

# Settlement, Land Use, Environment and Climate in the Landscape of the East Anglian Breckland c.1000 BC – 1600 AD

Thomas Lucking

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*Front Cover: Breckland old and new. The Bronze Age round barrow of Hut Hill sits in a mixed landscape of grazed heathland and pine plantation. Knettishall Heath, 18th January 2025, View North.*

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**Abstract: Settlement, Land Use, Environment and Climate in the Landscape of the East Anglian Breckland c.1000BC-1600 AD**

Examination of long-term patterns of settlement and land use in the environmentally sensitive and historically 'marginal' landscape of the East Anglian Breckland suggests that climatic fluctuations had little discernible difference in impact compared to wider Britain. Any potential impacts of these fluctuations appear to have broadly the same effect in Breckland as elsewhere. Instead, the distinguishing factor that gives Breckland a clear identity is the local environment. In particular, the underlying geological framework influences surface soil types and fertility, the resultant ecologies that develop on this, the accessibility of water, the settlement patterns of the region and the agrarian regimes employed, which show different adaptations at different times. The archaeological evidence indicates that some areas of heathland that were presumed to be of considerable age only developed in the post-medieval period after formerly being part of the arable landscape, with lidar imagery also revealing relict medieval field systems within former areas of rabbit warren. Likewise, there is evidence for similar extents of Roman arable land within areas of former medieval/post-medieval rabbit warren, further suggesting that areas of heathland recorded in the post-medieval period have a far more mixed history. This thesis examines and characterises a number of aspects of the historic Breckland landscape, including the hydrological and geological framework, the origins of Breckland heath, historic agricultural practices and arable extents, the impact of drift sand activity and the territorial and administrative structuring of the region. The result of these investigations demonstrate that the occupants of Breckland have always attempted to organise and farm their landscape in much the same way as elsewhere but that the particular environment of the region necessitated change and adaptation at certain times.

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## **Abbreviations**

ADS	Archaeology Data Service
AIM	Aerial Investigation and Mapping
BGS	British Geological Survey
BL	British Library
CUL	Cambridge University Library
GIS	Geographical Information System
HER	Historic Environment Record
LRM	Lidar Relief Model
MNI	Minimum Number of Individuals
NCA	National Character Area
NHER	Norfolk Historic Environment Record
NISP	Number of Identified Specimens
NMP	National Mapping Programme
NRO	Norfolk Record Office
OE	Old English
OS	Ordnance Survey
OSD	Ordnance Survey Drawings
PAS	Portable Antiquities Scheme
PRO	Public Record Office
RCIN	Royal Collection Inventory Number
SA	Suffolk Archives
SHER	Suffolk Historic Environment Record

## **Dating Conventions**

Dating conventions used in this thesis are broadly based upon Historic England's historic periods.<sup>i</sup> For clarity, they are listed below. Where a date range may fall outside the period boundaries given here, specific dating has been given in the text, while for all other references to historic periods (e.g. Iron Age, Roman, medieval) the date ranges given below may be applied.

### Historic England's Historic Periods

Palaeolithic 1,000,000 BC to 10,000 BC

- Lower Palaeolithic 1,000,000 BC to 150,000 BC
- Middle Palaeolithic 150,000 BC to 40,000 BC
- Upper Palaeolithic 40,000 BC to 10,000 BC

Mesolithic 10,000 BC to 4000 BC

- Early Mesolithic 10,000 BC to 7000 BC
- Late Mesolithic 7000 BC to 4000 BC

Neolithic 4000 BC to 2200 BC

- Early Neolithic 4000 BC to 3300 BC
- Middle Neolithic 3300 BC to 2900 BC
- Late Neolithic 2900 BC to 2200 BC

Bronze Age 2600 BC to 700 BC

- Early Bronze Age 2600 BC to 1600 BC (Includes Chalcolithic)
- Middle Bronze Age 1600 BC to 1200 BC
- Late Bronze Age 1200 BC to 700 BC

Iron Age 800 BC to AD 43 AD

- Early Iron Age 800 BC to 300 BC
- Middle Iron Age 300 BC to 100 BC
- Late Iron Age 100 BC to 43 AD

Later Prehistoric 4000 BC to 43 AD

Prehistoric 1,000,000 BC to 410 AD

Roman 43 AD to 410 AD (Sub-periods given are not Historic England's)

- Early Roman 43 AD to 150 AD
- Mid Roman 150 AD to 250 AD
- Late Roman 250 AD to 410 AD

Early Medieval AD 410 to 1066 (Sub-periods given are not Historic England's)

- Early Anglo-Saxon 410 AD to 650 AD
- Middle Saxon 650 AD to 850 AD
- Late Saxon 850 AD to 1066 AD

Medieval AD 1066 AD to AD 1540 AD

Post Medieval 1540 AD to 1901 AD

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<sup>i</sup> Historic England website, *England's Historic Periods* (2025).

## **Chapter One: Introduction**

This thesis is the result of a Collaborative Doctoral Award project between the University of East Anglia and Norfolk County Council's Air Photo Interpretation Team following the identification of further avenues of research from Aerial Investigation and Mapping (AIM) surveys of Breckland.<sup>1</sup> The principal purpose of this thesis is to place some of the newly-identified archaeological and earthwork features into the wider landscape of Breckland, in order to characterise how settlement and land use patterns may have developed and changed over time. Of particular interest is the potential extent to which longer-term climatic fluctuations may have impacted this in such a distinctive landscape and whether the perceived marginality of Breckland may have made these potential impacts any more or less detectable. As will be demonstrated, any potential difference in the impact of climate between Breckland and other landscapes is inconclusive but the role of the environment is brought to the fore as the core underlying factor in shaping the Breckland landscape, alongside a range of updated and new interpretations of various aspects of historic settlement and land use in the region.

At the same time as the research for this thesis was beginning, an opportunity arose to be involved in a vast archaeological investigation of part of the former Wangford Warren in Suffolk from December 2020 to June 2021 that provided the chance to gain first-hand experience of the character of the landscape, as well as providing a range of new archaeological information in a hitherto unexplored area.<sup>2</sup> The scheme involved

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<sup>1</sup> Jack Powell, Sophie Tremlett and Sarah Horlock, *Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 2)*, Research Report Series no. 211/2020 (Historic England, 2020): pp. 76-77.

<sup>2</sup> Romy McIntosh and Mark Hinman, *Land at Wangford Warren Phases One through Three: An Archaeological Evaluation, Topographic Survey, Metal Detecting Survey, Field Walking Survey,*

detailed topographic and earthwork survey alongside systematic metal detecting of more than 120 hectares (311 acres) of former pine plantation. After this stage of survey was complete, the mulched, nutrient rich topsoil was stripped to reveal the characteristic windblown acidic sand subsoil of this part of Breckland. This too was then subject to systematic fieldwalking, before areas of interest were further stripped in order to expose and excavate a selection of archaeological remains on the site. The results of this project revealed the remnants of millennia of human interaction with this piece of Breckland landscape.

The wider purpose of the Wangford investigations was to create suitable habitat for ground-nesting birds, mainly stone curlew and nightjar, by 'restoring' a large tract of the former warren to its pre-plantation, heathland ecology, counterbalancing habitat lost during widening of the A11 a short distance to the east a few years prior. That work, too, involved considerable archaeological investigation and, much like the Wangford Warren project, revealed evidence of occupation, agriculture and industry in this landscape from prehistory to the post-medieval.<sup>3</sup>

Standing on the slope of the Wangford site, looking across onto the heathland and herds of grazing sheep in Lakenheath Warren, it was possible to gain a sense of the distinctive character of the Breckland landscape that separates it from the rest of East Anglia (Figure 1). Even before the plantation topsoil had been stripped the abundance of struck and burnt flint was apparent across the site and, along with the discovery of Bronze

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*Excavation and Mitigation Trenching*, Report No. R15481 (Pre-Construct Archaeology, 2023), Unpublished Fieldwork Report.

<sup>3</sup> Matthew Lees, Mark Hinman and Daryl Stump, *A11 Fiveways to Thetford Road Improvements, A Post Excavation Assessment of Archaeological Excavations 2012-2013* (Pre-Construct Archaeology Ltd, 2013), Unpublished Fieldwork Report: pp. 180-182.

Age, Iron Age and Roman metalwork, attested to a landscape that was clearly well-used in prehistoric and Roman times. Anglo-Saxon metalwork was conspicuously rare and medieval and post-medieval material also limited, but the low, broad earthwork banks of former medieval furlong boundaries demonstrated that the site had formerly been part of the medieval open fields of Wangford, before abandonment and eventual incorporation into rabbit warren and later development into pine plantation. Even with the intermittent noise of jet engines from nearby RAF Lakenheath, it was easy to understand why W. G. Clarke had found Breckland to be a particularly immersive landscape and so often drifted into artistic licence when describing the more ancient history of Breckland.<sup>4</sup> A number of publications and studies have been undertaken on Breckland since Clarke's *In Breckland Wilds* was first published in 1925, notably Postgate's investigations into the post-medieval landscape that falls outside the study period for this thesis,<sup>5</sup> as well as Gregory's thesis examining post-medieval improvements to marginal landscapes,<sup>6</sup> but since Olive Cook's second edition of *Breckland* was published in the 1980s,<sup>7</sup> no other publication has attempted to provide a synthesis of the Breckland landscape as a whole entity. This thesis will go at least some way to providing this by examining the Breckland landscape from the Late Bronze Age (c.1000 BC) to the post-medieval period (c.1600 AD) with the benefit of large-scale historic databases, finds recording, and modern interpretations of landscape and historic periods.

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<sup>4</sup> W. G. Clarke, *In Breckland Wilds*, First Edition (Robert Scott, 1925).

<sup>5</sup> M. R. Postgate, *Historical Geography of Breckland, 1600-1850*, Unpublished MA Thesis, University of London (1960).

<sup>6</sup> Jon Gregory, *Marginal Environments and the Idea of Improvement: transforming heathland and moorland landscapes 1650-1850*, Unpublished PhD Thesis, University of East Anglia (2008).

<sup>7</sup> Olive Cook, *Breckland*, Second Edition (Robert Hale, 1980).



*Figure 1: View south-west showing Shaker's Road crossing the lower slopes of Wangford Warren across into Lakenheath Warren. 16th December 2020.*

The work undertaken at Wangford must be placed in the wider landscape of Breckland and the broader patterns of settlement and land use over many centuries. These patterns will have been subject to a variety of influences and forces across long periods of time, including, geology, topography, technological developments, and social organisation and structuring. Of particular focus and the initial basis for this thesis is the possible role of climate in impacting settlement and land use patterns and the extent to which changes in climate influenced human activity in Breckland against other factors, particularly within a landscape that may have been more sensitive to smaller variations in climate compared to other regions.

Despite the distinctiveness of Breckland compared to the surrounding landscapes of East Anglia, it has often been incorporated into larger overall areas during studies of regionality, which may be useful in establishing wider trends across a greater area but may come with the trade-off of losing some of the detail by grouping areas into a single region that may contain a considerable degree of internal variation. Widely used examples of this include Rackham's models of planned and ancient countryside in England, where much of Breckland is grouped with the planned countryside zone more characteristic of Midland landscapes,<sup>8</sup> or Roberts' and Wrathmell's "Eastern Province" where Breckland is incorporated into the "Wash" region alongside other parts of Norfolk, Suffolk and Cambridgeshire that have similar distributions of settlement in the nineteenth century.<sup>9</sup> Other studies, such as *The Rural Settlement of Roman Britain* project have distinguished Breckland as one of a number of *pays* within "The East", but this was more to allow for identifying any smaller-scale variations in the data across the larger study area, rather than carrying out any in-depth investigation specifically into Breckland.<sup>10</sup> Indeed, modern trends towards carrying out larger-scale investigations in the past twenty years, such as Gosden and Green's 'EngLald' Project,<sup>11</sup> is almost certainly a result of the ever-improving developments in Geographic Information Systems (GIS) allowing large amounts of data to be marshalled more easily, helping to facilitate these national-scale projects. These developments have also undoubtedly aided smaller-scale

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<sup>8</sup> Oliver Rackham, *The History of the Countryside* (J.M. Dent, 1986): pp. 3-5.

<sup>9</sup> Brian Roberts and Stuart Wrathmell, *Region and Place, A Study of English rural settlement* (English Heritage, 2002): pp. 1-12.

<sup>10</sup> Alexander Smith, Martyn Allen, Tom Brindle and Michael Fulford, *The Rural Settlement of Roman Britain*, Britannia Monograph Series no. 29 (Society for the Promotion of Roman Studies, 2016): pp. 208-241.

<sup>11</sup> Chris Gosden and Chris Green, *English Landscapes and Identities: Investigating Landscape Change from 1500 BC to AD 1086* (Oxford University Press, 2021).

studies, but in contrast to national-scale investigations, sub-regional studies often use administrative divisions as their cut-off points rather than areas defined by a particular environmental or historic character. In large part, this is to allow the researcher to focus on a specific area in sufficient scope and detail to test a hypothesis, but the character of landscape they are investigating often continues beyond the bounds of their study area. Recent work by Tom Cox, for example, has focused on the relationship between Anglo-Saxon settlement patterns and parish boundaries in East Suffolk, but could equally be applied at a wider East Anglian level.<sup>12</sup> As such, this thesis seeks to fall in between these two ends of the landscape spectrum and provide something of a middle-level approach to landscape investigation, at a scale larger than the focused study of a particular parish or district, but smaller than regional investigation. This type of investigation has been carried out for other landscapes, such as the Peak District,<sup>13</sup> New Forest,<sup>14</sup> and Suffolk Sandlings,<sup>15</sup> demonstrating the usefulness of this scale of study, but has yet to be done for Breckland. This thesis will examine Breckland as a ‘complete’ area that is notably distinct from the surrounding landscapes, using the boundary of the Brecks National Character Area as defined by Natural England,<sup>16</sup> with discussion about differing historic definitions of Breckland given in Chapter Two. The only minor exception to this being the very small part of this area that falls inside Cambridgeshire, where for the sake of simplicity when marshalling archaeological and GIS data, it was decided to limit investigations to within Norfolk and Suffolk. However, any conclusions drawn from this

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<sup>12</sup> Tom Cox, “Reassessing the Relationship Between Early Saxon Activity and Parish Boundaries” in *Landscapes*, Vol. 23, No. 2 (2022): pp. 123-139.

<sup>13</sup> John Barnett, *Reading the Peak District Landscape* (Liverpool University Press, 2019).

<sup>14</sup> Hadrian Cook, *New Forest: The Forging of a Landscape* (Windgather Press, 2018).

<sup>15</sup> Tom Williamson, *Sandlands: The Suffolk Coast and Heaths* (Windgather Press, 2005).

<sup>16</sup> Natural England, *National Character Area Profile: 85. The Brecks* (Natural England, 2014).

thesis may still be applied to the piece of Cambridgeshire Breckland. A broad approach to the time period under scrutiny will also be applied, beginning during the Late Bronze Age (c. 1000 BC) through to the post-medieval (c. 1600 AD). The date ranges of the study period are particularly useful for two main reasons. Firstly, taking such a broad approach allows for any long-term trends to be identified across historic periods, including any trends that may recur under certain conditions. Secondly, it fills something of a gap in landscape studies of Breckland between the earlier prehistoric periods that have seen particular attention in the region,<sup>17</sup> and the later post-medieval landscape that is already relatively well-characterised and understood.<sup>18</sup> The scope and scale of this thesis means that some investigations are necessarily broad in their approach, but the character and results of these studies are clear enough and may provide useful avenues for further, more detailed work on specific aspects of the Breckland Landscape.

While the results of assessing the role of climate in Breckland will be shown to be inconclusive, in the sense that the impact of climate appears to be the same as seen in other landscapes, what will be apparent through the succeeding chapters is the role of the environment in shaping how people historically settled, used and moved through Breckland. The overarching theme that emerges is one where those living in the study area attempted to farm, organise and administer the landscape in much the same way as elsewhere despite the distinct environment, but that this very same environment meant that adaptations were often needed in order to make the most efficient use of the

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<sup>17</sup> See, for example, Barry Bishop, *Grimes Graves Environs Survey*, Unpublished PhD Thesis, University of York (2013).

<sup>18</sup> For examples, see Gregory, *Marginal Environments and the Idea of Improvement*; Jon Gregory and Sarah Spooner, "Mapping a changing landscape: Breckland c.1750-1920" in *Journal of Breckland Studies*, Vol. 3 (2019): pp. 9-21.

landscape. Despite this thesis initially being an investigation of possible climatic influences, and the limited conclusions that may be drawn from this that shall be shown in succeeding chapters, this investigation will provide a solid foundation and point of reference for understanding the character and development of the region between the Late Bronze Age and post-medieval.

To begin, Chapter Two will characterise Breckland as a distinct landscape, as well as giving an overview of various aspects of regionality, settlement studies, the ways in which historic and modern climates are reconstructed, and a summary of historic climate across the study period. Chapter Three provides a review of the historic source material available in Breckland, how this has been gathered and collated at different times, and the usefulness of this data for this investigation. Chapter Four outlines a number of sites that are frequently referred to in this thesis, so that the reader has a reasonable understanding of them for their regular reference, while Chapter Five summarises the character of the Breckland landscape before the start of the study period. These early chapters are intended to provide an overview and wider context to a range of aspects of Breckland and landscape studies, which are then applied in the subsequent chapters to investigate a number of different ways in which the landscape may have developed, evolved and seen human exploitation and management, and the ways in which climate and environment have impacted this. Chapter Six investigates the hydrology of Breckland and the influence of water supply on human activity in the region, underpinned by the geological framework. Chapter Seven explores the origins of Breckland heath, which while now much reduced in area once covered large tracts of the study area, alongside the degree of historic woodland that may have been present. Following this, Chapter Eight investigates the historic agriculture of the region, the

preferred arable and pastoral regimes across the study period and how these adapted to the local environment. Chapter Nine explores a specific aspect of the historic agricultural use of Breckland, specifically the earthwork evidence for medieval arable extents and reveals that a number of areas thought to be long-term heath were under extensive open field systems in the medieval period and post-medieval periods. Chapter Ten then explores historic drift sand activity in Breckland and whether the trigger of this activity was more likely to be climatic, environmental or anthropogenic. The final subject to be characterised in Chapter Eleven is the historic territorial and administrative structuring of Breckland, with the chapter demonstrating the people have historically attempted to divide and organise the region in much the same way as elsewhere in East Anglia and beyond despite the distinctive character of Breckland. Chapter Twelve then takes all of the various aspects discussed in the preceding chapters and presents a broader overview and characterisation of Breckland across the study period, demonstrating that the impact of climate was no more noticeable than elsewhere in England. Instead, it was the distinct environment of the study area that led to the differences in settlement and land use in Breckland. Chapter Thirteen then presents the overall conclusions that can be drawn from this thesis.

## **Chapter Two: Introducing Breckland, Settlement and Climate Studies**

This chapter will provide a context for the succeeding discussions in this thesis. The first section introduces the physical landscape of Breckland by describing the location, topography, geology and ‘natural’ environment of the region to provide a broad understanding of the character of the study area. Following this, a brief overview of the ways in which historic and modern climate may be reconstructed is given, before current interpretations of climate change, settlement and land use patterns over the study period are described. Considering how the landscape of Breckland outlined in the first section may have been impacted by the climatic changes discussed in the second, a series of hypotheses and questions is briefly outlined in the final section, the answers to which will form the body of later chapters.

### **Introducing Breckland**

The Brecks National Character Area as defined by Natural England, also known as Breckland, forms the study area for this thesis.<sup>20</sup> The definition of where exactly is classed as Breckland has varied between a number of different researchers across the twentieth century, influenced by their particular reasons for studying the area.<sup>21</sup> The creation of Breckland District Council in 1974 further complicated this by including much of the area considered as Norfolk Breckland, but also extending eastwards beyond Attleborough and almost as far north as Fakenham. However, the modern definition of Breckland, and that used by Natural England is The Brecks National Character Area, which combines many of the individual aspects of interest to earlier researchers and characterises the region based

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<sup>20</sup> Natural England, *National Character Area Profile: 85. The Brecks*

<sup>21</sup> For a discussion of these definitions see UEA Landscape History, *Where is Breckland?* UEA Landscape History Wordpress Website (2016).

upon a number of attributes that are broadly common across the defined area.<sup>22</sup> These include natural features such as geology, topography, ecology and local climate as well as human-influenced features such as settlement patterns, building styles, and historic and modern land use. This area covers just under 1,020 square kilometres (393.5 square miles) of south-west Norfolk, north-west Suffolk and a small part of Cambridgeshire (Figure 2).<sup>23</sup> Breckland is described as having an “ages-old identity, a very particular land use history and a richly distinctive wildlife, which sets it apart from all surrounding landscapes.”<sup>24</sup> It also has one of the warmest and driest climates of the United Kingdom, being markedly less maritime and more continental in climate than other parts of England and receiving less than 600mm of annual rainfall.<sup>25</sup> Despite this distinctive environment and history, ‘Breckland’ is a relatively recent name coined by the historian and naturalist W. G. Clarke in 1894,<sup>26</sup> in reference to the agricultural practice of ‘Brecking’, where areas of relatively poor soil would be put under arable cultivation for a year and then left for several years to recover. The geology of Breckland is characterised by a solid chalk bedrock, part of a former Cretaceous Period seabed, which today underlies the western half of East Anglia and continues as part of a larger band running south-west to the Dorset coast.<sup>27</sup> Within this chalk may be found particularly pure deposits of flint, widely exploited during both the prehistoric period to produce tools, and the post-medieval for the production of gunflints. This chalk bedrock has given the region a relatively muted topography. Across much of the

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<sup>22</sup> Natural England, *National Character Area Profile: 85. The Brecks*.

<sup>23</sup> Ibid.

<sup>24</sup> Ibid.: p. 3.

<sup>25</sup> Ibid.

<sup>26</sup> W. G. Clarke, “A Breckland Ramble” in *The Naturalists’ Journal*, Vol. 3 (1894): pp. 90-92 and 105-107.

<sup>27</sup> British Geological Survey (BGS), Geology Viewer online (2024).

character area, the land lies at between 15m and 45m above sea-level, the terrain being dissected by the limited watercourses in the landscape, the main rivers being the Gadder, Lark, Little Ouse, Thet, Wissey and their principal tributaries.<sup>28</sup>

At the northern end of the study area, the ground rises to a height of 78m north of Swaffham before sloping down to the River Nar as the landscape transitions into the so-called Good Sands region of Norfolk.<sup>29</sup> At the southern end, the ground begins to rise as the Breckland sands give way to the clays of the East Anglian heights. To the east, the topography remains muted, but the sandy soils become progressively more intermixed and transition into the south Norfolk and north Suffolk clays, while on the western side the landscape slopes down and meets the Fens, sitting near sea-level.

Deposits overlying this chalk are mixed in character. Broadly speaking, the British Geological Survey records superficial deposits of diamicton (that is, mixed material formed through glacial and/or periglacial action) covering much of the eastern half of Breckland and providing some depth between the topsoil and the chalk bedrock.<sup>30</sup> Some of these superficial deposits consist of areas boulder clay, usually buried beneath the surface layers of sandier soil, raising the possibility that perched water tables may exist in certain areas where the impermeable clay hinders downward water movement. The extent and impact of this has not been previously investigated and is dealt with in Chapter Seven.

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<sup>28</sup> A. S. Watt, "Studies in the Ecology of Breckland: I. Climate, Soil and Vegetation" in *Journal of Ecology*, vol. 24, no. 1 (1936): pp. 118-119.

<sup>29</sup> Natural England, *National Character Area Profile: 76. North West Norfolk* (Natural England, 2014). The 'Good Sands' is a term used to describe the fertile light soils in North West Norfolk, directly in contrast to the low fertility soils of Breckland.

<sup>30</sup> BGS, Geology Viewer online.

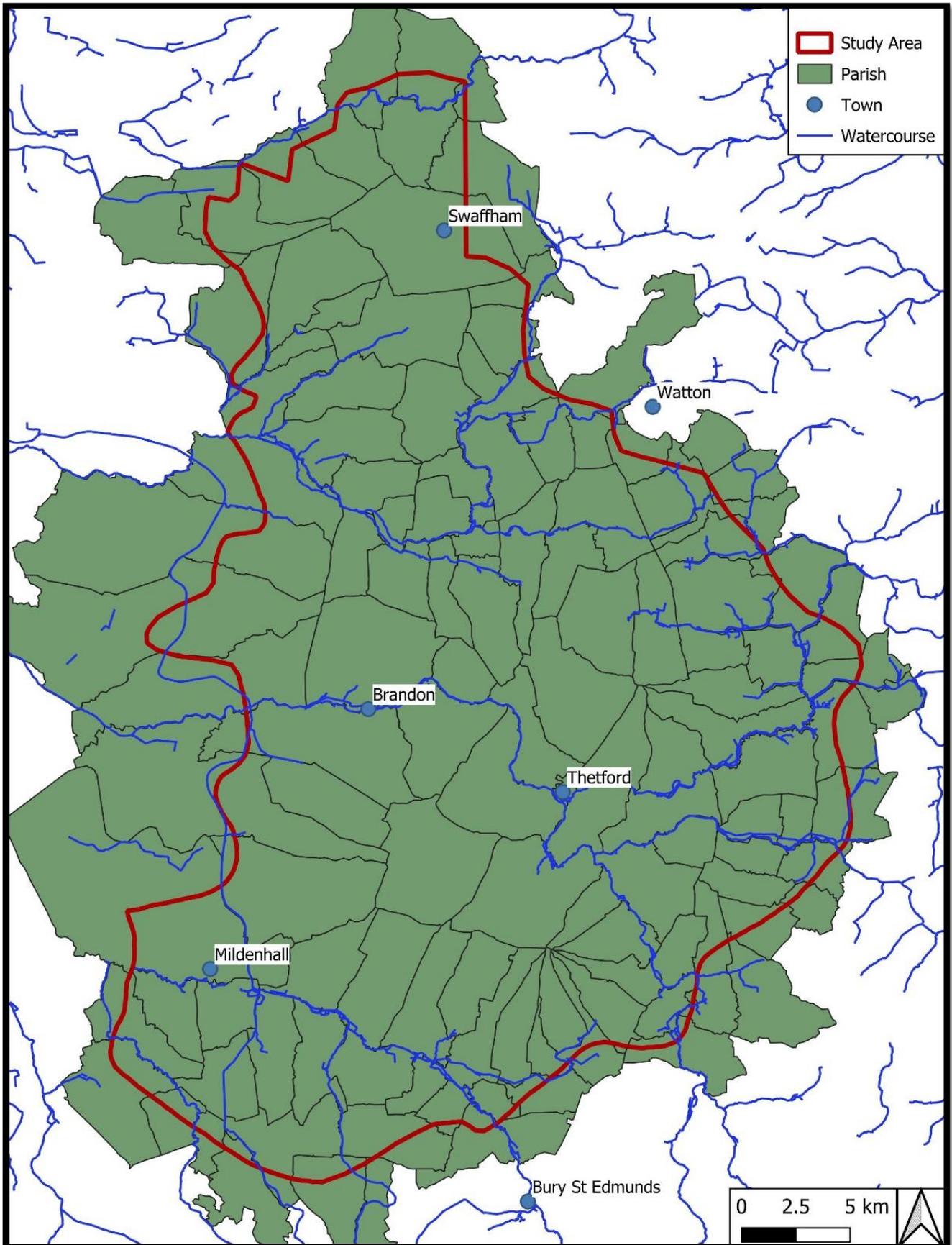


Figure 2: The Brecks National Character Area with modern parishes, principal towns of the region and watercourses.

