

Malaria, migration and merry widowers in the Essex marshes 1690 – 1730.

Romola Davenport and Max Satchell

Cambridge Group for the History of Population and Social Structure, Department of Geography,

Downing Place, Cambridge CB2 3EN

Abstract

Scientific, medical and anecdotal evidence indicates that malaria was endemic in coastal marshes of England before the early twentieth century. However the lethality of historical malaria in England remains contested. One of the most influential anecdotes regarding malaria is Daniel Defoe's early eighteenth-century account of agues in the Essex marshes. Defoe reported that marsh farmers had very high rates of remarriage because they married brides from upland parishes who were unused to marsh diseases and who suffered very high mortality rates as a consequence. We tested the veracity of Defoe's anecdote using marriage registers for Essex parishes. Contrary to Defoe's claims, we found no evidence of high remarriage rates for marsh grooms and no evidence that men from marsh parishes married women from 'upland' parishes in unusual numbers. These results suggest, as Defoe himself hinted, that his informants may have been exaggerating the exceptionalism of marsh conditions, and that this anecdote should not be used as evidence for the health impacts of malaria in early modern England.

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Introduction

Malaria remains a major disease in many tropical areas and is expected to extend its range under the influence of climate change. The disease is caused by several species of the *Plasmodium* parasite and the parasite life cycle involves transmission by mosquitos that feed on infected human hosts. The disease therefore flourishes in environments where mosquito vectors are abundant, most notably tropical and equatorial regions. However the historical range of malaria was much more extensive and included temperate areas of Europe as far north as Finland and Russia.¹ In England malaria was endemic in some coastal marsh areas, most notably the marshes of Essex and Kent that bordered the Thames estuary.² Early modern descriptions of ‘ague’, marsh fevers’ and ‘tertian’ and ‘quartan’ fevers accord in many instances with clinical symptoms from modern laboratory-confirmed cases, and these diseases were associated by contemporaries with marshes and poorly drained land. However definitive proof of indigenous malaria was lacking until the identification of the malarial parasite in the 1880s and the development of microscopy-based blood tests. Examination of blood samples in the early 20th century confirmed the presence of indigenous malaria in residents of the Essex marshes who had never travelled to known malarial areas or had contact with imported cases, and identified the indigenous malarial species as *Plasmodium vivax*.

¹ O.S. Knottnerus, ‘Malaria around the North Sea: A survey’, in G. Wefer, W.H. Berger, K.-E. Behre and E. Jansen (eds) *Climate Development and History of the North Atlantic Realm* (Berlin, Heidelberg, 2002), pp. 339–53; L. Huldén, L. Huldén, and K. Heliövaara, ‘Endemic malaria: An “indoor” disease in northern Europe. Historical data analysed’, *Malaria Journal*, 25(4) (2005), pp. 4–19; T.T. Chen, F.C. Ljungqvist, H. Castenbrandt, F. Hildebrandt, M.M. Ingholt, J.C. Heson, J. Ankarklev, K. Seftigen and H.W. Linderholm, ‘The spatiotemporal distribution of historical malaria cases in Sweden: A climatic perspective’, *Malaria Journal*, 20(1) (2021), 212; L.J. Bruce-Chwatt and J. de Zulueta, *The Rise and Fall of Malaria in Europe* (Oxford, 1980).

² W.D.L. Smith, ‘Malaria and the Thames’, *The Lancet*, 267(6920) (1956), pp. 433–36; M.J. Dobson, *Contours of Death and Disease in Early Modern England* (Cambridge, 1997).

P. vivax is the dominant malarial species in tropical areas of Asia and Latin America and is often dubbed 'benign malaria' to distinguish it from the much more lethal *P. falciparum* found predominantly in Africa. Indigenous malaria also appears to have been a relatively mild disease in northern Europe by the nineteenth century. Sweden and Denmark introduced compulsory notification of malaria cases in 1861 and 1862 respectively, and the clinical descriptions and geographical distribution of cases fit well with the predicted epidemiology of northern *P. vivax* strains. Malarial deaths were rare and areas with high malaria prevalence were not characterised by excess mortality.³

Despite the reputed low mortality of *P. vivax* malaria, a number of historians have argued that endemic malaria was associated with very high death rates in England and in Scandinavia in the seventeenth and eighteenth centuries.⁴ The most compelling evidence for the lethality of malaria in England is provided by Mary Dobson's influential work on marshy and upland areas of south-eastern

³ Chen et al., 'Spatiotemporal distribution'; M.M. Ingholt, 'The epidemiology and medical history of malaria in nineteenth-century Denmark' (unpublished Ph.D. thesis, University of Roskilde, 2022). Malaria did not become a notifiable disease in England and Wales until 1919.

⁴ Chen et al., 'Spatiotemporal distribution'; Dobson, *Contours*; M.J. Dobson, 'History of malaria in England', *Journal of the Royal Society of Medicine*, 82(Suppl. 17) (1989), pp. 3–7; M.J. Dobson, 'Death and disease in the Romney Marsh area in the 17th to 19th centuries', in J. Eddison, M. Gardiner and A. Long (Eds) *Romney Marsh: Environmental Change and Human Occupation in a Coastal Lowland* (Oxford, 1998), pp. 166–81; A. Nicholls, 'Fenland ague in the nineteenth century', *Medical History*, 44 (2000), pp. 513–30; Huldén et al., 'Endemic malaria'; L. Huldén, and L. Huldén, 'The decline of malaria in Finland – the impact of the vector and social variables', *Malaria Journal*, 8(1) (2009), 94; P. Reiter, 'From Shakespeare to Defoe: Malaria in England in the Little Ice Age', *Emerging Infectious Diseases*, 6(1) (2000), pp. 1–11; K. G. Kuhn, D.H. Campbell-Lendrum, B. Armstrong and C.R. Davies, 'Malaria in Britain: Past, present, and future', *Proceedings of the National Academy of Sciences*, 100(17) (2003), pp. 9997–10001.

England in the period c.1550 – 1850.⁵ Dobson used counts of burials and baptisms from parish registers to demonstrate very high mortality in the marshes of Kent and the Thames estuary and hypothesised that malaria was a key driver of this excessive mortality. Acknowledging the lower virulence of *P. vivax* malaria compared with *P. falciparum* strains she argued that the main impact of malaria in England was probably to cause debility (via anaemia and liver damage) that exacerbated the lethality of other infections and co-morbidities. She also argued that this pattern of heightened mortality in marsh areas waned after the mid-eighteenth century, a trend she attributed to drainage as well as other more general improvements in health and land management.

In addition to demographic evidence of high death rates in marsh areas Dobson drew on a wealth of literary, medical, official and anecdotal evidence to document the presence of malaria and to build a case for its lethality. This paper examines one of the most compelling of these anecdotal sources relating to the virulence of endemic malaria, Daniel Defoe's account of malaria in the Essex marshes.

Defoe commenced his famous *Tour thro' the whole island of Great Britain* (1724) by describing a journey from London along the northern coast of the Thames estuary through the ancient Essex Hundreds of Barnstable, Rochford and Dengie (Figure 1). This area was characterised by extensive salt marshes ramified with rivers and tidal creeks, an area that Defoe described as 'both unhealthy and unpleasant' but also as very rich grazing land.⁶ He concluded his brief description of the three Hundreds with an anecdote that has been widely quoted by historians as evidence of the historical malignancy of malaria in this area (and by extension other marshy areas of Britain). The anecdote is repeated in full below:

⁵ Dobson, *Contours*; Mary J. Dobson, "'Marsh Fever" - the geography of malaria in England', *Journal of Historical Geography*, 6(4) (1980), pp. 357–89; Dobson, 'Death and disease in the Romney Marsh Area'; Dobson, 'History of malaria'.

