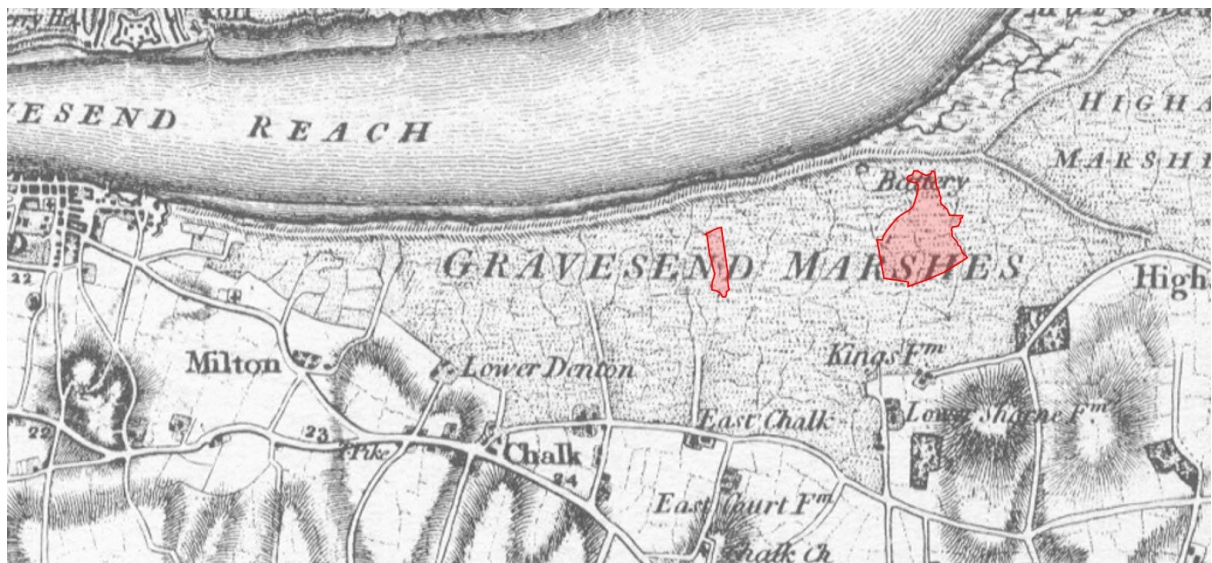


Fig 17. Extract from the 1801 Mudge map, showing the approximate location of the PDAs