Other areas on the eastern and southern fringes of the study area are encroached by mapped clay soils of Beccles and Melford associations.<sup>31</sup> By contrast, much of the western half of Breckland has little or no superficial deposits recorded, meaning that the chalk may lie directly beneath the thin surface deposits at a relatively shallow depth.<sup>32</sup> This can be seen in places such as Wangford Warren, where the removal of the former pine forest topsoil across large areas revealed a thin subsoil formed from a mixture of windblown sand and periglacial sands and gravels, but with islands of chalk bedrock visible only a few centimetres below the original surface (Figure 3).<sup>33</sup> Habitat restoration within the former Hockwold Warren also revealed a geology no more than 50cm below the surface, consisting of a mixture of solid chalk and periglacial sands and gravels.<sup>34</sup> At the northern end of Breckland, excavations at Marham Abbey revealed topsoil and subsoil layers formed by human activity directly on top of the solid chalk.<sup>35</sup>

Within the chalk is a water table for which a reliable source may be a considerable depth below the surface. W. G. Clarke notes that the well in the medieval Thetford Warren lodge is “103½ feet (31.54m) deep”,<sup>36</sup> while archaeologists on the A11 road scheme believed the modern water table to be around 14m below modern ground levels.<sup>37</sup>

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<sup>31</sup> C. Hodge, R. Burton, W. Corbett, R. Evans, R. Seale, *Soils and their Use in Eastern England* (Lawes -Agricultural Trust, 1984): pp. 117-121 and 245-247.

<sup>32</sup> BGS, Geology Viewer online.

<sup>33</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*.

<sup>34</sup> Jonathon House, *Hockwold Heath, Norfolk, Targeted Archaeological Investigation, Metal Detecting Survey and Fieldwalking*, Report No. R14476 (Pre-Construct Archaeology, 2021), Unpublished Fieldwork Report.

<sup>35</sup> Thomas Lucking, *Abbey House, The Street, Marham: An Archaeological Excavation as part of a programme of archaeological mitigation* (Pre-Construct Archaeology, 2020), Unpublished Fieldwork Report.

<sup>36</sup> Clarke, *In Breckland Wilds*, First Edition: p 145.

<sup>37</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 180-182.

Elsewhere, however, the grain of the chalk may direct the aquifers within it to the surface, forming the distinctive fluctuating meres of Breckland at places such as Rymer and Ringmere. The levels of these meres have historically varied from overflowing in some years to nearly dry in others as groundwater levels have fluctuated in supply. W. G. Clarke suggested a latency of around one year for the effects of seasonal wetness to be seen, with the occurrence of a dry year in 1893 leading to a reduction in water levels in the meres in 1894.<sup>38</sup> Historic variation in groundwater levels and potential long term changes in this are clearly significant for the provision of water in the characteristically dry Breckland landscape, and this is something that will be discussed further in this thesis.



*Figure 3: Chalk bedrock exposed after the removal of c.20cm of topsoil in Wangford Warren. 5th January 2021.*

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<sup>38</sup> Clarke, “A Breckland Ramble”: p. 105.

One of the most visually striking characteristics of Breckland is the occurrence of 'patterned ground', visible at places such as Knettishall Heath and Lakenheath Warren, and noted during archaeological mapping surveys of the study area.<sup>39</sup> This geological formation is the result of ice wedges eroding strips or cracks into the chalk bedrock during glacial conditions. These strips subsequently filled with sands and gravels deposited through periglacial outwash or aeolian activity. This, in turn, has affected the characteristics of the overlying soil and the *flora* that grow on those areas. Where this process has occurred in a regular fashion, the *flora* may alternate between lines of plants that prefer the chalkier ground and those that prefer deeper sands. However, it must be noted that this process was not always regular in form and more irregular patterns may be found, such as at Hockwold Heath, Norfolk (See Figure 11).

The flood plains of the river valleys are mainly formed of sandy peaty soils of the Isleham 2 association, with the exception of much of the soil adjacent to the River Lark, which is formed of deeper peats of the Adventurers 1 association.<sup>40</sup> Away from the valley floors, surface soils are characterised by a range of relatively acidic, sandy soils mainly consisting of the deep sandy Methwold and Worlington associations, the deep sandy and very acidic Newport 4 association, and the loamier and relatively less acidic Newmarket association (Figure 4).<sup>41</sup> Before post-medieval agricultural improvements and the

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<sup>39</sup> Sarah Horlock and Sophie Tremlett, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 1)*, Research Report Series 66-2018 (Historic England, 2018): p. 16; Powell, Tremlett and Horlock, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region: Stage 2 and Overall Results*: p. 24; Tom Williamson, John Bumstead, Jayne Frost, Lynsey Owens and Steve Pease, "The Landscape Archaeology of Knettishall Heath, Suffolk and its Implications" in *Landscapes*, vol. 18, no. 2 (2017): p. 162.

<sup>40</sup> Hodge *et al.*, *Soils and their Use in Eastern England*: pp. 83-85 and 231-235.

<sup>41</sup> *Ibid.*: pp. 249-253, 265-267, 277-279, and 368-370.

development large-scale pine plantations from the 1920s onwards,<sup>42</sup> large areas of these acid sands were covered by an open heathland ecology, consisting predominantly of heather, gorse, broom, and a range of other specialised *flora* and *fauna*.<sup>43</sup> Only a fragment of these heathlands survive today.

The depth of underlying chalk influences the chemical balance of the Breckland soils through the variable supply of Calcium Carbonate (CaCO<sub>3</sub>). Some areas may be particularly acidic, especially where the chalk lies at some depth, reducing alkalinity near the surface as nutrients are quickly leached out of the sandy soils, and those of the Newport 4 and Worlington associations may be particularly acidic.<sup>44</sup> Where there is a sufficient depth of soil, podsoles may develop, with the formation of a grey leached layer underlying the surface soil with a horizon to an iron rich layer below this.<sup>45</sup> Adding further complexity to this landscape is the reworking of some of these sands by aeolian activity, creating areas of dunes which have shifted at different times historically and overlie buried palaeosoils in some areas.<sup>46</sup> The most notable of these systems are in the area of Wangford and Lakenheath where soil sequences through the relict dunes have been recorded and archaeological excavations within the airbase have revealed preserved prehistoric buried

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<sup>42</sup> Norman Dannatt, "Thetford Forest: its history and development" in Philip Ratcliffe and Jenny Claridge (Eds.), *Thetford Forest Park, The Ecology of a Pine Forest* (Forestry Commission, 1996); Kate Skipper and Tom Williamson, *Thetford Forest: making a landscape 1922-1997* (Centre of East Anglian Studies, 1997).

<sup>43</sup> Clarke, *In Breckland Wilds*, First Edition: pp. 51-94; John Sheail, "Documentary evidence of the changes in the use, management and appreciation of the grass-heaths of Breckland" in *Journal of Biogeography*, Vol. 6, No. 3 (1979): pp. 277-292; Trist (Ed.), *An Ecological flora of Breckland*; Watt, "Studies in the ecology of Breckland": pp. 131-137.

<sup>44</sup> Hodge *et al.*, *Soils and their Use in Eastern England*: pp. 277-279 and 368-370.

<sup>45</sup> Watt, "Studies in the Ecology of Breckland": pp. 128-131.

<sup>46</sup> Maika de Keyser and Mark Bateman, "Late Holocene landscape instability in the Breckland (England) drift sands" in *Geomorphology*, vol. 323 (2018): pp. 123-134.

soil profiles and the remains of levelled areas of dune field.<sup>47</sup> Investigations at Redhill in the Ouse valley near Thetford also recorded the presence of possible former sand dunes across the site.<sup>48</sup> Historic accounts of shifting sand dunes are also recorded and no discussion of Breckland is complete without mentioning Thomas Wright's account of the "Sand Floud" (sic) of 1668.<sup>49</sup>

The amount of periglacial activity and shifting sands in Breckland means that the surface soils can be widely variable in depth. In some places, there may be several metres between the modern ground surface and solid chalk, whereas in others the chalk may be covered by only a thin layer of sand (Figure 5).

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<sup>47</sup> Ibid.; Alfreda Thistlethwaite, *Evaluation Report, RAF Lakenheath Hospital Zone Maintenance Facility, ERL 086* (Suffolk County Council Archaeological Service, 1995), Unpublished Fieldwork Report; John Craven, *Fitness Centre, RAF Lakenheath, ERL 130* (Suffolk County Council Archaeological Service, 2006), Unpublished Fieldwork Report.

<sup>48</sup> P. L. Gibbard, R. G. West, A. Pasanen, J. J. Wymer, S. Boreham, K. M. Cohen and C. Rolfe, "Pleistocene geology of the Palaeolithic sequence at Redhill, Thetford, Norfolk, England" in *Proceedings of the Geologists' Association*, vol. 119 (2008): pp. 175-192.

<sup>49</sup> Thomas Wright, "A curious and exact Relation of a Sand-Floud, which hath lately overwhelmed a great tract of Land in the County of Suffolk; together with an account of the Check in part given to it; Communicated in an obliging Letter to the Publisher, by that Worthy Gentleman Thomas Wright Esquire, living upon the place, and a sufferer by that Deluge" in *Philosophical Transactions of the Royal Society of London*, Vol. 3, Issue 37 (1668): pp. 722-725.

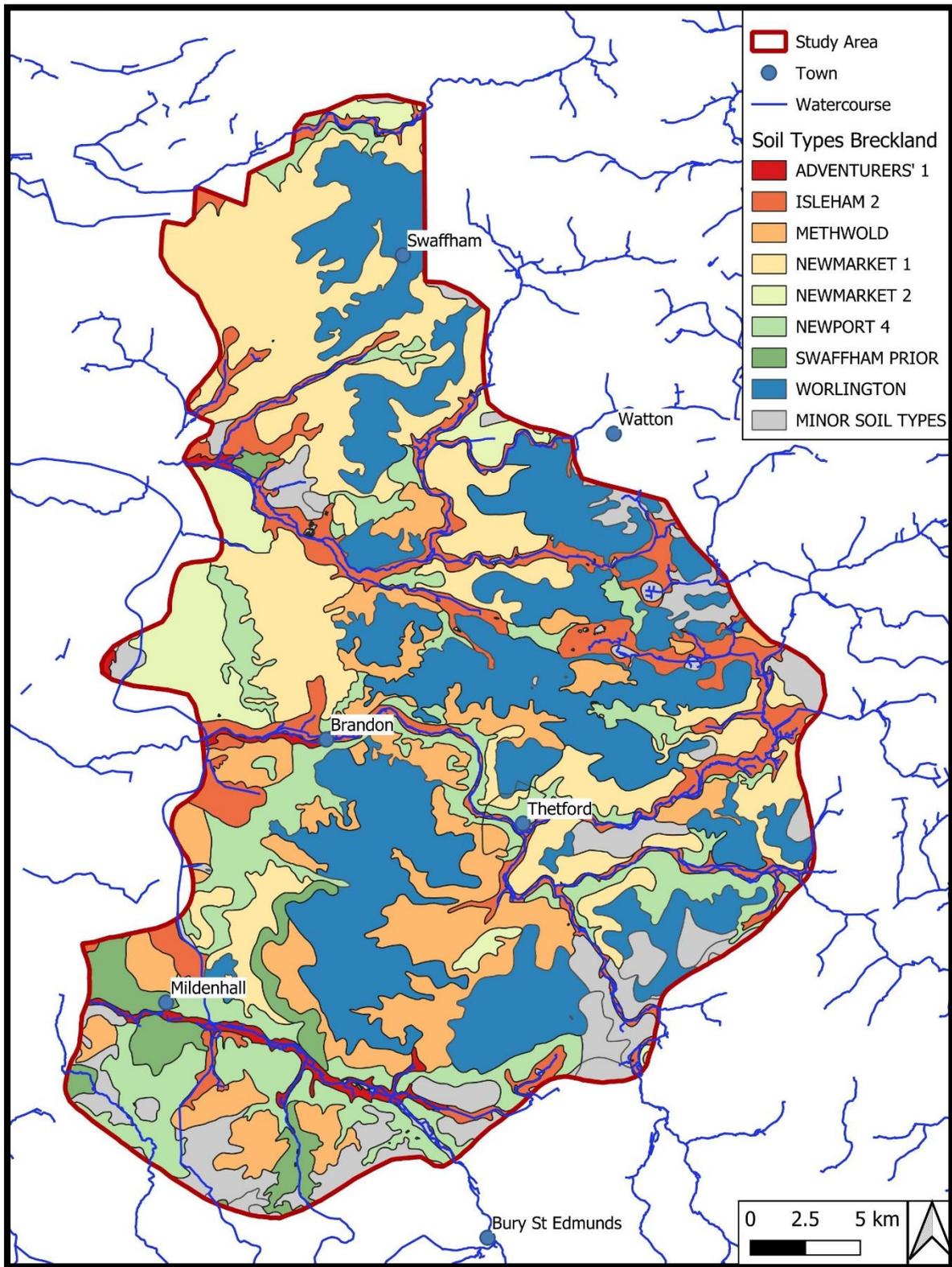


Figure 4: The principal soil types of Breckland.

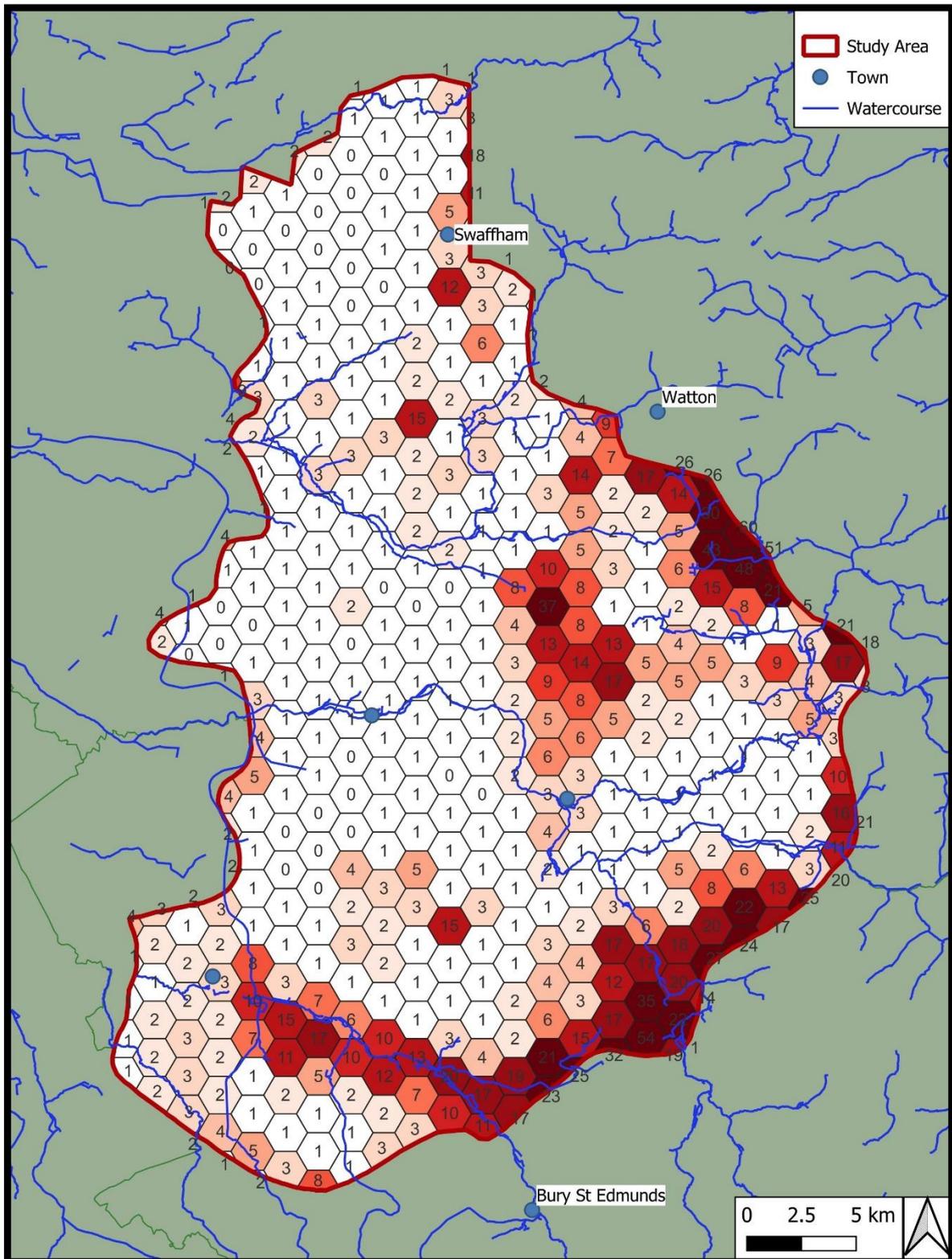


Figure 5: The average thickness in metres of superficial geology in Breckland, mapped on 1km hex tiles. Data from the British Geological Survey.

### ***Regionality and Settlement Visibility***

The purpose of this section is to outline current interpretations of settlement patterns in the wider British landscape and the extent to which these changes have previously been linked to climatic fluctuations. This will provide a context to the succeeding discussion on Breckland and produce a broad framework against which a number of hypotheses and interpretations can be tested and compared in later chapters. Two key themes shall first be discussed that are present across the entirety of the study period – that of regionality and settlement visibility – before an outline of the ways in which climates may be reconstructed is given, followed by a broader chronological discussion of climate change across the study period and how this has been interpreted as impacting settlement and land use.

#### ***Regionality***

Britain contains a diverse range of landscapes. That is, distinct areas defined by similarities or differences in geology, topography, prevailing climate, and historic land use. As such, the interaction of people with these landscapes historically has also naturally varied. Many historians and archaeologists have divided the landscape into a series of regions or *pays*, in an attempt to rationalise and provide explanation for these historic differences.<sup>50</sup> As will be seen below, some of these periods and regions are defined more in terms of their economic and social organisation, or in relation to their position within wider networks of trade and contact, while at other times their environmental contexts are given greater emphasis. It is not the purpose of this section to specifically discuss how the regions of Britain emerged and evolved, but to demonstrate the central role of regionality in

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<sup>50</sup> For examples see, Rackham, *The History of the Countryside*; Roberts and Wrathmell, *Region and Place*; Smith *et al.*, *The Rural Settlement of Roman Britain*.

interpretations of historic settlement patterns and the degree to which natural and environmental factors have been given greater or lesser prominence in these debates. The place of Breckland within these regional frameworks will be analysed in more detail in the relevant later chapters.

For the prehistoric period, Barry Cunliffe argued that regional differences were a result of factors such as the availability of certain resources, soil quality and topographic constraints, all of which would have impacted how communities managed their landscape, structured their societies and generated material culture.<sup>51</sup> In addition to this, Britain's position in maritime trade networks and the extent to which certain communities would have interacted with different societies across the sea is at the centre of Cunliffe's interpretation of the prehistoric.<sup>52</sup> In the Iron Age, Cunliffe further emphasises the role of European trade alongside the emergence of more defined tribal groups in the later Iron Age, broadly based upon topographically defined territories.<sup>53</sup> In the Late Iron Age the impact of the 'Romanisation' of Gaul on overseas trade networks is viewed as further dividing the country into three zones based upon the proximity to Gallic trading networks and therefore access to Roman material. The 'core' zone was formed of a number of tribes in south-east England, the 'periphery' surrounded this, with the remaining zone 'beyond' to the north and west.<sup>54</sup>

Recognisable regional distinctions are also present in the Roman period and attempts have been made to define these, taking into account factors such as geology,

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<sup>51</sup> Barry Cunliffe, *Britain Begins* (Oxford University Press, 2013).

<sup>52</sup> *Ibid.*

<sup>53</sup> Barry Cunliffe, *Iron Age Communities in Britain: An Account of England, Scotland and Wales from the Seventh Century BC until the Roman Conquest*, Fourth Edition (Routledge, 2005): pp. 89-108.

<sup>54</sup> *Ibid.*: p. 182.

soils, topography and the extent of Roman cultural or military influence. Two recent works which attempt to deal with this issue are the *Fields of Britannia* project<sup>55</sup> and *The Rural Settlement of Roman Britain*,<sup>56</sup> which divide England and Wales into nine and eight landscape regions respectively. *Fields of Britannia* explored continuity between the Roman and medieval landscape and was therefore influenced by Roberts and Wrathmell's medieval landscape provinces, a work which is discussed more below.<sup>57</sup>

The Anglo-Saxon period has been interpreted in a slightly different way. The end of Roman administration in Britain and the upheaval that came with this traditionally saw the earliest period defined by areas of 'Anglian', 'Saxon' and 'British' cultural zones. These were based in part on the distribution of certain artefact types correlated with early written sources detailing the movement of folk groups and the establishment of early polities.<sup>58</sup> The demographic changes of this period are still debated, but more recently these broad cultural zones, particularly the 'Anglian', have been correlated with three principal drainage provinces in England.<sup>59</sup> This in turn is linked with the 'river-and-wold' model, first developed by Alan Everitt as an explanation for territorial formation in the Anglo-Saxon period. The broad argument made by Everitt was that the topography of much of the English landscape encouraged the movement of people along river valley systems, rather than across the

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<sup>55</sup> Stephen Rippon, Chris Smart and Ben Pears, *The Fields of Britannia* (Oxford University Press, 2015).

<sup>56</sup> Smith *et al.*, *The Rural Settlement of Roman Britain*.

<sup>57</sup> Roberts and Wrathmell, *Region and Place*.

<sup>58</sup> For a summary of this debate see: Tom Williamson, *Environment, Society and Landscape in Early Medieval England, Time and Topography* (The Boydell Press, 2013): pp. 6-11.

<sup>59</sup> *Ibid.*: pp. 55-60.

more liminal interfluves.<sup>60</sup> This limited human contact between river systems and meant that as early social and cultural groups emerged they tended to form within, rather than across, river valleys and, in the words of Williamson, over time social territories tended to approximate to drainage basins.<sup>61</sup> The growth of political territories and the emergence of the Anglo-Saxon kingdoms was suggested by Steven Bassett as a form of ‘knock-out competition’, where, over time, political units would come to dominate their neighbours and grow in size, either through warfare, political marriage or other means, eventually leading to the English kingdoms present in the Middle Saxon period.<sup>62</sup> While the Middle Saxon period sees a shift towards political rather than cultural or topographical boundaries, concepts such as ‘river-and-wold’ serve to demonstrate that some parts of the political boundaries that crystallise in the later Saxon period are derived from earlier divisions relating to the natural landscape.

The stabilisation of territories and boundaries in the Late Saxon and early medieval periods has provided a convenient method of regional distinction for many historians to use even if, for example, there may be no clear difference between settlement patterns and social organisation either side of a county boundary. The shifting nature of settlement in the Early Anglo-Saxon period has also made difficult any distinctions beyond the broad cultural zones or political boundaries of this time, but as settlement began to stabilise in the Middle and Late Saxon periods, shown in East Anglia through fieldwalking surveys in places such

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<sup>60</sup> Alan Everitt, “River and Wold: Reflections on the Historical Origins of Regions and Pays” in *Journal of Historical Geography*, vol. 3 (1977): pp. 1-19.

<sup>61</sup> Williamson, *Environment, Society and Landscape*: p. 56.

<sup>62</sup> Steven Bassett, “In Search of the Origins of Anglo-Saxon Kingdoms” in Steven Bassett (Ed.), *The Origins of Anglo-Saxon Kingdoms* (Leicester University Press, 1989): pp. 3-27.

as Launditch Hundred,<sup>63</sup> with associated changes in agriculture, a different form of regionality was highlighted by historians.

Historic distinctions of agricultural land use contrasted the zones of ‘champion’ and ‘woodland’. The ‘champion’ consisted of predominantly nucleated villages and regular open field systems occupying a belt of countryside running from Northumberland to the south coast. ‘Woodland’ settlement, to the east and west of the ‘champion’, was more dispersed in character, with old enclosures and irregular open field systems.<sup>64</sup> Attempts to define these areas were made by Gray as early as 1915,<sup>65</sup> and subsequently by Homans in 1941.<sup>66</sup> Oliver Rackham drew similar boundaries when defining his ancient and planned countrysides of lowland England,<sup>67</sup> while Roberts and Wrathmell sought to define differences between a central province, an eastern province, and a northern and western province, which in turn contained a number of distinct sub-provinces.<sup>68</sup> All of these interpretations were drawing broadly the same distinctions between the Midland belt of ‘champion’ countryside and the ‘woodland’ countryside surrounding this. Counties such as Northamptonshire have been used as the prime example of ‘champion’ landscapes,<sup>69</sup> while regions such as East Anglia have seen research projects investigating the anciently

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<sup>63</sup> Peter Wade-Martins, *Fieldwork and Excavation on Village Sites in Launditch Hundred*, Norfolk, East Anglian Archaeology Report no. 10 (Norfolk Museums Service, 1980).

<sup>64</sup> Williamson, *Environment, Society and Landscape*: pp. 125.

<sup>65</sup> Howard Gray, *English Field Systems* (Harvard University Press, 1915).

<sup>66</sup> George Homans, *English Villagers of the Thirteenth Century* (Russell & Russell, 1960).

<sup>67</sup> Rackham, *The History of the Countryside*: pp. 3-5.

<sup>68</sup> Roberts and Wrathmell, *Region and Place*: pp. 6-12.

