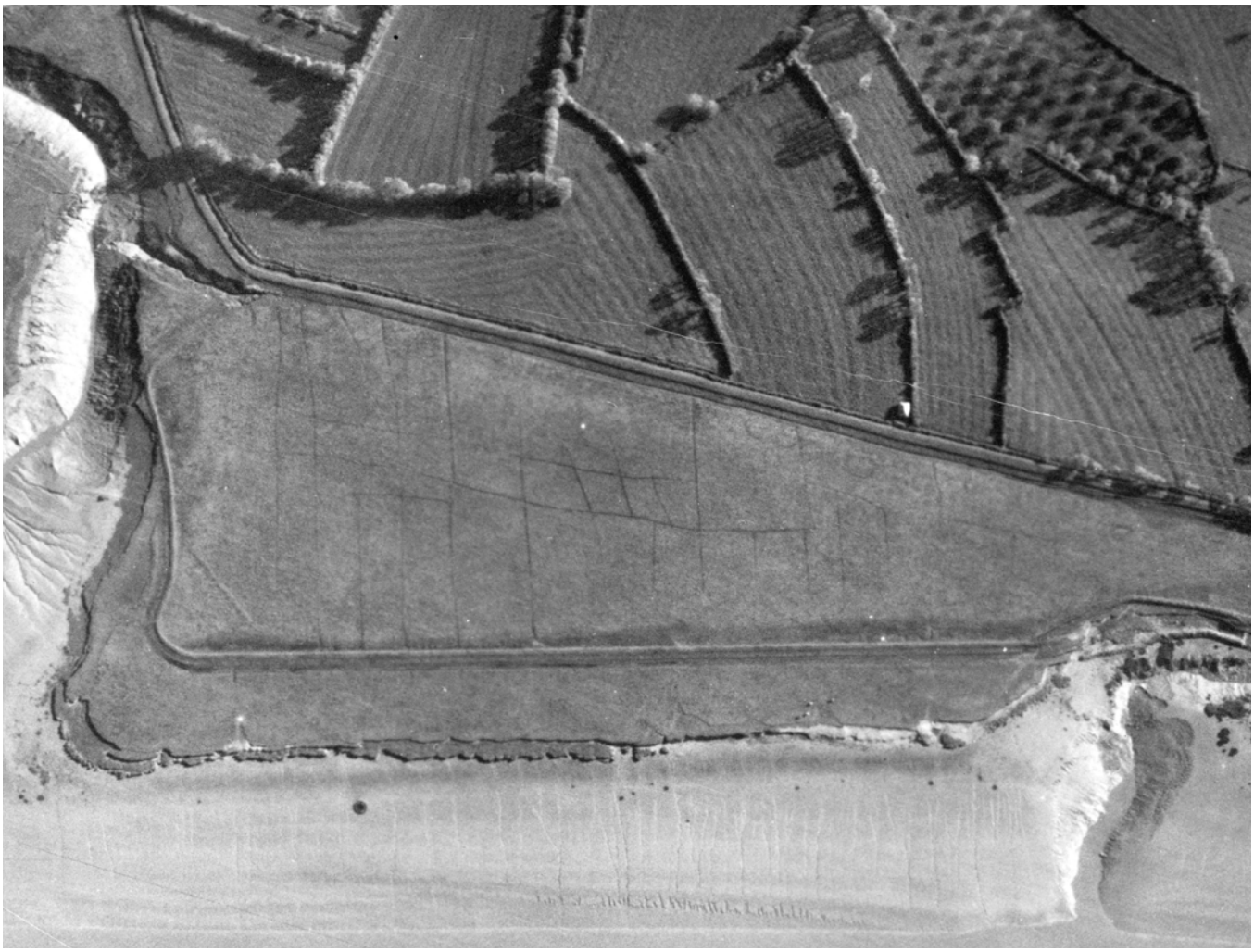
Historic England

Roman and Medieval Sea and River Flood Defences

Introductions to Heritage Assets



Summary

Historic England's Introductions to Heritage Assets (IHAs) are accessible, authoritative, illustrated summaries of what we know about specific types of archaeological site, building, landscape or marine asset. Typically they deal with subjects which have previously lacked such a published summary, either because the literature is dauntingly voluminous, or alternatively where little has been written. Most often it is the latter, and many IHAs bring understanding of site or building types which are neglected or little understood.