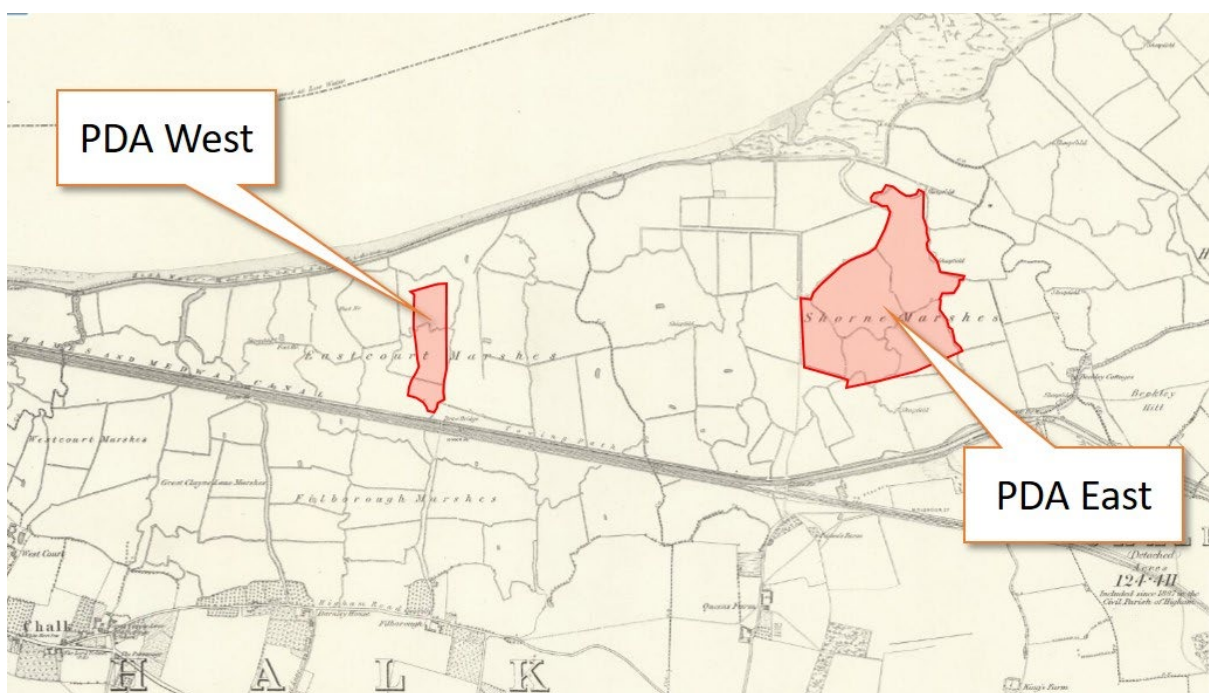


Fig 18. Extract from the First Edition OS 6-inch map, Essex Sheet LXXXIX, surveyed 1863, published 1872, showing the location of the PDAs

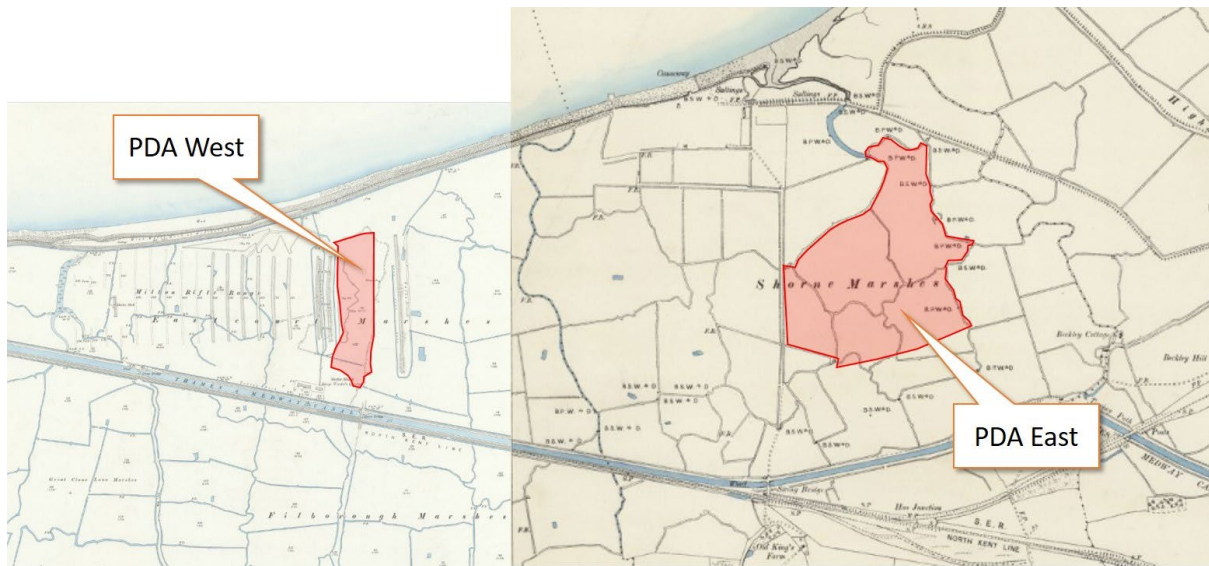


Fig 19. Extract from the Second Edition OS 25-inch map, Kent X.8, revised 1895, published 1897 and OS 6-inch map, Essex Sheet LXXXIX.NE, revised 1895, published 1899, showing the location of the PDAs