<sup>69</sup> Tom Williamson, Robert Liddiard and Tracey Partida, *Champion: The Making and Unmaking of the English Midland Landscape* (Liverpool University Press, 2013).

enclosed character of this ‘woodland’ landscape.<sup>70</sup> The causes of these distinctions have been characterised in a number of ways,<sup>71</sup> but Williamson has recently emphasised the geological and hydrological differences between these zones, which in turn would encourage differing settlement patterns and a greater or lesser degree of communal land use.<sup>72</sup>

The later medieval and post-medieval periods saw an increasing regional specialisation of agriculture, which led to a gradual divergence away from the medieval model and towards a series of new regional distinctions. The farming regions of Joan Thirsk are perhaps the best known of these<sup>73</sup> and, while Rackham’s ‘planned countryside’ is often used as a convenient proxy for medieval champion landscapes, in large part because these were the areas where open fields had been most extensive, it is principally referring to those areas which were subject to processes of widespread, organised enclosure in the post-medieval period.<sup>74</sup>

It is clear from the discussion above that the landscape of Britain was divided into distinct regions from an early date, and that these divisions could be formed through a range of factors including climatic variation, topography, social structure and semi- arbitrary administrative boundaries. Across the study period Breckland has a place within these regional frameworks but is itself a distinct landscape within modern East Anglia.

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<sup>70</sup> Edward Martin and Max Satchell, *Where Most Inclosures Be: East Anglian Fields: History Morphology and Management*, East Anglian Archaeology Report no. 124 (Suffolk County Council Archaeological Service, 2008).

<sup>71</sup> See, for example, Roberts and Wrathmell, *Region and Place*: pp. 59-82.

<sup>72</sup> Williamson, *Environment, Society and Landscape*: p. 184-206.

<sup>73</sup> Joan Thirsk, *England’s Agricultural Regions and Agrarian History, 1500-1750* (Economic History Society, 1987).

<sup>74</sup> Rackham, *History of the Countryside*: p. 5.

The distinctiveness of Breckland is the result of various factors but fundamentally derives from the particular character of the natural environment, increasing the potential that climate may have a greater impact in defining the region. This is of particular importance as it is the environmental character of Breckland that has led to it being described as historically 'marginal'.<sup>75</sup> It is important therefore to emphasise the care and awareness needed when seeking to compare settlement patterns both from within East Anglia, where settlement patterns may have been similar, but the physical landscape may be very different, and from elsewhere in Britain, where the landscape may have been of similar character to Breckland, but settlement and social structure may have differed. That is not to say that comparisons with other landscapes is limited, but that Breckland and any other landscapes discussed must be placed within their own regional contexts.

### Settlement Visibility

In any study of historic settlement patterns an understanding of the visibility of settlement in the landscape or archaeological record is crucial to producing an informed interpretation, including the study of the factors that may have influenced settlement development, climatic or otherwise. This short section will emphasise the factors that must be considered when analysing settlement patterns of different periods and in different landscapes by providing a general outline of the five main ways in which historic settlement visibility may vary archaeologically: earthworks and upstanding remains, cropmarks, surface artefact scatters, below ground remains, and documentary evidence. Many of the records dealing with this material in Breckland exist in published form, but a significant

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<sup>75</sup> For a summary of the development of this definition see Bailey, *A Marginal Economy?*: pp. 1- 39.

body of unpublished grey literature reports also covers previous archaeological and historical investigations in the region. A review of this material, both published and unpublished, is given in Chapter Three, which will allow a more nuanced and in-depth understanding of the settlement history and visibility of the region to be developed in later chapters.

Earthworks and upstanding remains are perhaps the clearest indication of human activity in a landscape and can take a range of forms, from the foundations of Bronze Age settlement and reave systems on Dartmoor<sup>76</sup> to the low earthwork agger of a lost Roman road in Suffolk,<sup>77</sup> to any number of derelict medieval churches across the English countryside. Traditionally, the recognition and recording of these features and structures would be undertaken through field survey,<sup>78</sup> but modern methods are increasingly using lidar, photogrammetry, and other three-dimensional scanning techniques to achieve similar results.<sup>79</sup> The survival of these remains is dependant partly on the materials used in their construction and partly on the subsequent land use of that landscape, as well as the durability of a particular feature to resist erosion. For example, the foundations of Bronze Age roundhouses at Grimspound on Dartmoor<sup>80</sup> have survived because they were

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<sup>76</sup> Andrew Fleming, *The Dartmoor Reaves: investigating prehistoric land divisions*, Second Edition (Windgather Press, 2008).

<sup>77</sup> For example: SHER BAR 142 has been tentatively identified as a possible Roman road visible as a linear earthwork between Bardwell and Barningham.

<sup>78</sup> For examples, see Sussams, *The Breckland Archaeological Survey*; Brian Cushion and Alan Davison, *Earthworks of Norfolk*, East Anglian Archaeology Report No. 104 (Norfolk Museums and Archaeology Service, 2003).

<sup>79</sup> John Bedford, *Photogrammetric Applications for Cultural Heritage, Guidance for Good Practice* (Historic England, 2017); Clive Boardman, *3D Laser Scanning for Heritage, Advice and Guidance on the Use of Laser Scanning on Archaeology and Architecture* (Historic England, 2018).

<sup>80</sup> Devon and Dartmoor Historic Environment Record Number MDV8778.

constructed in stone, whereas in a region such as East Anglia where stone is not available, prehistoric roundhouses constructed of wood simply could not survive above ground. Similarly, prehistoric remains on Dartmoor survive because the landscape did not see widespread arable use, aiding preservation, while East Anglia is an intensively arable region. Christopher Taylor has previously drawn attention to this, referring to zones of preservation and destruction where medieval arable practices would have removed earlier features.<sup>81</sup> The differential preservation of remains in contrasting landscapes can equally apply to later periods. A relative lack of surviving medieval ridge-and-furrow in East Anglia is argued to be a result of the scale of post-medieval ploughing in the region removing most of these features.<sup>82</sup> This contrasts with the Midlands where large areas of ridge-and-furrow have survived under pasture.<sup>83</sup> In relation to Breckland, this concept is particularly significant in comparing settlement and land use between those areas of surviving warren and heathland which have previously been assumed to be free of historic cultivation, and those areas which have been subject to intensive arable and forestry regimes in the post-medieval and modern periods. As will be seen in Chapter Ten, however, the reality of these areas being undisturbed is somewhat more complex.

Cropmarks, by their very nature, indicate the presence of below ground remains, but for the purposes of this discussion 'below ground remains' shall refer to those that are

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<sup>81</sup> Christopher Taylor, "The study of settlement patterns in pre-Saxon Britain" in Peter Ucko, Ruth Tringham and G. W. Dimbleby (Eds.), *Man, Settlement and Urbanism: proceedings of a meeting of the Research Seminar in Archaeology and Related Subjects held at the Institute of Archaeology, London University* (Duckworth, 1972): pp. 109-113.

<sup>82</sup> Robert Liddiard, "The distribution of ridge and furrow in East Anglia: ploughing practice and subsequent land use" in *The Agricultural History Review*, vol. 47, no. 1 (1999): pp. 1-6.

<sup>83</sup> Williamson, Liddiard and Partida, *Champion*.

excavated archaeologically. Cropmarks may indicate a range of historic land uses in a similar fashion to earthworks, such as former field systems, occupation or industrial sites, and funerary or ceremonial monuments. The underlying geology of a landscape can affect the visibility of cropmarks with areas such as the East Anglian clays having relatively few cropmarks recorded compared to areas of lighter soil despite both landscape types being rich in the other forms of evidence for settlement visibility discussed here. While some cropmarks may be identifiable at ground level, the most common way to record these is through the use of aerial photography.<sup>84</sup> A number of surveys in East Anglia, such as in Breckland,<sup>85</sup> the coastal zone of Norfolk,<sup>86</sup> and the Norfolk Broads,<sup>87</sup> have used aerial photography to both record new cropmarks and to assist in the interpretation of other features where possible. Cropmarks have the potential to provide landscape-scale information on historic settlements and land use, but care must be taken in the confident dating of some cropmarks without supporting evidence. Recent excavations at Hopton in east Norfolk discovered that features tentatively identified by the Norfolk Coastal mapping programme as roundhouse ring ditches were in fact barrows, and a feature suggested to be a prehistoric barrow was actually of Roman date.<sup>88</sup> It must also be noted that not all

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<sup>84</sup> David Wilson, *Air Photo Interpretation for Archaeologists* (Tempus, 2000).

<sup>85</sup> Horlock and Tremlett, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 1)*; Powell, Tremlett and Horlock, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region: Stage 2 and Overall Results*.

<sup>86</sup> James Albone, Sarah Massey and Sophie Tremlett, *The Archaeology of Norfolk's Coastal Zone, Results of the National Mapping Programme*, English Heritage Project no. 2913 (English Heritage, 2007).

<sup>87</sup> James Albone, Sarah Massey and Sophie Tremlett, *The Archaeology of Norfolk's Broads Zone, Results of the National Mapping Programme*, English Heritage Project no. 2913 (English Heritage, 2007).

<sup>88</sup> Mike Pitts and Mark Hinman, "Ceremony & settlement in rural Norfolk" in *British Archaeology*, no. 178 (2021): pp. 8-9.

features, including field systems and buildings, will necessarily leave identifiable crop marks, even in areas that are considered productive for this.

Scatters of artefacts on the surface can provide direct evidence of human activity in a landscape, but the presence or absence of this material highlights the differences between settlement visibility over different periods. Prehistoric pottery generally survives poorly once it has been disturbed, particularly in arable soils, meaning that evidence of prehistoric sites may be limited to flint scatters (depending on the date of activity) or metalwork, which itself may only have been sparsely used at certain periods. Flint survives well but will not have been in widespread use over the study period, so is not discussed further here. This is in stark contrast with Roman artefact assemblages, which usually survive well and in relatively high quantities. Likewise, surface finds assemblages from the Middle Saxon period onwards in East Anglia are more durable and can be present in greater quantities than Early Saxon settlement material. The result is that Roman and medieval activity is often far more easily detected through the presence of ceramics and metalwork compared with prehistoric and Early Anglo-Saxon activity, and this in turn raises questions about how much surface material constitutes a 'site' in these less visible periods. Similarly, it is important to distinguish between a background of material present through manuring, and therefore the implication of arable land use, and direct evidence of domestic settlement, specialist activities (pottery production, for example) or plough-disturbed burial grounds. Scatters from manuring also present problems in that they are only indicators of midden waste being spread on a field, while sheep-folding would leave little material trace. Pastoral land use may also be difficult to define because, by its very nature, it does not generate artefact scatters, while farmstead sites situated in pastoral landscapes

may be relatively discrete and easily missed. Alongside artefact scatters collected systematically, an increasingly large body of material is being recorded through hobbyist metal detecting. There is a clear value to this material in that it has revealed countless sites of all periods and functions that would otherwise be unknown, but care must be exercised when using data collected in this way. A guide published by the Portable Antiquities Scheme discusses the variety of ways in which finds data from metal detecting may contain biases that hinder interpretation.<sup>89</sup>

Below ground remains in the form of archaeologically excavated features can provide clear and well-dated evidence of historic settlement. The modern development-led nature of archaeology, however, means that many investigations happen in the periphery of modern settlements, and this in turn may skew the settlement pattern towards those areas where settlement stabilised in the medieval and post-medieval periods and has since remained, as well as being limited to the scope of the development site. Large-scale infrastructure projects across rural landscapes can provide a counterbalance to this, and recent excavations as part of the A14 improvement works in Cambridgeshire are perhaps one of the best examples, where landscape-scale excavations revealed occupation and other activities covering a range of historic periods.<sup>90</sup> As with artefact scatters, the visibility of settlement archaeology is also varied across different periods. For example, it is not uncommon for Bronze Age sites in East Anglia to produce limited evidence for structural

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<sup>89</sup> Katherine Robbins, *The Portable Antiquities Scheme, A guide for Researchers* (Portable Antiquities Scheme, 2014).

<sup>90</sup> A. Smith and E. West, *A14 Cambridge to Huntingdon Improvement Scheme, Cambridgeshire, Archaeological Investigations, Volume 1: Post-Excavation Assessment* (MOLA Headland Infrastructure, 2019) Unpublished Fieldwork Report.

remains. This is demonstrated by two enclosures excavated at Leiston in Suffolk, which had scant evidence for buildings but domestic rubbish tipped into the enclosure ditches suggested occupation within the enclosures.<sup>91</sup> Similarly, John Blair has argued that Middle and Late Saxon structures may leave relatively scant archaeological traces, possibly because changes in construction techniques meant that foundations were relatively shallow and therefore less likely to survive.<sup>92</sup> Finally, the survival of documentary evidence can also inform interpretations of historic settlement patterns. This type of evidence predominantly covers medieval and post-medieval settlement, where written documents such as manorial accounts, charters and field books, as well as historic maps and surveys, may provide insight into the location and/or layout of farms and villages, as well as the size of holdings and land use associated with this. It may also be possible to infer earlier historic land uses and the existence of archaeological sites through documentary study, as was recently emphasised by David Dymond in his examination of minor Suffolk place names.<sup>93</sup> Equally, antiquarian histories can mention archaeological sites and discoveries that may no longer be traceable on the surface, such as an account by Augustine Page on the discovery of bodies in a mound near the church of Fornham St Genevieve in Suffolk in 1826.<sup>94</sup> The principal drawback of this source material is the differential survival rates of documents from different places and periods.

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<sup>91</sup> Graeme Clarke, *Land South of Red House Lane, Leiston, Suffolk, Archaeological Excavation* (Oxford Archaeology East, 2019), Unpublished Fieldwork Report.

<sup>92</sup> John Blair, *Building Anglo-Saxon England* (Princeton University Press, 2018): pp. 51-66.

<sup>93</sup> David Dymond, "Minor Place-Names in Suffolk" in *Proceedings of the Suffolk Institute of Archaeology and History*, Vol. 44, Part 4 (2020): pp. 613-636.

<sup>94</sup> Augustine Page, *A Supplement to the Suffolk Traveller* (Joshua Page, 1844): p. 717.

It should be clear from the discussion above that a range of material is available to allow for the interpretation of historic settlement patterns. However, variations in the creation and preservation of this material over time mean that historic settlement in some periods may be highly visible in the landscape, while others may appear limited or entirely absent. It is therefore important that any discussions and interpretations of settlement patterns in this thesis make use of a wide range of sources to provide as comprehensive an image as possible of historic settlement and seek to emphasise settlement evidence from those periods that are less visible in the archaeological record.

### ***Climate Change and Settlement***

#### ***Reconstructing Modern and Historic Climates***

Both historic and more recent climate may be reconstructed at a variety of spatial scales with a range of different source material available. These varied datasets and the reconstructions drawn from them may have differing degrees of relevance depending on the region or period under investigation. While this thesis is principally one of historic study, the potential impact of climate is a core theme. As such, it is worthwhile providing a brief outline of the key aspects of palaeoclimatology and publications which deal with this in greater detail, so that the reader has an understanding of how the historic climatic fluctuations discussed in later sections have been modelled. Firstly, however, it is useful to mention the ways in which modern climate is measured and reconstructed and how this data helps inform historic proxy reconstructions, as well as highlighting the challenges of interpreting historic climate compared with modern climatic datasets.

### Modern Climatic Reconstructions

Reconstruction and ongoing recording of the more modern climate is, by its very nature, a considerably easier task than palaeoclimatic reconstructions. This is principally because more recent data is likely to have been gathered in a structured way, by instruments specifically designed to record aspects of the Earth's climate. As the purpose of this thesis is an examination of historic climate, it is not necessary to go into detail about the methods of modern climatology, other than to state that data is often methodically gathered from all aspects of the Earth including the atmosphere, biosphere, cryosphere, hydrosphere, and land surface,<sup>95</sup> using a range of instruments and observations that record changes in these climatic components.<sup>96</sup> What is significant about modern datasets from a palaeoclimatic perspective is that they can provide reliable data for known climatic conditions. This, in turn, means that historic data may be compared with modern datasets and inferences made about climate in the distant past, something that is at the core of many of the reconstructions of historic climate.

### Historic Reconstructions

Historic climatic reconstructions, or palaeoclimatology, are the study of climates prior to the period of instrumental measurements.<sup>97</sup> In contrast with modern climatology, where a range of instruments capture climatic conditions as they occur, palaeoclimatology relies on a variety of proxy datasets from which historic conditions can be extrapolated and interpreted. The spatial and temporal scale at which climate may be reconstructed is

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<sup>95</sup> Chester Ropelewski and Phillip Arkin, *Climate Analysis* (Cambridge University Press, 2019): pp. 2-11.

<sup>96</sup> *Ibid.*: pp. 40-63.

<sup>97</sup> Raymond S. Bradley, *Paleoclimatology, Reconstructing Climates of the Quaternary*, Third Edition (Elsevier, 2015): p. 1.

dependent upon the resolution of the data, the timespan over which the source material accumulated, the type of climatic conditions contained in a proxy source (such as temperature, wetness, atmospheric composition) and whether this data can be accurately assigned to a specific period, or whether the dataset has a ‘floating’ chronology. Thus, sources such as the Greenland ice core samples provide data that stretches back more than one hundred thousand years, with an annual resolution near the top of the core that gradually diminishes to broader time scales as the depth and age of the core increases due to compression of the ice layers.<sup>98</sup> A reduction in temporal resolution is common the further into the past that reconstructions are made. Where this reduced resolution makes assigning a specific time period to part of the sample more difficult, the presence of deposits such as volcanic tephra from known eruptions provide cut-off dates within the sample.<sup>99</sup> This may not always allow for a precise dating in time but does allow correlation with other samples where these deposits have also been detected. Similarly, dendrochronology provides annual records of tree-ring growth from which changes in climate may be detected. In some regions where historic timbers and sub-fossil wood samples allow, this may provide an unbroken annual record of tree-ring growth for many centuries, from which a climatic signature can then be extrapolated.<sup>100</sup> Lake varve sediments may also provide annual records of climatic conditions, and the environment of

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<sup>98</sup> Ibid.: pp. 167-175.

<sup>99</sup> Ibid.: pp. 163-164.

<sup>100</sup> For example, see Richard Cooper, Thomas Melvin, Ian Tyers, Rob Wilson and Keith Briffa, “A tree-ring reconstruction of East Anglian (UK) hydroclimate variability over the last millennium” in *Climate Dynamics*, vol. 40 (2013): pp. 1019-1039.

the lake catchment, but may have significant gaps in their accumulation due to subsequent erosion or periodic drying of the lakebed.<sup>101</sup>

Lower resolution data may also be just as valuable in reconstructing historic climate over broader periods of time, with information derived from bog surface wetness records being used to reconstruct the climate of Bronze Age Britain, for example.<sup>102</sup> Other sources, such as historic levels of carbon-14 preserved in peat deposits provide broad patterns of changes in solar activity over prolonged periods.<sup>103</sup>

Most of the methods and sources described above provide climatologists with the ability to reconstruct historic conditions at a particular place over a certain period and, depending on the source being studied, make inferences about wider climatic fluctuations. However, this comes with the caveat that the data being studied may show conditions particular to one location that are not seen at a wider level. To overcome the effect of local conditions and reconstruct palaeoclimate on a larger scale, a number of proxy sources from different locations may be combined and extrapolated into broader trends, thus removing any potentially localised anomalies present in single datasets. Ljungqvist's reconstruction of extra-tropical Northern Hemisphere temperatures, for example, used

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<sup>101</sup> For examples, see Andreas Leemann and Frank Niessen, "Holocene glacial activity and climatic variations in the Swiss Alps: reconstructing a continuous record from proglacial lake sediments" in *The Holocene*, vol. 4, no. 3 (1994): pp. 259-268; Sylvia Peglar, "The mid-Holocene *Ulmus* decline at Diss Mere, Norfolk, UK: a year-by-year pollen stratigraphy from annual laminations" in *The Holocene*, vol. 3, no. 1 (1993): pp. 1-13.

<sup>102</sup> Tony Brown, "The Bronze Age climate and environment of Britain" in *Bronze Age Review*, vol. 1 (2008): pp. 7-22.

<sup>103</sup> Dmitri Mauquoy, Bas van Geel, Maarten Blaauw, Alessandra Speranza and Johannes van der Plicht, "Changes in solar activity and Holocene climatic shifts derived from <sup>14</sup>C wiggle-match dated peat deposits" in *The Holocene*, vol. 14, no. 1 (2004): pp. 45-52.

thirty different proxy records to model historic temperatures, gathered from sites at a range of longitudes and latitudes across the Northern Hemisphere.<sup>104</sup>

What this section seeks to highlight is that palaeoclimatology involves the use of a variety of proxy sources, which have the potential to provide information on different aspects of Earth's historic climate at different spatial and temporal scales. This thesis is making use of a variety of reconstructions in order to develop an understanding of how climatic fluctuations may have impacted the historic Breckland landscape. It is not seeking to challenge or critically analyse the climatic data in-depth, but to utilise it to place Breckland within its environmental context. As such, it is not necessary to go into full detail about the range of types of data available and how this information is collected and interpreted, only to raise the point that the current understanding of palaeoclimatic conditions is derived from a range of proxy sources. Should the reader wish to gain a more in-depth knowledge of the methods of palaeoclimatology, then the author would direct them towards recent works such as Bradley's *Paleoclimatology, Reconstructing Climates of the Quaternary*, which details the range and usefulness of proxy sources available for palaeoclimatic reconstruction, and the information that each of these sources can provide.<sup>105</sup> Likewise, Ruddiman's *Earth's Climate: Past and Future* discusses changes in the Earth's climate from millions of years ago to the present day.<sup>106</sup> Finally, Roberts's *The*

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<sup>104</sup> Fredrik Ljungqvist, "A New Reconstruction of Temperature Variability in the Extra-Tropical Northern Hemisphere During the last two Millennia" in *Geografiska Annaler*, vol. 93, issue 3 (2010): pp. 339-351.

<sup>105</sup> Bradley, *Paleoclimatology, Reconstructing Climates of the Quaternary*.

<sup>106</sup> William Ruddiman, *Earth's Climate: Past and Future*, Third Edition (Macmillan, 2014).

*Holocene: An Environmental History* discusses post-glacial changes in climate and the sources that have been used to reconstruct this.<sup>107</sup>

### *The Climate Through Time*

Across the study period, a number of climatic fluctuations have been reconstructed by climatologists as variations between higher/lower average temperature, higher/lower average rainfall, and broader climatic stability/instability. Some of these fluctuations have been argued as a factor driving changes in settlement and population dynamics and the benefit of having a broad study period is that trends across the *longue durée* can be examined. These reconstructions are derived from a range of proxy sources, which allow periods of climatic change to be modelled and compared with information derived from other proxy sources. As summarised in Chapter Two, some of these models are reconstructions of climate at a local level, such as the catchment for a lake or peat bog, while others use material that may allow the reconstruction of climate at a broader national or continental scale. This section will provide a summary of the main climatic changes over the study period and ways in which they have been suggested as impacting historic settlement and land use patterns.

Before proceeding, it is worth considering that the range of temperature change across the study period is often modelled as being no more than around 1°C either side of what is usually the modern average, depending on the spatial scale to which the data is being modelled.<sup>108</sup> Some models show slightly greater variability, such as Buntgen *et al.*

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<sup>107</sup> Neil Roberts, *The Holocene: An Environmental History*, Third Edition (Wiley and Sons, 2014).

<sup>108</sup> For examples, see: Hubert Lamb, "Climate from 1000 BC to 1000 AD" in Martin Jones and Geoffrey Dimbleby (eds.), *The Environment of Man: the Iron Age to the Anglo-Saxon Period*, BAR British Series 87 (BAR, 1981): pp. 55-56; Jan Esper, David Frank, Mauri

who suggest the Little Ice Age could have been approaching 2°C below the average,<sup>109</sup> while others suggest it may have been as little as 0.5°C.<sup>110</sup> Conversely, the Roman and Medieval Warm Periods may have been above average by as much as 1°C,<sup>111</sup> or as little as 0.2°C.<sup>112</sup> Historic rainfall is much more difficult to measure by a precise scale, and as a result is usually described in rather vaguer terms as periods of wetter or drier climate.<sup>113</sup> Two key points are emphasised by this that must be borne in mind when considering historic climate. Firstly, the fluctuations described below are not dramatic changes in climate but instead represent small trends over a prolonged period that have been argued in some cases as impacting human activity. Secondly, because of the often low temporal resolution of the data, many of the interpretations of historic climate focus on the longer-term trends and averages, modelling changes as a smooth curve, rather than on shorter-term fluctuations which may be more variable. That is to say, an increase in average temperature might, for instance, be the result of a series of particularly hot summers over a relatively short period, rather than the gentler increase suggested by the modelled averages. In some cases, often where documentary evidence survives, these shorter-term variations can be recorded,

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Timonen, Eduardo Zorita, Rob Wilson, Jurg Luterbacher, Steffen Holzammer, Nils Fischer, Sebastian Wagner, Daniel Nievergelt, Anne Verstege and Ulf Buntgen, "Orbital forcing of tree-ring data" in *Nature Climate Change*, vol. 2 (2012): p. 863.

<sup>109</sup> Ulf Buntgen, Willy Tegel, Kurt Nicolussi, Michael McCormick, David Frank, Valerie Trouet, Jed Kaplan, Franz Herzig, Karl-Uwe Heussner, Heinz Wanner, Jurg Luterbacher and Jan Esper, "2500 Years of European Climate Variability and Human Susceptibility" in *Science*, vol. 331 (2011): pp. 581.

<sup>110</sup> Keith Briffa, Timothy Osborn, Fritz Schweingruber, Ian Harris, Philip Jones, Stepan Shiyatov and Eugene Vaganov, "Low-frequency temperature variations from a northern tree ring density network" in *Journal of Geophysical Research*, Vol. 106, No. D3: p. 2938.

<sup>111</sup> Esper *et al.*, "Orbital forcing of tree-ring data": p. 863.

<sup>112</sup> Ljungqvist, "A New Reconstruction of Temperature Variability": p. 345.

<sup>113</sup> For example, see Brown, "The Bronze Age climate and environment of Britain": pp. 7-22.

such as differences in the timing of the Nile floods during the Roman period,<sup>114</sup> or the cold, wet conditions during the Great Famine,<sup>115</sup> but these are often exceptions and are almost entirely absent for prehistory.

The beginning of the study period (c.1000 BC) covers the Late Bronze Age and much of the British landscape by this time had already seen changes through human activity and influence. Some areas had seen considerable woodland clearance in the Neolithic and earlier Bronze Age as the area under agricultural use expanded. For example, the construction of barrows in southern England is thought to have taken place in a landscape that was already heath and downland in the Early Bronze Age.<sup>116</sup> Further areas of England, including Dartmoor, parts of south-east England and the southern and western sides of the Fens had seen the creation of large-scale organised field systems from the Middle Bronze Age, demonstrating the open nature and degree of landscape and social organisation already present before the start of the study period.<sup>117</sup> Bradley has interpreted this time as being

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<sup>114</sup> Michael McCormick, Ulf Buntgen, Mark Cane, Edward Cook, Kyle Harper, Peter Huybers, Thomas Litt, Stuart Manning, Paul Mayewski, Alexander More, Kurt Nicolussi and Willy Tegal, “Climate Change during and after the Roman Empire: Reconstructing the Past from Scientific and Historical Evidence” in *The Journal of Interdisciplinary History*, vol. 43, no. 2 (2012): pp.188-190.