⁶ D. Defoe, *A Tour Thro' the Whole Island of Great Britain* (London, 1724, 1968), p. 9.

I have one remark, before I leave this damp part of the world, and which I cannot omit on the women's account; namely, that I took notice of a strange decay of the sex here; insomuch, that all along this county it was very frequent to meet with men that had from five to six, to fourteen or fifteen wives; nay, and some more; and I was informed that in the marshes on the other side the river over-against Candy [Canvey] Island, there was a farmer, who was then living with the five and twentieth wife, and that his son who was but about 35 years old, had already had about fourteen; indeed this part of the story, I only had by report, though from good hands too; but the other is well known, and easy to be inquired in to, about Fobbing, Curringham, Thundersley, Benfleet, Prittlewell, Wakering, Great Stambridge, Cricksea, Burnham, Dengy, and other towns of the like situation. The reason, as a merry fellow told me, who said he had had about a dozen and a half of wives, (though I found afterwards he fibbed a little) was this; that they being bred in the marshes themselves, and seasoned to the place, did pretty well with it; but that they always went up into the hilly country, or to speak their own language into the uplands for a wife: that when they took the young lasses out of the wholesome and fresh air, they were healthy, fresh and clear, and well; but when they came out of their native air into the marshes among the fogs and damps, there they presently changed their complexion, got an ague or two, and seldom held it above half a year, or a year at most; and then, said he, we go to the uplands again, and fetch another; so the marrying of wives was reckoned a kind of good farm to them. It is true, the fellow told this in a kind of drollery, and mirth; but the fact, for all that, is certainly true; and that they have abundance of wives by that very means. As first you seldom meet with very ancient people among the poor, as in other places we do, so, take it one with another, not one half of the inhabitants are natives of the place; but such as are from other countries, or in other parts of this

county settle here for the advantage of good farms; for which I appeal to an impartial inquiry, having myself examined into it critically in several places.⁷

This quote has been reproduced by historians and scientists to argue two main points with respect to malaria in Britain. First, it has been used to demonstrate the lethality of malaria, which is assumed to be the cause of the high death rates of brides from upland areas.⁸ Second, it has been used to demonstrate a characteristic feature of malaria, which is the difference in susceptibility between those who live permanently in malarial areas and newcomers from non-malarial areas.⁹ Malarial infection confers short-lived immunity on those who survive an attack. Regular reinfection sustains this immunity and therefore long-term residents of malarial areas may suffer few or no acute effects of malarial infection. However newcomers from non-malarial areas lack acquired immunity and therefore experience more severe symptoms if infected. Defoe specifically described the marsh farmers as 'seasoned' to the local environment and relatively immune to its malign influence. Brides

⁷ Defoe, *A Tour*, pp. 13-4.

⁸ Dobson, 'History of malaria'; Dobson, *Contours*, p. 318; Reiter, 'Shakespeare to Defoe'; Nicholls, 'Fenland ague'; G.H.F. Nuttal, L. Cobbett, and T. Strangeways-Pigg, 'Studies in relation to malaria. I. The geographical distribution of Anopheles in relation to the former distribution of ague in England', *Journal of Hygiene*, 1(1) (1901), pp. 4-44; P. MacDougall, 'Malaria: Its influence on a North Kent community', *Archaeologia Cantiana*, 95 (1979), pp. 255-64.

⁹ B. Cracknell, *Canvey Island: The history of a marshland Community*, University of Leicester Department of Local History Occasional Papers, 12 (1959); Dobson, *Contours*, p. 318; R.A. Hutchinson, 'Mosquito borne diseases in England: Past, present and future risks, with special reference to malaria in the Kent marshes' (unpublished Ph.D. thesis, Durham University, 2004); R. Kendall, 'Past endemic malaria and adaptive responses in the fens and marshlands of eastern England' (unpublished Ph.D. thesis, Durham University, 2014); Nicholls, 'Fenland ague'; Reiter, 'Shakespeare to Defoe'.

from 'upland' areas on the other hand were healthy when they left their upland parishes, but quickly sickened in the marsh atmosphere, 'changed their complexion, got an ague or two' and died.¹⁰

Mary Dobson used Defoe's quote repeatedly as evidence of the acquired resistance of marsh residents to malaria.¹¹ While Defoe was speaking only of the Essex marshes, Dobson used his anecdote to describe the immunity of long-term marsh residents throughout her study area of Essex, Kent and Sussex in south-eastern England.¹² Other scholars have similarly extrapolated Defoe's anecdote to other marshy areas.¹³ Alice Nicholls in her study of malaria in the Cambridgeshire Fens in the nineteenth century relates that

Every couple of years men from the Fens would visit the surrounding upland counties, such as Nottinghamshire, in search of new brides, their previous wives having succumbed to the ague. This event tended to occur every two to three years because the new wives, being strangers to the Fens, would quickly become infected, and not having encountered this disease in their upland parishes, they had little immunity to it and consequently died. This oral tradition is corroborated by evidence in Defoe's book that this practice also took place in the marshes of Essex.¹⁴

However Nicholls provides no evidence for any oral tradition in the Fens, and the only source she cites for this practice is Defoe's account of the Essex marshes.

More sceptical scholars have quoted Defoe with greater caution. William MacArthur in his 'Brief story of English malaria' (1951) contrasted Defoe's account of the rapid remarriage of marsh farmers and

¹⁰ Defoe, *A Tour*, p. 13.

¹¹ Dobson, 'History of malaria', p. 3; Dobson, "'Marsh Fever'", pp. 374-5; Dobson, *Contours*, p. 318.

¹² Dobson, *Contours*, p. 339.

¹³ For recent examples see Hutchinson, *Mosquito Borne Diseases*, p. 22; Reiter, 'Shakespeare to Defoe'.

¹⁴ Nicholls, 'Fenland ague', p. 528.

the short lives of Essex marsh residents with his account of the East Anglian Fens where Defoe asserted that

..the natives of the Fen country, especially those who are used to it, live healthy except now and then for an ague which they make light of, and there are many ancient people among them.¹⁵

While Defoe referred to ague in the Fens and to the phenomenon of seasoning (of 'natives ... who are used to it'), his comment on the prevalence of 'ancient people' in the Fens contrasts with the apparent rarity of the elderly poor in the Essex marshes.¹⁶ Defoe was relieved to leave the region 'for 'tis a horrid air for a stranger to breathe in'.¹⁷ However he clearly did not regard the Fens as being as unhealthy as the Essex marshes. Notably, Defoe also had little to say about the unhealthiness of several other major areas of coastal marsh. The Romney marshes, the most extensive area of marshes in Dobson's study area, and which she regarded as particularly unwholesome, were described by Defoe without any comment on the quality of air or inhabitants.

The Essex historian Margaret Tabor dismissed Defoe's account of high bridal turnover in the Essex marshes as implausible.¹⁸ She conducted a search of the marriage registers of a number of Essex parishes and found what she regarded as very few examples of men who remarried frequently. She stated 'the records do not show any evidence to support Defoe's story beyond the fact that five wives in a man's lifetime was not very uncommon and that the inhabitants in general and the infants in particular did not live very long'.¹⁹ Tabor provided very little detail regarding how she conducted her

¹⁵ Cited in W. MacArthur, 'A brief story of English malaria', *British Medical Bulletin*, 8(1) (1951), pp. 76–9 (p. 77).

¹⁶ Defoe, *A Tour*, p. 13.

¹⁷ Defoe, *A Tour*, p. 496.

¹⁸ M. Tabor, 'Marsh marriage', *Essex Journal*, 4 (1969), pp. 215–21.

