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

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Abstract

Scientific, medical and anecdotal evidence indicates that malaria was endemic in coastal marshes of England before the early twentieth century. However there is no direct demographic or medical evidence regarding the health impacts of malaria in England and so the lethality of historical malaria in England remains contested. One of the most influential anecdotes regarding malaria is Daniel Defoe's 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. Defoe's account has been used as evidence of the lethality of malaria, and of the risks to newcomers to marsh areas who lacked acquired immunity to the disease 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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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 (Bruce-Chwatt and de Zulueta, 1980; Knottnerus, 2002; Huldén, Huldén and Heliövaara, 2005; Chen *et al.*, 2021). In England malaria was endemic in some coastal marsh areas, most notably the marshes of Essex and Kent that bordered the Thames estuary (Smith, 1956; Dobson, 1997). 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 late 19th and early 20th centuries 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.*

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. In the early decades of the twentieth century syphilis sufferers were deliberately infected with *P. vivax* in order to induce therapeutic fevers. Experimentation with different *P. vivax* strains identified 'northern' strains that were adapted to high latitudes where mosquito vectors are very seasonal (Verhave, 2013; White, 2019). These strains induced mild or even no fever upon initial infection but were associated with a recrudescence of fever nine months later. Further studies demonstrated that some strains of *P. vivax* are capable of long dormancy. At high latitudes it is likely that human hosts were bitten by infected mosquitos in the summer months and then the malarial parasites entered a dormant state in the liver of the human host until they were reactivated in the following spring and re-entered the bloodstream where they caused fever (Verhave, 2013; White, 2019; Merrick, 2021). These features of *P. vivax* (spring fevers and negligible virulence) were evident in Danish and Swedish malarial case data in the later nineteenth century. Both countries introduced compulsory notification of malarial cases in the 1860s and the clinical symptoms, geographical distribution and seasonality of reported cases fit well with the predicted epidemiology of northern *P. vivax* strains (Chen *et al.*, 2021; Ingholt, 2022).

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 (Dobson, 1989, 1997, 1998; Nicholls, 2000; Reiter, 2000; Knottnerus, 2002; Kuhn *et al.*, 2003; Huldén, Huldén and Heliövaara, 2005, 2009; Chen *et al.*, 2021). 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 England in the period c.1550 – 1850 (Dobson, 1980, 1989, 1997, 1998). 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 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 through 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 Dengy (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. He described the abundance of wildfowl and the harvesting of various fish and shellfish that were supplied to London. He then 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:

> 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 (Defoe, 1724 [1968]: 13).

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 (e.g. Dobson 1989, 1997; Reiter 2000; Nicholls 2000; Mann 2012; Nuttal et al. 1901; MacDougall 1979). 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 (e.g. Cracknell 1959; Kendall 2014; Nicholls 2000; Dobson 1997; Reiter 2000; Hutchinson 2004). 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 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 (Defoe 1724 [1968]: 13).

Mary Dobson used Defoe's quote repeatedly as evidence of the acquired resistance of marsh residents to malaria (Dobson, 1989: 3; 1980: 374-5; 1997: 318). 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 (Dobson, 1997: 339). Other historians have similarly extrapolated Defoe's anecdote to other marshy areas (for recent examples see Mingay, 2013: 63; Reiter, 2000; Hutchinson 2004: 22). 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.' (Nicholls 2000: 528)

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 more caution. The doctor William MacArthur in his 'brief history of English malaria' (1951) contrasted Defoe's account of the rapid remarriage of marsh farmers and 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'. (Defoe cited in MacArthur, 1951: 77).

While Defoe refers to ague in the Fens and to the phenomenon of seasoning ('of those that 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 (Defoe 1724 [1968]: 13). Defoe was relieved to leave the region "for 'tis a horrid air for a stranger to breathe in" (Defoe, 1724 [1968]: 496). 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 (Tabor, 1969). 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' (Tabor, 1969).[1] Tabor provided very little detail regarding how she conducted her 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 much 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 our aim is to test whether Defoe's claims regarding marriage patterns in the Essex marshes are supported by demographic evidence. We extend Tabor's work by tracing the marriages of all 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.