This IHA provides an introduction to Roman and medieval sea and river flood defences (largely consisting of banks rather than walls). The banks are normally simple dumps of earth but occasionally have a masonry component. Particularly when connected with land-claim, they are frequently accompanied by a 'back ditch' on their landward side, by outfall works to enable water to continue to drain through and off the defended area, and, in the case of seabanks, by breakwaters to protect against storm damage. Descriptions of the asset type as well as its associations and a brief chronology are included. A list of in-depth sources on the topic is suggested for further reading.

This document has been prepared by Marcus Jecock and edited by Joe Flatman and Pete Herring. It is one of a series of 41 documents. This edition published by Historic England October 2018.

Please refer to this document as:
Historic England 2018 *Roman and Medieval Sea and River Flood Defences: Introductions to Heritage Assets.* Swindon. Historic England.

HistoricEngland.org.uk/listing/selection-criteria/scheduling-selection/ihas-archaeology/

Front cover
Detail from a 1946 vertical air photograph showing the reset seabank between Cowhill Pill and Oldbury Pill on Oldbury Flats, Severn estuary.

Introduction

In modern times, the phrase ‘flood defence’ conjures up images of walls and banks erected to protect existing settlements and fields against inundation from rising sea and river levels. In historic terms, however, it is far more likely that such defences represent the initial step in the process of converting coastal and estuarine salt marsh and inland (freshwater) fen and peat bog into farmland. Only once defences had been constructed and tidal and seasonal floodwaters excluded, could permanent occupation and farming of the enclosed land begin, although the banks were frequently heightened and strengthened thereafter.

The process of winning and improving salt marsh and fen is termed reclamation or land-claim. Sometimes reclamation was preceded by warping: the erection of low timber or brushwood fences to raise the level of the land by trapping flood-borne silt; alternatively it could begin with, or consist solely of, the digging of channels to speed up surface drainage. In either case, physical barriers normally quickly followed to exclude floodwaters. Flood barriers require the provision of outfall works and sluices to enable established streams, ditches dug to help lower the water-table of the newly won land, and, periodically, floodwaters if the defences are overtopped or breached, to drain seaward.

In the Mediterranean World, instances of land-claim are known that date to the mid-1st millennium BC, but in England the practice seems to be no earlier than the 1st century AD. At this time, for example in the Central Somerset Levels, there is also evidence, in the form mainly of waste mounds, for deliberately not draining marshland, and instead exploiting it for 1st - 3rd century AD salt-production.

Although the present discussion is concerned solely with Roman and medieval flood defences, methods of land-claim did not suddenly change in the post-medieval period. Better engineering techniques did enable more ambitious schemes to be enacted, however, and, particularly following improvements in the technology of sluice and tidal-gate construction, the length of floodbanks (which formerly had to follow creeks and small streams inland until they became narrow enough to dam) to be reduced.

In England, the principal areas of surviving medieval and earlier land-claim are: the Lincolnshire coast (often called ‘Lincolnshire Marsh’); the Wash/Fenland embayment; the Essex and north Kent marshes, particularly around the Thames estuary; Romney and Walland Marshes in Kent and Sussex (Figure 1); the Somerset Levels; and the Severn estuary. Although there was medieval land-claim in the Humber estuary, much of what now exists is post-medieval or modern. There seem to have been few attempts at reclamation in the north-west of England before the post-medieval period.

Figure 1
The 13th century 'Great Wall' on Walland Marsh.

In Britain, the history of marsh and fen reclamation is a subject little studied (except by historical geographers using documentary sources) before the mid-1980s. Even today, sea and fen banks are a poorly researched category of field monument, and in the absence of much excavation, archaeologists have had to use various strands of indirect evidence to elucidate the chronology of land-claim.

The provision of flood defences specifically to protect urban areas and military and other installations is comparatively rare before the post-medieval period, but examples include: embankments protecting Roman London; a stretch of Hadrian's Wall at Burgh Marsh east of Bowness-on-Solway supposedly built on a 2 m-high turf bank to raise it above the level of spring tides; gravel banks outside the Roman forts of Ambleside (Cumbria) and Caersws (Wales), claimed as flood barriers; the 'Anglo-Danish Embankment' at York (so called because when discovered in excavation it was thought to date to the 10th/11th centuries, although it may rather be a response to rising water levels consequent upon William I's damming of the River Foss about 1070 to create the King's Fishpool); various 'dams', probably late 12th or 13th century, on and outside the precinct boundary of Byland Abbey (North Yorkshire); and the first phase of an embankment along the north bank of the River Humber, possibly contemporary with Henry VIII's fortification of the port of Hull.