¹⁹ Tabor, 'Marsh marriage', p. 217.

study but she did give specific examples of certain men who she thought had remarried frequently, although in the twelve marsh parishes she examined she seems to have identified only one man whom she thought might have married as many as five times. Tabor evidently thought that five wives was not a large enough number to validate Defoe's claims regarding the high turnover of marsh wives. However there are reasons to think that Tabor's method would have produced an undercount of remarriages, because examination of individual parish registers would omit the marriages of residents of those parishes who married elsewhere.

In this paper we test whether Defoe's claims regarding marriage patterns in the Essex marshes are supported by demographic evidence. We extend Tabor's work by tracing, where possible, all the marriages of residents of the Essex marsh parishes identified by Defoe. We begin by setting out the demographic implications of Defoe's account and how these might be expected to manifest in marriage patterns as recorded in marriage registers. We then test for evidence of the types of patterns predicted by Defoe.

Testing Defoe's claims

Defoe's first claim is that marshland farmers married wives from 'upland' parishes. The passage is brief and so we are not told why marshmen were marrying women from outside the marshes instead of locally-born women. However Defoe did begin the passage with a comment on 'the strange decay of the female sex', implying that sex ratios were skewed towards men in the marshes, a situation that would make it harder for marsh men to find a bride in their own or neighbouring marsh parishes. Defoe also concluded with the comment that 'not one half of the inhabitants are natives of the place' but instead came from elsewhere in Essex or beyond to exploit the agricultural riches of the marshes.²⁰ Dobson characterised early modern marsh parishes as frontier communities dominated by men, and this impression is supported by later evidence of persistently skewed sex ratios in early nineteenth

²⁰ Defoe, *A Tour*, p. 13.

century censuses.²¹ This pattern could have arisen for several reasons. First, the Essex marshes are likely to have been characterised by sex differences in migration and labour markets, as men were drawn in to work in agriculture while women were drawn away to work in London (which was characterised since the late seventeenth century by an excess of women over men due to high demand for female labour especially in domestic service). Secondly, married women may have experienced higher death rates than their husbands even if they were locally born in the marshes, if they were more susceptible to malaria during pregnancy. In areas where *P. vivax* malaria remains endemic, malarial infection is associated with higher morbidity in pregnancy and with higher rates of infant and maternal mortality.²² Indeed, evidence from family reconstitution studies provides indirect support for this pattern. Among the 26 parishes reconstituted by Wrigley and colleagues, marsh parishes were associated with high neonatal and maternal mortality relative to other parishes in the seventeenth and eighteenth centuries.²³ Therefore marsh men may have married outsiders because there was an insufficiency of locally-born women. An alternative explanation is that marsh-born women preferred to marry outside the marshes, something we will test.

Defoe also claimed that marshland farmers remarried frequently because their upland wives succumbed quickly to the lethal marsh environment. The pattern he describes implies that death rates were especially high amongst married women, and amongst recent immigrants.

To summarise, Defoe's description of the Essex marshes implies that:

1. Marsh men often married wives from upland parishes
2. Brides from upland parishes experienced very high mortality rates in marsh parishes

²¹ Dobson, *Contours*, p. 181, 216, 301.

²² A.P. Phyo, P. Dahal, M. Mayxay, E.A. Ashley, 'Clinical impact of vivax malaria: A collection review', *PLoS Medicine*, 19(1), (2022), e1003890.

²³ E.A. Wrigley, R.S. Davies, J.E. Oeppen and R.S. Schofield, *English Population History from Family Reconstitution 1580-1837* (Cambridge, 1997).

3. Marsh men were frequently widowed and experienced high remarriage rates

Testing whether these behaviours really occurred is not straightforward. Our main sources of demographic data, before the first census in 1801 and the advent of civil registration of births and deaths in 1837, are parish registers of burials, baptisms and marriages. These are often terse lists of events registered in the parish, and their patterns depend on the composition of the parish population and on local cultural and socioeconomic as well as epidemiological factors. They therefore require careful interpretation. A second issue, discussed later in the paper, is whether the phenomena described by Defoe applied only to farmers, who formed a minority of men in marsh parishes.

The most obvious place to start our inquiry is with burial registers. Defoe claimed that women suffered higher mortality rates than men in the marshes due to ague, and that married women were at especial risk (as a result of their lack of resistance to local conditions and possibly also because of heightened vulnerability during pregnancy). Therefore *a priori* we would expect to see a high ratio of burials of wives relative to husbands in marsh parishes, because we expect many marsh men to have outlived their wives. Unfortunately however burial registers are not much help in identifying such patterns. While English burial registers often assiduously recorded the marital status of married or widowed women, they almost never recorded the marital status of men, and this makes it impossible to distinguish the burials of married from single or widowed men. This limitation therefore precludes a direct comparison between death rates of spouses. At first glance a simpler alternative might be to compare counts of adult female to adult male burials in marsh parishes to detect sex imbalances in mortality. However this is also a problematic measure, because the sex ratio of burials in a parish depends not only on the relative longevity of men and women, but also on the sex ratio of the living population, which was probably skewed towards men (as discussed above). Therefore any excess

mortality amongst women that may have occurred could have been masked by large numbers of male burials simply because there were more men in these parishes than women.²⁴

Given the difficulties of interpreting burial patterns, can we test Defoe's claims using marriage registers? Marriage registers often recorded marital status (single or widowed) and parish of residence of both bride and groom. Therefore they can in theory be used to identify marriages between residents of marsh and upland parishes, and more specifically the marriages between marsh widowers and upland brides that Defoe claimed were so abundant. The registers should also allow us to identify individual men who remarried frequently, and to test whether remarriage was unusually common for marsh men.

The first step is to formulate what we would expect if Defoe was correct. If wives of marsh men died in rapid succession and marsh men resorted to upland parishes to source new brides, then we would expect *a priori* to see large numbers of marriages involving widowers from marsh parishes and single or widowed women from upland parishes. But what would constitute an *unusually* large number of such marriages? At first glance an obvious approach is to compare marriage patterns in marsh parishes with patterns in non-marsh parishes. However we chose not to take this approach because the results of such a study would be difficult to interpret. This is because rates of remarriage and exogamous marriage depend not only on the levels of adult mortality in the parish, but also on economic, demographic and cultural factors that regulated marriage practices. For example, the time to remarriage for widows was generally much longer than for widowers, and depended on the number

²⁴ We might also expect that if married women suffered high mortality relative to their husbands then we should find relatively few widows in the burial records compared to married women (relative to ratios in upland parishes). However the preponderance of widows in the living populations of parishes depends not only on mortality rates but also on remarriage rates, and remarriage rates may have been higher for widows in marsh parishes given the high (male-biased) sex ratios in these parishes. Therefore widows may be scarce compared to married women in marsh burial registers because widows remarried quickly in these parishes.

of living children a widow already had and her financial position, factors that could vary from parish to parish.²⁵ The tendency to choose a spouse from outside one's own parish also depended on the size of the local marriage market and on opportunities for meeting potential spouses.

Our approach sidesteps the problems of comparing parishes of different types and instead compares marriage patterns by sex *within* marsh parishes. Since the behaviours that Defoe described were sex-specific, we should expect to find very different marriage patterns for men and women from marsh parishes. We test (1) whether marsh men had markedly higher rates of remarriage compared with marsh women; and (2) whether marsh men were more likely to marry a spouse from outside the parish compared with marsh women. We discuss the limitations of these approaches below.

Methods

Marsh parishes

To identify 'marsh' parishes we used a Geographical Information Systems (GIS) dataset of ancient marsh grazing land created by Adrian Gascoyne and Maria Medlycott as part of the Essex Historic Grazing Marshes project.²⁶ They used the 1777 Chapman and Andre map of Essex to identify and map areas of ancient coastal grazing marsh, and generously allowed us the use of their dataset. The distribution of ancient coastal grazing marshes corresponded fairly closely to land that is currently 5 metres or less above sea level (Figure 1). These ancient grazing marshes were created by the progressive enclosure of salt marshes by sea walls and the digging of drainage ditches, a process that was underway since at least the period of Roman occupation. This process created large pools of

²⁵ Wrigley at al., *English Population History*, pp. 171-82.