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. He 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 ((Defoe 1724 [1968]: 13). 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 century censuses (Dobson 1997: 181, 216, 301). This pattern could have arisen for several reasons. First, the area is likely to have been characterised by sex differences in migration and labour markets, as men were drawn in to work in the marshes while women were drawn 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). In addition, 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. 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 very high neonatal and maternal mortality relative to other parishes in the seventeenth and eighteenth centuries (Wrigley *et al.*, 1997).[2] Therefore marsh men may have married outsiders because there

[1] Dobson however cites Tabor as providing some evidence for high malarial mortality, on account of the high rates of remarriage she reported for marsh parishes (Dobson 1997: 318). Notably though, the highest rates of remarriage reported by Tabor occurred in the parish of Cold Norton which Tabor classified as upland (Tabor 1969: 219).

[2] The 26 parishes studied by Wrigley and colleagues included four low-lying parishes. Of these, three parishes were associated with very high infant and maternal mortality: the Fen parish of March (Cambridgeshire), the Fen edge parish of Willingham (Cambridgeshire) and Great Oakley (Essex). The fourth, the market town of Dawlish (Devon) was on the other hand characterised by low mortality relative to other towns in the sample, and although low-lying was not marshy.

was an insufficiency of locally-born women. A third alternative 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
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 we cannot use burial registers for this purpose, because while English burial registers often assiduously recorded the marital status of married or widowed women, they almost never recorded the marital status of men, making 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.[3]

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

[3] 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 marish burial registers because widows remarried quickly in these parishes

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? One 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 would be difficult to interpret. This is because rates of remarriage and exogamous marriage depend not only on the level of 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 of living children a widow already had and her financial position, factors that could vary from parish to parish (Wrigley et al., 1997: 171-82). 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 GIS of ancient marsh grazing land created by Adrian Gascoyne and Maria Medlycott as part of the Essex Historic Grazing Marshes project (Gascoyne and Medlycott, 2014). 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 Geographical Information Systems (GIS) 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 stagnant brackish water behind the sea walls and in ditches that were ideal breeding sites for the main malarial vector *Anopheles atroparvus* (Hawkes *et al.*, 2020).

Figure 2 shows the percentage area in each Essex parish that was coastal grazing marsh. The parishes used in the study are indicated in the lower inset of Figure 2 and in Table 2. While it is not clear from the map, 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 2) was divided into detached portions of grazing land belonging to nearby parishes. Hence some areas of marshy coastal land are coded as having a low percentage of marsh because they belong 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 the lower inset of Figure 2) contained no marsh. However a third of the parish area consisted of a detached portion of marshland located on Canvey island.

Figure 2 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. *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 overwinter preferentially in barns and houses (Hawkes *et al.*, 2020). 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 the location of the parish church to identify the main settlement in each parish. This was an area of nucleated settlements, and the earliest Ordinance Survey maps available for Essex indicated that the parish church was generally located in the main settlement. We assumed that the majority of the parochial population lived within the main settlement in this period, as the Chapman and Andre 1777 map suggests. We then calculated the distance between the parish church and the nearest marsh edge for each parish (Table 2).

We used these two measures of 'exposure' to potentially malarial conditions to define parishes in our study as 'marsh', 'marginal' or 'upland'. We defined marsh parishes as those parishes where 30% or more of the land area was deemed ancient grazing marsh, and where the distance from the main settlement to the marshes was less than 1500 metres. This definition incorporated seven of the eleven parishes singled out by Defoe as particularly unhealthy (Fobbing, Curringham, South Benfleet, Great Wakering, Great Stambridge, Burnham on Crouch and Dengie). The other four parishes (Creeksea, North Benfleet, Prittlewell and Thundersley) contained much smaller fractions of marsh, and their main settlements were located further from the marshes (Table 2). Thundersley (numbered 14 in the lower inset of Figure 2) was 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).[4] Prittlewell, like North Benfleet (discussed above), lacked any marshes apart from a small detached area on Canvey Island. The main part of the parish and the main settlement were located almost three kilometres from the nearest marsh. Creeksea ('Cricksea') also contained only a small area of marsh (less than 5 % of the parish area). We therefore classified Prittlewell, Creeksea and North Benfleet as 'marginal', because while most of the population probably lived at a safe distance from the marshes (with respect to mosquito flight ranges), 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. All parishes where the area of marshland was less than 30 % of the parish area or where the marsh portion was confined to a detached part of the parish were categorized as marginal.[5] We defined 'upland' parishes 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.

