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Battling the tides: the Severn Estuary wetlands during the prehistoric, Roman and medieval periods

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I first met Martin during a break from the Theoretical Archaeology Group conference held at the University of Lampeter in the early 1990s when I had just started my PhD. I was immediately struck by two things: how generous Martin was with his time, and the interest he showed in my research. This is of course typical of Martin, and I have benefitted from his advice and support on many occasions over the subsequent years. I also have many fond memories of Severn Estuary Levels Research Committee meetings when Martin would show us his remarkable discoveries in the intertidal zone of the Gwent Levels. That he and his team could work so meticulously in such a difficult environment filled me with admiration, and inspired me to dabble in intertidal survey myself (most notably with another the Severn Estuaries great figures, John Allen). But Martin is not just an inspirational teacher and fieldworker: he also has a remarkable publication record and as one of the founding fathers of intertidal research in the Severn Estuary, the profession of archaeology as a whole owes him an enormous amount.

ABSTRACT

This paper will review how human communities changed from simply exploiting the rich natural resources of the Severn Estuary's wetlands during the prehistoric period, through to modification and then transformation as the coastal marshes were reclaimed over the course of the Roman and medieval periods. This intensification of wetland utilisation can in part be accounted for by a 'push in the margins' driven by expanding population and the need for more agricultural land, but it was also affected by other social and economic factors that sometimes prevented reclamation such as the rich natural resources of intertidal marshes occasionally being more highly valued than agricultural land. Indeed, the model of wetland exploitation, modification, and transformation is itself in need of revision as we become increasingly aware that the history of human endeavour in wetland landscapes has not been one of unilinear success. Instead, periods extensification (the reclamation of new land) intensification (such as increased arable cultivation) have been interspersed with episodes of retreat when reclaimed land was abandoned and the estuarine tides recovered some of what they had lost.

INTRODUCTION

The Severn Estuary, and its adjacent wetlands, is a remarkable landscape. With the second largest tidal range in the World, large areas of land are exposed twice a day only to be covered once again by the Severn's muddy waters. Rising sea levels since the last Ice Age have laid down a deep sequence of sediments comprising a series

of alluvial clays interspersed with layers of peat representing periods when freshwater vegetation colonised what had previously been intertidal mudflats and saltmarshes. Similar sequences of Holocene sediments are found around many of our major estuaries, but one of the things that makes the Severn Estuary so special is how its large tidal range and vast intertidal zone provides a window into how past human communities made use of this landscape from prehistory through to the present day.

Another reason why the Severn Estuary is so important is its long history of archaeological investigation. The excavations of the Iron Age ‘lake villages’ at Glastonbury and Meare, in Somerset, were amongst the first sites in Britain to reveal just how remarkably well-preserved structural remains and material culture could be in wetland landscapes (see Coles and Minnitt 1995 for a reflective discussion). The truly inspirational Somerset Levels Project – directed by John and Bryony Coles – revealed the vast array of prehistoric evidence that was preserved within the deep peat sequences of the low-lying inland ‘backfens’ (summarised in Coles 1989), and from the 1980s the potential of the intertidal zone also started to be appreciated. This came about through the fortuitous coming together of various strands of fieldwork which included the remarkably perceptive fieldwork of geologist John Allen who made sense of the Holocene sequence, the recognition of archaeological sites by local bird-watcher Derek Upton, and growing interest on the part of professional archaeologists – including Martin Bell – in the face of the potential impact of a proposed tidal power barrage.

And so began over 30 years of fieldwork in the Severn Estuary wetlands, and its impressive series of research publications that includes the Severn Estuary Levels Research Committee’s (SELRC) annual report *Archaeology in the Severn Estuary* and a series of Council for British Archaeology Research Reports (Rippon 1996; Naying and Caseldine 1997; Nayling 1998; Bell *et al.* 2000; Bell 2007; Nayling and McGrail 2004; Rippon 2006; Bell 2003). The cumulative result of this and other research has been a remarkably detailed understanding of the changing ways in which human communities have interacted with the Estuary, exploiting its rich natural resources and – over time – gradually changing the natural environment in order to intensify its productivity.