<sup>115</sup> Henry Lucas, “The Great Famine of 1315, 1316, and 1317” in *Speculum*, Vol. 5, No. 4 (1930): pp. 343-377.

<sup>116</sup> Richard Bradley and Elise Fraser, “Bronze Age Barrows on the Heathlands of Southern England: Construction, Forms and Interpretations” in *Oxford Journal of Archaeology*, vol. 29, issue 1 (2010): pp. 15-33.

<sup>117</sup> Matthew Amesbury, Dan Charman, Ralph Fyfe, Peter Langdon, and Steve West, “Bronze Age upland settlement decline in southwest England: testing the climate change hypothesis” in *Journal of Archaeological Science*, vol. 35 (2008): pp. 87-98; David Yates, *Land, Power and Prestige: Bronze Age Field Systems in Southern England* (Oxbow Books, 2007).

one of growing prosperity and that, although signs of climatic deterioration were present, it did not indicate an impending crisis.<sup>118</sup>

The main way in which the Bronze and Iron Age climate of Britain has been reconstructed is through the study of bog surface wetness records, which suggest the start of the study period was characterised by a significant climatic deterioration at the Bronze Age/Iron Age transition around 850 BC lasting until around 500 BC.<sup>119</sup> The cause of this deterioration has been partly linked with a reduction in solar activity at this time,<sup>120</sup> but Brown suggests other moderating factors such as changes in oceanic cycles may also have influenced the scale of this event.<sup>121</sup> Inferred population modelling likewise found a reduction in the quantity of radiocarbon dated samples from this period, and by inference a reduction in visibility of population and therefore a likely reduction in real population.<sup>122</sup>

The distribution of proxy climate datasets from the prehistoric is skewed towards the northern and western parts of the country and are often retrieved from historically 'marginal' areas. Cunliffe has argued that the physical characteristics of these regions would make them more susceptible to climatic changes compared to southern and eastern Britain.<sup>123</sup> Indeed, Dark's study of pollen samples suggested a general continuity of land use across much of Early Iron Age Britain but with a tendency for greater abandonment of

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<sup>118</sup> Richard Bradley, *The Prehistory of Britain and Ireland*, Second Edition (Cambridge University Press, 2019): pp. 235 and 264.

<sup>119</sup> Brown, "The Bronze Age climate and environment of Britain": pp. 7-22; Lamb, "Climate from 1000 BC to 1000 AD": pp. 55-56.

<sup>120</sup> Mauquoy *et al.*, "Changes in solar activity and Holocene climatic shifts": pp. 45-52.

<sup>121</sup> Brown, "The Bronze Age climate and environment of Britain": p. 8.

<sup>122</sup> Andrew Bevan, Sue Colledge, Dorian Fuller, Ralph Fyfe, Stephen Shennan, and Chris Stevens, "Holocene fluctuations in human population demonstrate repeated links to food production and climate" in *Proceedings of the National Academy of Sciences*, vol. 114, no. 49 (2017): pp. E10524–E10531.

<sup>123</sup> Cunliffe, *Iron Age Communities in Britain*: p. 37.

upland areas in Wales and limited evidence for woodland regeneration in southern England.<sup>124</sup> This latter trend was suggested as potentially being a result of rising groundwater levels impacting agricultural activities within the catchments of the sampling sites.<sup>125</sup> The implication that the Early and Middle Iron Age climate was both wetter as well as relatively cold was discussed by Lamb, who suggested the construction of wooden causeways and lake villages across the Somerset Levels were a response to an increasingly wet landscape.<sup>126</sup> Even if East Anglia was drier compared to the South- West, studies of Iron Age Norfolk suggest that water tables within river valleys were rising at this time, correlating with the wider evidence for a wetter climate.<sup>127</sup>

Other investigations have claimed that a climatic forcing event caused by volcanic eruptions in Iceland in the later Bronze Age triggered the abandonment of many upland settlements near the start of the study period.<sup>128</sup> However, this drew criticism with the counter-argument that a causal link could not be proven and the effects of such an eruption would be relatively short-lived.<sup>129</sup> Grattan and Gilbertson suggested instead that on those upland landscapes where soil conditions were already relatively acidic, such as at

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<sup>124</sup> Petra Dark, "Climate deterioration and land-use change in the first millennium BC: perspectives from the British palynological record" in *Journal of Archaeological Science*, vol, 33 (2006): pp. 1381-1395.

<sup>125</sup> *Ibid.*: pp. 1391-1392.

<sup>126</sup> Lamb, "Climate from 1000 BC to 1000 AD": pp. 55-56.

<sup>127</sup> Patricia Wiltshire and Peter Murphy, "Chapter 6. Current Knowledge of the Iron Age Environment and Agrarian Economy of Norfolk and Adjacent Areas" in John Davis and Tom Williamson (Eds.), *Land of the Iceni, The Iron Age in Northern East Anglia* (Centre of East Anglian Studies, 1999): p. 156.

<sup>128</sup> M. Baillie, "Do Irish bog oaks date the Shang dynasty?" in *Current Archaeology*, no. 117 (1989): pp. 310-313; C. Burgess, "Volcanoes, catastrophe and the global crisis of the late second millennium BC" in *Current Archaeology*, no. 117 (1989): pp. 325-329.

<sup>129</sup> Paul Buckland, Andrew Dugmore and Kevin Edwards, "Bronze Age Myths? Volcanic activity and human response in the Mediterranean and North Atlantic Regions" in *Antiquity*, vol. 71, issue 273 (1997): pp. 581-593.

Caithness in Scotland, the addition of further acidic material in the form of falling volcanic tephra and aerosols could push these ecosystems beyond their critical thresholds to cope with the acidity.<sup>130</sup> This, in turn, could make the area unworkable for agricultural activities in a very short time but take many decades to recover.

Cunliffe summarises that after the upheaval of the Early Iron Age, climate returned to somewhat drier conditions after 500 BC.<sup>131</sup> After 150 BC, climatic amelioration began to pave the way for what has been identified as the Roman Warm Period.<sup>132</sup> Cunliffe has also interpreted the Middle and Late Iron Age as one where Iron Age society and settlement patterns started to shift towards those seen at the time of the Roman conquest.<sup>133</sup> As discussed above, patterns of Iron Age settlement were regionally varied, with some areas seeing the widespread development of hillforts, while other areas saw fewer large-scale constructions.<sup>134</sup> In East Anglia, Iron Age settlement has been described as being formed of unenclosed villages, compared with the hillfort dominated zones of the west and the enclosed homesteads of the north.<sup>135</sup> It is worth emphasising that non-climatic factors have also been argued as having a key influence in shaping British society and culture in the Late Iron Age, through the increasing influence of Rome in the century before the Claudian invasion. East Anglia, as part of the lands of the Iceni, was located in what Cunliffe describes as the 'peripheral' zone in terms of its position relative to international exchange

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<sup>130</sup> John Grattan and David Gilbertson, "Acid-loading from Icelandic Tephra Falling on Acidified Ecosystems as Key to Understanding Archaeological and Environmental Stress in Northern and Western Britain" in *Journal of Archaeological Science*, vol. 21 (1994): pp. 851-859.

<sup>131</sup> Cunliffe, *Iron Age Communities in Britain*: p. 37.

<sup>132</sup> Lamb, "Climate from 1000 BC to 1000 AD": p. 56.

<sup>133</sup> Cunliffe, *Britain Begins*: pp. 303-338.

<sup>134</sup> Bradley, *The Prehistory of Britain and Ireland*: pp. 275-311.

<sup>135</sup> Cunliffe, *Britain Begins*: pp. 303-306.

networks, Roman cultural influence, and consequent levels of social complexity. The ‘core’ zone was formed of tribes in the south-east who had more direct contact and influence from Rome at this time.<sup>136</sup> Developments such as this were not necessarily driven by the prevailing climate.

The end of the Iron Age and subsequent Roman conquest took place during a period most climatologists agree was one of “exceptional” climatic stability between c.100 BC and c.200 AD.<sup>137</sup> Palaeoclimatic data indicates that north-western Europe experienced a climatic optimum, being relatively warm, having stable annual rainfall and limited climatic forcing events.<sup>138</sup> It has even been suggested that this period may have been warmer than the Medieval Warm Period (discussed below).<sup>139</sup> Settlement and population have been interpreted as expanding in the Late Iron Age,<sup>140</sup> with upland areas and heavier soils seeing increasing occupation and agricultural exploitation, and this appears to have continued into the Roman period. It should, however, be noted that Late Iron Age and Roman material culture is generally more durable and therefore tends to be more visible than earlier material, which may impact interpretations about when certain areas began to see more permanent settlement. While a favourable climate may have encouraged settlement expansion onto previously unattractive soils at a regional level, the uncertainty with this prolonged period of stability at a wider level is the extent to which it can be attributed to the expansion of the Roman Empire. It may be that a favourable climate was the key factor driving expansion of

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<sup>136</sup> Cunliffe, *Iron Age Communities in Britain*: p. 182.

<sup>137</sup> McCormick, *et al.*, “Climate Change during and after the Roman Empire”: p. 174.

<sup>138</sup> *Ibid.*: pp. 174-175.

<sup>139</sup> Esper *et al.*, “Orbital forcing of tree-ring data”: pp. 862-866.

<sup>140</sup> Cunliffe, *Iron Age Communities in Britain*: pp. 281-329.

the Roman Empire, but it is also possible that Roman Imperial structure was such that it would have expanded regardless.

Investigations of excavated Roman sites in East Anglia show settlement concentration to be varied across the region, with a particular nucleus of activity in Breckland, although it is acknowledged that this may be more reflective of modern excavation patterns rather than the true distribution of settlement.<sup>141</sup> Mentions of climate in these works are limited, again possibly because it is difficult to define between an expansion of settlement and arable land because of stable climate, and an expansion because of organised Roman administrative structure and the reduction in labour costs associated with a slave-owning society. Elsewhere in England, the existence of Roman vineyards has been argued and it has been suggested that these may have been more extensive than have survived archaeologically, further supporting the evidence for a mild climate at this time.<sup>142</sup> In the later Roman period, slight cooling is recorded in the later third century with a return to milder conditions during the fourth century.<sup>143</sup> This correlates with a decline in smaller farming settlements alongside an increasing size and complexity of other farmsteads.<sup>144</sup> However, it is again uncertain whether these changes may be linked to climate, or an increasing need to centralise agricultural output to maintain supplies to the Roman military.<sup>145</sup>

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<sup>141</sup> Smith *et al.*, *The Rural Settlement of Roman Britain*: p. 212.

<sup>142</sup> A. Brown, I. Meadows, S. Turner, D. Mattingly, "Roman vineyards in Britain: stratigraphic and palynological data from Wollaston on the Nene Valley, England" in *Antiquity*, no. 75 (2001): pp. 745-757.

<sup>143</sup> McCormick *et al.*, "Climate Change during and after the Roman Empire": pp. 185-191.

<sup>144</sup> Smith *et al.*, *The Rural Settlement of Roman Britain*: pp. 240-241.

<sup>145</sup> *Ibid.*

McCormick *et al.* suggest climatic instability and prolonged drought in Asia in the fourth century as a possible trigger for the migration of the Huns, which in turn caused a wider movement of people westwards, contributing to the fall of the Western Empire.<sup>146</sup> This, again, is difficult to attribute with any certainty, accounting for the range of other factors that were destabilising the Roman Empire at this time. The overall trend for this period, though, was one of mild and relatively stable climate where population, settlement and farming in Britain expanded into landscapes that subsequently saw settlement abandonment during the fifth century.

The withdrawal of Roman Imperial administration at the beginning of the fifth century saw a significant transition away from the organised surplus-producing economies of the Late Roman period, towards a more subsistence-based economy, with sparser settlement and a material culture that was less archaeologically visible than Roman material. The climate of north-western Europe during what is usually called the Migration Period saw a shift towards a colder, drier climate.<sup>147</sup> Rainfall modelling shows a marked peak of wetness during the first half of the fifth century before a sharp decline of rainfall until the middle of the seventh century.<sup>148</sup> Temperature reconstructions also show a decline to a colder climate, before a return to milder conditions during the seventh century.<sup>149</sup> The Early Anglo-

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<sup>146</sup> McCormick *et al.*, “Climate Change during and after the Roman Empire”: pp. 190-191.

<sup>147</sup> Buntgen *et al.*, “2500 Years of European Climate Variability and Human Susceptibility”: pp. 578-582.

<sup>148</sup> Lamb, “Climate from 1000 BC to 1000 AD”: p. 57; McCormick *et al.*, “Climate Change during and after the Roman Empire”: p. 181.

<sup>149</sup> Buntgen *et al.*, “2500 Years of European Climate Variability”: pp. 578-582; Lamb, “Climate from 1000 BC to 1000 AD”: p. 57; McCormick *et al.*, “Climate Change during and after the Roman Empire”: p. 181.

Saxon climate, then, was a period of relative cold and arid conditions between two warmer peaks.

In an English context, debate for this period has focussed around the extent of migration of Anglo-Saxon peoples and culture, whether a mass movement of people into eastern and southern England occurred, or whether this movement was smaller-scale and the result of acculturation from a relatively small incoming elite.<sup>150</sup> The role of climate in this movement has been explored, with some arguing that climatic deterioration during the fifth century encouraged migrations across much of the European continent.<sup>151</sup> Others have suggested that rising sea levels and the inundation of low-lying land around coastal north-western Europe would have provided further incentive for the migration of the Anglo-Saxon peoples.<sup>152</sup>

Further debates on the nature of settlement at this time have discussed the ideas of continuity and discontinuity of settlement sites at the end of the Roman period. Rippon *et al.* highlight the number of excavated sites that saw Early Anglo-Saxon occupation appearing to respect Late Roman features.<sup>153</sup> Sites in East Anglia, such as Rendlesham, suggest continuity from a Late Roman military presence into a high status Early Anglo-Saxon central place.<sup>154</sup> Alan Davison's fieldwalking studies in south Norfolk showed a reduction in the

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<sup>150</sup> For a summary of this debate, see Williamson, *Environment, Society and Landscape*: pp. 61- 66.

<sup>151</sup> B. Lee Drake, "Changes in North Atlantic Oscillation drove Population Migrations and the Collapse of the Western Roman Empire" in *Scientific Reports*, no. 7 (2017): pp. 1-7.

<sup>152</sup> Williamson, *Environment, Society and Landscape*: p. 45.

<sup>153</sup> Rippon, Smart and Pears, *The Fields of Britannia*.

<sup>154</sup> Christopher Scull, Faye Minter and Judith Plouviez, "Social and economic complexity in early medieval England: a central place complex of the East Anglian kingdom at Rendlesham, Suffolk" in *Antiquity*, vol. 90, issue 354 (2016): pp. 1600-1601.

number of Early Anglo-Saxon sites (or rather, a reduction in settlement visibility) and an apparent retreat of settlement from the heavier clay soils onto the more limited areas of permeable geology. Where potential continuity on Roman sites was detected, this was on the lower slopes and lighter soils.<sup>155</sup> Andrew Rogerson's fieldwalking survey of Fransham produced a similar pattern, with a reduction in the number of detected Early Anglo-Saxon sites and limited overlap between earlier Roman scatters.<sup>156</sup> Overall, the settlement pattern appears to have changed from a stable Late Roman system to settlements of a more ephemeral, transient nature in the landscape alongside a broader contraction from the margins.

During the eighth century climate ameliorated into somewhat milder conditions.<sup>157</sup> This process continued through the ninth and tenth centuries with increasing average temperatures and lower rainfall leading to the Late Saxon and early medieval being referred to as the Medieval Warm Period, with average temperatures peaking in the middle of the tenth century before a gradual decline and a return to colder, wetter conditions from the thirteenth century.<sup>158</sup> Debate for this period has centred around determining the scale of increased temperature, with some questioning whether the Medieval Warm Period even

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<sup>155</sup> Alan Davison, *The Evolution of Settlement in Three Parishes in South-East Norfolk*, East Anglian Archaeology Report no. 49 (Norfolk Museum Service, 1990): pp. 15-19.

<sup>156</sup> Andrew Rogerson, *Fransham: An Archaeological and Historical Study of a Parish on the Norfolk Boulder Clay*, Unpublished PhD Thesis (University of East Anglia, 1995): pp. 52-101.

<sup>157</sup> Ljungqvist, "A New Reconstruction of Temperature Variability": pp. 339-351.

<sup>158</sup> H. Lamb, "The Early Medieval Warm Epoch and its Sequel" in *Palaeogeography, Palaeoclimatology, Palaeoecology*, vol. 1 (1965): pp. 13-37; Cooper, Melvin, Tyers, Wilson and Briffa, "A tree-ring reconstruction of East Anglian (UK) hydroclimate variability over the last millennium": pp. 1019-1039.

existed at all.<sup>159</sup> However, Lamb has highlighted that the existence of vineyards in England at this time and their absence in later, perceived cooler, periods demonstrates a relatively warm climate must have existed.<sup>160</sup>

Settlement patterns from the Middle Saxon period began a process of stabilisation in the landscape, where the transient nature of Early Saxon settlement gradually became more fixed.<sup>161</sup> Studies in East Anglia, such as fieldwalking surveys by Alan Davison<sup>162</sup> and Peter Wade-Martins<sup>163</sup> revealed that outlying Early Anglo-Saxon settlements stabilised in the Middle and Late Saxon periods onto places that in many cases are still overlain by villages today. Other East Anglian settlements initially stabilised, often for long enough to allow a church to be constructed, before gradually drifting away to common edges from the later eleventh to thirteenth centuries, which may have left the parish church isolated in the landscape.<sup>164</sup> At the same time, farming systems in England were undergoing a process of change, eventually seeing the emergence of the open field system, although the precise dating and development of this is still debated.<sup>165</sup> What is clear, however, is that during this period much of the medieval settlement and land use patterns that still structure large parts of the landscape today were established. Population was increasing, settlement was expanding onto upland and marginal areas that had not seen occupation since the Roman period and the area under arable cultivation generally increased.<sup>166</sup>

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<sup>159</sup> P. Jones and M. Mann, "Climate Over Past Millennia" in *Reviews of Geophysics*, vol. 42, no. 2 (2004): pp. 1-42.

<sup>160</sup> Lamb, "The Early Medieval Warm Epoch and its Sequel": p. 30.

<sup>161</sup> Williamson, *Environment, Society and Landscape*: pp. 162-165.

<sup>162</sup> Davison, *The Evolution of Settlement in Three Parishes*: pp. 15-19.

<sup>163</sup> Wade-Martins, *Village Sites in Launditch Hundred*: pp. 82-88.

<sup>164</sup> *Ibid.*

<sup>165</sup> Williamson, *Environment, Society and Landscape*: pp. 177-182.

<sup>166</sup> Roberts and Wrathmell, *Region and Place*: pp. 40-52.

From the thirteenth century onwards climate became relatively cool, but saw a significant decline from the middle of the fourteenth century.<sup>167</sup> This deterioration has been linked with events such as the Great Famine and colder climate has been argued as the driving force in reducing agricultural output and causing a significant population decline from the start of the fourteenth century.<sup>168</sup> Other studies have highlighted the extreme wet conditions that occurred during the years of the Great Famine, which have been argued as a key contributory factor in causing such catastrophic crop failures in Europe.<sup>169</sup> The desertion or shrinking of many villages after the middle of the fourteenth century has traditionally been linked with the population crash caused by the Black Death, but many deserted settlements were sited on relatively outlying, ‘marginal’ areas, and it may also be the case that these places could have struggled to maintain a population at near-subsistence levels during such a climatic deterioration.<sup>170</sup> Settlement contraction and desertion was a process rather than an event, and many villages were not fully deserted until the post-medieval period, or only survived as a few properties within the former tofts and crofts.

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<sup>167</sup> Ljungqvist, “A New Reconstruction of Temperature Variability”: pp. 339-351.

<sup>168</sup> Mauricio Lima, “Climate change and the population collapse during the “Great Famine” in pre-industrial Europe” in *Ecology and Evolution*, vol. 4, issue 3 (2014): pp. 284-291.

<sup>169</sup> Seung Baek, Jason Smerdon, George-Costin Dobrin, Jacob Naimark, Edward Cook, Benjamin Cook, Richard Seager, Mark Cane and Serene Scholz, “A quantitative hydroclimatic context for the European Great Famine of 1315-1317” in *Communications, Earth & Environment*, Vol. 1, Article No. 19 (2020): pp. 1-7.

<sup>170</sup> Christopher Dyer, “The Retreat from Marginal Land: The Growth and Decline of Medieval Rural Settlements” in Christopher Dyer (Ed.), *Everyday Life in Medieval England* (Bloomsbury, 2000): pp. 13-26; Christopher Dyer and Richard Jones (Eds.), *Deserted Villages Revisited* (University of Hertfordshire Press, 2010).

After a brief, but still relatively cold, climatic respite over the fifteenth and sixteenth centuries, the climate once again deteriorated from the middle of the sixteenth century, entering what is referred to as the Little Ice Age.<sup>171</sup> This deterioration continued beyond the study period with temperatures falling until the end of the eighteenth century.<sup>172</sup> Population at this time has been interpreted as relatively stable, only beginning to increase from the middle of the sixteenth century.<sup>173</sup> Farming practices have also been interpreted as seeing a shift away from earlier medieval practices, becoming more regionally specialised during the post-medieval period.<sup>174</sup>

### **The Breckland Questions**

The section above provides a broad outline of current interpretations of settlement and climate change across both the study period and Britain at a wider level. It is within this context that the landscape of Breckland is to be studied as the main theme of this thesis. However, to analyse the impact of changing climate as fully as possible a number of hypotheses must first be tested, and important questions answered. Some of these questions fall outside of the study period but are crucial in establishing when key aspects of Breckland developed, while others deal with the availability of resources and establishing settlement patterns of certain periods. This in turn will allow the full discussion on settlement and climate to take place. These hypotheses are outlined below and shall be answered in subsequent chapters.

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<sup>171</sup> Lamb, "The Early Medieval Warm Epoch and its Sequel": p. 27.

<sup>172</sup> Ibid.

<sup>173</sup> Roberts and Wrathmell, *Region and Place*: pp. 40-52.

<sup>174</sup> Thirsk, *England's Agricultural Regions and Agrarian History*.

A key landscape development, which is of central importance in examining the history of Breckland, is the emergence of heathland and the chronology of its spread across the study area. Heathlands are characterised as open, treeless landscapes with a floral ecology that favours leached acidic soils, usually dominated by heather, gorse, broom and other grasses such as sheep's fescue.<sup>175</sup> Many of these landscapes are usually assumed to have origins in the prehistoric period as woodland covering these areas was increasingly cleared from the Neolithic onwards. However, investigations have shown the chronology of heathland development is more varied in character and not restricted to one particular point in time. Studies of heathland in southern England revealed that while initial development of these landscapes began in the Late Neolithic, further expansion occurred during the Bronze and Iron Ages.<sup>176</sup> This was supported by other investigations, which revealed heathland with similar mixed origins across the prehistoric.<sup>177</sup> In East Anglia, however, there is evidence that areas of heath and wood-pasture were being cleared of trees into the post-medieval period,<sup>178</sup> and in Breckland the very process of Brecking, where an area of outlying land was used for arable on a temporary basis before being left to recover for several years, blurs the distinction between heathland and agricultural land. A similar mixed history was shown to exist at a wider European level, with some regions seeing

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<sup>175</sup> Williamson *et al.*, "The Landscape Archaeology of Knettishall Heath": p. 161.

<sup>176</sup> Jon Groves, Martyn Waller, Michael Grant and J. Edward Schofield, "Long-term development of a cultural landscape: the origins and dynamics of lowland heathland in southern England" in *Vegetation History and Archaeobotany*, Vol. 21 (2012): pp. 453-470.

<sup>177</sup> P. Moore and A. Evans, "The development of valley mires in south-east England" in *Aquilo Ser Bot*, Vol. 30 (1991): pp. 25-34; R. Scaife, "The prehistoric vegetation of Midhurst: a pollen study of the common at New Pond" in J. Magilton and S. Thomas (Eds.), *Midhurst* (Chichester District Council, 2001): pp. 95-102.

<sup>178</sup> Gerry Barnes, Tom Williamson, Patsy Dallas, Heidi Thompson and Nicola Whyte, "Heathland and wood pasture in Norfolk: ecology and landscape history" in *British Wildlife*, Vol. 18, Issue 6 (2007): pp. 395-403.

significant heathland expansion as arable practices changed in the medieval period.<sup>179</sup> What this serves to demonstrate is that the formation of heathland was a protracted process rather than a single event, and that the tracts of heathland present in lowland England essentially mark their later medieval extents rather than necessarily representing their prehistoric or pre-medieval extents.

Related to this, investigations of Bronze Age barrows in southern England showed that these monuments were sited on what was already open ground at the time of their construction, with those on heathlands being of Early Bronze Age date.<sup>180</sup> That is to say, it is not necessarily coincidence that heathlands, or former heathlands, contain relatively high numbers of barrows and/or ring-ditch cropmarks, it is possible that these areas were already open and of a 'heathy' character in the Early Bronze Age. The presence of a relatively high number of barrows on Breckland therefore raises an interesting possibility about the development of the Breckland landscape. If barrows were being constructed on what was already open ground in the Bronze Age, could the distribution of barrows act as a proxy for defining the earliest cores of Breckland heath? Does the known settlement archaeology of the region support or oppose this hypothesis, and can the settlement archaeology of Breckland provide evidence for periodic expansion of heathland at certain times? Finally, does this expansion of heathland correlate with periods of climatic shift that may be contributing to the development of this landscape or is it an entirely human-driven process? One aspect that requires extra attention in dealing with this issue is the extent to which post-glacial Breckland developed a wooded landscape, with the presence of plant species more

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<sup>179</sup> Groves *et al.*, "Long-term development of a cultural landscape": p. 466.

<sup>180</sup> Bradley and Fraser, "Bronze Age Barrows on the heathlands of southern England": pp. 20-25.

suited to steppe or Mediterranean environments being argued as an indication that Breckland may have always been relatively open.<sup>181</sup>

Relating to the development of heathland, it is necessary to establish the chronology of settlement patterns in Breckland across the study period, so that these can then be examined against changes in climate. Patterns of medieval and post-medieval settlement and land use are better understood in the region compared to earlier periods. The process of Brecking, where an area of land was ploughed for arable use for a single year and then left to recover for several years afterwards, as well as the foldcourse system, where flocks of sheep were grazed on the heath during the day and penned together on the arable at night to provide manure, have both been previously examined.<sup>182</sup> Individual parishes have also been investigated,<sup>183</sup> and the distribution of rabbit warrens has been plotted.<sup>184</sup> The broad survival of medieval and post-medieval physical landscape features, along with a range of contemporary documents makes the later part of the study period relatively well-understood, but still worth scrutiny. Earlier periods are less well-understood, or rather, are based upon interpretations that may have become outdated. For example, Alexander Smith highlights that in the East Anglian region Breckland appears as a nucleus of excavated

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<sup>181</sup> Paul Dolman, Chris Panter and Hannah Mossman, *Securing Biodiversity in Breckland: Guidance for Conservation and Research. First Report of the Breckland Biodiversity Audit* (University of East Anglia, 2010): p. 12.