²⁶ A. Gascoyne and M. Medlycott, *Essex Historic Grazing Marsh Project* (Chelmsford, 2014).

stagnant brackish water behind the sea walls and in ditches that were ideal breeding sites for the main malarial vector *Anopheles atroparvus*.²⁷

Figure 2c shows the percentage area of each parish that was coastal grazing marsh in the Essex hundreds described by Defoe, and in adjacent 'upland' areas. The parishes for which we collected full marriage data are indicated in Figure 2b and in Table 1. We included all the parishes singled out as unhealthy by Defoe, together with several additional parishes in the same Hundreds that contained large areas of marshland. While it is not clear from Figure 2, many parishes that were predominantly located in upland areas also had separate, detached parts of the parish that gave the inhabitants access to valuable coastal marshes and to grazing rights. Canvey Island for example (indicated in Figure 2c) was divided into detached portions of grazing land belonging to nearby parishes. Hence some areas of marshy coastal land are coded in Figure 2c as having a low percentage of marsh because they belonged to parishes located mainly on higher land. Conversely, parishes that were predominantly 'dry' could contain large areas of marsh. This was the case for North Benfleet. The main part of the parish (labelled 13 in Figure 2b) contained no marsh. However a third of the parish area consisted of a detached portion of marshland located on Canvey island.

Figure 2c also shows the position of the parish church. We used this information to estimate how close the majority of the parochial population would have lived to marshlands. This was an area of nucleated settlements, and the earliest Ordnance Survey maps available for Essex indicated that the parish church was generally located in the main settlement. We calculated the distance between the parish church (as a proxy for the location of the majority of the parochial population) and the nearest marsh edge for each parish (Table 1). *A. atroparvus* mosquitoes breed in brackish water and the newly hatched mosquitoes fly to find shelter and food. They can fly up to several kilometres, and live and

²⁷ F.M. Hawkes, J.M. Medlock, A.G.C. Vaux, R.A. Cheke and G. Gibson, *Wetland Mosquito Survey Handbook: Assessing Suitability of British Wetlands for Mosquitoes* (Chatham, 2020), pp. 90-1.

overwinter preferentially in barns and houses.²⁸ Therefore even in parishes without extensive marshes it is possible that the inhabitants were routinely exposed to mosquito bites, if they lived in proximity to the marshlands.

We used these two measures of 'exposure' to potentially malarial conditions to define parishes in our study as 'marsh', 'marginal' or 'upland'. Table 1 shows the parishes we focussed on in our study, ranked by the percentage area of marshland. We defined marsh parishes as those parishes where 5 per cent or more of the land area was deemed ancient grazing marsh. We chose a threshold of 5 per cent marshland because this definition incorporated ten of the eleven parishes singled out by Defoe as particularly unhealthy (Burnham on Crouch, Creeksea, Curringham, Dengie, Fobbing, Great Stambridge, Great Wakering, North Benfleet, South Benfleet and Prittlewell). The remaining parish, Thundersley, is located on a clay ridge behind the coast and contained no marshes. Nor was it very close to marshes (the church and the main settlement were roughly 2.4 km from the nearest area of marsh). We therefore classified Thundersley as 'upland'.²⁹ Most of the marsh parishes in our sample contained large areas of marsh and the main settlement was located within roughly a kilometre of the marsh edge. North Benfleet and Prittlewell were atypical because they both had detached areas of marsh at some distance from the main settlement (Table 1). In the case of North Benfleet these detached marshlands comprised a third of the parish area and so it seemed likely that many of the inhabitants would have been exposed to marsh environments in the course of tending cattle, cutting reeds, fishing, hunting and exploitation of other resources associated with the coastal portions of the parish. Prittlewell however included only a small area of marsh, and could perhaps have been classified as marginal rather than marsh.³⁰ All Essex parishes with marshes where the area of coastal marshland was less than 5 per cent of the parish area were categorized as marginal. We defined 'upland' parishes

²⁸ Hawkes et al., *Wetland Mosquito Survey*, pp. 62-3.

²⁹ Defining the parish as marginal or omitting it from analysis did not change the results substantially.

³⁰ Defining Prittlewell as marginal did not change the results substantially.

as parishes with no coastal marshes. The term ‘upland’ is used advisedly, because the whole of Essex is below 150 metres above sea level. Defoe himself used apostrophes (‘upland’) to indicate the relative nature of the descriptor.

Marriage registers

Complete transcripts of surviving marriage registers for Essex parishes are available as searchable entries via the genealogical website FindMyPast. However we required access to the underlying datasets and these are not publicly available. We therefore extracted information on marriages in selected parishes directly from images of the original registers available through the Essex Record Office.³¹ Using marriage registers for the parishes named by Defoe, as well as several additional marsh parishes in the same area (Foulness, Wennington, Chadwell St Mary, Bowers Gifford, West Tilbury and Canewdon: see Figure 2b), we extracted details of marital status (single or widowed) and parish of residence for marriages in the four decades flanking the period when Defoe may have visited the marshes, c. 1690 – 1730 (Table 1). This exercise identified marriages that took place in 14 marsh parishes. However, this exercise only identified marriages that occurred *in* these marsh parishes: it did not capture the marriages of residents of these parishes who married in other parishes outside our sample. Where brides and grooms came from different parishes then the marriage could take place and be registered in either parish (or more rarely in a third parish). Indeed Keith Snell argues that by the second half of the eighteenth century at least, it was the norm for marriages to take place in the bride’s parish.³² This was a critical issue for our study because we were particularly interested in identifying marriages of marsh residents to upland partners, and many of these marriages may have taken place in upland parishes. In order to identify non-local marriages of marsh residents we used the search engine facility in FindMyPast to search for all marriages in the years 1690-1730 that

³¹ <https://www.essexarchivesonline.co.uk/ParishRegisters.aspx>

³² K. D. M. Snell, ‘English rural societies and geographical marital endogamy, 1700-1837’, *Economic History Review*, 55(2), (2002), pp. 262–98.

involved a bride or groom whose parish of residence was identified as one of the marsh parishes in our sample. We recorded the parish in which they married, the parish their marriage partner belonged to, and the marital status of each partner at marriage. We identified marriages of marsh residents in a wide range of Essex parishes, and these were classified into 'marsh', 'marginal' or 'upland' as described in the previous section.

The amount of detail given in marriage registers varied. Some registers recorded only the names of the bride and groom and the date, and so were of no use for present purposes. On the other hand, some registers recorded the marital status and parish of residence of brides and grooms for every entry. Unfortunately such full description was relatively unusual (Table 1). In most cases the place of residence of the groom or bride was recorded only occasionally. In these cases the residence recorded was generally a parish other than the marriage parish and this suggested that the incumbent noted parish of residence only when one of the marriage partners was resident outside the parish of marriage.³³ However it was not possible to tell whether this was indeed the case, or whether omission of residence information was more random. We therefore tested our hypothesis involving inter-parochial marriage patterns on two assumptions; (1) that omission was random (in which case we used only entries where parish of residence was noted for both partners); or (2) that those entries without any mention of residence referred to marriages where both parties were 'of the parish'. Similarly, where marital status was given for some but not all brides and grooms then we either (1) used only entries where marital status was recorded for both partners; or (2) assumed that entries lacking a descriptor referred to single persons.