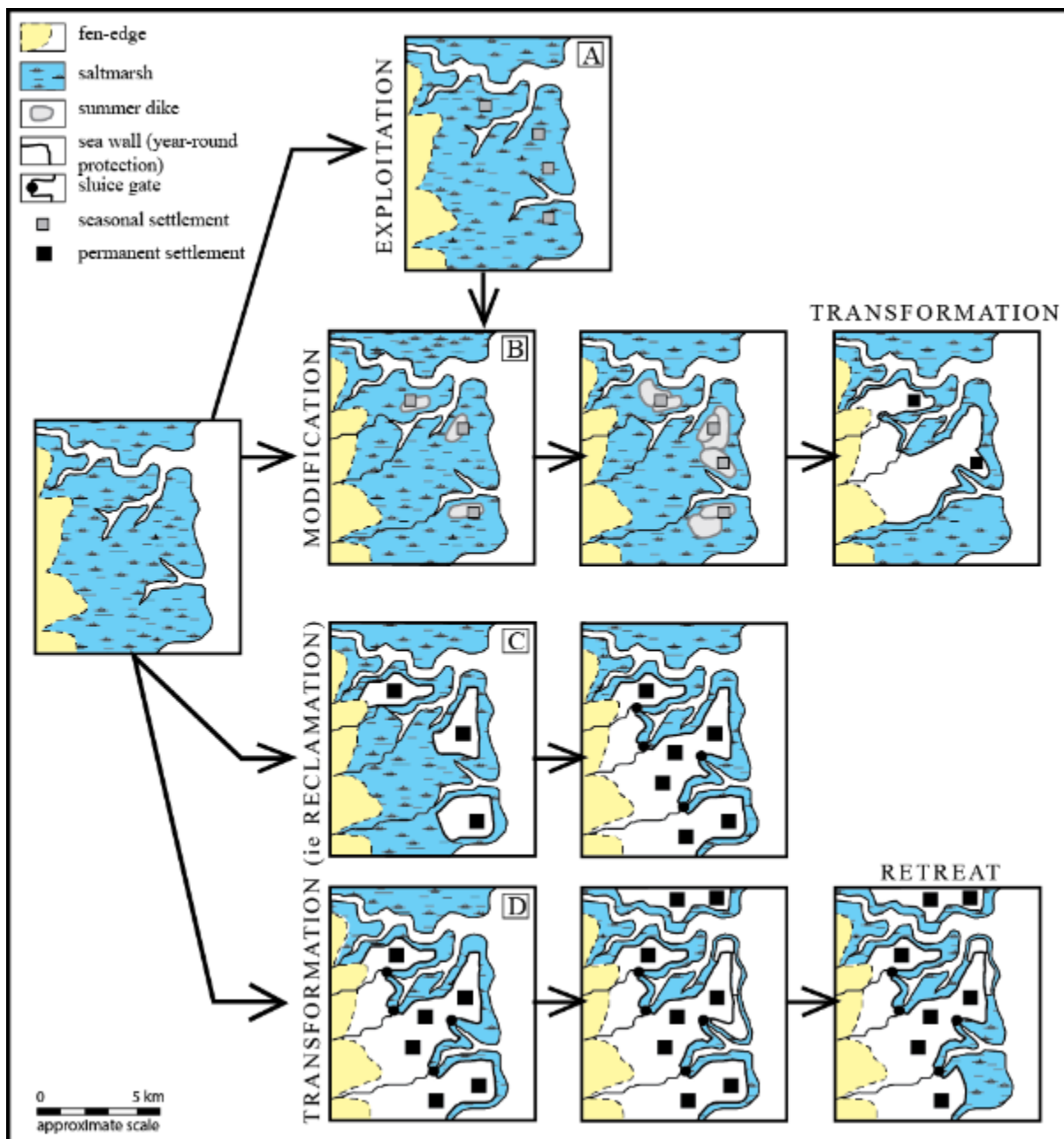


Figure 1 Schematic model for the increasing intensity with which human communities initially exploited the rich natural resources of coastal wetlands, and then modified and transformed them in order to increase agricultural productivity. This was first published in Rippon 2000a, but we now have a better understanding of how reclamation is not a unilinear progression and that there were also periods when nature retook control with previously reclaimed areas reverting to intertidal environments as sea walls were set back in the face of coastal erosion (hence the 'Retreat' stage bottom-right has been added; drawn by author).

