

Chapter 12

Reclamation and regional economies of medieval marshland in Britain

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Introduction

This is a study of how past human communities have perceived their environment, and made decisions as to how it should be exploited. In their natural state, coastal marshes are not ideal for settled agriculture and would be described as 'marginal': areas of poor quality agricultural land settled only at times of high population pressure (see for example Postan 1972). Intensification of the human exploitation of marginal environments has received considerable attention from archaeologists and landscape historians, though all too often discussion has focused simply upon the relationship between population increase and agriculture, and particularly the shift from pasture to arable. However, more recent scholarship is showing that a far wider range of factors affect how a particular landscape is exploited, including the structure of landholding, proximity to centres of consumption and any natural resources that might be available (see for example Bailey 1989; Dyer 1989; Rippon 1997a). This study focuses on one type of physically marginal landscape - coastal marshland - and attempts to explore the reasons why similar environments are exploited in different ways depending on local socio-economic conditions.

An earlier study by this author of one particular marshland, the Gwent Levels in South East Wales, has already established the need for an interdisciplinary approach to studying wetland landscapes (Rippon 1996a). This was followed by a comparative regional study of all the wetlands around the Severn Estuary in south-west Britain which showed that although some of the trends in

landscape exploitation seen on the Gwent Levels were typical of other marshes in the region, this was not always the case: even within this one region there was remarkable variation in the patterns of land-use (Rippon 1997a). This paper forms part of a wider programme of research into the exploitation and management of coastal wetlands in the whole of north-west Europe during the Roman and medieval periods, which aims to examine such issues on a far larger scale. A number of papers derived from this work appear elsewhere (Rippon 1999a; 1999c), and a final monograph has been published (Rippon 2000). The particular theme that will be explored in this paper is how medieval communities perceived the opportunities offered by these wetland environments, and in particular the decision to intensify the level of landscape exploitation through wetland reclamation.

Reclamation: the costs, risks and benefits

Coastal saltmarshes (Fig. 1) offer a wide range of seasonally available natural resources including the grazing of livestock and the opportunity for producing salt through boiling sea water. Experiments on modern marshes, and palaeoenvironmental material from prehistoric, Roman and medieval sites, have shown that even arable cultivation is possible on high intertidal marshes, though the crops are very vulnerable to flooding (Bottema *et al.* 1980; van Zeist 1974a; 1974b). However, if the marshes are to be used for agriculture, the landscape really needs to be modified,

for example through the digging of ditches and the construction of low embankments. This can be done locally in a gradual and piecemeal fashion simply to improve drainage and provide some protection from flooding during the summer growing season, though on very high saltmarshes, settlements located on the raised banks of tidal creeks and protected in this way could even be occupied all year round.

However, for an area of marshland to be free of flooding, particularly in a region where relative sea level continues to rise, reclamation is required (Fig. 2). This involves the construction of an earthen embankment around an area of coastal marsh, and the subsequent drainage of that area now protected from tidal inundation through the digging of a hierarchical system of ditches (Rippon 1996a, 47-58). Water falling on the embanked marsh surface first drained into shallow furrows, and from there into more substantial gullies, sometimes known as gripes. Water then flowed into a system of field ditches, which fed into larger watercourses that were controlled by a system of sluices. These drains fed into the major rivers, which discharged their waters under the sea wall via a tidal door known as a gout (Allen and Rippon 1995; Rippon 1996a, 50-60; 1997a, 19-21; 1999a). This transformation of the landscape, from a saltmarsh to a freshwater environment, could be brought about in two ways: through the large-scale and systematic drainage of the entire area protected from the sea, or in a more gradual and piecemeal unsystematic process of drainage (Fig. 3).



Figure 1. Tidal saltmarsh, Kingston Seymour, North Somerset

The construction of this drainage system was clearly a complex and costly enterprise in terms of the manpower and materials required in its initial construction. For example, in 1455/56, the construction of 'Rogers Gout', in the manor of Rumney near Cardiff, cost over £52 and took 14 weeks. Four different ships brought 40 loads of stone, six loads of filling stone, two loads of paving slabs, and 11 loads of limestone for burning in order to produce lime. For an eight-week period, 117 of the lord's tenants were working on its construction - this was a huge commitment of human resources for an agricultural community (Reeves 1979, 169).

Reclamation was also a high-cost undertaking in terms of the regular maintenance that the drainage system required, including clearing drainage ditches of vegetation and repairing sea walls. Reclamation was also an expensive strategy towards landscape exploitation in that it led to the loss of the rich natural resources of these coastal wetlands, such as the opportunity for salt production. It must also be remembered that reclamation was a high-risk strategy as the threat of flooding was ever present. Occasional freshwater flooding was not a serious problem so long as the water receded quickly, but even a brief inundation with sea water would pollute the soils, making them difficult to cultivate for several years.

With reclamation such a high cost and high risk approach to landscape utilisation, it raises the question of why anyone bothered. The answer is that it could offer a high return on the investment. The rich alluvial soils of coastal wetlands gave rise to high yields of both grass and cereals, making it ideal for arable and pastoral farming. For example, in the Somerset Levels around c.1300 AD, arable land on the reclaimed coastal marshes was valued at around 0.8 to 0.9 shillings per acre, in contrast to values as low as 0.3 to 0.4 shillings per acre on the adjacent dryland areas (Rippon 1997a, table 9.1). Clearly, despite the costs and risks, reclamation was seen as a worthwhile endeavour because of the high return on the investment. It was all an issue of perception: how did landowners and their tenants perceive the costs and risks of reclamation versus the benefits that it brought?