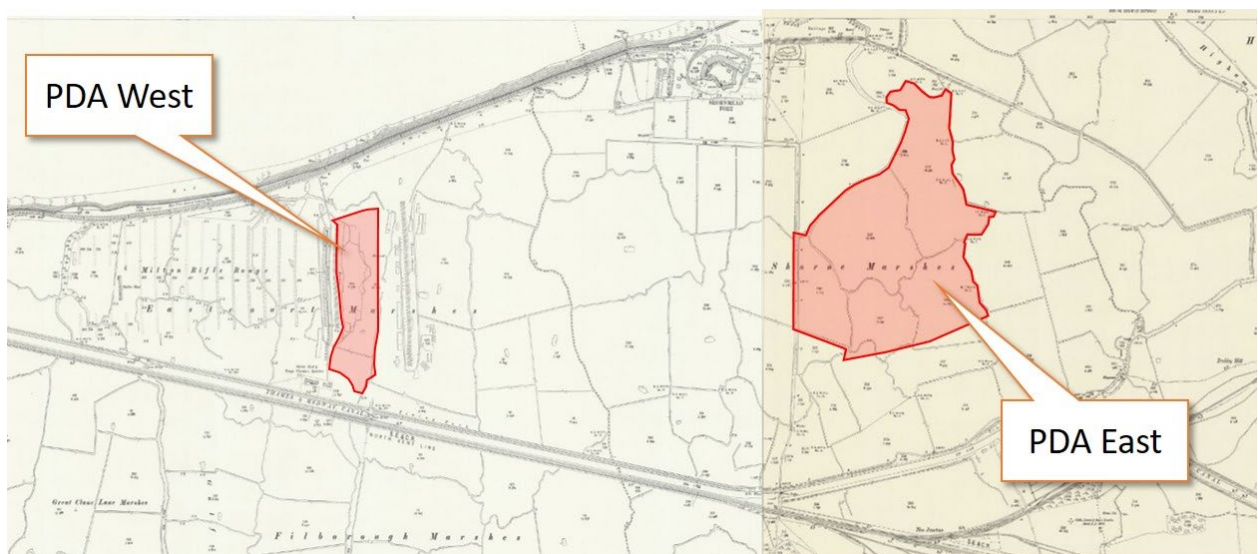


Fig 20. Extract from the Third Edition OS 25-inch maps, Kent XI.5 and Kent X.8, revised 1907, published 1908, showing the location of the PDAs