[4] We therefore classified Thundersley as 'upland'. Defining the parish as marginal or omitting it from analysis did not change the results substantially.

[5] While this is a rather clunky definition the only problematic parish with respect to classification was North Benfleet, which exceeded the threshold of 30% marsh area but was classified as 'marginal'. However classifying the parish as 'marsh' instead made little difference to the analytical results.

Table 1. Marsh, marginal and upland parishes

Type	% coastal marsh	Other features
Marsh	30 - 100	AND main settlement <1500m from marsh edge
Marginal	>0 & < 30 %	OR marsh area only in detached part of the parish
Upland	0	

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 (https://www.essexarchivesonline.co.uk/ParishRegisters.aspx). Using marriage registers for the parishes named by Defoe, as well as several more marsh parishes in the same area, 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 2). This exercise identified marriages that took place in twelve marsh parishes. However, this exercise only identified marriages that occurred in these marsh parishes: it did not capture the marriages of residents of those parishes who married in 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 (Snell, 2002).[6] 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 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.

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. 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 it was other than the parish of marriage.[7] However it was not possible to tell whether this was 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

[6] Hardwick's Act of 1754 clarified the requirement for marriage registers to state the parish of residence (before marriage) of the bride and groom, and Snell has argued that the Act codified the pre-existing practice of recording residence, although some incumbents additionally recorded parish of settlement (Snell, 2002).
[7] Following Snell (2002). This assumption is only justifiable, as Snell argued, where the marriage registers appear well-kept, and where residence was recorded at least intermittently.

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 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 marriages, 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 2. Where registers contained no 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.

Table 2. 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	notes
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	No marriages 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	marginal	32.7	69.4	49	1690-1730		
South Benfleet*	33		marsh			139		1690-1730	Very scrappy
Prittlewell*	5	2885	marginal	16.5	28.3	127	1691-1711	1699-1700, 1712-28	
Creeksea*	5	1102	marginal					1690-1730	not available before 1769
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.
Sources: Essex parish registers (Essex Archives Online and FindMyPast); Essex Grazing Marshes project.

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.

Altogether we identified 719 marriages of men and 799 marriages of women who were resident at marriage in the twelve marsh parishes in our study, and who married within Essex in the period 1690 – 1730 (see Table 2). Table 3 shows the percentage of marriages of marsh residents who were single or widowed at marriage by gender (excluding Wennington because marital status was poorly recorded: see Table 2). Of marriages involving marsh grooms 12.2 % were remarriages (where the groom had been married before) (table 3 col (2)). For marsh brides the comparable figure was 20.0 % of marriages (where the marsh bride was a widow) (Table 3 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 to sample to marriages where marital status was explicitly stated for both bride and groom (Table 3 cols (3) and (4). In this case 42.0 % of marriages involving female residents of our marsh parish sample were remarriages, compared with 32.7 % of those involving male residents ($P = 0.04$). This result was the opposite of what we expected if Defoe were right and marsh men remarried frequently.

It is also notable that the total number of marriages involving marsh women (799, including Wennington) was larger than the number involving marsh men (719). Inspection of table 3 indicates that the numbers of marriages involving marsh residents who were single at marriage was almost the same for brides and for grooms (626 and 621, excluding Wennington). That is, the excess of marriages involving female marsh residents was almost 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.