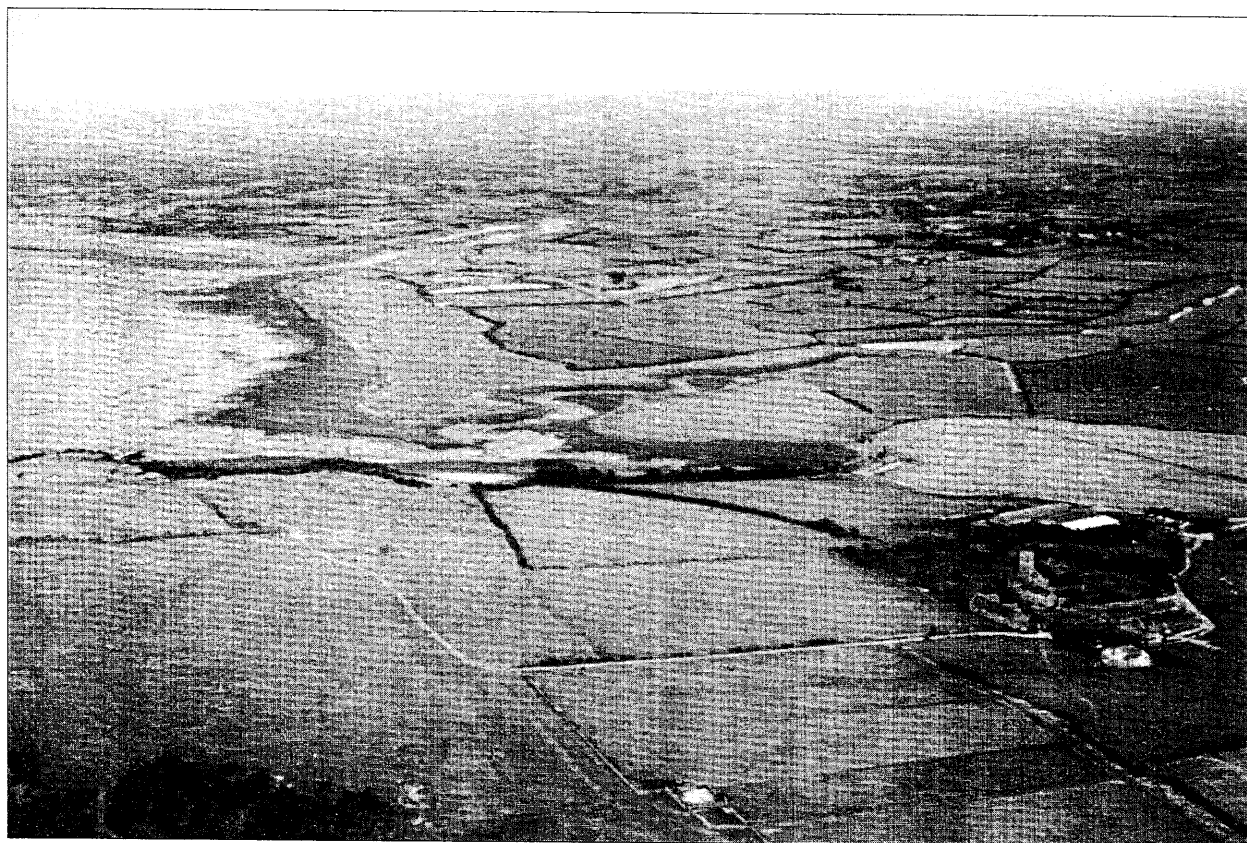


Figure 2. The North Somerset Levels, with sea walls along the coast, looking north-east from above Middlehope across Kingston Seymour. Woodspring Priory can be seen towards the bottom right

Therefore, three broad approaches to the utilisation of coastal marshes can be identified, each involving increasing levels of investment, risk and return (Fig. 3). The first approach, exploitation, involves simply harvesting the natural produce of the marshes, notably through seasonal grazing and salt production. The second, modification, involves making the marshes more suited to agriculture through improving the drainage and the provision of rudimentary measures to prevent summer floods, while retaining their essentially intertidal character.

In contrast, transformation entails a wholesale change from intertidal saltmarshes into flood-free, freshwater environments: it represents an attempt to control a landscape very much against the forces of nature.

This progression appears to fit into traditional views of how a marginal landscape should be exploited, with a simple transition from exploitation, through modification, to transformation as population and the demand for food increased.

However, this paper hopes to show that the diversity of resources on offer, and local socio-economic variations in the hinterland of each coastal marsh, meant that radically different strategies towards wetland utilisation were adopted in south-east Britain during the first millennium AD.

The process of reclamation

Although most of the coastal marshlands around Britain were extensively settled during the Roman period, a sustained episode of flooding led to these landscapes being buried under later alluvium. The large number of settlements and ploughteams recorded on many of these coastal marshes in the late 11th century Domesday Book shows that recolonisation was well underway by that time, though this in itself does not prove that the marshes were reclaimed: recent work in the Fenland has shown that the environmental context for the extensive Romano-British settlements there was a high tidal saltmarsh (Lane 1993a, 42; 1993b, 26; Murphy 1993a, 38; 1994, 28). The scarcity of documentary and archaeological mate-