<sup>182</sup> Mark Bailey, *East Anglian Breckland: A Marginal Economy?* (Cambridge University Press, 1989): pp. 40-96; John Belcher, *The Foldcourse and East Anglian Agriculture and Landscape 1100-1900* (Boydell & Brewer, 2021).

<sup>183</sup> Alan Davison, Barbara Green and Bill Milligan, *Illington: A Study of a Breckland Parish and its Anglo-Saxon Cemetery*, East Anglian Archaeology Report No. 63 (Norfolk Museums Service, 1993).

<sup>184</sup> Anne Mason and James Parry, *The Warrens of Breckland* (The Breckland Society, 2010).

Roman activity compared to the rest of Norfolk and Suffolk,<sup>185</sup> with further archaeological investigations at Elveden and Wangford producing evidence for extensive Roman activity away from the Fen edge (See Chapter Five). There is no shortage of Roman material from the study area and a review of Roman settlement is necessary to demonstrate that activity in Breckland at this time was more extensive than previously thought. Similarly, an up-to-date review of Late Bronze Age, Iron Age and Anglo-Saxon settlement patterns shall also be undertaken to establish a current interpretation of settlement and land use across the study period. An important part of this review will be to place these patterns and changes within their climatic and environmental contexts, to establish the extent to which climate may be influencing these changes to a greater or lesser extent than might be expected.

A further key consideration in the relatively dry landscape of Breckland is the issue of water supply. The geology of the region means that the modern availability of water is limited in certain places. While areas within river valleys may be close to a reliable source of water, and other areas may contain spring lines at certain points in the chalk, many of the upland areas outside of the valleys are regarded as having restricted access to water with modern-day Breckland receiving only around 600mm of annual rainfall. This is in comparison to the national average of around 1100mm, making Breckland one of the driest places in Britain. Some upland areas have historically accessed fluctuating meres, such as at Rymer and Ringmere, which are supplied by aquifers in the chalk. These may vary in depth from year to year and W. G. Clarke describes the scale of changes that could occur at these meres.<sup>186</sup> Excavations at Elveden revealed the Roman solution was to construct deep wells into the

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<sup>185</sup> Smith *et al.*, *The Rural Settlement of Roman Britain*: pp. 208-212.

<sup>186</sup> Clarke, *In Breckland Wilds*, First Edition: pp. 83-87.

chalk, presumably until a reliable water table was found.<sup>187</sup> The availability of water in the prehistoric and post-Roman periods is less understood, despite archaeological evidence showing prehistoric activity in areas away from the principal river valleys. It is therefore necessary to establish how people historically sourced water in Breckland, how this in turn may have impacted settlement and land use, and how changing climate may have altered the availability of water over the study period. It may be that in some places water was more easily available than has previously been suggested, or that in certain periods occupation was seasonal, or social structuring meant that labour could be mobilised to transport water to these areas.

Alongside understanding human interaction with Breckland, it is worthwhile to build an understanding of how the *flora*, *fauna* and physical landscape might react to changes in climate. To an extent, this will cover similar themes to questions about the generation of heathland, but it must be remembered that Breckland is/was not just a heathland ecology, and questions about the use and evolution of the physical landscape must be asked. For example, it is well-known that the region specialised in barley production as part of a foldcourse system of arable husbandry in the medieval period on ground that was unsuitable for wheat,<sup>188</sup> but archaeological evidence suggests Roman arable practices were processing both barley and wheat in similar proportions.<sup>189</sup> Is there evidence to suggest this wheat was being widely produced in Breckland, or was it being simply being imported to a processing hub? If it was being produced locally, is the difference in crop production

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<sup>187</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 180-182.

<sup>188</sup> Bailey, *A Marginal Economy?*: pp. 40-96.

<sup>189</sup> Val Fryer, "The Charred Plant Macrofossils and Other Remains" in Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 279-290.

between these periods related to differences in the contemporary climates, soil quality, arable practices or needs of wider markets? Similarly, primary broadleaf woodland in Breckland is generally considered to have been removed at a relatively early date. Hockham Mere data suggests the catchment was deforested in the Roman period and then remained open,<sup>190</sup> while the only appreciable tract of ancient woodland within the study area is the former medieval deer park of Fakenham Wood, situated on an island of Beccles association clay soils.<sup>191</sup> However, place names such as Northwold, Methwold and Hockwold (OE ‘-wood’) suggest that, at least in that part of Breckland, notable stands of woodland existed into the Anglo-Saxon period. Was the decline of woodland (where it existed at all) primarily the result of human- driven processes, or did a reduction in soil quality or acidification prevent regeneration, and to what extent did climatic factors such as decreased rainfall or lower temperatures contribute to the general reduction in woodland over the study period? Does it necessarily follow that the removal of woodland leads to the development of heath rather than other ecologies, and to what extent does the *faunal* ecology contribute to heathland development through grazing pressures and the prevention of woodland regeneration?

Finally, it will be worthwhile to compare settlement patterns in Breckland with interpretations of contemporary settlement on other areas of light soil, both in East Anglia and beyond. This will provide insight into whether Breckland settlement and land use is

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<sup>190</sup> K. D. Bennett, “Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere, Norfolk, England. I. Pollen Percentages and Concentrations” in *The New Phytologist*, Vol. 95, No. 3 (1983): p. 457-487.

<sup>191</sup> SHER EUN 022.

unique over the course of the study period, or whether the human reaction to living on light land at different periods and in different areas is broadly similar.

What will become clear through the exploration of these questions is the changes that have occurred to a range of different Breckland aspects across the study period. One of the overarching themes of the chapters that attempt to answer these questions will be addressing the challenge of separating changes that may be the direct result of climatic fluctuations, changes that may be indirectly related to climate, and changes that may have no apparent connection with climate at all. This will ultimately help to construct a far more in-depth understanding of Breckland and the factors which have impacted settlement and land use over the study period.

### **Chapter Three: The Archaeological and Historic Source Material**

The interpretations of historic land use and settlement patterns that are discussed in later chapters are derived from a range of evidence. Some of the evidence for the medieval and post-medieval periods is drawn from documentary sources such as historic mapping and manorial records, but the primary source for much of the study period is the archaeological record, which today is organised as the Historic Environment Record (HER) and maintained for each county by the relevant authority. In the case of Breckland, two databases cover Norfolk and Suffolk respectively. The information stored within these databases has itself been gathered from a range of different sources under a variety of conditions and methods. Some entries may represent chance finds or material collected or observed by keen antiquarians in the eighteenth and nineteenth centuries, while others may be the result of large-scale archaeological investigations using modern methods and technologies, alongside a range of records in between. Essentially, the HER databases that cover Breckland are attempting to provide a single common repository for all archaeological interventions, monuments and discoveries in their respective counties in a way that is easily accessible and, to at least some degree, commonly formatted across the spectrum of different source types and time periods. In order to have a better understanding of this information, it is therefore necessary to, firstly, review the material available for Breckland and how the gathering and interpretation of this material has changed through time, and secondly, to explore how useful and reliable this information is in answering some of the core aspects of this thesis. Differences exist between the Norfolk and Suffolk HER's in how information is recorded, the methods of which may change and evolve over time creating idiosyncrasies in the data and an attempt must be made to 'iron out' these differences, or

at the very least understand these differences, to allow the data covering Breckland to be viewed as one continual group with a knowledge of the extent to which certain information and interpretations can be drawn from the data at a regional level. Table 1 shows the basic quantities of records that exist for both Norfolk and Suffolk Breckland. However, it must be noted that the way in which the data was supplied will have impacted these numbers. The Norfolk data was supplied by using the boundary of the Brecks National Character Area, while the Suffolk data was supplied for each entire parish that fell wholly or partly within the study area, meaning that some of the Suffolk records fall outside of this. When that is taken into account, the number of records for each county is broadly similar.

<b>County</b>	Norfolk	Suffolk
<b>HER Entries Quantity</b>	4853	5668

*Table 1: The number of HER entries for Norfolk and Suffolk Breckland. Suffolk entries include those that fall within parishes that partly or wholly fall within Breckland, meaning some records fall outside of the study area.*

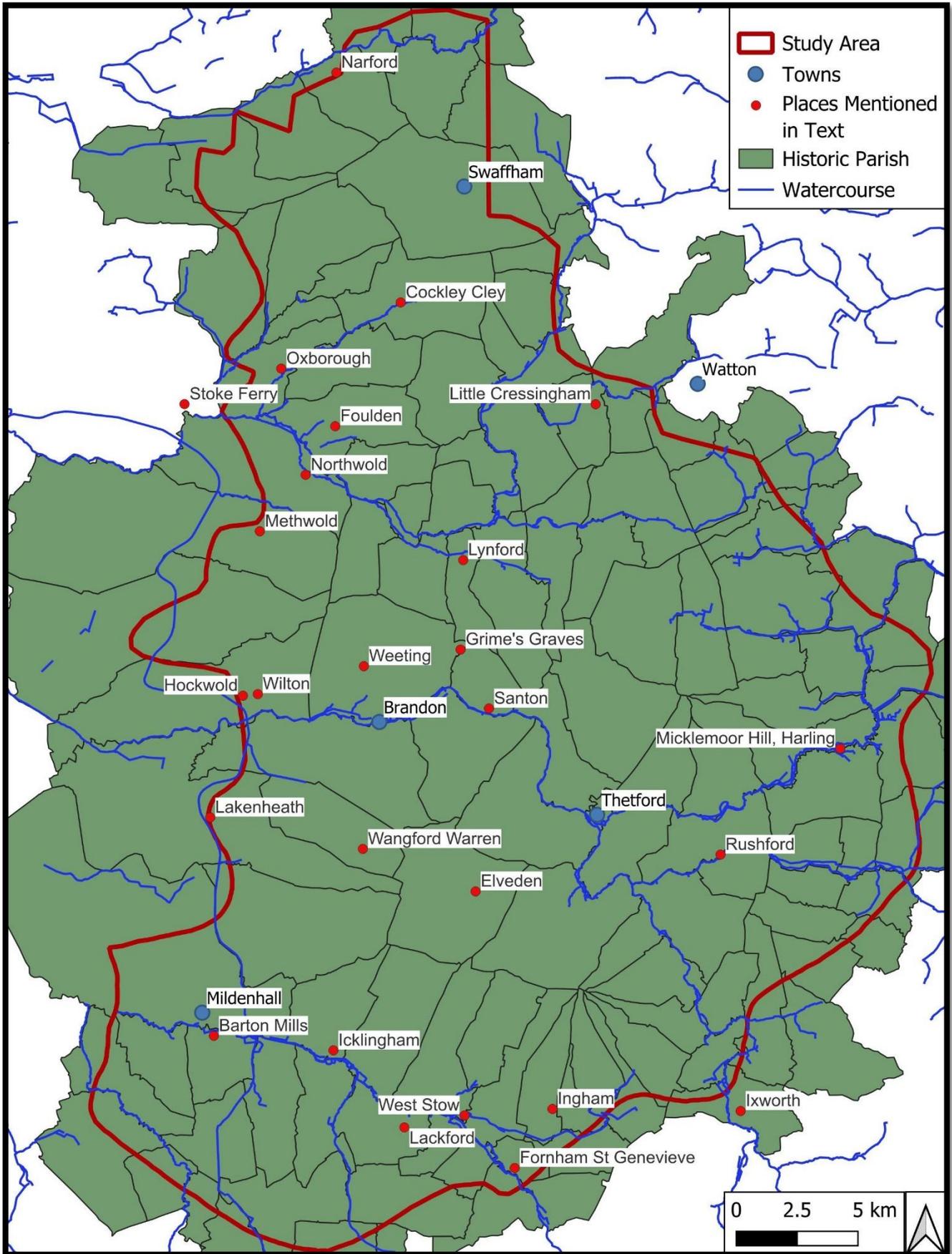


Figure 6: Towns and other places mentioned in the text in this chapter.

### **The Development of Breckland Archaeology**

As a context to understanding the broader archaeology of Breckland, it is worthwhile setting out the way in which the monuments and archaeology of the Breckland landscape and the objects recovered from its soils have historically been discovered, recorded and interpreted, in order to better inform current interpretations of settlement and land use patterns within the study area.

### **Archaeology in Breckland before the Second World War**

The history of archaeological investigation in England has its origins in the early post-medieval period, with interested landowners or members of the gentry beginning to either directly investigate monuments themselves, often Bronze Age barrows, or seek out reports of locally made discoveries and recording them. These may either have been through chance discoveries, such as that of a possible Anglo-Saxon cremation cemetery found during the digging of a ditch at Kenninghall in Norfolk in the sixteenth century,<sup>192</sup> or through the deliberate excavation of upstanding earthworks, a number of examples of which are described below.

In terms of written interpretations, antiquarian writers of the region would occasionally note some of the more substantial earthworks or features as part of their topographical descriptions of the counties, but the dating of these features would often be highly speculative, often attempting to link these monuments with recorded historic events. Thus, Francis Blomefield, writing in the mid-eighteenth century, described a “rank of ten or eleven *tumuli*” at Rushworth (now part of Brettenham) as being constructed after the battle

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<sup>192</sup> NHER 10845.

between King Edmund and the Danish army in 871.<sup>193</sup> He similarly describes the flint mines of Grime's Graves as being a Danish encampment, with the many *tumuli* in the hundred the result of battles between the English and Danish armies, further reinforced by his possession of a "Danish spear, made of brass" recovered from a barrow on Methwold heath, which, from the description, was almost certainly of Bronze Age date.<sup>194</sup> Roman remains were also of particular interest to early topographical writers and Blomefield describes a range of objects and archaeological remains discovered at Brettenham, Lynford, Narford and Oxborough,<sup>195</sup> while Augustine Page's description of Breckland parishes in Suffolk highlighted Roman discoveries at Icklingham and Ixworth.<sup>196</sup> Medieval monuments were often limited to brief descriptions of the remains of buildings or sites that could be linked with the manorial history of a particular place, such as Blomefield's descriptions of Weeting castle or the site of a former chapel in Foulden.<sup>197</sup> A particularly interesting account is given by Page in his entry for Fornham St Genevieve, where he describes how, in 1826, "a pollard ash was felled near the church, which had the appearance of great antiquity ... and standing on an hillock, which seemed to have been left at a distant period, when the rest of the soil round it had been lowered. On its fall, the ground was torn up to a considerable extent and immediately under the trunk many skeletons were found lying in a circle with the heads

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<sup>193</sup> Francis Blomefield, *A Topographical History of the County of Norfolk*, Vol. 1 (Miller, 1805): pp. 290.

<sup>194</sup> Francis Blomefield, *A Topographical History of the County of Norfolk*, Vol. 2 (Miller, 1805): pp. 148-149.

<sup>195</sup> Blomefield, *A Topographical History*, Vol. 1: p. 441; Blomefield, *A Topographical History*, Vol. 2: p. 263; Francis Blomefield, *A Topographical History of the County of Norfolk*, Vol. 6 (Miller, 1805): pp. 168 and 229-239.

<sup>196</sup> Page, *A Supplement to the Suffolk Traveller*: pp. 787-788 and 838.

<sup>197</sup> Blomefield, *A Topographical History*, Vol. 2: p. 173; Blomefield, *A Topographical History*, Vol. 6: pp. 26-36.

inwards, piled on tiers from the depth of four feet.”<sup>198</sup> Page sought to link this discovery with the twelfth-century battle of Fornham, but noted that no “warlike instruments” were found.<sup>199</sup> The description given raises the distinct possibility that this may in fact have been an Early Anglo-Saxon cemetery orientated around a prehistoric barrow. The location of the parish church, which is described as being near to this discovery, would also support this, being on a south-facing slope above the River Lark.<sup>200</sup> A survey of barrows in East Anglia also found that it seemed to have been “deliberate policy” to plant trees on earthworks in the medieval and post-medieval periods, perhaps further supporting the suggestion that this was a more ancient feature in the landscape.<sup>201</sup>

Many early accounts of deliberate excavations in East Anglia focussed on surviving earthwork barrows of the region, with documentary evidence suggesting these monuments were being dug from at least the fifteenth century in Norfolk and the sixteenth century in Suffolk.<sup>202</sup> Subsequent excavations in the region continued throughout the eighteenth and nineteenth centuries, many of which had very little or no recording of the archaeology or objects recovered.<sup>203</sup> Indeed, it was not until 1925 when the first systematic and methodical excavation of a barrow at Barton Mills was published.<sup>204</sup> A series of Breckland barrow excavations were also undertaken in the 1930s but publication was

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<sup>198</sup> Page, *A Supplement to the Suffolk Traveller*: p. 717.

<sup>199</sup> *Ibid.*

<sup>200</sup> SHER FSG 002.

<sup>201</sup> Andrew Lawson, Edward Martin and Deborah Priddy, *The Barrows of East Anglia*, East Anglian Archaeology Report no. 12 (Norfolk Archaeological Unit, Suffolk County Council, Essex County Council, 1981): p. 29.

<sup>202</sup> *Ibid.*: pp. 36 and 68.

<sup>203</sup> *Ibid.*: pp. 36, 37 and 68.

<sup>204</sup> Earl Cawdor and Cyril Fox, “The Beacon Hill Barrow, Barton Mills, Suffolk” in *Proceedings of the Cambridge Antiquarian Society*, Vol. XXVI (1925): pp. 19-56.

limited to a short section in Grisnell's *The Ancient Burial Mounds of England* published after the Second World War.<sup>205</sup> However, it must be noted that the barrows discussed in the 'Breckland' section of that work fall outside of the Brecks National Character Area and therefore the study area for this thesis.

Of a different character, but one that still drew much antiquarian attention in the region, were the complex of undulating pits at Grime's Graves, which had been previously interpreted as possible Danish encampments or Iron Age sunken huts.<sup>206</sup> Excavation of one of these features by William Greenwell in the later 1860s proved that they were, in fact, an extensive area of Neolithic flint mines.<sup>207</sup>

Other archaeological investigations in Breckland in the nineteenth and first half of the twentieth century are characterised by the chance discovery of sites or individual objects, predominantly of Bronze Age, Roman or Early Anglo-Saxon date. Contemporary regional journals contain many accounts of discoveries made during gravel extraction, road building or other groundwork, with local antiquarians effectively conducting rescue excavations, or the recording of artefact assemblages recovered by the workmen. Most of these published chance discoveries were cemetery sites, with human bones and readily datable assemblages of grave goods being more easily recognised, retained by the workmen and tracked down for investigation by the keen historians of the area. For example, a high status Bronze Age burial was discovered by a labourer digging at Little Cressingham in 1849,<sup>208</sup>

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<sup>205</sup> Leslie Grisnell, *The Ancient Burial Mounds of England* (Methuen, 1953).

<sup>206</sup> William Greenwell, "On the opening of Grime's Graves in Norfolk" in *Journal of the Ethnological Society of London*, New Series, Vol. 2 (1870): pp. 419-39.

<sup>207</sup> *Ibid.*

<sup>208</sup> Thomas Barton, "Antiquities Discovered at Little Cressingham, Norfolk" in *Norfolk Archaeology*, Vol. 3 (1849): pp. 1-2.

while at West Stow in 1853 an Early Anglo-Saxon cemetery was discovered during gravel extraction.<sup>209</sup> In 1870, 'Viking' burials were discovered during gravel extraction works at Santon.<sup>210</sup> At Mildenhall, too, rescue excavations were undertaken on a Bronze Age barrow at Warren Hill in advance of the mound's destruction for gravel extraction, under which was discovered a Beaker period burial, with a secondary Anglo-Saxon cemetery in the upper layers of the barrow.<sup>211</sup> The author, Henry Prigg, notes that this was a known site, with previous investigations apparently undertaken in the 1820s and a number of the barrows recently having been demolished for gravel extraction with no investigations taking place.<sup>212</sup> A Roman cemetery was also discovered at Ingham during the cutting of the Bury to Thetford railway line in the early 1870s and the account contrasts the practices of the first ganger running the site, who regularly informed Henry Prigg when a new burial appeared, and the second ganger who simply told the author how many burials had appeared after the work had been completed.<sup>213</sup> Similarly, a small Anglo-Saxon cremation cemetery was discovered at Lackford in 1914 and reported to Moyses Hall Museum by the lord of the manor only after all the urns had been excavated.<sup>214</sup>

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<sup>209</sup> Samuel Tymms, "Anglo-Saxon Relics from West Stow Heath" in *Proceedings of the Bury and West Suffolk Archaeological Institute*, Vol. 1 (1853): pp. 315-328.

<sup>210</sup> William Greenwell, "Scandinavian Brooches found at Santon, in Norfolk" in *Proceedings of the Suffolk Institute of Archaeology and History*, Vol. 4, Part 4 (1870): pp. 208-217.

<sup>211</sup> Henry Prigg, "The Tumuli of Warren Hill, Mildenhall" in *Proceedings of the Suffolk Institute of Archaeology and History*, Vol. 4, Part 5 (1872): pp. 287-299.

<sup>212</sup> *Ibid.*: p. 288.

<sup>213</sup> Henry Prigg, "On a Roman British Cemetery at Ingham near Bury St Edmunds" in *Proceedings of the Suffolk Institute of Archaeology and History*, Vol. 6, Part 1 (1888): pp. 41-54.

<sup>214</sup> Horace Barker, "Anglo-Saxon Urns Found Near Lackford" in *Proceedings of the Suffolk Institute of Archaeology and History*, Vol. 16, Part 2 (1917): pp. 180-182.

Individual objects or hoards considered worthy of reporting were also occasionally discovered by chance, such as a hoard of Roman coins ploughed up in Icklingham in 1872<sup>215</sup> or a Late Bronze Age founder's hoard discovered in Wangford Warren in 1913.<sup>216</sup> Important Anglo-Saxon gold crosses were also found during this period, first at Wilton in 1849,<sup>217</sup> and then near Ixworth in about 1856.<sup>218</sup> These formed part of an early emerging group of high status Anglo-Saxon metalwork being discovered in East Anglia alongside a gold pendant from Bacton in north Norfolk, although they were considered to be Byzantine imports at the time because the quality of their workmanship was thought too good to be a native production.<sup>219</sup> It has been suggested that both the Wilton Cross and Ixworth Cross are likely to have been grave goods as part of excavated cemetery sites, adding to the tally of cemetery sites discovered as chance finds at this time.<sup>220</sup>

Colin Pendleton's research into Bronze Age metalwork on the fen edge emphasised the fact that many of the finds made prior to the invention of the metal detector were often larger objects, more easily spotted during excavations or lying on the surface of a ploughed field.<sup>221</sup> However, this did not mean there was no interest in the collection and identification

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<sup>215</sup> Henry Prigg, "On a hoard of Roman silver coins" in *Proceedings of the Suffolk Institute of Archaeology and History*, Vol. 4, Part 5 (1872): pp. 283-286.

<sup>216</sup> SHER WNG 012.

<sup>217</sup> Greville Chester, "Notice of a Gold Cross Found at Wilton, Norfolk" in *Norfolk Archaeology*, Vol. 3 (1849): pp. 375-376.

<sup>218</sup> Charles Roach Smith, "Saxon Remains, Found near Ixworth, in Suffolk" in *Collectanea Antiqua*, Vol. 4 (1857): 162-164.

<sup>219</sup> S. W. Stevenson, "Some Account of an Enchased Gold Coin, found at Bacton, Near Cromer" in *Norfolk Archaeology*, vol. 1 (1847): pp. 193-208.

<sup>220</sup> Richard Hoggett, *The Archaeology of the East Anglian Conversion* (The Boydell Press, 2010): pp. 111-113.

<sup>221</sup> Colin Pendleton, *Bronze Age Metalwork in Northern East Anglia, A study of its distribution and interpretation*, BAR British Series 279 (British Archaeological Reports, 1999): pp. 65-67.

of pottery and flint assemblages amongst the historians of the region, and some published examples may be found describing pottery scatters picked up by enthusiastic local historians, such as an assemblage of Roman pottery collected from just outside the study area at Stoke Ferry in 1921.<sup>222</sup> Flint collecting was also an established pursuit, with W. G. Clarke describing flints as “scattered by the million” over the Breckland landscape and that one individual had collected “several hundred thousand implements” from around Icklingham alone.<sup>223</sup> Rather than there being no interest in this material, it is perhaps fairer to say there was little done in terms of the methodical collection and recording of these types of finds assemblages beyond parish or field level until later in the twentieth century. Even then, Rainbird Clarke, in the second edition of *In Breckland Wilds*, suggested that flints collected from the surface of Breckland fields provided limited potential for interpretation because of difficulties in accurately dating many implements, and that “pottery and metal tools” were far more useful for understanding historic settlement patterns.<sup>224</sup>

The piecemeal nature of these discoveries over the previous decades served to influence broader contemporary interpretations of historic Breckland, ideas themselves which would subsequently impact later interpretations of land use and settlement in the region. One of the emergent themes in a landscape which, at the time, contained substantial tracts of heathland was an apparent timelessness of the landscape, and W. G. Clarke placed his visions of Neolithic hunters wandering along ancient trackways

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<sup>222</sup> J. F. Williams, “An Early Site at Stoke Ferry” in *Norfolk Archaeology*, Vol. 23, No. 1 (1926): pp. 16-18.

<sup>223</sup> Clarke, *In Breckland Wilds*, First Edition: p. 176.

<sup>224</sup> W. G. Clarke and R. R. Clarke, *In Breckland Wilds*, Second Edition (Heffer and Sons, 1937): p. 71.

surrounded by vast expanses of heath.<sup>225</sup> With the gift of having a range of modern ways to investigate historic landscapes and climatic conditions, this image may seem somewhat naïve, but this interpretation was based upon what was readily observable in the Breckland landscape. William Greenwell, writing after his excavations at Grime's Graves, recognised, in a similar manner to Clarke, that the Neolithic landscape had been relatively well-populated, but that in a landscape "where the soil is an infertile and drifting sand, it appears difficult, at first sight, to account for it having been so extensively occupied in those early days".<sup>226</sup> Greenwell further stated that this occupation continued throughout Roman and Anglian times, presumably based in part on the range of Roman finds and Early Anglo-Saxon cemetery sites discussed above.<sup>227</sup> The recognition of a populated Roman landscape contrasts with more recent interpretations of Breckland as a 'marginal' landscape, which are derived primarily from patterns of medieval and post-medieval land use, rather than earlier trends. A map of known Roman finds and occupation by the 1930s was produced by Rainbird Clarke, who interpreted settlement as mainly present in the west of Norfolk Breckland and the Little Ouse valley.<sup>228</sup> Clarke attributed much of this pattern to the availability of water, stating that even where sites were present adjacent to a Roman road, they only occurred where water was also easily available.<sup>229</sup> His map, however, suffered from the problem of suggesting that blank areas were devoid of occupation, rather than because the material had yet to be found, and it is striking that areas he considered to be blank match well with areas of historic heath and warren, where finds would have been

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<sup>225</sup> Clarke, *In Breckland Wilds*, First Edition: p. 34.