Most of the variation in registration practices reflected the scrupulosity of the incumbent priest or his agent (the curate or churchwarden), and therefore a run of years of excellent recording could be followed by an abrupt reduction in information content upon a change of incumbent. This begs the

³³ Following Snell, 'English rural societies'. This assumption is only justifiable, as Snell argued, where the marriage registers appear well-kept, and where residence was recorded at least intermittently.

question of why we did not confine our study to the period after 1753, when Hardwick's Act 'for the Better Preventing of Clandestine Marriage' improved marriage registration (and led to the use in most cases of printed forms). While this approach would indeed have provided much fuller information on residence at marriage in particular, the second half of the eighteenth century was according to Dobson the period when malaria receded as a cause of significant mortality. Therefore it was possible that the phenomenon that Defoe described was disappearing as marriage registration improved, and so would not have been detectable using post-1753 evidence. The variation in registration practices between parishes is described in Table 1. Where registers did not provide usable information for the whole period of analysis (1690 – 1730) then shorter periods of good recording were used. Parishes with long gaps in recording or with no usable detail were omitted.

Results

We tested two hypotheses, and we discuss our results with respect to each hypothesis in turn.

*Hypothesis 1: Marsh men experienced higher rates of remarriage than marsh women. Formally, remarriages involving widowed marsh residents would form a higher proportion of marriages for marsh men than for marsh women.*³⁴

Altogether we identified 850 marriages of men and 937 marriages of women who were resident at marriage in the 14 marsh parishes in our study (see Table 1), and who married within Essex in the period 1690 – 1730. Table 2 shows the percentage of marriages of marsh residents who were single

³⁴ In fact our null hypothesis was that there was no difference in the proportions of marriages that were remarriages by sex of marsh resident. We therefore used two-sided t-tests, which tested the likelihood that the proportions of remarriages in each sample differed (in either direction) simply due to chance. The likelihood is indicated by the P value. For example, a P value of 0.05 indicates that there was a 5 % probability that the observed difference in proportions between brides and grooms arose by chance rather than due to a true difference between the samples.

or widowed at marriage by sex (excluding Wennington because marital status was poorly recorded: see Table 1). Of marriages involving marsh grooms 11.0 per cent were remarriages (where the groom had been married before) (table 2 col (2)). For marsh brides the comparable figure was 19.0 per cent of marriages (where the bride had been married before) (table 2 col (1)). The proportion of remarriages for marsh women was substantially higher than for marsh men ($P < 0.001$, two-sided t-test of proportions). This was also the case when we confined the sample to marriages where marital status was explicitly stated for both bride and groom (table 2 cols (3) and (4)). In this case 42.2 per cent of marriages involving female residents of our marsh parish sample were remarriages, compared with 33.5 per cent of those involving male residents ($P = 0.050$). This result was the opposite of what we expected if Defoe were right and marsh men remarried unusually frequently.

It is also notable that the total number of marriages involving marsh women was larger than the number involving marsh men (921 compared with 838). Inspection of table 2 indicates that the numbers of marriages involving marsh residents who were single at marriage was the same for brides and for grooms (746). That is, the excess of marriages involving female marsh residents was entirely due to remarriages of marsh widows. This excess of widows implies either that female marsh residents were more likely than marsh men to outlive their spouses, or that marsh women were more likely than marsh men to remarry upon widowhood. Since women usually experienced longer durations to remarriage than men in early modern England, it seems likely on balance that marsh wives tended on average to outlive their husbands (contrary to Defoe's claim).

It is also important to note that many of the widows that we observed remarrying in marsh parishes may have come there originally as brides from upland parishes. The marriages registers recorded place of residence at remarriage not place of birth. Therefore women who married marsh men acquired marsh residency if they went to live in their husband's parish, and retained that status when he died. We test whether many upland women married marsh grooms in the next section.

Hypothesis 2: Marsh men were more likely (as a consequence of high bridal turnover) to marry partners from non-marsh parishes than was the case for marsh women. That is, the proportion of marriages involving partners from non-marsh parishes would be higher for marsh men than for marsh women.

Table 3 shows the distribution of marriage partners for marsh brides and grooms. Again, the results did not support the hypothesis. Most marriages involving marsh residents were contracted between partners who were both from marsh parishes (either the same or another marsh parish). Partners from marsh parishes accounted for 89.9 per cent of marriages for marsh women (77.9 per cent from their own parish and 12.0 per cent from other marsh parishes), and 93.0 per cent of all marriages involving marsh men. For marsh brides, only 5.1 per cent, and for marsh grooms only 3.5 per cent, of marriages involved a partner from an upland parish, and there was little statistical difference between brides and grooms in the propensity to marry upland partners ($P = 0.100$, two-sided t-test of proportions). Marsh brides were however more likely to marry partners from non-marsh parishes (that is, upland or marginal parishes and excluding other/not identified parishes) ($P = 0.046$). This pattern is the reverse of that predicted by Defoe.

To check that these results were not dependent on our assumption that brides and grooms with no stated residence were from the parish in which they were marrying, we conducted the same test using only marriages where parish of residence was explicitly recorded for both bride and groom. The results were very similar to those obtained with the full sample. Marsh brides and grooms were equally likely to marry upland partners. For marsh brides, 10.0 per cent of partners were from upland parishes (32/320 marriages) and for marsh grooms the figure was 9.8 per cent (26/265) ($P = 0.963$, two-sided t-test of proportions).

Taken together these results do not provide any support for Defoe's description of the Essex marshes as particularly inimical to women or characterised by a rapid turnover of brides from upland parishes. Instead we found that women from marsh parishes were more likely than men from the same parishes to remarry, and slightly more likely to source marriage partners from parishes outside the marshes.

Obviously, some caution is needed in interpretation. While more marsh widows than marsh widowers remarried in our sample, we cannot tell from these patterns whether men or women were more likely to be *widowed* in marsh parishes. If the high sex ratio in marsh parishes evident in the early nineteenth century (where adult men outnumbered women) was also evident in the early eighteenth century, then women may have found it easier to remarry than men. However the patterns regarding the sources of marriage partners are clearer. Women living in marsh parishes were at least as likely as men from the same parishes to marry partners from outside the marshes. This is surprising given the probable excess of men in marsh parishes who constituted potential marriage partners for marsh women.

So far we have taken a statistical approach to what was in fact a collection of anecdotes. Importantly, Defoe's account of high rates of spousal turnover referred specifically to marsh farmers rather than to all male inhabitants of marsh parishes. The marshlands were frequently described as providing very rich farming prospects, and it is likely that many marsh farmers had sufficient means to remarry frequently, to attract brides from upland parishes and to lure them to their deaths in the marshes. However most men in marsh parishes were probably not farmers. Indeed Mary Dobson characterised the English marshlands as populated by 'lookers' (shepherds) and 'smugglers' and their wives, and avoided by wealthy yeomen and clergy.³⁵

We don't know the occupations of men who were marrying in marsh parishes in the eighteenth century. However baptismal registers from the early nineteenth century indicate that farmers comprised a low proportion of fathers (a reasonable proxy for married men) in the 14 marsh parishes in our study. Of 270 baptisms recorded in these parishes in the years 1813-20 (the first period in which paternal occupation was routinely recorded in baptism registers), only 24 (8.9 per cent) had fathers

³⁵ Dobson, *Contours*, pp. 53-6.

with descriptors consistent with the status of farmer ('farmer', 'yeoman' or 'husbandman').³⁶ Therefore it seems likely that the types of men described by Defoe were a relatively small minority of the adult male population of the Essex marshes in the seventeenth and eighteenth centuries.³⁷ We have conducted our study on the assumption that the extravagant marriage behaviours described by Defoe were sufficient to produce a clear signature in aggregate marriage data. However if the pattern were more muted then we may have been unable to detect it clearly (although notably our analyses not only fail to confirm our hypotheses, but provide some statistical support for marriage patterns that were the opposite of those predicted if Defoe were correct).