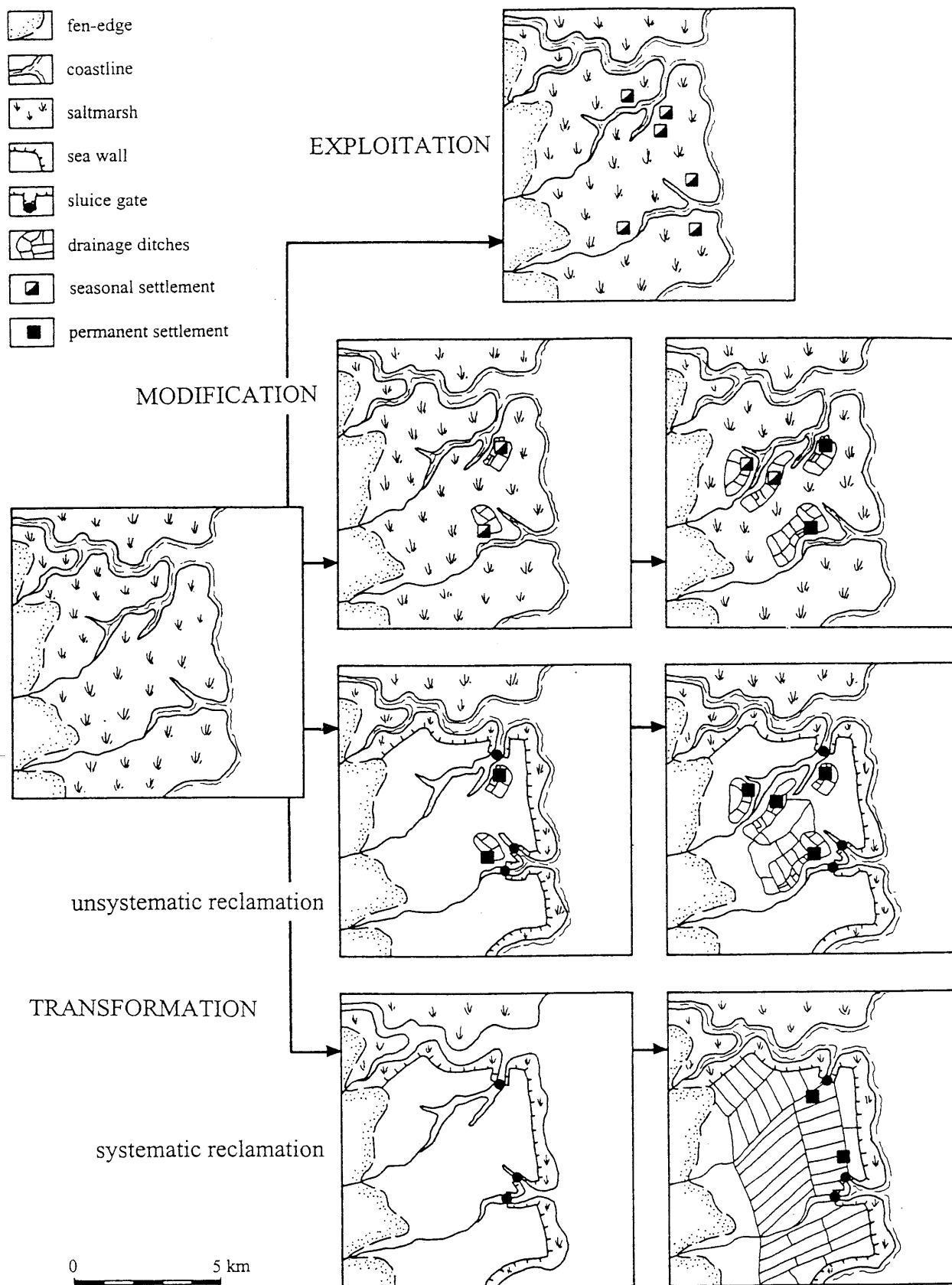


Figure 3. Schematic model showing four approaches towards the utilisation of coastal marshes: the seasonal exploitation of the area's rich natural resources, modification of the environment through localised drainage and transformation (systematic and unsystematic reclamation following the construction of sea walls)

rial for the Early Medieval period generally makes this a difficult one to study, and marshland landscapes are no exception. However, the results of recent work, notably around the Severn Estuary, Romney Marsh, Thames Estuary and in the Fenland, are shedding new light on when, how and why coastal marshes were reclaimed during the medieval period.

In terms of when recolonization and reclamation took place, a fairly consistent pattern is starting to emerge all around southern and eastern Britain. Occasional details that can be gleaned from documentary sources and place-names suggests that the recolonisation of areas such as the Somerset Levels and Romney Marsh started around the 8th or 9th centuries (Brooks 1988; Rippon 1997a, 168-78). In Fenland, a near continuous early medieval ceramic sequence and an extensive programme of fieldwalking in what is now a largely arable region, have allowed the development of the settlement pattern there to be studied in particular detail. In Lincolnshire, the inland margins of the coastal marsh, where it graded into the freshwater backfens, were extensively settled in the Roman period, and this continued during the 5th to 7th/9th centuries when 'Early' and 'Middle Saxon' pottery was used (Hayes and Lane 1992;1993). However, some time around the 7th/9th centuries this part of the Fens was abandoned as settlement appears to have shifted towards the higher, coastal parts of the saltmarsh (Hayes and Lane 1992, 31; Silvester 1993, 28; Hall 1996, 182). In Norfolk, the marshland was almost wholly deserted in the 5th century, with just one settlement associated with 'Early Saxon' pottery, located close to the backfen, but between the 7th and the 9th centuries a series of settlements was once again established on the higher parts of the coastal marsh (Silvester 1988, 156-60).

However, as described above, occupation and even agriculture are possible on a high intertidal saltmarsh and this settlement expansion seen in areas such as the Fens does not necessarily imply that reclamation - the construction of a sea wall and drainage of the area so protected from tidal inun-

dation - had taken place. Fortunately, recent work is also shedding new light on the process of wetland reclamation during the early medieval period.

A detailed analysis of the historic landscape - the present pattern of fields, roads and settlements - around the Severn Estuary has been used to develop a schematic model of how these wetlands were reclaimed (Rippon 1996a, fig. 4, superseded by Rippon 1997a, fig. 7). For example, Fig. 4 shows the complex field boundary pattern in the coastal part of the North Somerset Levels, and contrasts with the far more regular arrangements in the lower-lying inland backfens shown in Fig. 5. Understanding how such morphological variations came about, alongside a wide range of archaeological, cartographic, documentary and place-name evidence, suggests one possible approach to wetland reclamation (Figs 6A & 6B). Initially a sea wall was constructed along the coast, with a number of sluice gates (or gouts) to allow the discharge of freshwater run-off (Fig. 6B). Having protected the former saltmarsh from tidal inundation, small areas of ground were enclosed with a bank and ditch while settlements were established on the higher coastal parts of the marsh (Fig. 6C). As these earliest 'infield' enclosures were relatively unconstrained by other landscape features they assumed an oval shape (see for example Fig. 4). Over time, as the demand for land increased, further areas were enclosed in a piecemeal fashion until eventually all the coastal zone was drained and enclosed. Subsequently, parts of the lower-lying backfens were enclosed, though this led to an increasing problem of freshwater flooding which had to be countered through the construction of fen-banks (Fig. 6D). The last stage of reclamation was the draining of the backfen which, unlike the piecemeal enclosure of the coastal marshes, tended to occur on a large scale resulting in a highly rectilinear landscape (Figs 5 and 6E-G).