<sup>226</sup> Greenwell, "On the opening of Grime's Graves in Norfolk": p. 420.

<sup>227</sup> *Ibid.*

<sup>228</sup> R. Rainbird Clarke, "A Roman Site at Santon" in *Norfolk Archaeology*, Vol. 25 (1933): pp. 202- 206.

<sup>229</sup> *Ibid.*

more limited compared to the core areas of ‘modern’ occupation and arable land in the river valleys and slightly better soils.

The general trends for understanding Breckland in the later nineteenth and earlier twentieth century were that the open, heathy nature of the landscape had remained largely unchanged for centuries, if not millennia. This, along with the piecemeal patterns of discovery at the time, led to the interpretation that while Breckland had been well-populated in the past, the landscape was such that settlement and farming would have been broadly similar to the post-medieval landscape with little activity on the large tracts of heath, which themselves were ancient and relatively fixed aspects of Breckland.

#### *Breckland Archaeology from the Second World War to 1990*

In decades between the end of the Second World War and its integration within the planning system in 1990, archaeology evolved away from antiquarian hobby and towards a more scientific and organised discipline, while at the same time new ways of revealing features in the landscape and methods of survey and analysis were developed. At a wider East Anglian level, the development of the county Historic Environment Records has its origins in the post-war period. In Norfolk, an index of historic sites compiled from the 1930s by Rainbird Clarke was brought to Norwich Castle when he joined the staff in 1946.<sup>230</sup> This index continued to be expanded and reorganised, developing into the Norfolk Sites and Monuments Record when the Norfolk Archaeological Unit was established in 1974 when the index was duplicated and further standardised, and subsequently began to be digitised from the mid-1980s.<sup>231</sup> In Suffolk, a similar pattern of indexing and standardisation of

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<sup>230</sup> Norfolk Heritage Explorer online, “The History of the Norfolk Historic Environment Record (NHER)” (2024).

<sup>231</sup> Ibid.

records occurred, with the formation of the Suffolk County Council Archaeological Service in 1974 acting as a central county-wide body overseeing and upholding the archaeological archives for the county.<sup>232</sup> These two central bodies provided a way for a diverse range of archaeological and historical material to be standardised into their respective databases, aiding in the interpretation of the history of the region at this time. However, these two databases were not without their problems, particularly as the input of data was not standardised between the two counties, and this is discussed in more detail below (pages 78-84). At the same time, aerial photography of the region became more commonplace, with archives such as the Cambridge University Collection of Aerial Photography containing hundreds of images covering East Anglia and the Breckland study area.

In terms of field excavation, a number of sites in Breckland were subject to intensive excavation, analysis and publication, both for research and as rescue archaeology prior to development. An important Neolithic site was excavated at Hurst Fen, Mildenhall in the 1950s, providing the type-site for Mildenhall Ware pottery,<sup>233</sup> while a further shaft was excavated at Grime's Graves in the early 1970s.<sup>234</sup> Prehistoric barrows also continued to interest excavators, and mounds at Little Cressingham, Cockley Cley and Gallows Hill were excavated during this period.<sup>235</sup> At Harling, an enclosed Middle Iron Age site, a rarity in East Anglia, was excavated in the 1930s, 40s and 50s.<sup>236</sup> Important Roman sites were also

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<sup>232</sup> Suffolk County Council, "Archaeological Archives Service", (2024).

<sup>233</sup> J. G. D. Clark, E. S. Higgs and I. H. Longworth, "Excavations at the Neolithic Site at Hurst Fen, Mildenhall, Suffolk (1954, 1957 and 1958)" in *Proceedings of the Prehistoric Society*, Vol. 26 (1960): pp. 202-245.

<sup>234</sup> R. J. Mercer, *Grimes Graves, Norfolk, Excavations 1971-72: Volume I* (Her Majesty's Stationery Office, 1981).

<sup>235</sup> Andrew Lawson, *Barrow Excavations in Norfolk, 1950-82*, East Anglian Archaeology Report No. 29 (Norfolk Museums Service, 1986).

<sup>236</sup> NHER 6019.

excavated, including a substantial settlement and religious site at Hockwold-cum-Wilton,<sup>237</sup> and monumental temple complex at Fison Way, Thetford.<sup>238</sup> The best-known Early Anglo-Saxon site in the region is the village of West Stow, excavated during the 1960s and early 1970s,<sup>239</sup> while a significant high-status Middle Saxon site was revealed at Staunch Meadow, Brandon over the course of the 1980s.<sup>240</sup> Late Saxon material was most commonly revealed during urban excavations, mainly centring on the town of Thetford, where investigations were a mix of research and rescue projects. In 1962, excavations at Thetford Castle sought to prove that the bailey defences were part of an Iron Age enclosure repurposed after the Norman Conquest.<sup>241</sup> Further excavations in 1985 at Ford Place in advance of development revealed that Iron Age activity continued over this area.<sup>242</sup> A number of other excavations were undertaken in different parts of the town, which mainly characterised areas of Anglo-Saxon and medieval occupation.<sup>243</sup> On the western side of the

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<sup>237</sup> NHER 5587.

<sup>238</sup> Tony Gregory, *Excavations in Thetford, 1980-1982, Fison Way*, Volume One, East Anglian Archaeology Report No. 53 (Norfolk Museums Service, 1991).

<sup>239</sup> Stanley West, *West Stow, The Anglo-Saxon Village*, East Anglian Archaeology Report No. 24 (Suffolk County Planning Department, 1985).

<sup>240</sup> Andrew Tester, Sue Anderson, Ian Riddler and Robert Carr, *Staunch Meadow, Brandon, Suffolk: a high status Middle Saxon settlement on the fen edge*, East Anglian Archaeology Report No. 151 (Suffolk County Council, 2014).

<sup>241</sup> John Davies, Tony Gregory, Andrew Lawson, Robert Rickett and Andrew Rogerson, *The Iron Age Forts of Norfolk*, East Anglian Archaeology Report No 54 (Norfolk Museums Service, 1991): pp. 3-17.

<sup>242</sup> *Ibid.*: pp. 17-30.

<sup>243</sup> Andrew Rogerson and Carolyn Dallas, *Excavations in Thetford 1948-59 and 1973-80*, East Anglian Archaeology Report No. 22 (Norfolk Museums Service, 1984); Carolyn Dallas, *Excavations in Thetford by B. K. Davison between 1964 and 1970*, East Anglian Archaeology Report No. 62 (Norfolk Museums Service, 1993).

town at Redcastle Furze, excavations in the late 1980s revealed a multi-period site with significant Early Anglo-Saxon occupation and part of the Late Saxon and medieval town.<sup>244</sup>

While archaeological investigations continued across this period, and chance finds continued to be made and added to the respective county records,<sup>245</sup> the 1970s and 80s saw the rise of hobbyist metal detecting and a resultant increase in the amount of historic material being recovered. One of the principal challenges of this increase was encouraging the recording of as much material as possible found by the hobbyists, the problems of which were highlighted by the unfortunate circumstances surrounding the discovery of the Thetford Treasure,<sup>246</sup> while examples may be found of other objects that were not fully recorded before disappearing into the antiquities trade.<sup>247</sup> On the other hand, published examples of objects that were recorded, such as a hawking vervel from Harling,<sup>248</sup> an Anglo-Saxon gold pendant from Northwold,<sup>249</sup> and the many other additions to the county HER's during this period with metalwork recovered through hobbyist detecting demonstrates that some areas that had previously not seen investigation (and thus appeared as blank areas on interpretative mapping) contained unknown areas of activity. Indeed, an initiative in Norfolk at this time to encourage positive relationships between archaeologists and detector users resulted in a significant increase in the amount of material recorded.<sup>250</sup>

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<sup>244</sup> Phil Andrews, *Excavations at Redcastle Furze, Thetford, 1988-9*, East Anglian Archaeology Report No. 72 (Norfolk Museums Service, 1995).

<sup>245</sup> See, for example Pendleton, *Bronze Age Metalwork in Northern East Anglia*.

<sup>246</sup> NHER 5853.

<sup>247</sup> Gregory, *Excavations in Thetford, 1980-1982, Fison Way*: p. 202.

<sup>248</sup> Barbara Green, "Hawk Identification Tag From Harling" in *Norfolk Archaeology*, Vol. 37, No. 2 (1979): p. 229.

<sup>249</sup> Leslie Webster, "A Gold Pendant from Northwold" in *Norfolk Archaeology*, Vol. 37, No. 3 (1980): p. 350.

<sup>250</sup> Barbara Green and Tony Gregory, "An initiative on the use of metal detectors in Norfolk" in *Museums Journal*, Vol. 77 (1977): pp. 161-162.

Problems naturally existed with interpreting material collected in this way, and studies of more recent Portable Antiquities Scheme data highlight these issues, which will have been present in much the same way during the early years of hobby detecting.<sup>251</sup> Further discussion on the value of this data in relation to Breckland is given below.

The principal result of the discovery of such a range of different sites and finds of a variety of ages was an appreciation that the Breckland landscape, both urban and rural, contained a significant amount of archaeology, which both demonstrated that historic settlement and land use patterns were more complex and changeable than previous ‘antiquarian’ narratives had assumed and that these sites and finds held a demonstrably clear value for developing a better understanding of the historic environment. This was equally true at a wider level, with increasing calls for the consideration and/or protection of archaeological remains in the face of modern development projects, something that was subsequently incorporated into the planning process in the following decade.

#### *Archaeology from 1990 to the Present Day*

In 1990, archaeology was integrated within the planning process as part of Planning Policy Guidance 16 and subsequently incorporated into the National Planning Policy Framework.<sup>252</sup> This generally ensured that all new planning applications would be reviewed to assess their potential impact on the archaeological record, and therefore whether a strategy of mitigation would be needed to resolve this before development could commence. In practice, this has generally taken the form of non-invasive methods such as

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<sup>251</sup> Robbins, *The Portable Antiquities Scheme, A Guide for Researchers*.

<sup>252</sup> National Planning Policy Framework (Ministry of Housing, Communities and Local Government, 2023): Section 16, Conserving and enhancing the historic environment, pp. 57-60.

desk-based assessments and geophysical surveys, as well as structured field-walking and metal detecting surveys of the topsoil of a proposed development site. The usual invasive method of site investigation in East Anglia is the trial-trench evaluation, where a regular layout of trenches is machine-excavated across a site in order to provide a representative sample (usually 3-5%) of the character of below-ground remains on the site. Some of these trenches may be intentionally positioned to investigate geophysical anomalies, surface finds scatters, or features present on historic mapping. Features exposed within these trenches are then usually methodically excavated to provide evidence of the date and function of the archaeology. The overall aim of these various methods is to characterise the nature and significance of any below-ground remains within the development area to determine whether open area excavation is required in order to excavate and 'preserve by record' the archaeology of the site. For smaller projects, such as the installation of a water main or the digging of foundations for an extension on a pre-existing property, work may be limited to an archaeological watching brief during the period of the construction works. In Breckland, there is also monitoring of tree and stump clearing in the Forestry Commission plantations. The minimum result of these investigations (or each phase of investigation on the same site) is the production of an unpublished 'grey literature' report deposited within the relevant county archive and, as of November 2024, more than seven hundred reports are digitally available covering the parishes of the Breckland study area via the Archaeology Data Service.<sup>253</sup>

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<sup>253</sup> Online repository search of each individual Breckland parish on the Archaeology Data Service (ADS). Some reports may fall outside of the Breckland study area but are part of a parish which is partially covered by the study area.

Many of the development-led projects in the region have taken place around the airbases at Lakenheath and Mildenhall, as well as along the route of the A11 around Elveden, alongside expansion of towns such as Thetford, Brandon and Swaffham. As a result, the archaeological data from these projects tends to be skewed towards the Suffolk Breckland with comparatively limited data from the Norfolk Breckland. Larger- scale projects such as the A11 road scheme and, more recently, a habitat restoration scheme in Wangford Warren, have revealed areas of significant human activity in places that previously lacked any records and demonstrate that some areas of post-medieval heathland were previously well-settled during the prehistoric and Roman periods.

While development-led archaeology was firmly integrated into the planning system by the mid-1990s, recording mechanisms for amateur discoveries were still subject to county-level organisation. However, this changed with the creation of the Portable Antiquities Scheme in 1999 alongside the updating of the old Treasure Trove laws with the Treasure Act 1996. The creation of a national database, principally for the recording of finds made by amateur metal detectorists, provided a common platform for the recording of objects that was not subject to the idiosyncrasies of each county. In Breckland, this meant that material found in both Norfolk and Suffolk could be recorded onto a single database in a common format.

One aspect that has had perhaps the greatest impact in the collation and interpretation of historic and archaeological data in the last three decades is the increasing digitisation of historic and archaeological data and increasing access to this and other material online. At the same time, the development of lidar survey and access to this data, both in Breckland and beyond, has, alongside the continually growing body of aerial

and satellite imagery, opened up entirely new perspectives on the historic landscape.<sup>254</sup> In Breckland and elsewhere, the use of lidar imagery has the potential to reveal features that are hidden under plantation or other areas of high plant growth, where traditional earthwork survey would not necessarily be viable, or access not always available, and the use of lidar to reveal these features is demonstrated in subsequent chapters. The digitisation and generation of historic and archaeological source material has been further aided by the development and rapid improvement of Geographical Information Systems (GIS), which allows sometimes complex questions of a landscape to be asked at a large scale and forms a useful way of collating often disparate datasets into a single common format. This, in turn, allows for quick comparisons of certain aspects of the landscape in a way which may have been time-consuming previously. The use of GIS is central to this thesis and many of the succeeding discussions are only possible through the ability to quickly and effectively marshal large amounts of data through GIS. The various Aerial Investigation and Mapping (AIM)/National Mapping Programme (NMP) projects that have covered the Study Area were also reliant on GIS to be effective.<sup>255</sup>

### **Making use of the Data**

Such a vast archaeological resource naturally forms one of the key datasets to be used in this study in terms of providing information on the presence (or absence) of historic occupation and land use patterns within the Breckland, gathered in a broadly structured and methodical way from nearly all modern Breckland parishes. As such, it is therefore

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<sup>254</sup> For Breckland examples see: Horlock and Tremlett, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 1)*; Powell, Tremlett and Horlock, *Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region: Stage 2 and Overall Results*.

<sup>255</sup> *Ibid.*

necessary to assess the quality and usefulness of this data so that it may be integrated into this study in the most appropriate and nuanced way.

The source material available for the region is not without its problems. Some of the early material, particularly that recovered by antiquarian excavations in the nineteenth century or earlier, is not always recorded in any great detail (or records have not survived), and in some cases it is no longer possible to determine the location of particular finds or features in the landscape. This then limits the usefulness of some of these early records and can mean that they are unsuitable to be used in anything more than a broad overview of events within the region. In a similar fashion, different methods of more modern investigation may generate different results, such as a fieldwalking survey where a consistent coverage is applied compared to amateur metal detecting where searching may seek out specific areas of activity of a particular date, which may miss other evidence of human activity in an area. The detail with which all surveys of this nature are recorded onto the HER can also impact how useful they are for interpretation at different spatial scales. For example, a fieldwalking survey may be recorded onto the HER to 'field level', that is, the results from one field are assigned a record number, but the quantity and distribution of finds of different dates is not specified in the records, and not accessible without searching for the relevant grey literature report. This can make it difficult to distinguish between an area that has seen, for instance, Roman pottery scattered as a background from manuring and an area within a field that may represent a farmstead site. Likewise, records generated through hobbyist metal detecting may miss evidence of activity on a field if no metalwork of that period is discovered.

In terms of searching for below ground remains, survey methods such as geophysics do not necessarily reveal all archaeological features and the use of magnetometry, the principal method of commercial survey, can naturally only reveal features that have a different magnetic signature from the background geology. Similarly, within development-led archaeology, the use of trial-trenching may mean that some features are not easy to spot within the two-metre width of trench. This is particularly true of what can be ephemeral features within the Breckland sands such as prehistoric ditches and postholes. The presence of windblown sand deposits in the region also raises the possibility that these may be mistaken for the natural geology. A further problem with trial-trench evaluation is that for periods when the archaeology may be characterised by dispersed, relatively low-density features (such as the Bronze Age), areas of this activity may easily fall in between trenches and be missed entirely.

The recording of all of these different forms of evidence also contains limitations, the clearest of which is that the county HERs are databases of where things have been found, which may be influenced by a number of different factors including differing settlement visibility across different periods (see Chapter Two), different methods of investigation, and limited access to some areas, which prevents the identification of historic activity. This is particularly true of Breckland where the presence of large private estates alongside areas of pine plantation and military training areas can restrict both access to potential areas for survey as well as the visibility of historic activity, either as surface scatters, earthworks or cropmarks. The final problem generated is that such a variety of information, collected at different times with a range of different methods, must be collated into a single common database (county HERs), and the process of doing this can result in a loss of some detail

for certain records without consulting any material associated with a particular record. Further inconsistencies in the collating of the HER databases adds another layer of complications. While the Norfolk HER dataset supplied for this thesis contains a classification of the type of record present (e.g. Find spot, Monument, Building), the Suffolk dataset is far simpler in designation and many records for individual finds have been placed under the 'monument' designation, limiting the amount of analysis possible between different types of evidence, both within and across counties.

To an extent, then, a trade-off occurs when using the HER in knowing that some records may be more accurate or more detailed than others, but that the records can be correct in showing activity at a broad level. The county HERs are a record of where things have been found historically, rather than necessarily representing the complete pattern of historic activity within the study area.

While the problems discussed above must be considered when examining Breckland, this is not to say that the data and records available for the region are of little value. The mass of information available for the region has the ability to provide considerable insight into the historic landscape, but it must be dealt with in a nuanced way as would be expected for any study utilising such a range of sources. That said, the information available for Breckland is certainly of use for this thesis, with a considerable body of material available for analysis, comparison and interpretation that allows for updated and new thoughts about the region to be developed. A number of structured fieldwalking surveys have taken place within the study area, providing broad insights into

historic settlement and land use patterns, such as the Fenland Survey<sup>256</sup>, the Stanford Training Area survey<sup>257</sup> and surveys at Illington.<sup>258</sup> In addition to this, surveys of earthworks and other surface features provided further information on the landscape at a larger-scale, such as Kate Sussams's *Breckland Archaeological Survey*<sup>259</sup> and, more recently, NMP/AIM mapping projects covering Breckland that have benefitted from the use of lidar imagery to reveal details previously hidden in areas covered by modern forestry or otherwise not easily accessible.<sup>260</sup>

Development-led archaeology has also provided information on areas that had previously seen little or no work, and some of the case studies outlined in the next chapter, such as the A11 road scheme and Wangford Warren, have challenged previous interpretations of the historic Breckland landscape. At a wider level, development-led investigations, despite the potential limitations outlined above, still find a lot of archaeology in the region, to the extent where it is unlikely that any substantial activity would be missed during trial-trenching or geophysical survey. The methodology employed within modern archaeology also means that sites are investigated and recorded in a systematic way that allows for far easier comparison between sites. This methodical approach, in turn, provides

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<sup>256</sup> R. Silvester, *The Fenland Project, Number 4: Norfolk Survey, The Wissey Embayment & Fen Causeway*, East Anglian Archaeology Report No. 52 (Norfolk Museums Service, 1991).

<sup>257</sup> Alan Davison and Brian Cushion, "An Archaeological Survey of the Stanford Training Area, 2000-02" in *Norfolk Archaeology*, Vol. 44, No. 4 (2005): pp. 602-616.

<sup>258</sup> Davison, Green and Milligan, *Illington: A Study of a Breckland Parish*.

<sup>259</sup> Sussams, *The Breckland Archaeological Survey*.

<sup>260</sup> Horlock and Tremlett, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 1)*; Powell, Tremlett and Horlock, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region: Stage 2 and Overall Results*.

a consistent way of investigating and recording historic activity and landscapes, both within Breckland and beyond.

In terms of the collation of this information onto the relevant county HERs, the digitised nature of these databases means that data within them can be manipulated with relative ease in order to make some of the records more consistent and remove some of the idiosyncrasies that occur through the creation of a database from such a diverse range of sources. The integration of this data into a GIS further allows for the information to be filtered in such a way that comparisons and patterns across the study area are possible without it becoming prohibitively time-consuming. It must also be remembered that, while the records on the HER databases represent where material has been found to-date rather than the complete picture of historic activity, much of it does appear to be broadly reflective of historic settlement patterns within Breckland, insofar as areas with a greater density of historic activity are likely to be detected more readily than where material is relatively sparse. In that sense, it is perhaps better to think of the HER as a reflection of the broad density of activity, rather than a complete picture, even if this does not necessarily apply uniformly across the study area as shown by places such as Wangford Warren where a considerable amount of material was recovered from an almost blank area on the HER otherwise. At the very least, it provides a baseline level of activity in the region, with the results from new archaeological investigations being able to be tested against this pre-existing pattern.

The archaeological record for Breckland is derived from a range of different sources and forms of investigation, which in itself has a long history. Today, the vast majority of this record is accessible through the relevant county HERs, with new discoveries and

investigations being continually added to this. These records naturally form part of the key source material for this thesis in order to characterise the historic settlement and land use patterns of Breckland. This chapter has sought to provide an overview of how this data came to be collected from its earliest antiquarian roots through to the present day, the value of this resource, and the way in which such a diverse range of material may be presented and interpreted in a standardised format, most notably through the use of GIS. While the overall patterns and trends in the archaeological record are used to characterise the historic landscape more generally, a number of specific sites are referred to on several occasions and used as case studies for some of the more in- depth analysis of historic settlement patterns in the region. In particular, certain sites have provided new insight into these settlement patterns in areas where few, if any, records previously existed for the areas investigated, highlighting their significance in comparing and challenging previous interpretations of the region. These sites, alongside some of the better-known sites of significance in the region, are described in Chapter Five.

#### **Chapter Four: Case Studies Summaries**

This chapter will briefly outline a number of archaeologically investigated sites that are frequently referred to in this thesis and that provide key evidence for discussions of historic settlement patterns and land use in Breckland. Other archaeological sites are variously discussed in later chapters, but these sites are referred to a number of times and characterise much of the discussion. They are therefore outlined below to give readers a better understanding of these sites when they are later referred to in the text. The fact that most of these sites are found within the Suffolk Breckland further highlights the discrepancy between Norfolk and Suffolk in terms of the number of large-scale excavations that have taken place in Breckland within those respective counties. Figure 7 shows these sites and the areas that they covered.

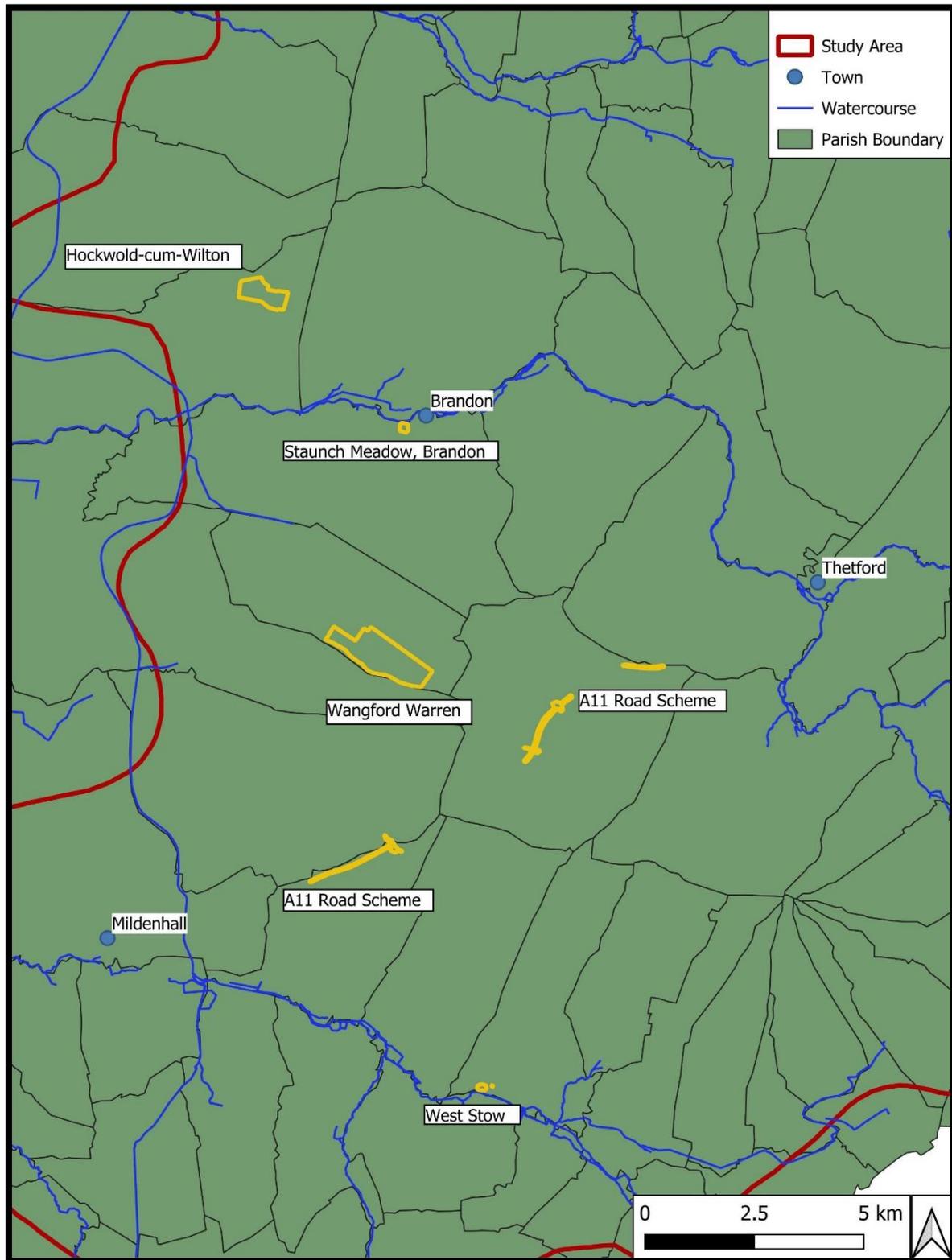


Figure 7: Case study sites in Breckland.