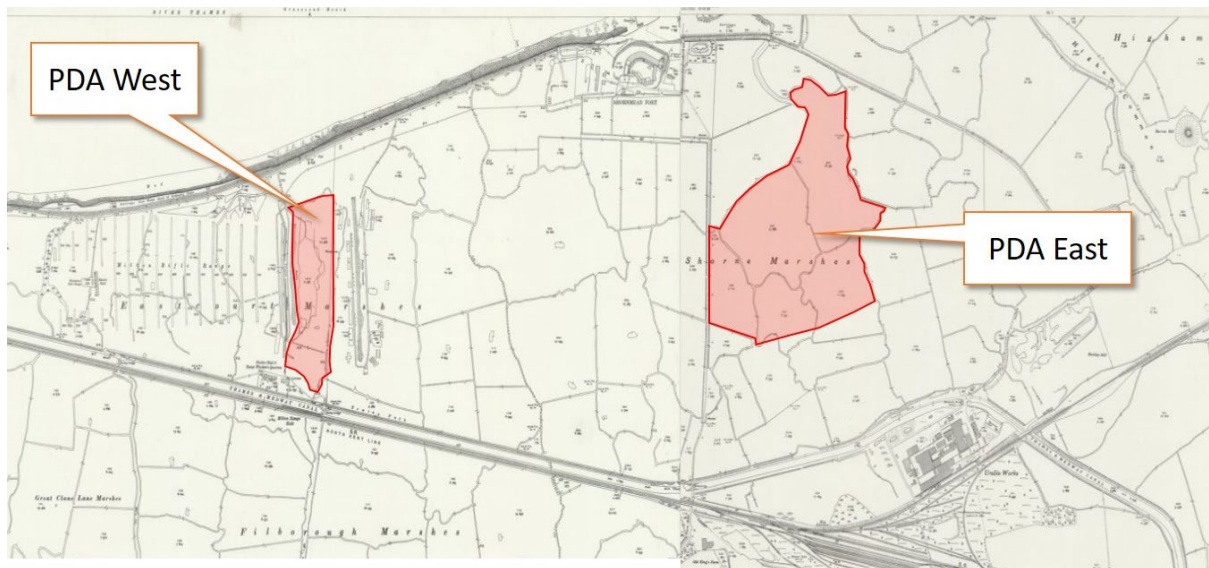


Fig 21. Extract from OS 25-inch maps Kent X.8 revised 1932, published 1933 and Kent XI.5, revised 1939 to 1940, published 1947, showing the location of the PDAs

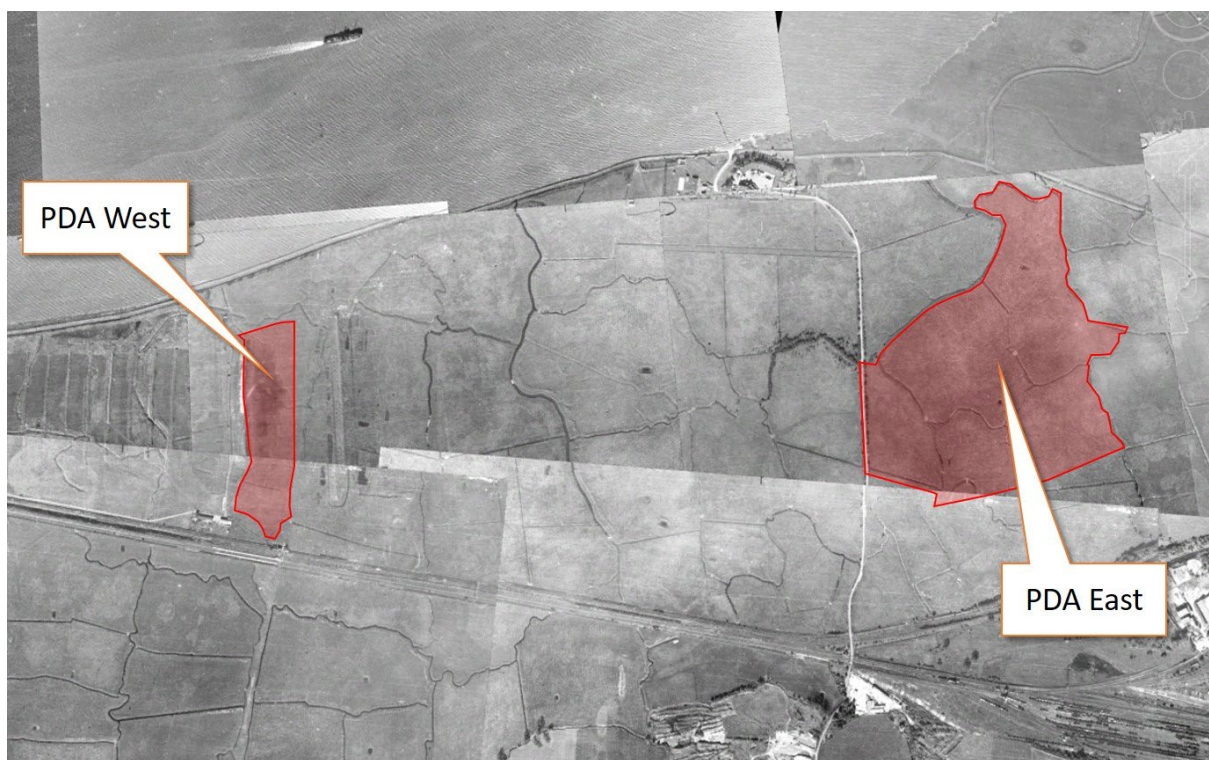


Fig 22. Aerial photograph from c 1940, showing the location of the PDAs (source: Google Earth)