It must be stressed that this is only a model for the stages through which coastal wetlands were reclaimed, and that it requires testing through fieldwork. For example, one of the key unresolved issues is whether the earliest settlements on these coastal marshlands pre-dated or post-dated the



Figure 4. Kingston Seymour, North Somerset Levels looking north. Typical area of 'irregular' landscape, derived from piecemeal reclamation on the higher, coastal parts of a former tidal saltmarsh. Note the oval-shaped infield at Ham Farm, centre right

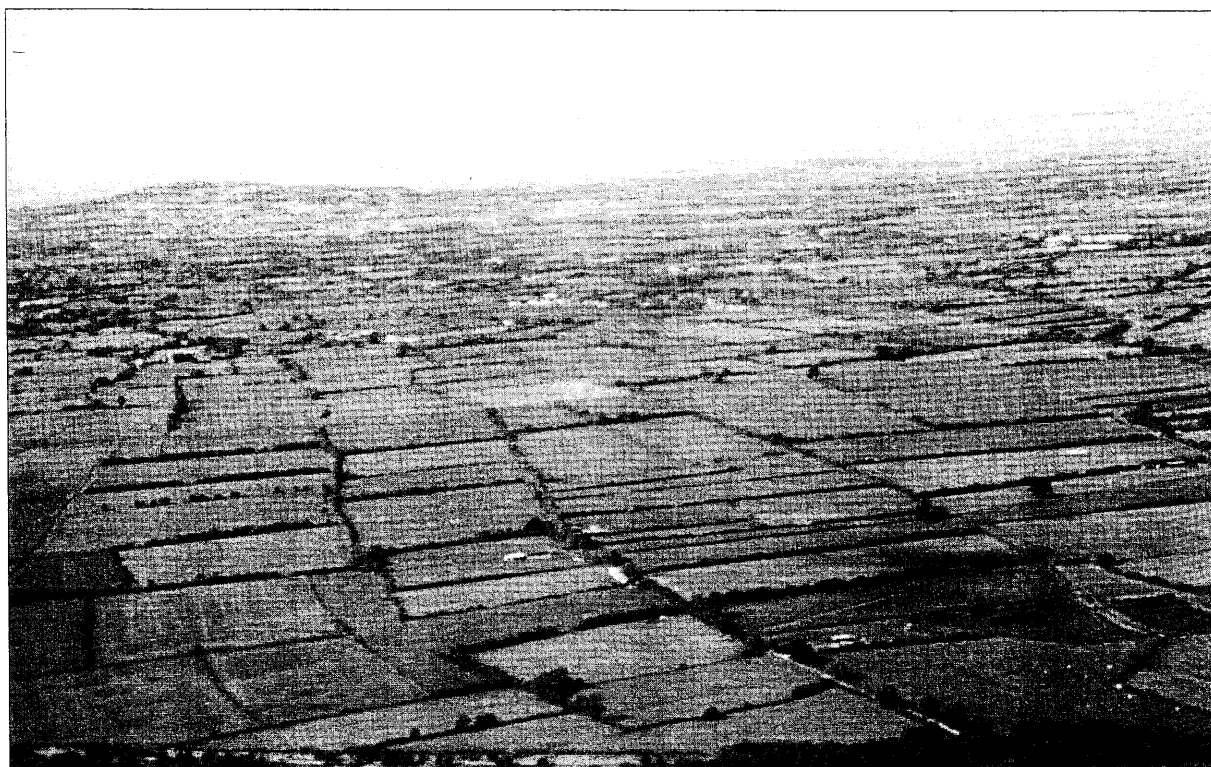


Figure 5. Congresbury and Puxton Moors, North Somerset Level, looking west towards Weston-super-Mare and the Severn Estuary. The rectilinear pattern of fields here in the low-lying backfens is the result of a co-ordinated approach towards enclosure and drainage

construction of the sea wall. The model developed for the Severn wetlands assumed that the earliest settlements post-dated the sea walls and were centred on the oval-shaped infield enclosures. However, in the Fenland, a rather different sequence to that proposed for the Severn Estuary has already emerged. Recent excavations and palaeoenvironmental analysis on the 7th to 9th century earliest colonising settlements on the Norfolk marshland indicates that they lay within a high intertidal environment that was not protected from tidal inundation by a sea wall (Leah and Crowson 1993, 45-6; Murphy 1993b). It was only around the 10th century, when the settlements were associated with 'Late Saxon' pottery, that the environment changed from saltmarsh to freshwater conditions indicating that reclamation had taken place.

This sequence in the Norfolk marshland represents a classic example of the gradual intensification in landscape use. The settlement associated with 'Early Saxon' pottery has been excavated, though very few cut features were uncovered and there were no substantial drainage ditches: the impression is of a small, possibly seasonal settlement, simply exploiting the rich natural resources of both the coastal marshes and the freshwater peat fens. By contrast, 7th to 9th century settlements were associated with drainage ditches, representing an attempt to modify the environment through improving the drainage, while retaining its essentially intertidal character. At the sites excavated, six-row hulled barley was the most common crop, with moderate amounts of horsebean and peas, all of which are salt tolerant. The weeds associated with the crops include saltmarsh species proving that the crops were grown down on the marshes, around the settlements, as opposed to having been imported from dryland areas. It was only around the 10th century that attempts were made to transform the landscape through full-scale reclamation, and it is then that salt-intolerant wheat appears to have been grown for the first time.

Therefore, evidence from Fenland suggests an alternative sequence of events to that shown in Fig. 6, which assumed a sudden change from the simple exploitation of the intertidal saltmarsh to large-

scale reclamation (landscape transformation): on the Norfolk Marshland settlements and localised drainage (landscape modification) may in fact have preceded the construction of a sea wall. There are parallels for this in the Netherlands and Germany where marshland settlements existed long before sea walls were constructed, though some of these settlements were associated with localised embankments, known as 'ring dikes' or 'summer dikes', that enclosed a small area of land around individual settlements (Fig. 7).

It is possible that the Severn Estuary 'infield' sites are similar to these continental 'ring dikes', and this alternative model is currently being tested through a programme of survey, excavation and palaeoenvironmental analysis at one of the 'infield' sites, Puxton, on the North Somerset Levels (Rippon 1996b; 1997b; 1998).

Archaeological and documentary material become more widespread by the 11th century, allowing a more comprehensive overview of the state of marshland settlement and reclamation in southern and eastern Britain. The extent of Domesday settlement and the large numbers of ploughteams associated with them suggest that, as was the case in the Roman period, the largest areas of coastal saltmarsh - central and north Somerset, the Avonmouth Levels, Romney Marsh and the Fenland - all appear to have been embanked though usually it was only the higher, coastal areas that were settled, the lower-lying backfens being left as open pasture (Brooks 1988; Hall and Coles 1990; Hayes and Lane 1992; Reeves 1993; Rippon 1997a, 168-85; 2000; Silvester 1988; 1993). During the Roman period, even the smaller areas of marsh, such as those on either side of the Thames (Evans 1953; Faulkner 1993; Miles 1975; Rodwell 1966) and Humber estuaries were extensively occupied (Challis and Harding 1975; Didsbury 1988; Van de Noort and Ellis 1998; Whitwell 1988). However, during the Early Medieval period these lesser areas of coastal marsh were not resettled, being exploited from fen-edge settlements instead. It appears that certain areas were being drained, and possibly embanked, such as the North Kent marshes and Avonmouth Levels where charters suggest there was extensive