To test for the presence of individual men who exhibited the behaviours described by Defoe we extended Tabor's search for individual men from marsh parishes who remarried frequently. Instead of searching individual parish registers, as Tabor did, we searched the FindMyPast database for repeated instances of marriages involving men with the same or similar forenames and surnames, who were resident in the marsh parishes in our study.³⁸ That is, we attempted to identify all grooms who were likely to have been residents of marsh parishes in our sample (either because they married in that parish and were not described as resident elsewhere, or because they married in another parish but their residence in a marsh parish was recorded). This strategy should have identified marsh

³⁶ '1813-20 Parish Register Occupational Data for England and Wales', unpubl. dataset, *The Occupational Structure of Britain 1379-1911*, Cambridge Group for the History of Population and Social Structure. This figure was very close to that for 'upland' parishes in Essex as a whole (8.4 %).

³⁷ It is possible that farmers were more abundant in Defoe's period, and that the progressive drainage of the Essex marshes in the eighteenth century resulted in rising levels of arable cultivation and rising labourer to farmer ratios. In this case farmers would have comprised a higher proportion of grooms in our sample, and this would strengthen the significance of our statistical results.

³⁸ We searched the FindMyPast datasets *Essex Marriages and Banns 1537-1935* and *England, Clandestine Marriages* (the latter in order to include the huge volume of marriages conducted at the Fleet prison in London in this period).

residents who married in other parishes, except in cases where their parish of residence went unrecorded. Tabor did not define the period of her study. We initially searched records within the period 1650 – 1740 in order to ensure that we would observe at least a fraction of remarriages of men with multiple wives who married in this period. In cases where we identified three or more marriages involving men of the same name and marsh parish, then we used this information to search for additional marriages for the same putative individual in a wider time frame (date of first observed marriage +/- 40 years) in order to observe their full marriage career.

For the twelve marsh parishes in our sample in the period 1650 – 1740 we did not identify any male residents who appeared to have married more than three times. When we searched for further marriages involving men of the same or similar name using a wider date range then we did not identify further marriages. While we may have missed some marriages of men from marsh parishes (if the marriage register failed to record their parish of residence), the failure to find any evidence of frequent remarriage is striking, and consistent with Tabor's findings (Tabor, 1969). That is, contrary to Defoe's claims of marsh farmers who married from five to thirty-five wives, we were unable to identify high rates of remarriage for individual men in Essex marsh parishes.

Conclusion

Daniel Defoe's *Tour* provides an unparalleled overview of the English economy in the early eighteenth century. However historians (as well as Defoe's contemporaries) have pointed to inaccuracies and exaggerations in some areas of his account. In this sense, the findings of the present paper are unsurprising. We find that Defoe's account of high female mortality and rapid bridal turnover in the Essex marshes, which he attributed to ague, is not borne out by the evidence of marriage registers. Instead it seems likely that the marsh farmers that Defoe interviewed exaggerated their penchant for upland women and for remarriage.

The purpose of this article is not to undermine Defoe's credibility as an historical source. In the case of the Essex marshes, Defoe himself acknowledged the unreliability of his informants. Our argument is that these unreliable anecdotes should not be used at face value as evidence of the lethality of English malaria and the vulnerability of immigrants, nor extrapolated to other geographical areas. These anecdotes may well reflect a widespread contemporary perception that immigrants into marsh areas were more susceptible than locals to endemic diseases. However such anecdotes cannot be taken as specific evidence of high malarial morbidity or mortality. Acquired immunity is a common feature of many other infectious diseases, and was widely recognised as a feature of urban populations in this period. Indeed Defoe's reference to the seasoning of marsh residents recalls John Graunt's description of London's population:

As for unhealthiness, it may well be supposed, that although seasoned Bodies may, and do live near as long in *London*, as elsewhere, yet new-comers, and Children do not: for the *Smoaks*, *Stinks*, and close *Air*, are less healthful than that of the Country; otherwise why do sickly Persons remove into the Country-*Air*?³⁹

Both towns and marsh areas were characterised by higher than average mortality rates in early modern England. In the case of towns, much of their lethality reflected the impact of epidemic diseases that spread easily through the transport networks that linked the urban hierarchy. In addition, the high density of urban populations promoted the faecal contamination of water and the rapid transmission of diseases. While marshes were characterised by relatively low population densities, they were generally associated with very poor-quality water supplies that were easily contaminated. Marsh areas were by definition poorly drained and lacked fast-flowing streams. The water table was high and so well water was easily contaminated by surface pollution. Therefore at least some of the excessive mortality of marsh areas probably reflected their vulnerability to

³⁹ J. Graunt, *Natural and Political Observations Made upon the Bills of Mortality*, 1676 edn ed. by C.H. Hull (Cambridge, 1899), p. 63.

waterborne diseases, as Dobson and others have argued.⁴⁰ The Essex marshes may also have been subject to a relatively high risk of disease importation, in common with towns. Dobson noted that the marshes of the Thames estuary were particularly lethal even compared to other marsh areas, and suggested this might reflect high disease exposure associated with proximity to London and to international shipping and military populations.⁴¹ That is, the similarities in demographic patterns between early modern towns and marsh areas (excessive mortality and possibly relative immunity of long-term residents) may reflect in part some commonality of risk factors that was independent of any influence of malaria. This is not to deny that malaria may have contributed a considerable additional burden of morbidity in early modern marsh communities. However this paper does draw attention to the fragility of some of the evidence for this phenomenon.

Finally, our study raises the question of where Defoe's story came from, and why it has proved so enduring. Marsh populations were often portrayed by their historical contemporaries as 'wild', 'wretched', stunted and uncivilised.⁴² However in the case of the East Anglian Fens at least, much of this critique was politically motivated and propagated by those who wished to see marshes drained, either for personal profit or in the broader pursuit of 'improvement'.⁴³ Did some marsh inhabitants also play up to these stereotypes, including Defoe's Essex informants?

⁴⁰ Dobson, *Contours*, pp. 25-8, 335-6; R. A. Hutchinson and S.W. Lindsay, 'Malaria and deaths in the English marshes', *Lancet*, 367(9526). (2006), pp. 1947–51. Mortality from epidemic cholera, a waterborne disease, was notably high in the Thames estuary including the Essex hundreds singled out as unhealthy by Defoe: R.J. Davenport, M. Satchell and L.M.W. Shaw-Taylor, 'Cholera as a 'sanitary test' of British cities, 1831-1866' *History of the Family*, 24(2019), figure 6; W. Farr, *Report on the Mortality of Cholera in England, 1848-49* (London, 1852), pp. lvii, cxxxv, 11, 243-6.

⁴¹ Dobson, *Contours*, pp. 499-500.

⁴² Dobson, *Contours*, p. 301.

⁴³ J. Hoppit, *Britain's Political Economies* (Cambridge, 2017), chap. 6.