EBB AND FLOW IN THE USE OF WETLANDS: EXPLOITATION, MODIFICATION, TRANSFORMATION, AND SET-BACK

The rapid rise in post-glacial sea levels led to the formation of intertidal saltmarshes and mudflats all around the Severn Estuary, and one of the most exciting early examples of intertidal archaeology was the recording of Mesolithic human footprints exposed within the intertidal zone (e.g. Aldhouse-Green *et al.* 1992; Bell 2007).

More recent work has mapped large numbers of similar lines of footprints, showing how small groups of humans were walking in consistent ways across the mud around Goldcliff island (Bell 2020, 90-101). One reason why people were trudging through the mud was to hunt for food, with the footprints of many animal and bird species also preserved in the mud (Allen *et al.* 2004; Barr and Bell 2017).

Wild animals and birds – a potentially rich source of food – are not the only natural resources afforded by the intertidal environments around the Severn Estuary: fish could be caught in the tidal waters, domesticated animals were grazed on the higher saltmarshes, and salt can be produced by gently heating the estuary's water (e.g. Rippon 2006; Bell 2013). This simple exploitation of natural resources is therefore the first, and simplest, way that human communities utilised coastal wetland not just around the Severn Estuary but across North West Europe (Figure 1; Rippon 2000a). Over time, however, as population rose and there was a need to produce more food, human communities started to intensify how they used the Severn Estuary wetlands, for example by digging drainage ditches and building low embankments to try and prevent summer flooding and improve the quality of the grazing, that can be termed 'summer dikes'. Examples have been excavated both on the Caldicot Level (e.g. Meddens and Beasley 2001) and the North Somerset Levels (Rippon 2000b; 2006). All around the British coast this phase of wetland 'modification' dates to the Roman period, and represents the second way that human communities utilised the Severn Estuary (Figure 1).

During this 'modification' phase the environment remained essentially intertidal: the drainage ditches and embankments will have helped prevent unseasonally high summer flooding, but palaeoenvironmental analysis of the water in the ditches shows that it was still brackish. The Severn Estuary appears to have been the only part of Roman Britain to then see a further intensification in how its wetland were used, when the landscape was transformed by full-scale reclamation whereby more substantial sea walls were constructed that changed the ecology from brackish to freshwater. This was a high cost, high risk, but high return strategy towards utilising a landscape. The initial capital cost in digging the drainage ditches and building the sea walls, and the subsequent recurrent costs associated with maintaining those flood defences, will have been considerable, while the risk of flooding due to storm surges was ever-present. What must, therefore, have been critical was that the agricultural productivity of a reclaimed wetland was far higher than an unreclaimed marsh (Rippon 2000a). Excavated examples of this transformative approach towards wetland management have been found on both sides of the Estuary, although in different contexts. On the Wentlooge Level it is likely to have been undertaken by the army based at the legionary fortress at Caerleon (Fulford *et al.* 1994), while in Somerset reclamation appears to have been within the context of civilian villa-based estates (Rippon 1995; 2006).

This model of intensification of wetland utilisation that progressed through exploitation, modification, and transformation should, however, now be revised in part to reflect what happened after the Roman period. The relationship between human communities and wetland environments was not a unilinear one, but instead saw episodes of retreat. In the early medieval period most of the reclaimed Roman landscapes appear to have been abandoned and flooded, with freshwater soils being buried under estuarine alluvium (e.g. Rippon 2000b; 2006; Meddens and Beasley 2001). In these areas the reclaimed landscape of today represents a second phase of reclamation that in Somerset dates to the late first millennium AD, while in Gwent it probably dates to shortly after the Norman Conquest (Rippon 1996; 2008a). The late medieval period saw another phase of retreat, as sea walls all around the Severn Estuary had to be set-back in the face of increased coastal erosion, and this is reflected in how the modern sea wall cuts diagonally across some fields (see below; Figures 1-2; Rippon 2002).