### *A11 Fiveways to Thetford Improvement Scheme*<sup>261</sup>

This was a large-scale, multi-phase project investigating areas that were to be impacted by road widening and other improvements to the A11 between the Fiveways junction at Barton Mills and Thetford, including the construction of a new bypass on the north-western side of the village of Elveden. The area of the Elveden bypass route produced the most significant archaeological remains of the project with the focus of activity being in Areas 10 and 11, covering a combined area of 8.92 hectares (22 acres) (Figure 8). This was an area of deep sandy Methwold and Worlington soils, sited on the relatively flat interfluvium between the Rivers Lark and Little Ouse and had the potential to provide insight into an area of historic heathland outside of the principal river valleys. At the time of writing, a monograph publication with updated interpretations and dating is forthcoming and is referred to here alongside the original post-excavation assessment. However, for clarity of referencing, in the remainder of this thesis the post-excavation assessment with a set of fixed and known page numbers will be referred to.

The excavations on site revealed that the area had seen earlier prehistoric activity, with further evidence for Middle Bronze Age activity in the form of cremation burials on site.<sup>262</sup> By the Middle Iron Age (c. fourth century BC) settlement had become more permanent in character.<sup>263</sup> A number of buildings were revealed, including an unusual example of an Iron Age sunken feature building, as well as posthole structures and

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<sup>261</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*; Tom Woolhouse, *The Heathland Road: Excavation of Prehistoric Remains, Iron Age Settlement and a Roman Farmstead and Estate Centre on the Route of the A11 Fiveways to Thetford Improvement, Suffolk*, East Anglian Archaeology (Pre-Construct Archaeology, Forthcoming).

<sup>262</sup> *Ibid.*: pp. 249-250.

<sup>263</sup> *Ibid.*: pp. 293-296.

roundhouses. This settlement evolved and developed into the Romano-British period, with all indications suggesting that it continued beyond the limits of excavation.<sup>264</sup> In the Early Roman period, an organised system of fields and trackways was imposed on the landscape, which was argued as helping to support the move beyond subsistence agriculture in the area and towards the production of a cereal crop surplus.<sup>265</sup> This surplus production appeared to reach its peak in the Late Roman period where a number of corn dryers were revealed, suggesting the site may have been acting as a processing hub and that the farmstead was part of a wider grain surplus production network in the region. Evidence for a range of pastoral and industrial activities were also revealed, the pastoral elements of which may have been necessary to ensure adequate supplies of fertiliser for the arable.<sup>266</sup> The presence of a well cut into the chalk bedrock also revealed the Roman solution to water supply in this relatively dry upland landscape.<sup>267</sup> Occupation on site appears to have contracted at the end of the Roman period but continued in some form into the fifth century, before finally being abandoned. The presumed Anglo-Saxon village of Elveden formed a short distance to the south-east.

The importance of this site are the insights it revealed into the historic land use of a relatively upland area of Breckland outside of the river valleys. When placed into the wider landscape context, it appears that during the Roman period this area of the landscape was part of a wider agricultural network in Breckland, with the activities on site feeding into a larger surplus production network principally producing spelt wheat. The Roman farmstead

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<sup>264</sup> *Ibid.*: pp. 296-300.

<sup>265</sup> *Ibid.*

<sup>266</sup> *Ibid.*

<sup>267</sup> *Ibid.*

discovered on this site was just one of an increasing number of farmsteads discovered in the region in areas with relatively little evidence for previous activity and creating a settlement pattern of a landscape with dispersed, but relatively dense occupation sites during the Roman period. See Chapter Nine for the full discussion and interpretation of the Roman farming systems of Breckland.

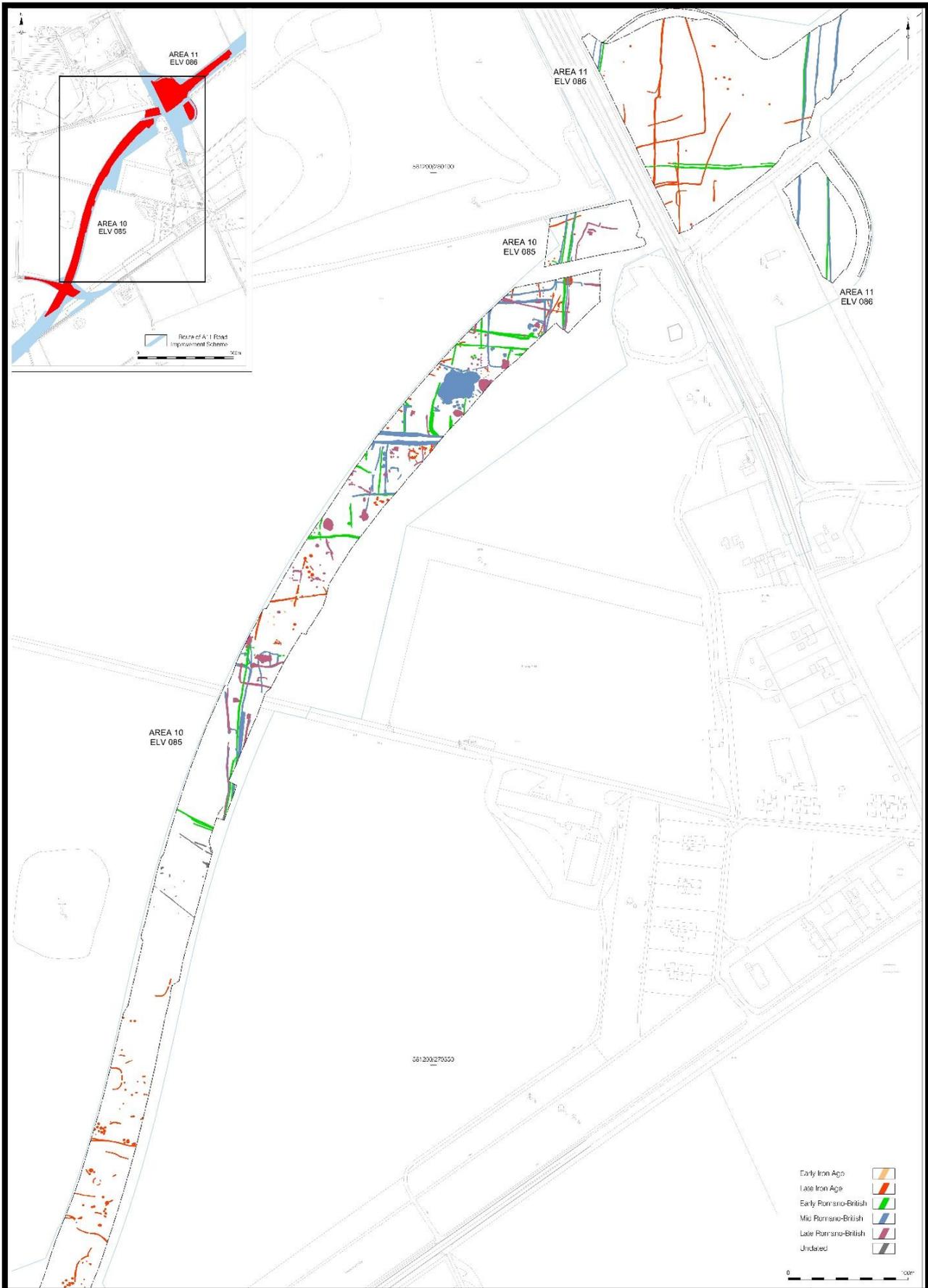


Figure 8: Areas 10 and 11 of the A11 road scheme contained evidence for a range of multi-period activities. After Lees, Hinman and Stump, 2013.

Wangford Warren Phase 3, Wangford, Suffolk<sup>268</sup>

This site was formed of a 126-hectare (330-acre) area of intended heathland habitat restoration within the former rabbit warren in Wangford, investigated between November 2020 and May 2021 (Figure 9). It was located on a south-west facing slope forming a small north-west to south-east valley that ran between the higher ground at Elveden to the east and Lakenheath to the west. Lakenheath Warren formed the opposite side of the valley to the south. Prior to this investigation it had been under pine plantation for much of the previous century, and before that was rabbit warren. Few archaeological records existed for the site, the only significant of which being a Late Bronze Age metalwork hoard found in the early twentieth century.<sup>269</sup> At the time of writing, a monograph publication with updated interpretations and dating is forthcoming and is referred to here alongside the original post-excavation assessment. However, for clarity of referencing, in the remainder of this thesis the post-excavation assessment with a set of fixed and known page numbers will be referred to.

The soils of the site were formed predominantly in the deep sandy Methwold association, with some deep sandy Worlington association soils at the western end and higher ground at the northern edge of site, as well as some deep sandy Newport 4 soils in the lower slopes forming the southern edge of site. The chalk geology was at variable depth across the site, being relatively shallow where there was little overlying windblown sand and forming striped patterned ground in some places. Archaeologically, after the trees had been felled and stumps cleared with a mechanical stump grinder, the site was covered by a

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<sup>268</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*; Lucking and McIntosh, *In Breckland Wilds: Land use and occupation at Wangford Warren, Suffolk and Hockwold Heath, Norfolk*.

<sup>269</sup>SHER WNG 012

topographic survey to identify and record any potential earthworks, before the top 20cm of soil in each forestry compartment was mechanically tilled and systematically metal detected in 10m transects to provide 10% sampling of the site.<sup>270</sup> This topsoil was then removed to reveal the underlying sandy subsoil which, after weathering, was subject to a rapid fieldwalking survey, alongside the excavation of any archaeological remains that were exposed by this stripping.<sup>271</sup>

The results of this investigation revealed a background of prehistoric activity across the area, including large quantities of flint debitage, occasional sherds of pottery, and metalwork ranging across the Bronze Age in date.<sup>272</sup> A few concentrations of burnt flint were also exposed and excavated. Early and Middle Iron Age activity was not detected but Late Iron Age activity was represented by a few scattered coins and brooches, with a concentration of Late Iron Age metalwork in the vicinity of a Roman farmstead (see below).<sup>273</sup> Roman material in the form of occasional pottery sherds and metalwork, predominantly coins and brooches, formed a relatively consistent background across much of the site, strongly suggesting that the area had been under agricultural use across the Roman period (probably from the Late Iron Age), with the recovered material representing objects scattered on the field through manuring. In the south-eastern corner of site, a large and dense scatter of metalwork and pottery of Roman date indicated a significant site and led to the decision not to strip the topsoil from this area.<sup>274</sup> A subsequent magnetometry

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<sup>270</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*: pp. 15-20.

<sup>271</sup> *Ibid.*

<sup>272</sup> *Ibid.*: pp. 22-24.

<sup>273</sup> *Ibid.*: pp. 24.

<sup>274</sup> *Ibid.*: pp. 72-75.

survey and targeted trial-trenching confirmed the presence of a complex settlement site. The site produced several hundred metal finds, and interpretation of this assemblage indicates it may have started as a small farmstead in the Late Iron Age before developing in the third and fourth centuries into a much larger complex.<sup>275</sup> The recovery of charred cereal processing waste from an excavated pit suggested that the site was involved in the production of grain, probably grown on the adjacent slopes where the background of Roman material indicated contemporary arable use.<sup>276</sup> Animal bones, including the recovery of a complete sheep skeleton from within a distinct enclosure, demonstrated the keeping of both cattle and sheep on site at this time, in large part probably to provide the manure necessary to keep the sandy soils in fertile condition for arable production.<sup>277</sup>

Anglo-Saxon and medieval archaeological remains were noticeably absent from site. However, a series of low, broad earthwork banks crossing site were identified as furlong boundaries from an area of former medieval open field, and examination of lidar imagery revealed these banks to extend over much of the former warren area along with a very sparse scatter of pottery and metalwork of Late Saxon through to post-medieval date.<sup>278</sup> A series of hollow ways forming the earlier route of Shaker's Road cut through these earthworks and contained later medieval and post-medieval pottery and metalwork finds.<sup>279</sup> Similarly, a scatter of later medieval and post-medieval metalwork was recovered from the north-western part of site but did not appear to respect any of the furlong boundaries in the landscape. This suggested that the area had been under open field arable,

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<sup>275</sup> Ibid.

<sup>276</sup> Ibid.: p. 93.

<sup>277</sup> Ibid.: p. 81-85.

<sup>278</sup> Ibid.: pp. 25-28

<sup>279</sup> Ibid.

probably since the Late Saxon period and was likely directly manured by sheep, hence the lack of finds. Documentary evidence provides further insight into the lifespan of the medieval arable landscape and suggests these field systems remained in use until at least the 1640s.<sup>280</sup> Further discussion and matching of the landscape and documentary evidence for this is given in Chapter Ten (pages 332-334). Later post-medieval finds (eighteenth-century onwards) were relatively sparse, correlating with the development of the site as a rabbit warren and its later use as pine plantation and as a military training area during the First and Second World Wars.

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<sup>280</sup> NRO MS 4071, 4E4, *Wangford Terrier* (1542).

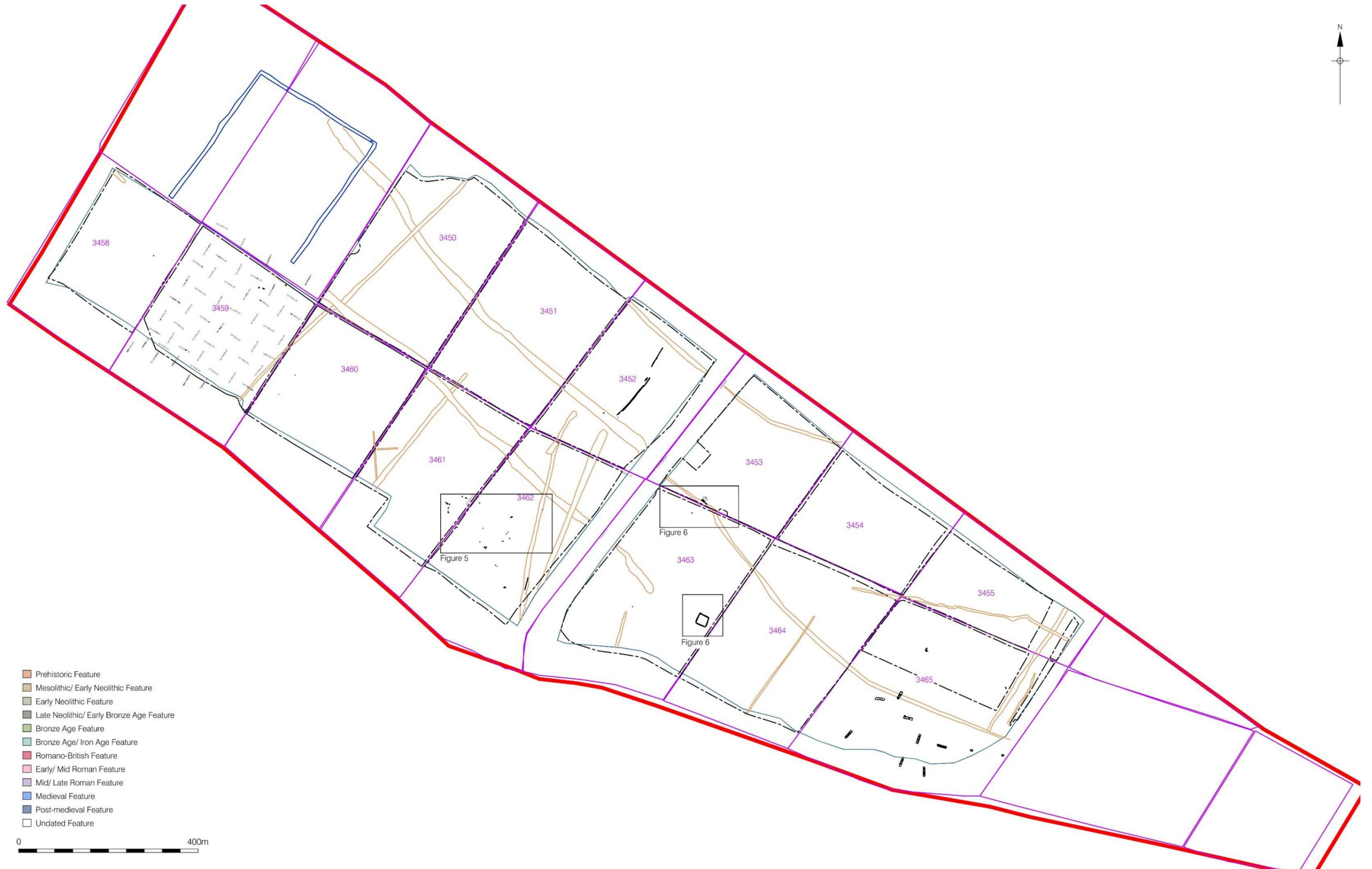


Figure 19: Overall site plan of Wangford Warren with forestry compartments, surveyed earthworks, archaeological trenches and other archaeological features. After Lucking, McIntosh and Hinman, forthcoming.

Hockwold Heath, Hockwold-cum-Wilton, Norfolk<sup>281</sup>

This site was formed of a 50-hectare (124-acre) habitat compensation scheme in an area of former pine plantation, to provide heathland habitat for that which was lost during the construction of the A11 road scheme, investigated in January 2021 (Figure 10). These investigations were intended to be of similar fashion to Wangford Warren (see above), comprising fieldwalking and metal detecting survey and targeted investigation of possible archaeological features. A number of flint finds had previously been recorded on the site, but this is unsurprising in a Breckland context. The site is recorded as lying within Methwold rabbit warren at a time when the warren was at its greatest extent. A number of barrows lie immediately to the north of the site, and the Devil's Dyke passes close to the east. To the south and west, lidar evidence suggests the landscape once formed part of the medieval open fields of Hockwold (see Chapter Ten for more discussion of these features), which may have encroached slightly into the south-west part of the site. The eastern part of the site consisted of shallow Newmarket 1 loams, while the central part of the site was formed of the deep sandy Newport 4 soils, and the western part of the shallow Newmarket 2 loams. The site was set in gently undulating landscape with no obvious modern water sources nearby. The archaeological investigations of the area revealed only prehistoric activity on site, much of which appeared to date to the Neolithic or Early Bronze Age at the latest.<sup>282</sup> The presence of barrows in the vicinity to the north of the site may suggest that this area was heathland in prehistory (see Chapter Eight) and the lack of any other historic activity potentially indicates that this area remained as heathland right into the post-medieval

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<sup>281</sup> House, *Hockwold Heath, Norfolk, Targeted Archaeological Investigation, Metal Detecting Survey and Fieldwalking*; Lucking and McIntosh, *In Breckland Wilds: Land use and occupation at Wangford Warren, Suffolk and Hockwold Heath, Norfolk*.

<sup>282</sup> *Ibid.*: pp. 17-19.

period, providing support for the idea that the heathlands in this part of Breckland may have existed from a very early date (see Chapter Eight).

While it does appear to be the case that there was little activity of other periods recorded on site, the treatment of the ground by the Forestry Commission prior to the archaeological investigation was particularly destructive and almost certainly hindered the recovery of archaeological material. In order to create a surface of sandy or chalky soil to encourage heathland development, the site was ploughed to a depth ranging between 0.4m and 0.6m in such a way to invert the soil profile in a remarkably neat manner. The result of this treatment meant that the original topsoil of site was buried up to 0.6m below the new ground level, while up to 0.2m of natural geology (and any archaeological features within this zone) were brought to the surface.<sup>283</sup> Indeed, the ring ditches of two prehistoric barrows present on aerial photography after the ploughing of the site indicate that substantial archaeological features did exist on site (Figure 11), but these were not identifiable on the ground by the time archaeological investigations took place and that part of site was overgrown. As such, the archaeological remains identified on the 'surface' of the site tended to be in the form of finds scatters or areas where it was apparent that an archaeological feature had been truncated by this ploughing and the material turned to the surface. A further result from this treatment was that the original topsoil and any subsoil on site was then buried too deep for effective metal detection or survey by fieldwalking, removing the potential for material, such as pottery and metalwork of Roman date scattered through manuring, to be recovered from site, if it was present. The overall result of these investigations, then, is that the archaeological remains suggest the site saw activity during

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<sup>283</sup> Ibid.: p. 29.

the prehistoric period with little activity of other periods present on the site after the Early Bronze Age. However, the destructive treatment of the site prior to archaeological investigation means that this cannot be stated with complete certainty as any evidence of historic farming practices may not have been detectable if they were present.

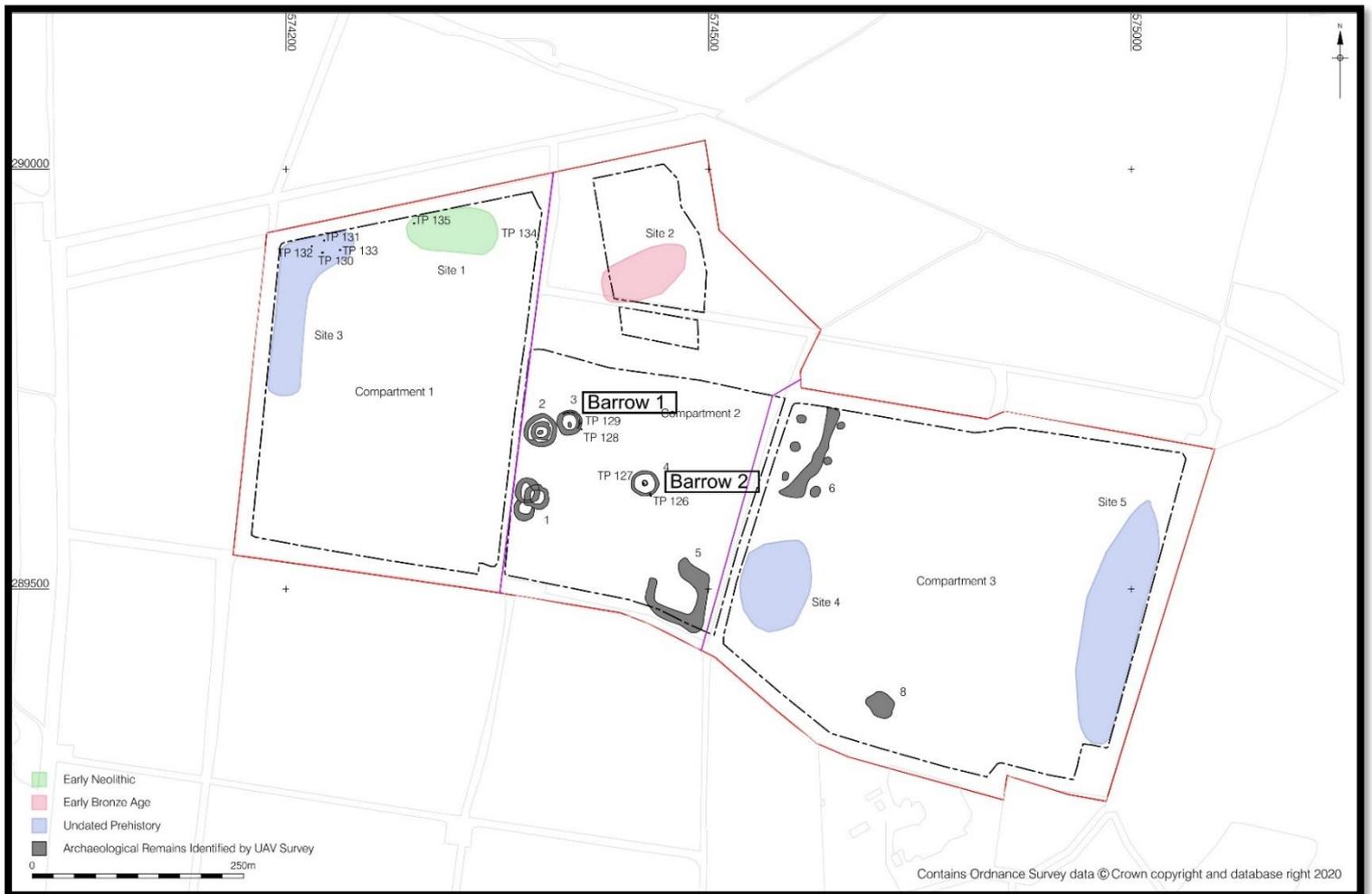


Figure 10: Overall site plan of Hockwold Heath. After Lucking, McIntosh and Hinman (forthcoming).



*Figure 11: Prehistoric barrows present as soil marks within the Hockwold-cum-Wilton site. Note the presence of irregular patterned ground. Aerial photography from EDINA Digimap, 2020, 25cm resolution.*

*West Stow: The Anglo-Saxon Village, West Stow, Suffolk*<sup>284</sup>

This was a site covering approximately 1.8 hectares (4.5 acres) on a sandy terrace above the floodplain of the River Lark in West Stow parish, Suffolk (Figure 12). Evidence of Anglo-Saxon activity in the area was known from the nineteenth century with the discovery of a cemetery in the area, as well as Romano-British pottery kilns. However, the location of the ‘village’ itself was only discovered during the middle of the twentieth century, where it has been subject to a series of excavations, most notably those undertaken by Stanley West in the 1960s and 1970s,<sup>285</sup> alongside more recent development-led works.<sup>286</sup> Excavations on the site revealed a number of post-built halls, sunken-featured buildings and other structures, alongside evidence for a variety of domestic, agricultural and industrial processes occurring on site between the late fourth and mid-seventh centuries. The site was regarded as one of the most complete examples of an excavated Early Anglo-Saxon settlement and produced a large quantity of finds that have subsequently been subject to various forms of analysis, as well as buildings on the site itself being reconstructed as a historic attraction in the area.

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<sup>284</sup> West, *West Stow, The Anglo-Saxon Village*.

<sup>285</sup> *Ibid.*

<sup>286</sup> David Gill and Ian Riddler, *New Museum Store, West Stow Country Park, WSW 076*, SCCAS Report No. 2010/184 (Suffolk County Council Archaeological Service, 2012), Unpublished Fieldwork Report.



*Staunch Meadow, Brandon, Suffolk*<sup>287</sup>

This was a site covering an area of approximately 1.17 hectares (2.9 acres) that was first recognised in the 1970s and subsequently excavated in the 1980s before the development of the site into a sports field (Figure 13). Excavations revealed a Middle Saxon settlement containing a number of buildings that saw occupation between the mid-seventh and late ninth centuries with evidence for high-status activities taking place on site. A considerable quantity of finds were recovered and analysed, including coins, precious metal dress accessories, a gold plaque (found through metal detecting before the excavation), pottery, animal bone and a range of other materials. Staunch Meadow provides a useful site-type for the character of Middle Saxon settlement in the region and also gives insight into the shifting nature of settlement sites at this time, with the medieval core of Brandon being a short distance to the west. However, acknowledgment of this earlier activity appears to have continued with the presence of a possible chapel on the site into the thirteenth century.