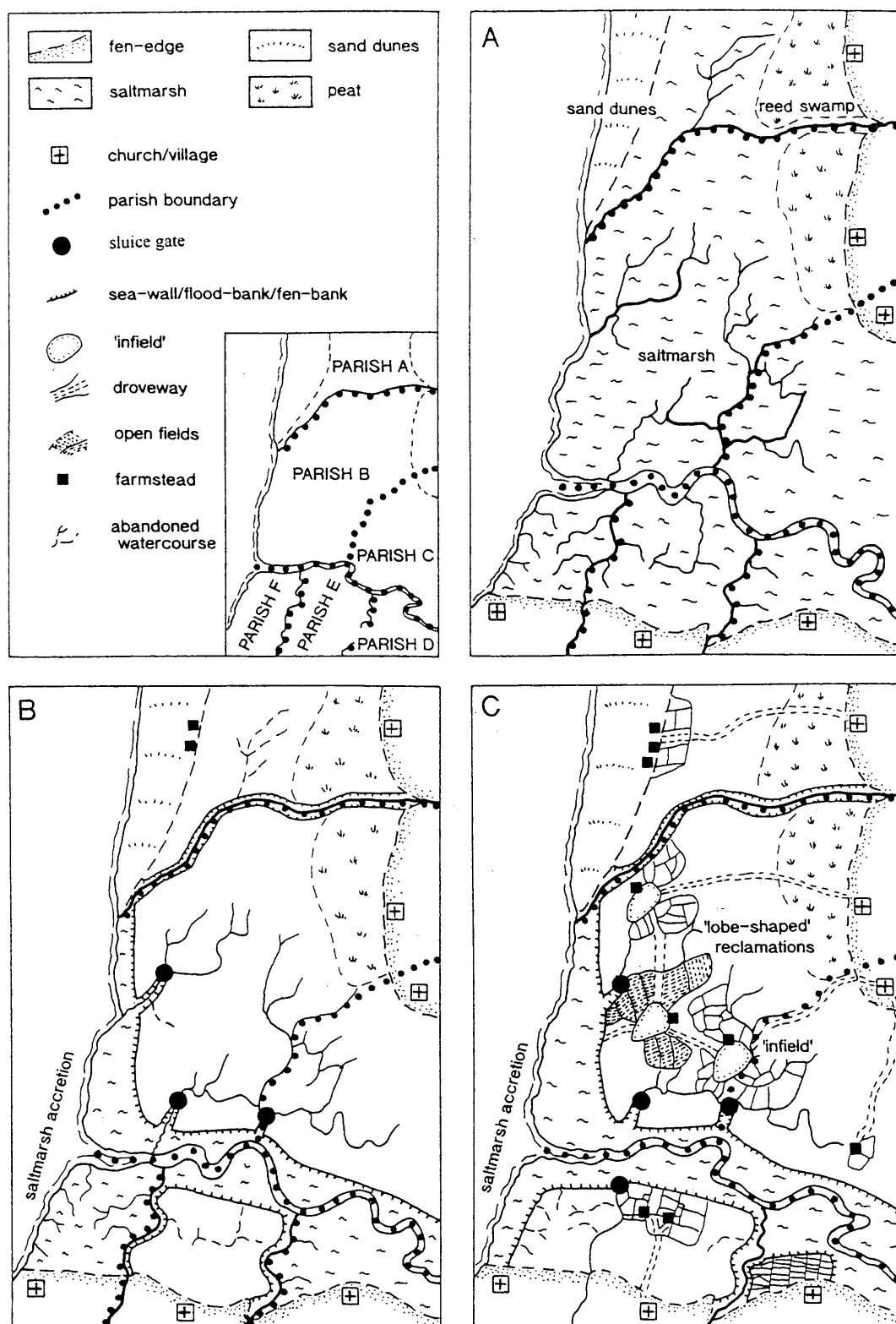


Figure 6.1. Schematic model for the reclamation of coastal marshland during the medieval period

A. Tidal saltmarsh, partly protected by a belt of coastal sand dunes, with a freshwater reedswamp in the lowest-lying part of the back-fen

B. Construction of sea wall around most of the marsh protecting it from tidal inundation

C. Initial settlement of the newly reclaimed areas, based on small 'infield' enclosures associated with 'lobe-shaped' intakes enclosed from an open landscape. Both communal 'open fields' and enclosed fields held in severalty. Settlements linked by tracks and droveway



Figure 6.2. Schematic model for the reclamation of coastal marshland during the medieval period

D. Further enclosure and drainage, leaving just the lowest-lying back-fen as a common moor. The enclosed lands are protected from freshwater run-off by a fen-bank. Settlement expansion down the droveways. Enclosure of riverside saltmarshes

E. Further rudimentary enclosure in the back-fen and saltmarshes

F. Drainage of the new enclosures in the backfen and coastal reclamations. Piecemeal enclosures of some open fields. Coastal erosion forces the sea wall to be partly set back

G. Systematic enclosure of the surviving back-fen commons, roadside waste along the droveways and the remaining open fields