Table 3. 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)	(2)	(3)	(4)
	bride	groom	bride	groom
single	80.0 % (626)	87.8 % (621)	58.0 % (142)	67.3 % (144)
widowed	20.0 % (157)	12.2 % (86)	42.0 % (103)	32.7 % (70)
N	783	707	245	213

Notes: Parishes included are: Bowers Gifford, Burnham, Canewdon, Chadwell St Mary, Corringham, Dengie, Fobbing, Foulness, Great Stambridge, Great Wakering, West Tilbury. Wennington was excluded due to a lack of marital status indicators in the registers.

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

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. Formally, the proportion of marriages involving partners from non-marsh parishes would be higher for marsh men than for marsh women.

Table 4 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 83.5 % of marriages ((613 + 54)/799) for marsh women, and 88.5 % of all marriages ((613+23)/719) involving marsh men. For marsh brides, only 5.1 % of marriages involved a partner from an upland parish, and only 3.8 % of marriages of marsh men (P = 0.24, two-sided t-test of proportions). That is, there was little statistical difference in the propensity to marry upland partners between brides and grooms from marsh parishes. Marsh brides were however much more likely to marry partners from non-marsh parishes (that is, upland and marginal parishes and excluding other/not identified parishes) (P<0.001). This pattern is quite the reverse of that predicted by Defoe.

Table 4. Percentage distribution of sources of marriage partners for marsh residents, 1690 - 1730

Partner's parish	Marsh bride	Marsh groom
Same as marsh spouse	76.7 (613)	85.3 (613)
Other marsh	6.8 (54)	3.2 (23)
Marginal	7.4 (59)	2.2 (16)
Upland	5.1 (40)	3.8 (27)
Other/not identified	4.1 (33)	3.2 (23)
N	799	719

Notes: Figures are percentages (and counts) of all marriages involving either brides or grooms from study parishes. Parishes included are: Bowers Gifford, Burnham, Canewdon, Chadwell St Mary, Corringham, Dengie, Fobbing, Foulness, Great Wakering, Great Stambridge, Wennington, West Tilbury.
Sources: see Table 3.

To check that these results were not dependent on our assumption that brides and grooms with no stated parish 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, 9.3 % of partners were from upland parishes (28/301) and for marsh grooms the figure was 9.7 % (24/247) (P = 0.87, two-sided t-test of proportions). However, as in the full sample, marsh brides were much more likely than marsh grooms to marry partners from non-marsh parishes (marginal and upland parishes) (24.9 % of marsh brides married partners from marginal or upland parishes, compared with 15.4 % of marsh grooms, P = 0.004).

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 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 more likely than 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 the means to remarry frequently, to source brides from upland parishes and to lure them to their deaths in the marshes. However most men in marsh parishes were not farmers. We don't know the occupations of men who were marrying in marsh parishes in the eighteenth century. However baptismal registers from the early 19th century indicate that farmers comprised a low proportion of fathers (a reasonable proxy for married men) in the 12 marsh parishes in our study. Of 228 baptisms recorded in these parishes in the years 1813-20 (the first period in which paternal occupation was routinely recorded in baptism registers), 21 (9.2 %) had fathers with farming occupations ('farmer', 'yeoman' or 'husbandman').[8] Therefore it is 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. 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 not be able to detect it clearly (although notably our analyses not only fail to confirm our hypotheses, but provide 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 with large numbers of remarriages. 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.[9] 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 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.

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[8] '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.

[9] We searched the 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).

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. Therefore 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?* Graunt, (1899) [1676], p. 63.

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 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 waterborne diseases, as Dobson and others have argued (Dobson, 1997; Hutchinson and Lindsay, 2006). 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. 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 some commonality of risk factors independent of any influence of malaria.

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 (Dobson 1997: 301. 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' (Hoppit, 2017). Did some marsh inhabitants also play up to these stereotypes, including Defoe's Essex informants?