1 Description

Roman and medieval flood defences consist of banks rather than walls. The banks are normally simple dumps of earth but occasionally have a masonry component (the dams protecting Byland Abbey against flash-flooding have sides of pitched stone, for example). Particularly when connected with land-claim, they are frequently accompanied by a 'back ditch' on their landward side (normally thought of as contemporary with the bank and interpreted as a quarry or drainage measure, but see below), by outfall works to enable water to continue to drain through and off the defended area, and, in the case of seabanks, by breakwaters to protect against storm damage.

Often where new banks were built to seaward in order to reclaim additional land (termed 'progressive land-claim'), the original defences will survive abandoned and downgraded into simple field boundaries, ploughed over, quarried into or re-used as routeways; occasionally only a scarp separating areas of different elevation will remain (see Chronology, below). Conversely in areas affected by marine erosion, increased storminess or natural change in the course of rivers, defences will have been abandoned and realigned ('set back') further inland (Figure 2).

Figure 2
Detail from a 1946 vertical air photograph showing the reset seabank between Cowhill Pill and Oldbury Pill on Oldbury Flats, Severn estuary.

Very few flood defences have been properly examined by excavation, and constructional details are consequently sparse or else derived from documents that only deal with the subject tangentially. Many banks probably started small and were later enlarged: the seabank at Tetney (Lincolnshire), known as Eastseadyke, was said in the late 16th century to have been no bigger than a plough furrow, while casual observation of a drainage cut through the medieval seabank that protected Leverington and Newton parishes in the Cambridgeshire Fens revealed it had been heightened on no fewer than three occasions.

Such increases were no doubt mostly in response to rising sea-levels or increased storminess, but in some areas, depending on the subsoil, would also have been necessitated by the lowering of ground level as reclaimed land dried out and shrank. A section recently excavated through a medieval seabank in Clenchwarton parish (Norfolk) revealed that it had been constructed in phases from mud scraped up from different zones on the foreshore, and, in this case, post-dated a rather small back ditch which presumably, therefore, represented an early phase of unprotected marshland drainage; a section excavated through the 12th/13th century Mere Bank on Hallen Marsh outside Bristol has suggested a similar constructional sequence.

Documentary evidence suggests that in the 13th century, at least some seabanks in Romney Marsh had a timber framework at their core, but this may not have been common practice for a later account of the maintenance procedures for the seabank at Dymchurch (compiled in the 16th or early 17th centuries, but undoubtedly recording medieval practice), makes no mention of framing, detailing instead how the bank was regularly repaired with mud and its seaward side re-faced with bundles of brushwood faggots, held in place by long wooden needles, to protect it from tidal scour.

A structural timber framework excavated beneath a small section of seabank at Foulness in Essex and dated by dendrochronology to 1483-1489 seems best interpreted as a localised foundation raft for the bank where it crossed an infilled tidal creek.

Other forms of protective reinforcement besides brushwood faggots are known according to the availability of local materials: stone flags in the (Romano-British) Great Wall in Elmore parish (Gloucestershire), beach cobbles in the 13th century Biggar Dyke on Walney Island (Cumbria), and stone slabs in the Henrician embankment at Hull (Figure 3).

At Dymchurch, groynes or breakwaters formed of large rocks and stones laid on a brushwood raft and held in place by timber piles, also helped to dissipate the force of storm waves. A number of what have been interpreted as groynes survive as earthworks in front of the old seabank at Leverington and Newton in the Fens, although they may rather be elongated saltern mounds. Only one outfall work has so far been recorded archaeologically, again at Newton. This was found to consist of three conjoined, hollowed-out tree trunks, capped by planking, passing through the base of the bank; it was radiocarbon dated to the mid-13th century. The sluice gate did not survive, but would presumably have been either hand-operated or a self-closing hinged flap-valve.

Figure 3
Faced flood embankments found in excavations at Hull Marina. The earlier (Henrician – that is, mid-16th century) seabank lies at an angle in the foreground, cut through by a 17th century successor behind.

2 Chronology

With the dearth of direct evidence from excavation, a variety of proxy methods have been employed to elucidate the chronology of land-claim in England. These have shown that major drainage and flood prevention work was underway in several areas well before the Norman Conquest.

Figure 4
The late 13th century Fairfield Church lies just inland of the Great Wall protecting Walland Marsh; the Wall must pre-date the church.