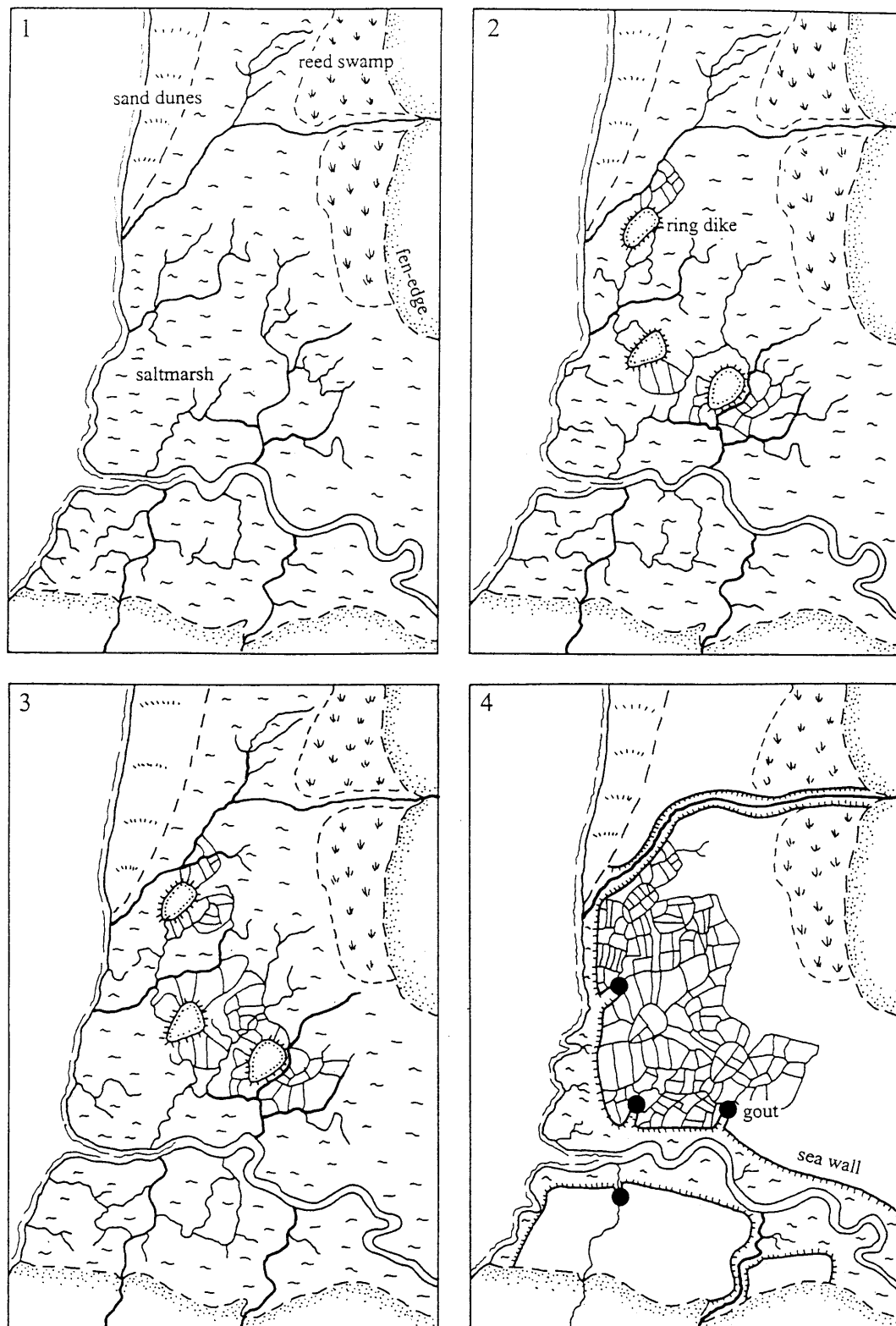


Figure 7. Alternative model for the early stages of reclamation, with settlement preceding the initial construction of sea walls (c.f. Figure 6)

1. Landscape Exploitation: open intertidal saltmarsh
2. Landscape Modification: Construction of individual ring dikes to protect small areas of marsh from summer flooding
3. Further areas of land drained through the digging of small scale ditch systems
4. Landscape Transformation: construction of a sea wall

meadowland (Evans 1953; Rippon 2000), but in other areas, such as around much of the Essex coast and the Pevensy Levels, the marshes appear to have been left open and were simply exploited for their rich natural grazing (see also below).

Taking the initiative in landscape change: who was responsible for reclamation?

That coastal wetlands were extensively recolonised during the Early Medieval period is now clear, which leads to the issue of why it happened. Environmental change does not appear to have been a major factor: though the late 1st millennium AD saw the start of the medieval climatic optimum, there is no evidence that relative sea level did anything other than continue to rise (Groot *et al.* 1996; Hofstede 1991). The expansion of settlement on to these coastal marshes was not, therefore, a simple human response to marine regression but instead appears to have been a cultural phenomenon resulting from socio-economic factors such as a gradually rising population, an expanding economy and the policies of individual landowners.

In certain cases it is clear that the initiative to undertake reclamation was taken by the landowner. The Gwent Levels, in south-east Wales, are a good example of this. The impact of the Norman conquest on south Wales is well documented, both in terms of the Anglo-Norman settlement of Pembrokeshire and the widespread creation of castle boroughs (see for example Murphy 1997). However, recent research has also shown that the Conquest had a significant impact upon the treatment of coastal marshes. The Gwent Levels had been extensively drained during the Roman period, though the extensive failure of these sea defences led to widespread post-Roman flooding (Rippon 1996a, 25-35). The second reclamation of the Gwent Levels appears to have started very soon after the Norman conquest and the establishment of the Marcher lordships. The Levels were divided between four such lordships, and it appears that several treated their marshland areas in different ways.

One of the earliest lordships was that of Strigoil (later renamed Chepstow), where the Norman castle still dominates the mouth of the River Wye. Those areas of marshland in Chepstow lordship were left largely unreclaimed throughout the medieval period, and were only finally enclosed during the 19th century. The drainage that was undertaken during the medieval period comprised small scale innings along the fen-edge and would appear to have been a gradual and piecemeal process, presumably on the initiative of local communities (Fig. 8D; Rippon 1996a, fig. 29).

By contrast, in the neighbouring lordship of Caerleon, the entire marshland area appears to have been embanked by the early 12th century and was subsequently enclosed and drained in a way similar to that shown in Fig. 6 (see Fig. 8D). However, even within this area, there were variations in the approach to utilising this newly won land. In Redwick, in the eastern half of the Caerleon lordship, there are several strands of evidence to suggest that reclamation was subject to some form of control or regulation. Though the field boundary pattern is largely irregular, and includes up to four possible infield areas representing early settlement foci, most of the population appears to have lived in a single loosely nucleated village strung out alongside a funnel-shaped green (Fig. 8 A-B; Rippon 1996a, fig. 27). To the west of the village lay an extensive open field, 'Broadmead', that was finally enclosed only in the 19th century. This extensive common meadow extended from the coast for nearly 2 km, where it was protected from freshwater flooding in the lower-lying backfen by an earthen fen-bank along the 'Mere (= OE boundary) Reen' (Fig. 8D). The overwhelming proportion of English place-names and field-names, alongside the nucleated village and open fields, is strongly suggestive of the active plantation of English settlers by the new Norman marcher lords. This element of landscape planning is seen even more clearly just to the west of Redwick in Whitson (Fig. 8), a fine example of a row-plan village which shows marked similarities to planned settlements in Pembrokeshire that were created during its colonisation by Henry I (see for example Kisko 1997), and it is tempting