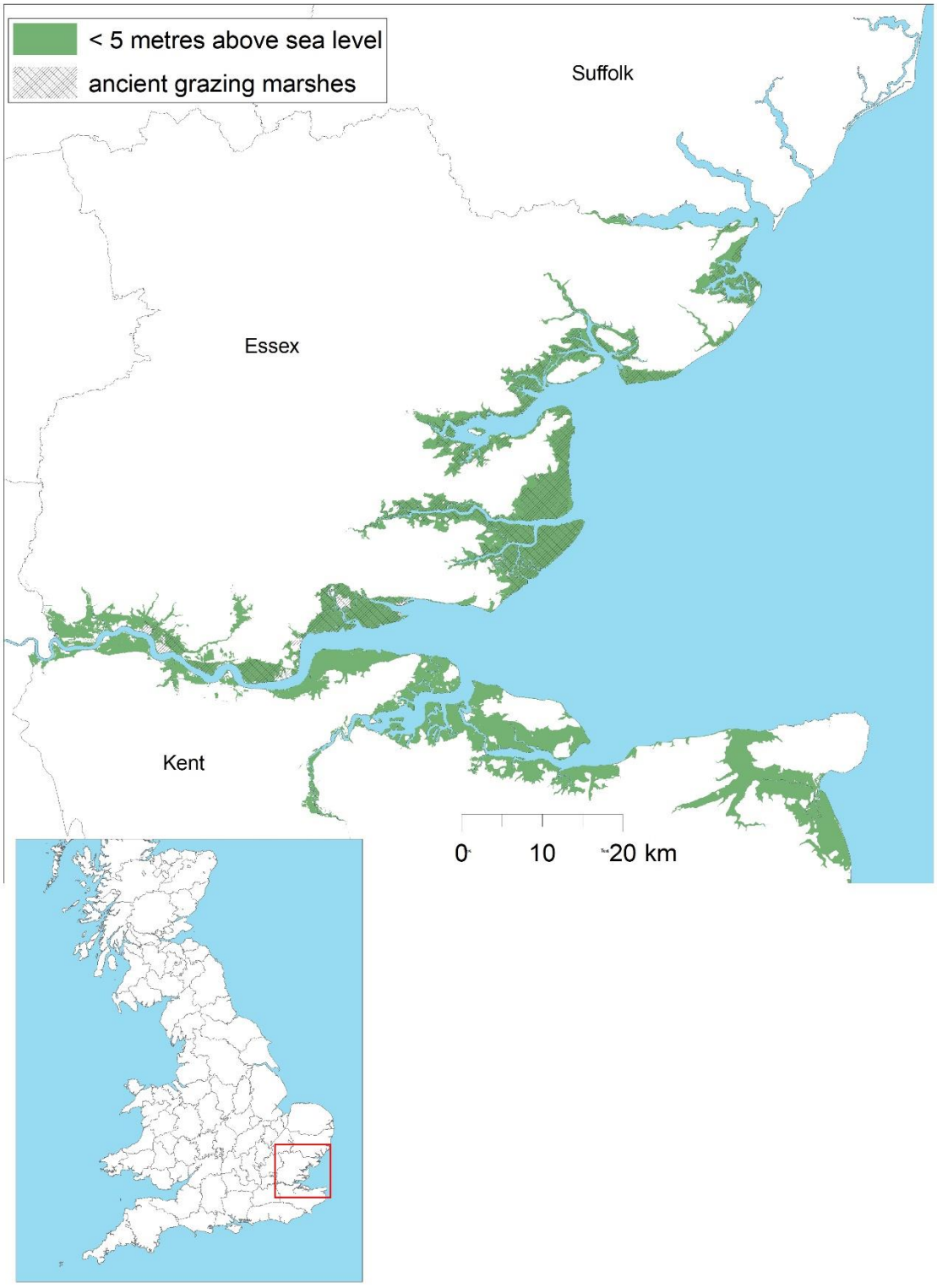

Figure 1. Ancient grazing marshes and low-lying land, Essex.

Sources: 5 metres contours generated from OS Terrain® 50 raster data (Ordinance Survey, UK) and ancient grazing marshes area from Gascoyne and Medlycott, 2014.