Figure 2. Aerial view of the coastal part of Redwick parish showing how the modern sea wall has been set-back to its present location such that it cuts diagonally across earlier fields (photo: author).

MARGINALITY: STILL A USEFUL CONCEPT IN LANDSCAPE STUDIES?

Studying particular landscapes is integral to archaeological research but in order to understand a place it must be seen in its wider context. The integration of techniques for mapping the physical structure of the landscape, alongside palaeoenvironmental analysis that allows us to reconstruct ecologies, vegetation cover, and land-use, means that palaeogeographical reconstruction is becoming increasingly sophisticated. This allows the different strategies towards wetland utilisation to be compared across both time and space, and one reason why the Severn Estuary wetlands are so important is that the change from exploitation, through modification, to transformation helps us understand wider trends within past societies. Developments during the Roman period are a very good example. It is noteworthy that all of the major coastal wetlands within Roman Britain see a gradual intensification of their use in the 1st and 2nd centuries AD and this reflects trends seen across most lowland areas where the number of settlements was increasing (Smith *et al.* 2016; Allen *et al.* 2017). This wetland use was, however, restricted to the exploitation of natural resources and the modification of some landscapes such as in Fenland, with the large-scale transformation of coastal wetlands being restricted in both time (the mid 3rd to mid 4th centuries) and space (some, but not all, of the wetlands around the Severn Estuary). At first sight this late Roman reclamation would seem curious as across most of Britain the numbers of rural settlements were in decline, and as such this is a good example of why studying one type of landscape – in this case coastal wetlands – that occurs in lots of different places is so interesting as they act as barometers for a variety of socio-economic processes.

The idea that the intensity of landscape exploitation reflects a variety of factors is not new, and it lay at the heart of Michael Postan's (1972) 'population-resource' model. This argued that as population and demand for food increased during the High Middle Ages (the 12th and 13th centuries) there was an expansion of settlement in previously less favoured landscapes – the 'journey to the margins' – and that in the late medieval period, when population and demand for food fell, it was followed by a 'retreat from the margins'. This model of 'marginality' has been prominent in both the medieval period and prehistory (e.g. Young and Simmonds 1995; Tipping 2002), but has been challenged on various grounds (e.g. Bailey 1989; Dyer 1989; Mills and Coles 1998). In particular, Postan's emphasis upon population growth and arable cultivation is questionable as we now have a better understanding of the productivity of mixed and predominantly pastoral economies, while the role of environmental factors in shaping landscape change has also come under close scrutiny. While it remains true that the rigidity of 'environmental determinism' should continue to be rejected, we are becoming increasingly aware of how the natural environment shapes human behaviour and landscape character over time (e.g. Williamson 2003; 2013; Rippon 2006; 2008a).

FORCING BACK THE TIDE: THE INCREASING INTENSITY OF WETLAND UTILISATION IN THE ROMAN PERIOD

The late Roman period saw a marked 'push into the margins' in some – but not all – of the coastal wetlands around the Severn Estuary, and the physical uniformity of these natural environments (alluvial marshland) allows us to explore the reasons why different communities chose to exploit the same type of landscape in different ways. On the English side of the Estuary, the extensive coastal marshland in North Somerset and the northern part of the Central Somerset Levels (the area that in the medieval period was known as 'Brent Marsh' to the north of the now silted-up river *Siger*) were both embanked with the resultant change in ecology from brackish/intertidal to freshwater (Figure 3; Rippon 1995; 2000b; 2006). These landscapes had clearly been transformed through reclamation, and in each case there was a Roman villa at the centre of the reclaimed area (Wemberham in North Somerset, and Lakehouse Farm near Brent Knoll). There is no reason to suppose that the decision to reclaim these marshlands was not on the initiative of these villa owners, and this fits in with the emerging picture of agricultural prosperity in this region during the late Roman period (the southern part of what has been termed Roman Britain's 'Central Belt': Smith 2016). This 'push into the margins' can therefore be seen as a socio-economic phenomenon: the contemporary perception must have been that that the initial capital cost of building flood defence, the recurrent costs associated with their annual maintenance, and the potential risks of flooding, were outweighed by the perceived economic return on that investment.