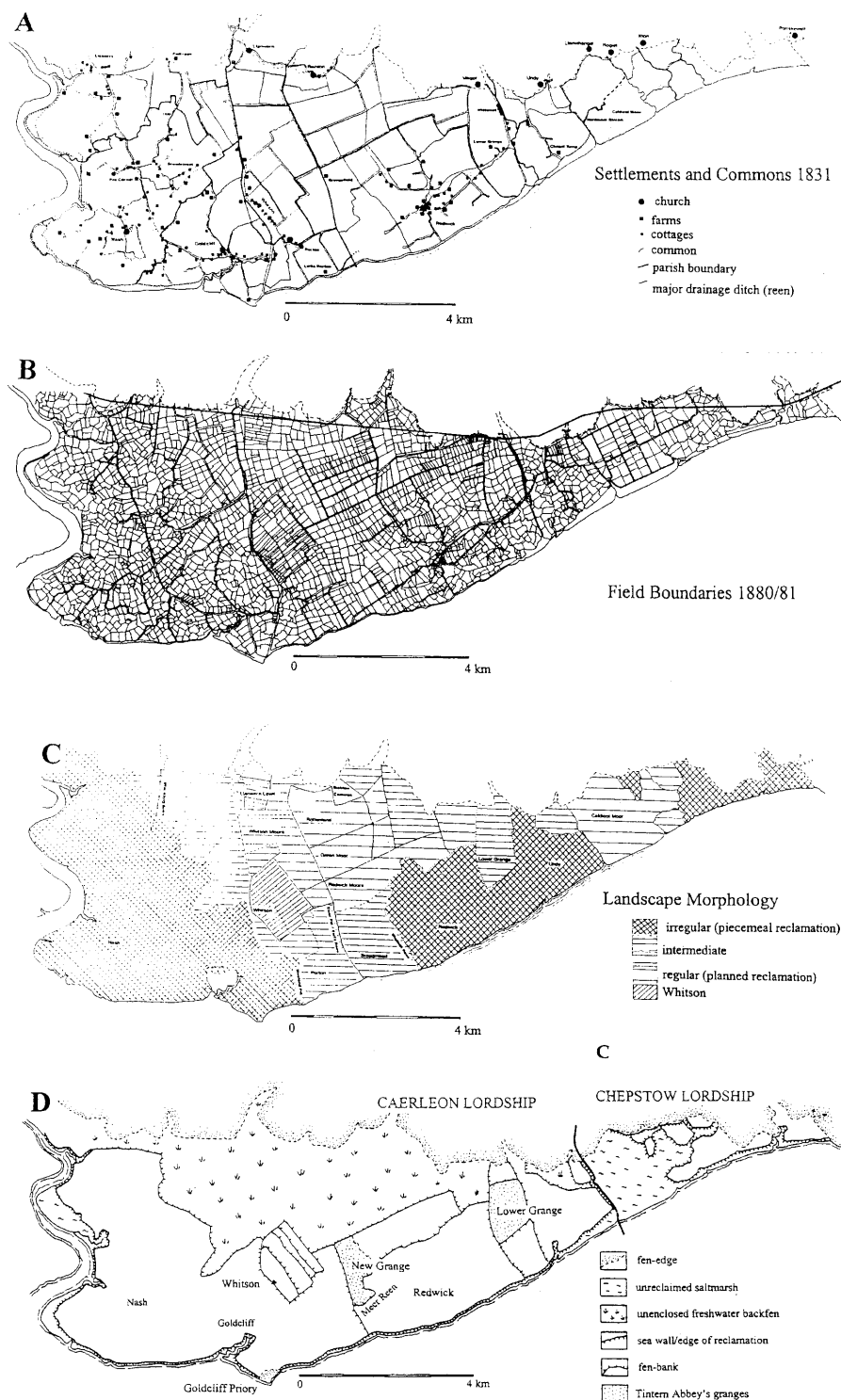


Figure 8. The Caldicot Level, South-east Wales

A. Settlement pattern in 1831. Note the dispersed settlement in the west compared to the more nucleated pattern in the east (around Redwick)

B. Field boundary pattern in 1880/81. Note the small irregular shaped fields in the higher areas towards the coast, and the more regular landscapes in the lower-lying backfens

C. Broad characterisation of the landscape into morphological zones

D. Highly simplified map showing key elements of the medieval landscape. Note that the sea wall along the coast was set back to this position around the 15th century: its original position lay several hundred metres further out into the Estuary

to see a similar process of Norman colonisation and estate management on the Gwent Levels. In the western half of the Caerleon lordship the landscape is very different, with very little evidence for common-field agriculture, a highly dispersed settlement pattern (Fig. 8A) and a significant number of Welsh place-names and field-names suggesting that it lay beyond the zone of English plantation.

Taken together, the replanning of rural landscapes, the creation of towns and their associated stimulus to the market economy, and the imposition of castles in order to regulate and control the landscape can be regarded as part of a coherent policy through which the new Anglo-Norman lords stamped their authority on their new estates and sought to improve their productivity. In the specific case of the marshland components of these estates, this increase in productivity was achieved through an intensification in use, changing from the simple exploitation of natural resources to a physical transformation of the landscape.

The best documented medieval estates are often those of ecclesiastical estates and, as a result, the Church is often seen as having had a major role in wetland reclamation. It is certainly true that throughout the medieval period the church invested heavily in improving the drainage of their marshland estates, though in many if not most cases they were not responsible for the initial construction of the sea walls. For example, during the 12th century two newly founded monastic establishments acquired extensive holding on the Gwent Levels. The Priory at Goldcliff, founded c.1113, was never a grand affair though it held extensive estates in the western part of the Caldicot Level. Although the monks may have contributed to the drainage and enclosure of this area, they cannot have been responsible for the construction of the initial sea wall: the Priory's foundation grant includes reference to two chapels, at Nash and Goldcliff, which indicate that the area had already been protected from tidal inundation. It seems, therefore, that the sea wall had already been constructed, presumably on the initiative of the Lord of Caerleon who wished to improve the whole of his marshland area.