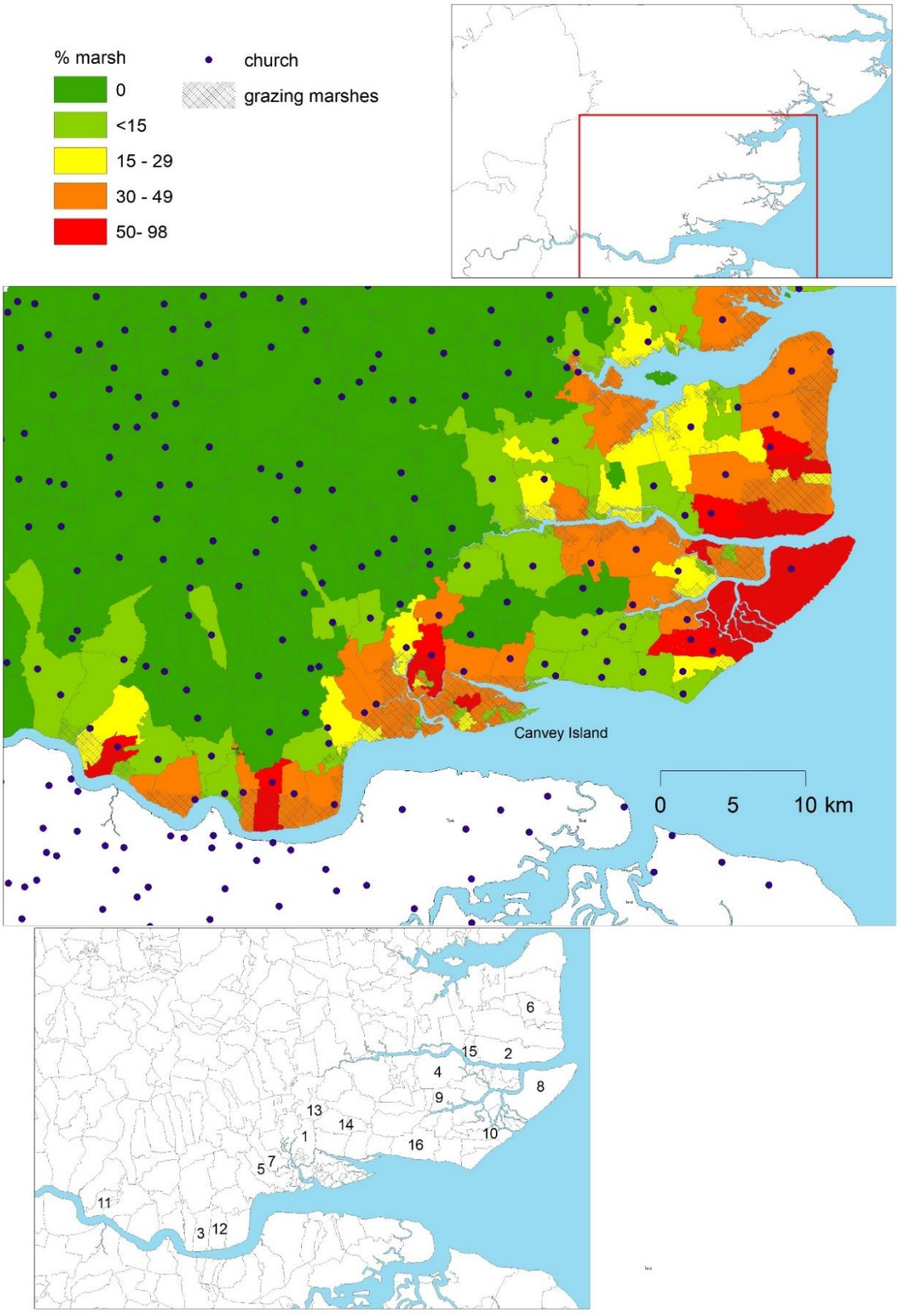

Figure 2. Percentage marshland per parish, Essex.

Notes: Lower inset 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.

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