The situation was, however, very different in the southern part of the Central Somerset Levels (the Brue Valley, between the *Siger* and the Parrett Estuary) where the landscape was left as intertidal saltmarsh and used for salt production. In part there may be an explanation for this in the character of the natural environment: the coasts of both the North Somerset Levels and Brent Marsh were protected by belts of natural sand dunes, although extensive embankments will still have been required along the tidal rivers. The open coast to the south of *Siger* was not, in contrast, protected by sand dunes but embanking this area would not have been an enormous task as there were a series of bedrock islands – notably Huntspill and Pawlett – that could simply have been linked by relatively short stretches of sea wall. It is instead likely that this area of marshland was left unreclaimed because its natural resources – most notably the opportunity to produce salt – were so highly

valued. In this respect it is very striking that no evidence for salterns have been found on the Welsh side of the Estuary, which is curious as the Gwent Levels lay close to the legionary fortress at Caerleon whose non-agriculturally productive military and civilian populations will have required large amounts of salt to produce food. The wetlands in the immediate hinterland of Caerleon appear to have been embanked and used for grazing animals (Fulford *et al.* 1994; Beasley and Meddens 2001), and so another area will have been required for salt production. There is in fact a direct link between Caerleon and the marshlands south of the *Siger* and in particular the port at Crandon Bridge besides the Parrett Estuary (Rippon 2008b). Crandon Bridge appears formed part of a major supply route for the military garrison at Caerleon, with a large amount of its pottery having been brought there from Poole Harbour in South-East Dorset before being loaded onto larger vessels that could cross the Severn Estuary and sail to Caerleon. Surely it is no coincidence that the only late Roman salt industry around the Severn Estuary was next to Crandon Bridge and this supply route for the military establishment? The Caldicot Level – directly south of Caerleon – was used extensively for grazing and no evidence has yet been found for salt production: perhaps the estuarine waters this far up the estuary were not sufficiently salty?