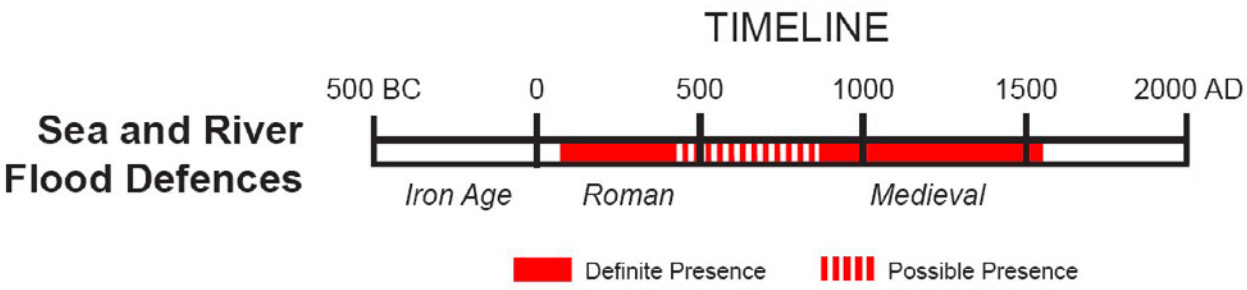
The principal dating methods used, have been: documentary and map evidence for the erection, or at least the presence, of defences at a given time; archaeological and documentary evidence of permanent settlement within the reclaimed area, again indicating that flood defences must have existed by a set date (Figure 4); and elevational differences across the line of the defences. This last method relies on the fact that active salt marsh gradually increases in height as silts are deposited by successive flood episodes, while former marsh areas protected by seabanks are starved of silt. Over time, this results in land seaward of the bank exceeding the height of land behind as active marsh deposits build up against it; the greater this elevational difference, the earlier the reclamation. Even if the bank is later removed following progressive land-claim, its line often survives as a scarp separating areas of different elevation (Figure 5).

Figure 5
View along the Elmore 'Great Wall', Severn estuary, showing the difference in elevation of land either side of the former line of the embankment.

Using these different strands of evidence, it has been claimed that reclamation was underway in the Severn estuary and in parts of the Somerset Levels by the 3rd century and possibly as early as the 1st. In other parts of England, such as the Fens, Thames estuary and Romney Marsh, current evidence suggests land-claim does not pre-date the 9th century, but then proceeded apace; large-scale reclamation of Walland Marsh may not have begun until after the Norman Conquest.

The chronology of land-claim in the Humber estuary and Lincolnshire Marsh is less well understood: seabanks were certainly being built here by the mid-12th century but considerable areas of reclaimed land appear to have been

lost to flooding and marine erosion between the 13th and 15th centuries. A similar picture of land-claim followed by set-back is true of the Thames estuary, too. The earliest securely dated flood defence in this country, however, is not connected with land-claim but protection of the suburb that developed in Southwark at the southern end of the Roman London Bridge, which is dated to about AD 50 – 60. Our present understanding of chronology, therefore, is probably best summarised by the timeline below:



3 Associations

Along much of Lincolnshire Marsh and in Fenland there appears to be an intimate association between medieval seabanks and salterns (places where sea salt was produced). This is because the salt was extracted from salt-encrusted sand gathered off the foreshore, which, following treatment, was dumped in large mounds.

As new salterns were created to seaward to minimise the distance fresh sand had to be brought, so the coastline advanced, and in many cases short lengths of bank were constructed linking up abandoned salterns, thereby reclaiming the land behind for pasture.

Around the Wash, seabanks were also frequently reused as anti-invasion lines during the Second World War, and are now crowned by pillboxes and other defensive structures (Figure 6). However, the antiquity of the seabanks in question is often unclear, and in many cases is probably post-medieval or modern.

Figure 6
Seabank at Freiston, Lincolnshire, re-used as a stop line against German invasion in the Second World War

4 Further Reading

No single volume has been written specifically on early flood defences and land reclamation from a national perspective, but the English Heritage/ RCHME resource assessment, *England's Coastal Heritage* (edited by M Fulford, T Champion and A Long, and published in 1997), contains on pages 135-9 a useful summary of, and references to, much of the detailed evidence published in academic journals, particularly the work of John Allen and Mike Fulford on the history of land-claim in the Severn estuary.

The same ground and more is covered in much greater detail in Stephen Rippon's *The Transformation of Coastal Wetlands* (2000), a scholarly analysis of how marshland landscapes in general were exploited (and reclaimed) in North-West Europe during Roman and medieval times.

More recent brief overviews of coastal reclamation together with references to more detailed information can be found in two books by Peter Murphy: on pages 52-7 of *The English Coast (*2009) and pages 41-4 of *England's Coastal Heritage* (2014).