Table 1. Characteristics of sample marsh parishes (upper case) and parishes named by Defoe (*).

parish	% marsh	distance to marsh edge (m)	type	% marriages with marital status for both partners	% marriages with residence for both partners	N	date range	years missing or illegible
FOULNESS	94	0	marsh	6.5	40.3	62	1690-1730	
WENNINGTON	64	64	marsh	0.0	50.0	20	1712-1730	1690-1711
BURNHAM-ON-CROUCH*	59	1043	marsh	28.6	13.2	189	1690-1730	1691-94
CHADWELL ST MARY	58	582	marsh	39.7	63.2	68	1690-1730	
DENGIE*	55	600	marsh	17.9	82.1	28	1704-1730	1690-1703
BOWERS GIFFORD	54	183	marsh	76.5	88.2	17	1690-1730	1722-29
GREAT WAKERING*	54	210	marsh	62.5	19.6	56	1690-1722	1722-30
WEST TILBURY	50	157	marsh	37.5	57.8	64	1690-1730	1692-94
CORRINGHAM*	48	295	marsh	47.1	50.6	85	1690-1730	
FOBBING*	45	274	marsh	81.8	54.5	55	1690-1730	
CANEWDON	37	1009	marsh	66.2	77.9	77	1690-1730	
GREAT STAMBRIDGE*	34	749	marsh	17.3	40.0	75	1690-1730	1696-1701, 1706-08
NORTH BENFLEET*	33	2806	marsh	32.7	69.4	49	1690-1730	
South Benfleet*	33	138	marsh					1690-1730
PRITTLEWELL*	5	2885	marsh	16.5	28.3	127	1691-1711	1699-1700, 1712-28
Creeksea*	5	1102	marsh					1690-1730
Thundersley*	0	2398	upland	62.5	37.5	16	1690-1730	1697-1721

Notes: South Benfleet was named by Defoe ('Benfleet') and was a marsh parish, however the registers were too poorly kept to warrant extraction. No registers were available for Creeksea before 1769.

Sources: Essex parish registers (Essex Archives Online and FindMyPast); Essex Grazing Marshes project.

Table 2. Marital status of marsh residents at marriage, 1690 - 1730

Marital status	Sample includes entries with no stated marital status		Sample excludes marriages with missing information on marital status	
	(1) bride	(2) groom	(3) bride	(4) groom
single	81.0 % (746)	89.0 % (746)	57.8 % (148)	66.5 % (149)
widowed	19.0 % (175)	11.0 % (92)	42.2 % (108)	33.5 % (75)
N	921	838	256	224
P	0.000		0.050	

Notes: Parishes included are: Bowers Gifford, Burnham, Canewdon, Chadwell St Mary, Corringham, Dengie, Fobbing, Foulness, Great Stambridge, Great Wakering, North Benfleet, Prittlewell, West Tilbury. Wennington was excluded due to a lack of marital status indicators in the registers. P values refer to the probability that the proportions widowed are the same for brides and grooms.

Sources: Essex parish registers (Essex Archives Online and FindMyPast).

Table 3. Percentage distribution of sources of marriage partners for marsh residents, 1690 - 1730

Partner's parish	Marsh bride		Marsh groom	
	%	N	%	N
Same as marsh spouse	77.9	730	85.9	730
Other marsh	12.0	112	7.1	60
Marginal	0.8	7	0.4	3
Upland	5.1	48	3.5	30
Other/not identified	4.3	40	3.2	27
total	100	937	100	850

Notes: Figures are percentages and counts of all marriages involving either a bride or a groom who was resident in one of the marsh parishes in our sample (Bowers Gifford, Burnham, Canewdon, Chadwell St Mary, Corringham, Dengie, Fobbing, Foulness, Great Wakering, Great Stambridge, North Benfleet, Prittlewell, Wennington, West Tilbury). Where the marriage entry did not state residency then marriage partners were assumed to be 'of the parish'. % columns may not sum to 100 due to rounding.

Sources: see Table 2.

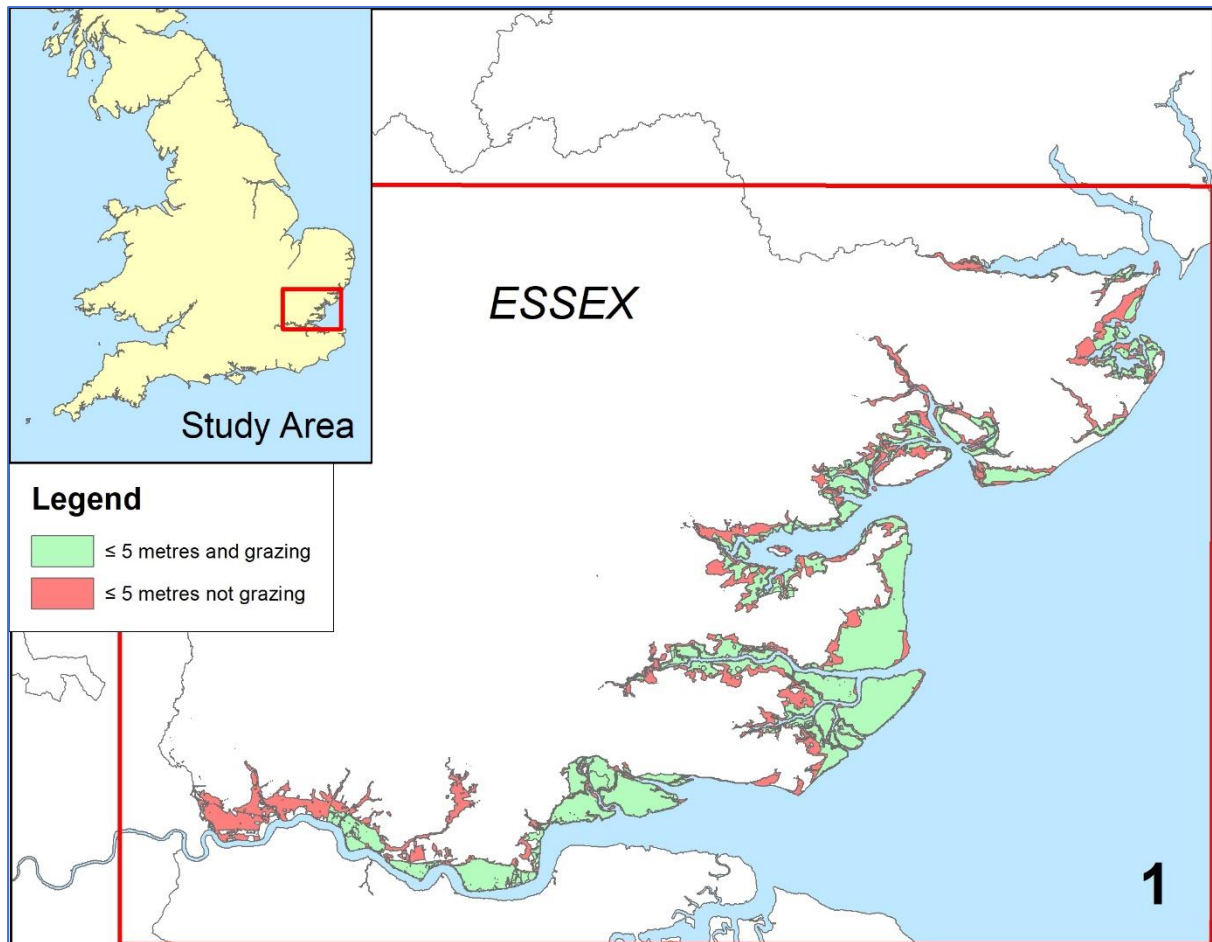
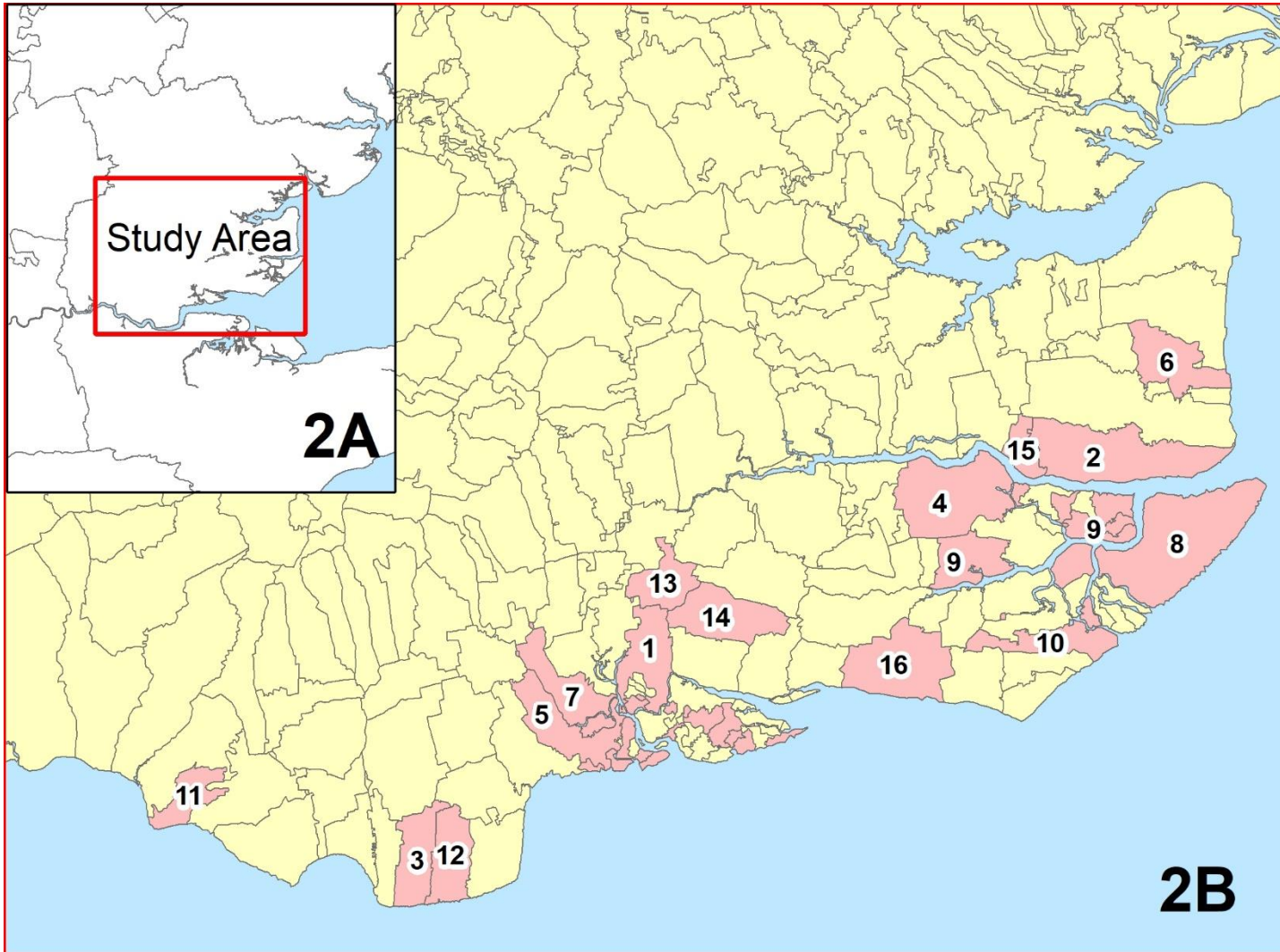