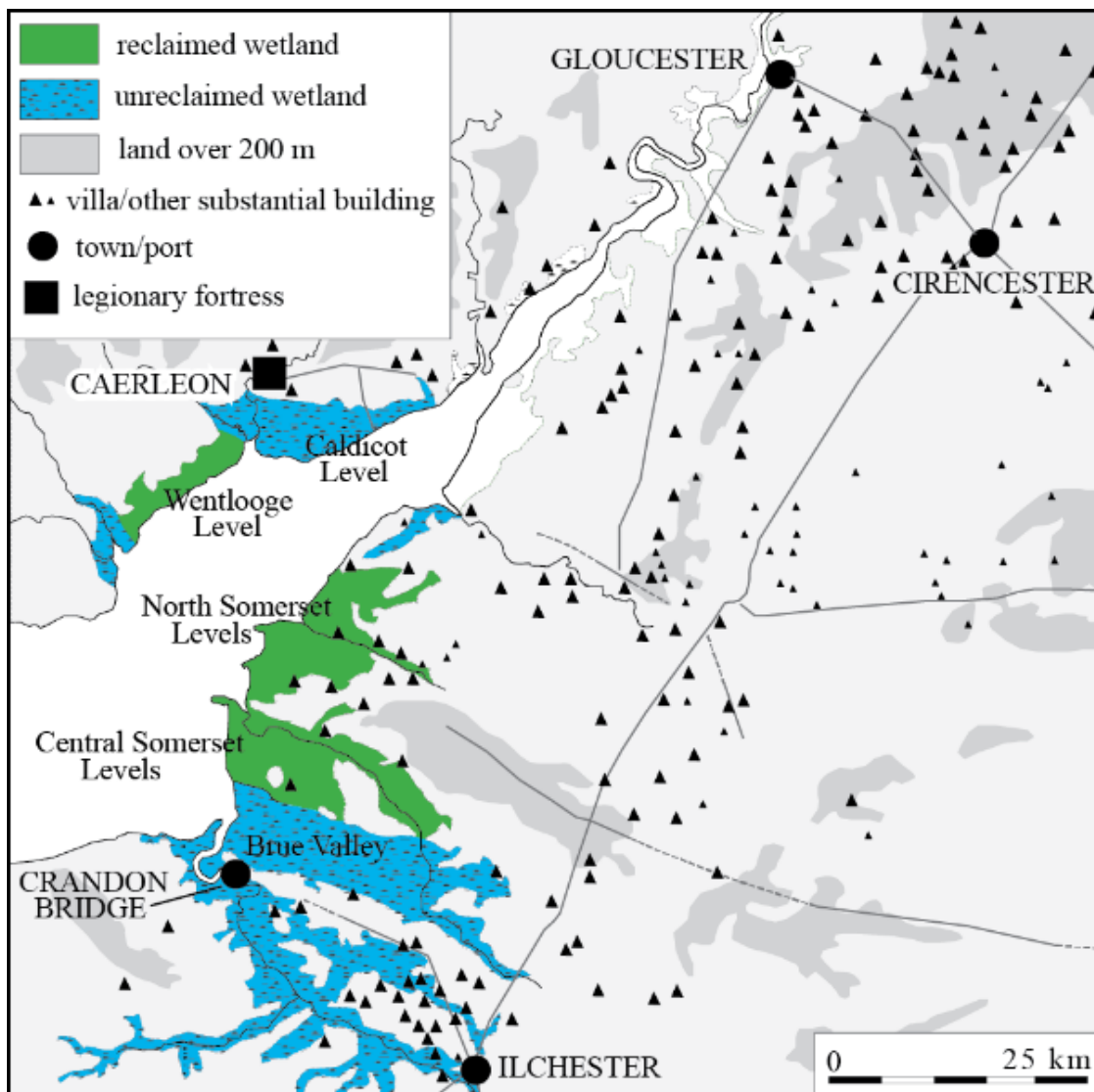


Figure 3. The extent of marshland reclamation in Somerset and Gwent during the Roman period (drawn by author).

What we see on the Somerset side of the Severn Estuary in the Roman period is, therefore, a divided landscape with the marshland south of the *Siger* responding to the demands of military procurement – the command economy – while to the north of the *Siger* the market economy saw civilian landowners invest in reclamation. That the Second Augustan Legion drew resources from across the South West of Britain is well known (Fulford 2006), and their presence on the southern coast of Devon in the late 2nd century – long after the legion withdrew from Exeter in c. AD80/85 – is confirmed by the clearly genuine stamped legionary tile from Seaton (Warry 2021, 403-6). What we therefore see around the Severn Estuary in the Roman period is that there was a ‘push into the margins’ in one sense, as the use of its wetlands intensified dramatically, but that this was in practice a far more complex process than Postan’s population-resource model envisaged. In North and Central Somerset north of the *Siger* there does indeed appear to have been wetland reclamation driven by market economics: the production of surplus agricultural goods that could be sold in order to pay taxes and procure goods and services (such as the specialists employed to build the villa at Wemberham with its mosaic pavements). Yet elsewhere around the Severn Estuary – south of the *Siger*, and on the Gwent Levels – the same type of landscape (alluvial coastal marshland) was used in different ways due to the dominance of a non-market based economy dominated by military control and/or procurement. This led to the ‘normal’ trajectory of landscape intensification – increased population leading to increased arable production – being skewed by socially embedded factor such as the demand of a dominant landowner for non-arable resources such as salt.

BATTLING THE TIDES: MEDIEVAL RECLAMATION AND RETREAT

In the 5th century the shift from wetland exploitation, through modification, to transformation was reversed with widespread flooding all around the Severn Estuary. By the 12th century, recolonization of the Severn Estuary’s wetlands was well underway, and while in many respects this represents a classic ‘push into the margins’ we once again see that in places the logical progression of reclamation was prevented by socially-embedded factors. The clearest example is Caldicot Moor, a vast tract of saltmarsh at the eastern end of the Caldicot Level that went unreclaimed until the 19th century. Different communities, and different landlords, could chose different ways to manage their land, and in the case of Caldcot Moor this involved retaining traditional common grazing on an intertidal saltmarsh while their neighbours were embanking and draining their lands.