Useful regional studies of land-claim include the following. The history of drainage in the Humber estuary is covered in two (admittedly now difficult to find) pamphlets by June Sheppard: *The Draining of the Hull Valley* and *The Draining of the Marshlands of South Holderness and the Vale of York* (East Yorkshire Local History Series, nos 6 and 20, published in 1958 and 1966).

Damian Grady's article, 'Medieval and Post-Medieval Salt Extraction in North-East Lincolnshire' (pages 81-95 in R Bewley (ed), *Lincolnshire's Archaeology from the Air* (1998) provides a useful introduction to the close relationship between salterns and land-claim in parts of eastern England.

H E Hallam's pamphlet, *The New Lands of Elloe: A Study of Early Reclamation in Lincolnshire* (1954) – and later works by the same author – represent important early case-studies of land-claim in the Fens from documentary evidence.

A very useful account of land-claim and set-back in the Thames estuary is James Galloway's paper, 'Storm Flooding, Coastal Defence and Land Use around the Thames Estuary and Tidal River c.1250-1450', *Journal of Medieval History 35* (2009), 171-88.

Anyone wishing to know more about reclamation in Romney Marsh should start with Jill Eddison's popular overview, *Romney Marsh. Survival on a Frontier* (2000), and follow up the references in the further reading section if desired, particularly the three OUCA volumes.

The results of the Clenchwarton seabank excavation feature on pages 225-30 of A Crowson, T Lane and J Reeve (eds), *Fenland Management Project Excavations 1991-1995* (2000), whilst excavation of the Newton sluice and other observations on the Newton/Leverington seabank are reported by A Taylor and D Hall in *Proceedings of the Cambridge Antiquarian Society 67* (1977), 63-8.

The Southwark flood bank, and others protecting Roman London, are reviewed on pages 12-15 of B Watson, T Brigham and T Dyson, *London Bridge: 2000 Years of a River Crossing* (2001), which also contains references to individual detailed excavation reports.

The Hadrian's Wall seabank is discussed briefly by Ian Richmond and J P Gillam, 'Milecastle 79 (Solway)', *Transactions of the Cumberland and Westmorland Antiquarian and Archaeological Society 52* (1953), 27-8.

The Anglo-Danish Embankment at York was reported by Kitty Richardson, 'Excavations in Hungate, York', *Archaeological Journal 116* (1959), 56-65, and re-interpreted by Richard Hall, 'The Waterfronts of York' in G L Good, R H Jones and M W Ponsford (eds), *Waterfront Archaeology,* (1991), page 181.

The Byland Abbey flood defences are discussed in M Jecock, A Burn, G Brown and A Oswald, *Byland Abbey, Ryedale, North Yorkshire: Archaeological Survey and Investigation of part of the precinct and extra-mural area* (HE Res Rep 4-2011), while details of the possible Henrician sea defences at the Hull Marina site are available from Humber Field Archaeology which carried out the excavations.

5 Where to Get Advice

If you would like to contact the Listing Team in one of our regional offices, please email: customers@HistoricEngland.org.uk noting the subject of your query, or call or write to the local team at:

North Region
37 Tanner Row
York
YO1 6WP
Tel: 01904 601948
Fax: 01904 601999

East Region
Brooklands
24 Brooklands Avenue
Cambridge CB2 8BU
Tel: 01223 582749
Fax: 01223 582701

South Region
4th Floor
Cannon Bridge House
25 Dowgate Hill
London
EC4R 2YA
Tel: 020 7973 3700
Fax: 020 7973 3001

West Region
29 Queen Square
Bristol
BS1 4ND
Tel: 0117 975 1308
Fax: 0117 975 0701

6 Acknowledgments

Cover: As Figure 2

Figures 1, 4: © Al Oswald, Historic England; reproduced with permission

Figure 2: RAF/CPE/UK/1825 3098, © Crown copyright.

Figures 3, 6: © Humber Field Archaeology; reproduced with permission

Figures 5: © Archaeology Service, Gloucestershire County Council; reproduced with permission

Historic England

We are the public body that helps people care for, enjoy and celebrate England's spectacular historic environment.

Please contact
guidance@HistoricEngland.org.uk
with any questions about this document.

HistoricEngland.org.uk

If you would like this document in a different format, please contact our customer services department on:

Tel: 0370 333 0607
Email: customers@HistoricEngland.org.uk

All information and weblinks accurate at the time of publication.

Please consider the environment before printing this document

HEAG 229
Publication date: v1.0 May 2011 © English Heritage
Reissue date v1.1 October 2018 © Historic England
Design: Historic England and APS.

< < Summary