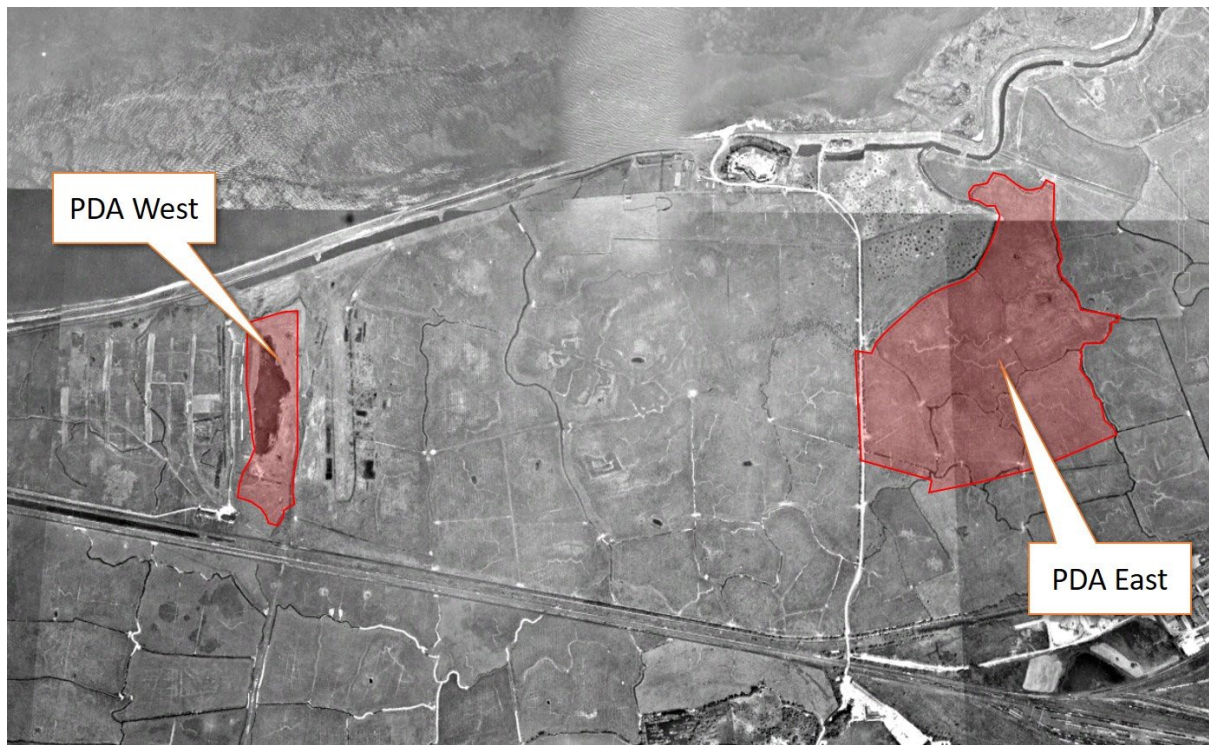


Fig 23. Aerial photograph from c 1960, showing the location of the PDAs (source: Google Earth)



Fig 24. Aerial photograph from c 1990, showing the location of the PDAs (source: Google Earth)



Fig 25. Satellite image from 2003, showing the location of the PDAs (source: Google Earth)



Fig 26. Satellite image from 2007, showing the location of the PDAs (source: Google Earth)



Fig 27. Satellite image from 2015, showing the location of the PDAs (source: Google Earth)



Fig 28. Satellite image from 2020, showing the location of the PDAs (source: Google Earth)



Fig 29. Satellite image from 2022, showing the location of the PDAs (source: Google Earth)