The other major monastic interest in the Caldicot Level was that of Tintern Abbey, which held two granges there. The best known is 'Lower Grange' in Magor (Fig. 8:D; Rippon 1996a, 79-80, figs. 30 and 36). In 1245, Walter, Earl of Pembroke and lord of Strigoil (Chepstow), gave the monks permission to enclose the land of their Moor Grange with a ditch and to make consequential arrangements for its enclosure and drainage (CChR III, 88-97). However, Tintern could only have been improving an estate that had already seen at least rudimentary enclosure and drainage since the estate was described as 'divided by ditches' when the monks received it in c.1114-50 (CChR III, 88-9). Their other major estate on the Caldicot Level was New Grange in Redwick (Fig. 8D). The modern farm name 'Grangefield', first recorded in 1687 (Bradney 1932, 239) suggests that this estate, in the north-west corner of Redwick parish, was the location of Tintern's 'New Grange' recorded in 1572 (NLW Bad.D. 254). By 1831 the estate had passed to the Duke of Beaufort, whose lands were mapped by the Commissioners of Sewers (GwRO D.1365/2). The estate covered much of the low-lying land in north western Redwick, beyond the Mere Reen fenbank, perhaps indicating that the monks were granted an area of unenclosed and undrained 'waste' land that they were left to improve.

Therefore, in some cases, such as the initial embankment and colonisation of the Caldicot Level, it was major landowners who took the initiative in marshland reclamation. The Caldicot Level also illustrates how one of the greatest medieval landowners, the Church, certainly played a major part in reclamation though this was often in the form of enclosure and drainage of land which had already been embanked before they were granted their holdings. Romney Marsh provides another example. That area is fortunate in possessing a wide range of early medieval land charters recording the granting of estates to the Church. These charters include detailed descriptions of the estate boundaries, and the landmarks recorded include arable fields and artificial watercourses (Brooks 1988). The impression given is of a crowded landscape that was already heavily utilised, and reclaimed, before parcels of land were granted to

the Church. It is frustrating that this initial act of sea wall construction around these early medieval wetlands is invariably undocumented. It must also be remembered that the documentary record is inherently biased towards the literate higher strata of society: many areas of coastal marshland were held by a multiplicity of lesser lords, yet these areas were also embanked and drained.

Alternative strategies towards the use of coastal marshes

During the medieval period, most communities and landowners chose to adopt the same strategy towards the utilisation of coastal wetlands: reclamation. In the 12th and 13th centuries, Britain continued to have an expanding population and a burgeoning economy, and the reclaimed marshes of Romney Marsh, Fenland and around the Severn Estuary were certainly associated with extensive arable cultivation illustrated, for example, by the extent of ridge and furrow and documents such as survey and account rolls. For example, on Glastonbury Abbey's Brent Marsh estate in Somerset, around 85 per cent of the demesne was down to arable, which was a higher proportion than the 77 per cent on the nearby, dryland manors (Keil 1964, table A; Rippon 1997a, table 9.1).

It might be expected, therefore, that a similar pattern of wetland modification and transformation, based on increasing arable production, was seen elsewhere, though this was not always the case. Around the Thames Estuary, for example, although many marshes were embanked during the medieval period there were also extensive areas that were not, these being used as seasonal sheep pastures instead as the salty conditions helped to prevent foot rot and liver fluke. Certain marshes, such as Canvey, Foulness and Wallasea Islands, were once huge tracts of common land, and Domesday records that manors many miles inland had the rights to pasture sheep there (Cracknell 1959; Round 1903; Smith 1970). When the marshes came to be enclosed, each of those communities which had held common grazing rights received a parcel of land which became detached parts of those distant parishes: it may

have been the resulting highly fragmented pattern of landholding that contributed to the late date of reclamation on these areas.

Even those marshes around the Essex coast that were embanked do not appear to have been used for intensive arable cultivation, but instead were grazed by cattle and particularly sheep. It appears that the profits from dairy production, for which there was a substantial market in nearby London, outweighed the benefits of increased cereal production through reclamation.

The Halvergate Marshes in Norfolk represent another extensive tract of tidal marshland that was left unreclaimed for much of the medieval period because it was so highly valued as sheep pasture, lying as it does close to the major markets of Norwich and Yarmouth (Williamson 1997). Therefore, the perception of the landowners and their tenants in this region was that the rich natural grazing was more highly valued than agricultural land: in other words, reclamation (remembering the complexity of the drainage system, and the cost of its initial construction and subsequent maintenance) was not worth the effort in that particular region. Even during the 12th and 13th centuries, when grain prices were at their highest, pastoral farming could be more profitable than arable cultivation because of the proximity of a substantial market for fresh dairy produce.

In fact, when placed in their regional context, the extensive and relatively specialist use of the Essex and Norfolk marshes is not surprising, as it forms part of a pattern seen throughout East Anglia of a relatively flexible approach to the utilisation of different topographical regions, in sharp contrast to the arable-dominated Midlands (see for example Bailey 1989; Rippon 1999b; Williamson 1993). Indeed, at Domesday, Norfolk had one of the highest densities of population in the country, and by 1334 had the third highest assessed wealth per square mile of any county (Glasscock 1973): clearly, considerable wealth and high populations could be supported by the simple exploitation and modification of wetlands, without the need for full-scale transformation.

Discussion

One of the fundamental themes of the research upon which this paper is based is the need to view landscapes in context. There is a long tradition in Britain and in mainland Europe of detailed local studies of particular landscapes at particular times, usually on the basis of extensive field surveys or detailed documentary research of individual regions. This paper shows that if we take a few steps back from this mass of data, there are a number of broad trends that can be detected, which can be used to address topics of much wider significance than the individual landscapes themselves. Particularly useful is the comparative study of one landscape type that occurs in a range of locations, as the differing ways in which that same landscape type was exploited can shed new light on regional socio-economic structures. Decisions whether or not to transform an area of marshland, or indeed any area of landscape, will reflect the way in which communities perceived their environment and, in particular, the high costs, considerable risks and enormous benefits of reclamation versus less intensive forms of

resource exploitation. These decisions might be affected by a wide range of general factors such as economic and demographic change, more local trends including the structure of landholding, proximity to towns and availability of natural resources, or even the whims of individuals.

Finally, our modern, very Western, perception of wetland use is one of zero tolerance towards flooding: in the 20th century we do not like getting our feet wet, and as a result huge sums of money are spent maintaining flood defences in a rather King Canute-like fashion. In the medieval period the same was true in certain areas in that reclamation - the physical transformation of the landscape against the forces of nature - was the most common strategy towards the utilisation of coastal wetlands. However, communities elsewhere took a more flexible approach, realising the natural potential of coastal marshes, rather than fighting against nature in order to create a wholly artificial environment simply to produce yet more grain. Coastal wetlands are 'marginal' only if human communities perceived them to be so.

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