Caldicot Moor shows how highly valued saltmarshes were as grazing land, but even when reclaimed these wetlands will have been inhospitable places in winter, and it is likely that much of the livestock would have been driven onto higher ground. Martin Bell (2020) has recently pulled together a wide range of evidence for the movement of people and animals across prehistoric landscapes, and the Roman and medieval countryside will have been just as busy. For the Roman period there appears to be a major road leading south from the Caerwent to Caerleon road down to the major tidal inlet at Magor Pill where there was clearly some form of Roman settlement (Rippon 1996, 32). What is striking about this road is that it appears to have continued north to the forested upland of Wentwood, as is the case with several other more sinuous droveways that are presumably of medieval date. These reflect how the grazing of livestock on the Levels will have been a seasonal activity, especially in the case of cattle whose considerable weight meant that they would poach the soft ground very easily. There are documentary references to ‘summerways’ on the Gwent Levels (Rippon 1996, 56), reflecting how cattle will have been driven down onto the wetlands during the summer months.



Figure 4. Aerial view of the island and medieval monastery of Muchelney, in Somerset, during the freshwater floods of 2014 (photo: Damian Grady, @Historic England Archive, NMR 27898_005).

By the 12th and 13th centuries the coastal marshes all around the Severn Estuary were mostly embanked and drained, although the lower-lying inland ‘backfens’ were mostly unenclosed common pasture and very vulnerable to flooding from freshwater running off the surrounding high ground (Figure 4). When assessing population densities and agrarian prosperity across different landscapes it is therefore important to differentiate between the permanently settled agricultural lands in the coastal districts, and sparsely or just seasonally utilised backfens. Unfortunately the Gwent Levels are poorly documented in the medieval period, but Somerset has a large number of documentary sources that allow us to compare the wetland and dryland economies. Domesday Book shows that in the late 11th century the settled coastal claylands of the Somerset Levels had densities of both population and ploughteams that were comparable to the adjacent dryland areas, while for the period 1250-1349 other sources suggest that the reclaimed coastal marshes supported an average to high population density, and a high to very high assessed wealth (Rippon 2021, appendix 2.1 [see top of table for sources used]). Quite simply, although the recurrent costs of maintaining the drainage and flood defence systems on the Levels were high, and there was an ever-present risk of flooding, the high agricultural productivity of these wetlands more than made up for the costs and risks.

But risks there were, and in the late medieval period the tides started to turn. It is all too easy to assume that the great earthen embankments (sea walls) that protect the Severn Estuary Levels date back to this era of medieval prosperity, but it is increasingly clear that this is often not the case. In many (most?) cases our present sea walls are no older than the late medieval period, having been set-back to their current location in the face of increased storminess and the resultant coastal erosion. A good example is the sea wall at Redwick, on the

Caldicot Level (Figure 2) that clearly cuts diagonally across several fields in a way that suggests it has been set-back to its present location having once been further out into the Estuary.

CONCLUSIONS

This paper has reviewed how human communities gradually intensified the ways in which they utilised the Severn Estuary wetlands. In prehistory communities simply exploited the region's rich natural resources, while in the Roman period modifications of the landscape allowed greater agricultural production by limiting the amount of flooding. In places reclamation brought about a complete transformation of what had once been intertidal environments, with the freshwater flora and fauna in the drainage ditches being very similar to those seen today. This intensification of wetland utilisation appears to have been carried out by land-owners who were wealthy enough to build well-appointed villas, and this transformation of the landscape can in part be accounted for by a 'push in the margins' driven by expanding population and the desire for more agricultural land. There were, however, other social and economic factors at play in the Roman and medieval periods that led to some areas of intertidal marsh being retained, suggesting that their rich natural resources were more highly valued than agricultural land. This is one instance of how the model of wetland exploitation, modification, and transformation is in need of revision as we become increasingly aware that the history of human endeavour in wetland landscapes has not been a unilinear one from low intensity hunting, fishing, grazing, and salt production through to intensive arable farming. Another example of how the creation of today's historic landscape was not one of progressive improvement is that periods of agricultural intensification were interspersed with episodes retreat when the estuarine tides recovered some of the lands that they had lost. These set back sea walls around the Severn Estuary are, therefore, in part monuments to human achievement – in holding back the tides and creating our reclaimed wetland landscapes – but also reflect the pragmatism required when it becomes apparent that nature has other plans.

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