Figure 1. Ancient grazing marshes and low-lying land, Essex.

Sources: 5 metres contours generated from OS Terrain® 50 raster data (Ordnance Survey, UK) and ancient grazing marshes area from Gascoyne and Medlycott, *Essex Historic Grazing Marsh Project*.



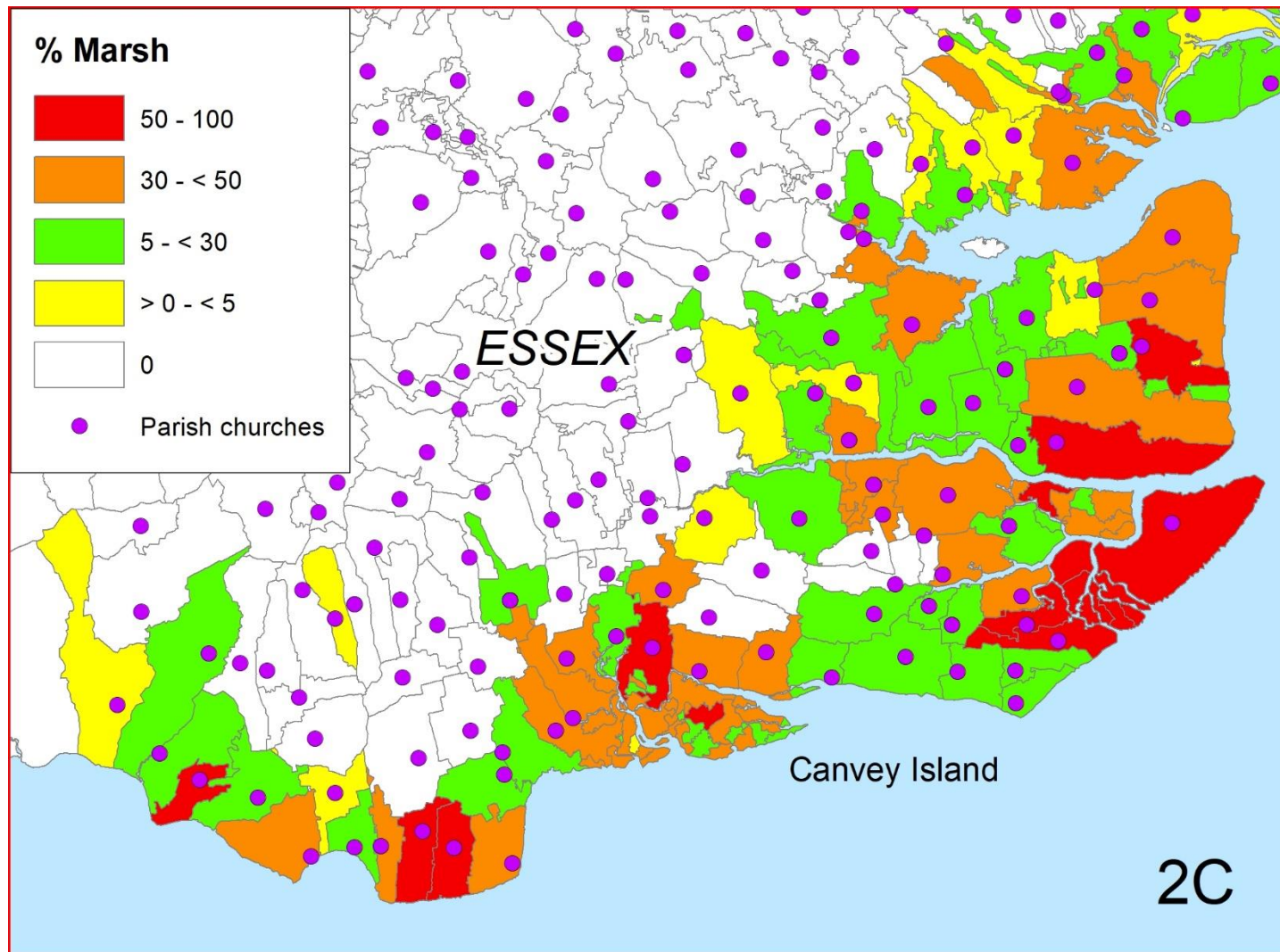


Figure 2. Location of study parishes (a,b) and percentage marshland per parish (c).

Notes: Figure 2b indicates marsh parishes included in the study, and those named by Defoe. 1 Bowers Gifford; 2 Burnham on Crouch; 3 Chadwell St. Mary; 4. Canewdon; 5 Corringham; 6 Dengie; 7 Fobbing; 8 Foulness; 9 Great Stambridge; 10 Great Wakering; 11 Wennington; 12 West Tilbury; 13 North Benfleet; 14 Thundersley; 15 Creeksea; 16 Prittlewell.

Sources: see Figure 1.