**Discussion**

The case study sites outlined above are significant either through representing some of the largest-scale archaeological investigations of Breckland undertaken, or because they are sites that have been used to define particular aspects of East Anglian history through the discoveries made. Various methods and techniques were used to investigate these sites at different times to generate a range of results of varying usefulness. As such, these sites may be seen as forming the ‘core’ of the interpretations of Breckland put forward in this thesis.

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<sup>287</sup> Tester *et al.*, *Staunch Meadow, Brandon, Suffolk*.

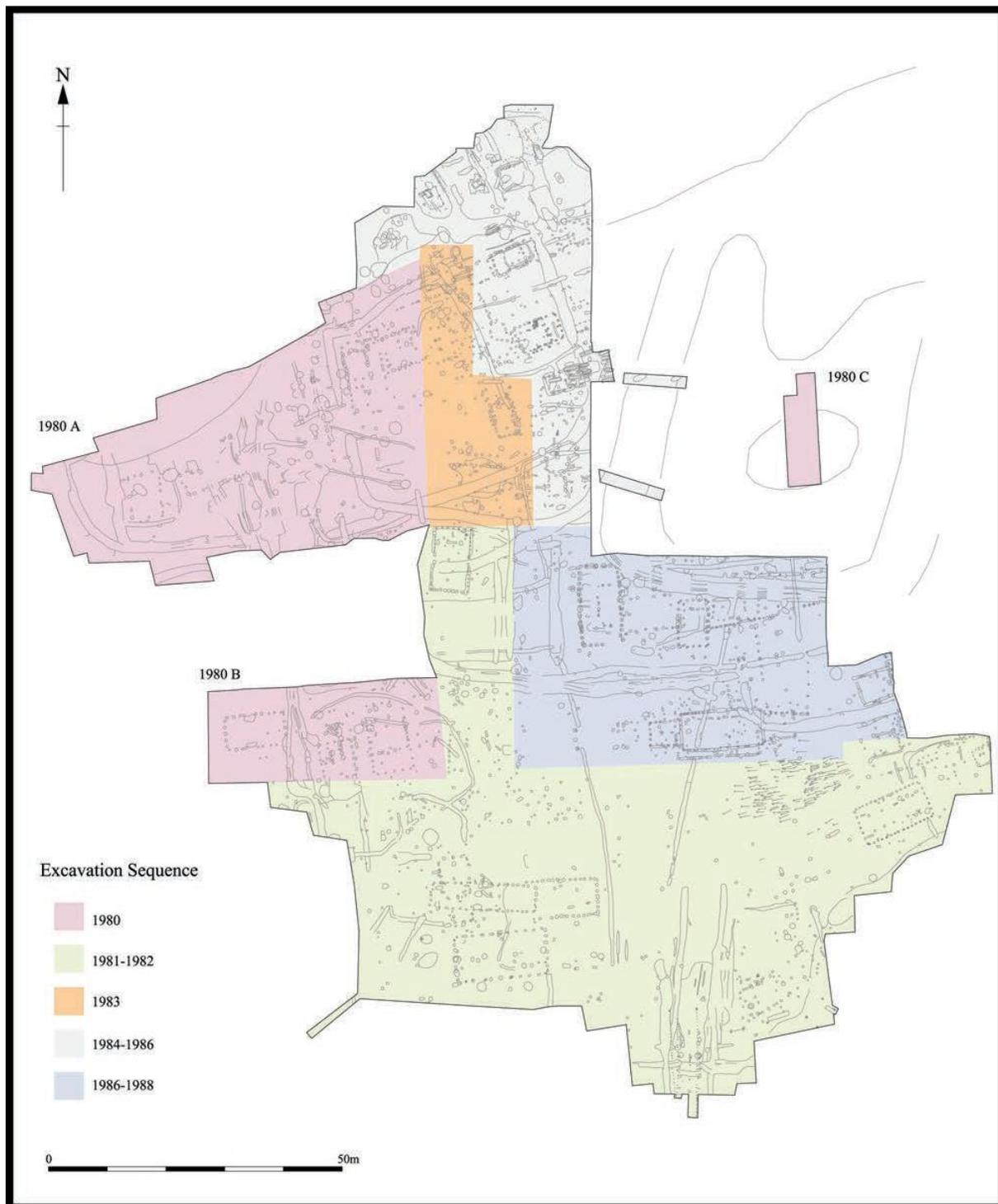


Figure 13: Overall site plan of Staunch Meadow, Brandon. After Tester et al., 2014.

## **Chapter Five: The Breckland Landscape before 1000 BC**

Before various aspects of the study period are addressed, it is worthwhile to provide a summary of human activity in Breckland prior to this, in order to demonstrate that the landscape of Breckland had, firstly, seen a considerable degree of activity and change before 1000 BC, and that, secondly, the changes and activities of those living in the region from the earliest date has always been connected to and influenced by wider patterns of human activity and development, and environmental conditions.

### *Palaeolithic (Figure 14)*

The Palaeolithic period in Britain covers a particularly vast timescale from c.1,000,000 BC, represented by regional sites such as Happisburgh<sup>288</sup> and Pakefield,<sup>289</sup> and lasting until c.10,000 BC. Occupation of Britain across this time was intermittent due to the advance and retreat of various ice sheets, the latest of which was the Devensian Ice Sheet. This reached a maximum around 27,000 years ago, began retreating c.23,000 years ago, and had retreated fully from southern England by c.16,000 years ago.<sup>290</sup> While the Palaeolithic is seemingly far removed from the study period of this thesis and will here only be briefly mentioned, it is significant both in terms of the various glacial and interglacial cycles that contributed to the geological formations of the Breckland landscape and also because of the quantity of Palaeolithic material that has been recovered from Breckland over the last two centuries.<sup>291</sup> Importantly, artefacts recovered from Breckland were central in proving the

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<sup>288</sup> NHER 35385.

<sup>289</sup> SHER GSE 061.

<sup>290</sup> Chris D. Clark, Anna L.C. Hughes, Sarah L. Greenwood, Colm Jordan, and Hans Petter Sejrup, "Pattern and timing of retreat of the last British-Irish Ice Sheet" in *Quaternary Science Reviews*, vol. 44 (2012): pp. 112-146.

<sup>291</sup> John Wymer, *Palaeolithic Sites of East Anglia* (Geobooks, 1985).

antiquity of humanity.<sup>292</sup> Considerable numbers of flint objects have been recovered from the region and John Wymer described the valleys of the Rivers Ouse and Lark as containing more Palaeolithic sites than anywhere else in England.<sup>293</sup> Early Palaeolithic archaeology is of particular significance in Breckland due to the preservation of material laid down by the former Bytham River, during the Hoxnian Interglacial and the early development of the Lark and Little Ouse valleys.<sup>294</sup> Investigations of some of the most prolific sites, such as Redhill near Thetford, suggested that the valley sides of the River Ouse would have provided a ready source of flint for tool production in this period, and may explain the quantities of worked flints recovered from historic gravel extraction on that site.<sup>295</sup> Indeed, the very characteristics of Breckland, being a geology of sands and gravels above chalk, have likely allowed more Palaeolithic material to be recovered compared to other areas of East Anglia where this material has either been removed by, or is underneath, large areas of glacial boulder clay.

The Late Upper Palaeolithic is here used to describe the period c.12,700 BC-9000 BC, which is sometimes further sub-divided to also include the Final Palaeolithic (c.12,000-10,800 BC) and the Terminal Palaeolithic (c.10,800 BC-9000 BC) and represents the period of human habitation in Britain between the last glaciation until the Mesolithic. It was characterised by the production of particular tool types used by hunter- fisher-gatherer

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<sup>292</sup> Robert J. Davis, Simon G. Lewis, Nick M. Ashton, Simon A. Parfitt, Marcus T. Hatch and Peter G. Hoare, "The early Palaeolithic archaeology of the Breckland: current understanding and directions for future research" in *The Journal of Breckland Studies*, vol. 1 (2017): pp. 29-32.

<sup>293</sup> John Wymer, *The Lower Palaeolithic Occupation of Britain* (Trust for Wessex Archaeology, 1999): pp. 137-141.

<sup>294</sup> Davis *et al.*, "The early Palaeolithic archaeology of the Breckland": pp. 33-40.

<sup>295</sup> Gibbard *et al.*, "Pleistocene geology of the Palaeolithic sequence at Redhill": pp. 175-192.

communities, which are relatively rare finds compared to later phases of flintwork. However, many of the records for tools of this period in Norfolk and Suffolk at the time of writing are from Breckland, which as discussed in Chapter Eight, may tentatively suggest parts of Breckland never saw the development of dense tree cover in some areas.

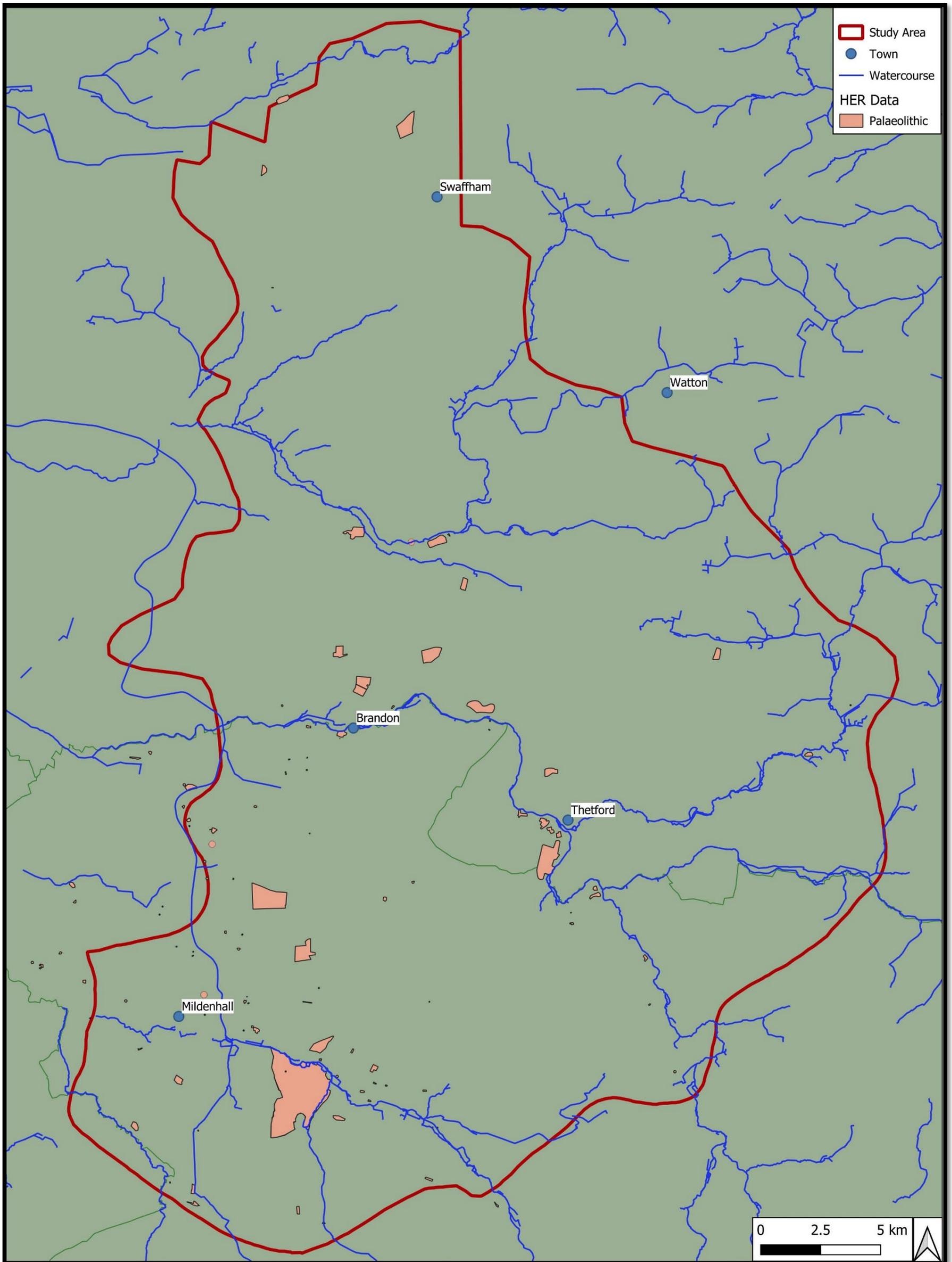


Figure 14: Palaeolithic sites and findspots recorded in the county HERs.

### Mesolithic (Figure 15)

The Mesolithic in Britain covers the period c.10,000 BC to c.4000 BC and the beginning of this period approximately coincides with a return to a warmer climate after the Younger Dryas/Loch Lomond Stadial event.<sup>296</sup> As with the Palaeolithic, human activity revolved around hunting, fishing and gathering. Again, this period shall only be briefly outlined for the purposes of providing a context to the study period.

Reconstructions of the Mesolithic Breckland landscape are largely reliant on ecological models inferred from pollen data, with the most complete sequence in Breckland coming from Hockham Mere on the eastern side of the region, initially sampled in the mid-twentieth century and again in the early 1980s.<sup>297</sup> While it must be remembered that the Hockham data reflects the catchment area of the mere, rather than the entirety of Breckland, it has been noted that the pollen sequence from Hockham differs from other East Anglian pollen sampling sites, and it is suggested this is because of the contrast in soil type compared to those meres sited on the Norfolk clays.<sup>298</sup> Rackham suggests the landscape of East Anglia was formed of a mosaic of woodlands of differing proportions depending on local soil and landscape conditions, and on this basis pollen cores taken from meres in clay landscapes are unlikely to be representative of the kind of ecology present in Breckland.<sup>299</sup> That said, trends between the sites do show broadly similar patterns of

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<sup>296</sup> Roberts, *The Holocene*: pp. 96-102.

<sup>297</sup> H. Godwin and P. Tallantire, "Studies in the Post-Glacial History of British Vegetation XII: Hockham Mere, Norfolk" in *Journal of Ecology*, Vol. 39, No. 2 (1951): pp. 285-307; Bennett, "Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere": pp. 457-487.

<sup>298</sup> K. D. Bennett, "Holocene Pollen Stratigraphy of Central East Anglia, England, and Comparison of Pollen Zones Across the British Isles" in *The New Phytologist*, Vol. 109, No. 2 (1988): p. 250.

<sup>299</sup> Oliver Rackham, *Woodlands* (Harper Collins, 2006): pp. 75-76.

succession, particularly with regards to the elm decline at the Mesolithic/Neolithic transition (see below). However, of these sites, the Hockham data is probably the most representative of the early Breckland ecology and shall be briefly summarized here.

Reconstructions from the Hockham sequence suggest a pattern of post-glacial woodland succession with a landscape of open birch (*Betula*) woodland and evidence of sand dune activity between c.10,500 BC and c.7600 BC, before an intensification of birch woodland between c.7600 BC and c.7300 BC.<sup>300</sup> Succession into closed woodland followed this, dominated by hazel (*Corylus*), pine (*pinus*), elm (*ulmus*) and oak (*quercus*), with oak gradually replacing pine on the sandier soils.<sup>301</sup> After c.5700 BC lime (*tilia cordata*) began to replace hazel as the dominant tree species, and this transition was complete by c.4700 BC.<sup>302</sup> At the point of the Mesolithic to Neolithic transition (c.4000 BC) a significant elm decline occurred.<sup>303</sup> This particular event has been detected in pollen samples across a wide geographical range, and the decline is usually attributed to the spread of disease within the elm population, probably in similar form to the modern Dutch Elm Disease.<sup>304</sup> No evidence of large-scale woodland clearance by human activity was detected around the mere, suggesting that by the start of the Neolithic period, the mere catchment consisted of relatively extensive, lime-dominated broadleaf woodland.<sup>305</sup> Instead, charcoal within the recovered Hockham sediments was thought to be indicative of domestic fires from

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<sup>300</sup> Bennett, "Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere": pp. 473-475.

<sup>301</sup> *Ibid.*: pp. 476-478.

<sup>302</sup> *Ibid.*: p. 479.

<sup>303</sup> *Ibid.*: p. 481.

<sup>304</sup> Peglar, "The mid-Holocene *Ulmus* decline at Diss Mere": pp. 1-13; Rackham, *Woodlands*: pp. 93-94.

<sup>305</sup> Bennett, "Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere": p. 480.

settlement rather than natural or anthropogenic forest fires.<sup>306</sup> The presence of Mesolithic flint scatters in the vicinity of the mere attests to this historic occupation.<sup>307</sup>

Across the rest of the Breckland landscape, a considerable quantity of Mesolithic flint has been recovered, suggesting patterns of human occupation predominantly within river valleys and near to the Fen edge. Many of these finds, however, have been recovered as topsoil finds through chance or fieldwalking surveys, or as residual artefacts within later archaeological features, such as was found during investigations at The Warrener Pub<sup>308</sup> and Redcastle Furze,<sup>309</sup> both in Thetford. Further along the Little Ouse valley, excavations at Staunch Meadow, Brandon recovered a Mesolithic assemblage that suggested significant flint-knapping activity with artefacts collecting in natural hollows.<sup>310</sup> Similarly, in the Lark Valley, excavations at West Stow also found flint-working concentrations in what were assumed to be leached away hollows in the natural geology, but no other features or artefact types were recovered.<sup>311</sup> The lack of substantial archaeology is unsurprising given the semi-nomadic nature of Mesolithic hunter-fisher-gatherer groups, as well as the acidic nature of the Breckland soils limiting the preservation of organic materials such as bone. The broader distribution of flint in Breckland suggests a population certainly living within the river

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<sup>306</sup> K. D. Bennet, W. D. Simonson and S. M. Peglar, "Fire and Man in Post-Glacial Woodlands of Eastern England" in *Journal of Archaeological Science*, Vol. 17, Issue 6 (1990): pp. 635-642.

<sup>307</sup> J. J. Wymer, "Mesolithic Occupation Around Hockham Mere" in *Norfolk Archaeology*, Vol. 41, No. 2 (1991): pp. 212-213.

<sup>308</sup> Phil Andrews and Jez Fry, *The Warrener, Thetford, Norfolk, Archaeological Evaluation 1996* (Wessex Archaeology, 1996) Unpublished Fieldwork Report: p. 8.

<sup>309</sup> Andrews, *Excavations at Redcastle Furze*: p. 8.

<sup>310</sup> Tester *et al.*, *Staunch Meadow Brandon*, Suffolk: p. 26.

<sup>311</sup> Stanley West, *West Stow, Suffolk: The Prehistoric and Romano-British Occupations*, East Anglian Archaeology Report No. 48 (Suffolk County Planning Department, 1989): p. 5.

valleys, but flints recovered from the higher ground indicate that these areas were not off-limits for the Mesolithic population, probably because the interfluves of Breckland are still relatively low in relief and may not have been as densely wooded outside of the Hockham Mere catchment. This pattern of dispersed activity, with a higher concentration in the lower parts of the river valleys, fits with that seen elsewhere in lowland Britain where Mesolithic life was one of hunter-fisher-gatherer communities occupying sites on an apparently seasonal basis. Larger groups may have gathered at sites within river valleys to pass the winter, while spending summer in smaller groups moving across the uplands.<sup>312</sup>

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<sup>312</sup> Roberts, *The Holocene*: pp. 152-154.

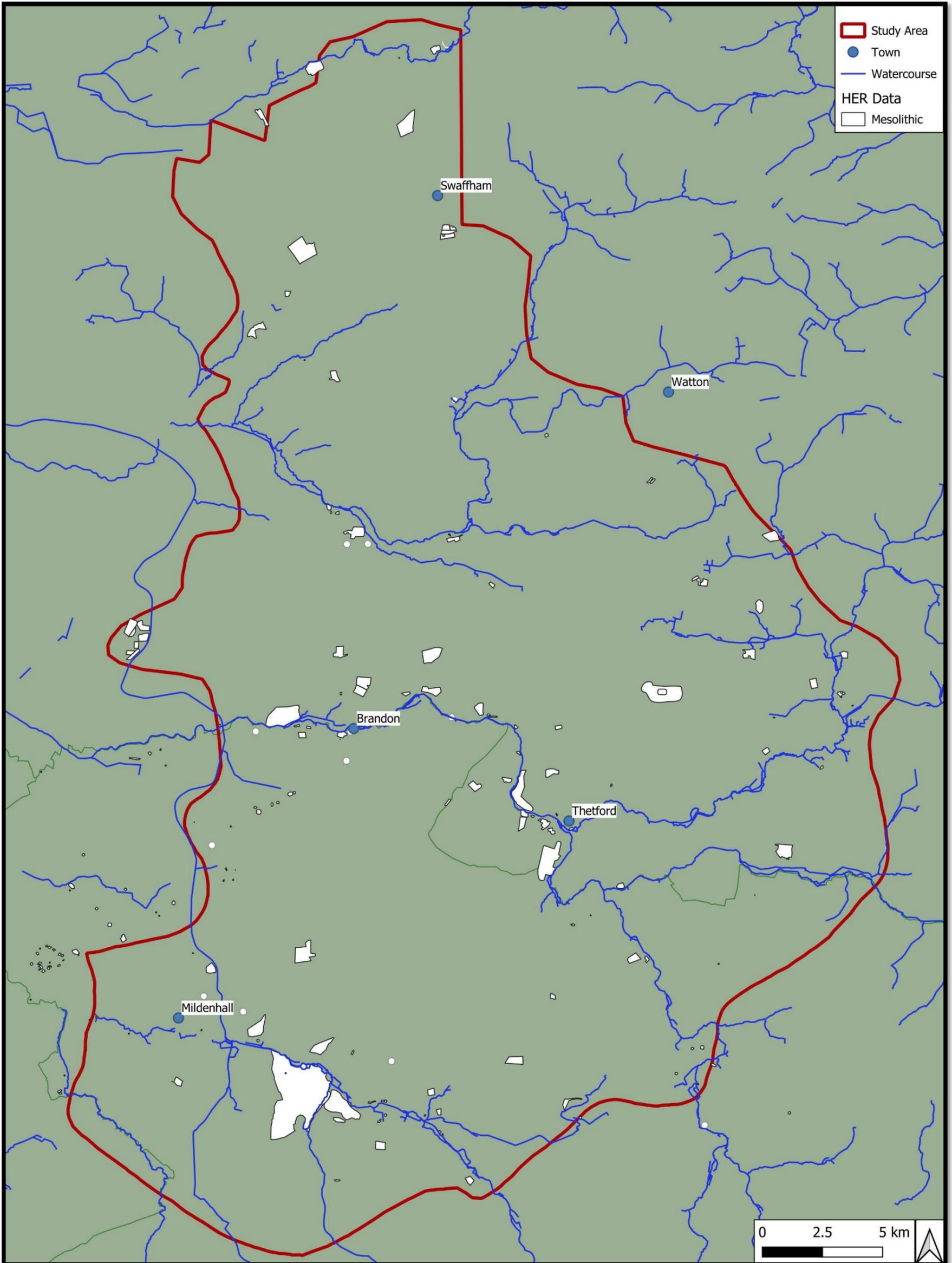


Figure 15: Mesolithic sites and findspots recorded in the county HERs.

### Neolithic (Figure 16)

The transition from the Mesolithic to the British Neolithic (c.4000 BC to c.2200 BC) is traditionally defined by the adoption of a new suite of flint technology, the appearance of pottery, the adoption of agriculture and concurrent move away from a hunter-fisher-gatherer lifestyle, and the construction of large-scale monuments such as causewayed enclosures, cursuses, stone circles and henges.<sup>313</sup> The importance of the Neolithic in Breckland has long been recognised and W. G. Clarke states that Neolithic flints may be found in every parish, “sometimes in almost bewildering profusion.”<sup>314</sup> The scale and apparent speed of change from the Mesolithic into the Neolithic led historians such as V. G. Childe to speak of a “Neolithic Revolution” in Britain.<sup>315</sup> The exact timing of the start of this period as well as the speed of changes have been widely debated and different regions of the British Isles appear to have developed along divergent trajectories.<sup>316</sup> In particular, the question of whether these changes were the result of an influx of new people or widespread acculturation of continental practices has been central to this debate, but recent genetic studies appear to have confirmed that Early Neolithic farmers were continental migrants, with clear differences between the genetic signatures of Mesolithic and Neolithic peoples.<sup>317</sup> A study of animal bone assemblages from southern Britain also suggest these

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<sup>313</sup> Keith Ray and Julian Thomas, *Neolithic Britain, The Transformation of Social Worlds* (Oxford University Press, 2018).

<sup>314</sup> Clarke, *In Breckland Wilds*, First Edition: p. 179.

<sup>315</sup> V. G. Childe, *Man Makes Himself* (Watts and Co., 1936).

<sup>316</sup> Bradley, *The Prehistory of Britain and Ireland*: pp. 30-42.

<sup>317</sup> Selina Brace, Yoan Diekmann, Thomas J. Booth, Lucy van Dorp, Zuzana Faltskova, Nadin Rohland, Swapan Mallick, Inigo Olalde, Matthew Ferry, Megan Michel, Jonas Oppenheimer, Nasreen Broomandkhoshbacht, Kristin Stewardson, Rui Martiniano, Susan Walsh, Manfred Kayser, Sophy Charlton, Garrett Hellenthal, Ian Armit, Rick Schulting, Oliver E. Craig, Alison Sheridan, Mike Parker Pearson, Chris Stringer, David Reich, Mark G. Thomas and Ian Barnes, “Ancient genomes indicate population

incomers brought domesticated animals into Britain, with assemblages concurrently showing a clear movement away from the consumption of wild animals.<sup>318</sup> Similarly, studies of radiocarbon dates from archaeological sites have been interpreted as showing a marked increase in population at the start of the Neolithic, coinciding with the appearance of cereal grains in the archaeological record.<sup>319</sup> Pollen samples, too, indicate a phase of significant woodland clearance and opening up of the landscape between 4000 BC and 3300 BC, further suggesting the creation of open space for cereal cultivation and the pasturing of domesticates.<sup>320</sup> However, these changes were not necessarily permanent, with the same datasets suggesting a rapid decrease in population after this period and some woodland regeneration lasting until the onset of the Early Bronze Age.<sup>321</sup> Shennan has referred to this period as a “population boom and bust”,<sup>322</sup> while Stevens and Fuller have argued this represents a failure of Neolithic cereal farming and a subsequent shift towards pastoralism in the middle and later Neolithic, before a true prehistoric agricultural revolution to cereal

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replacement in Early Neolithic Britain” in *Nature Ecology & Evolution*, vol. 3 (2019): pp. 765-771.

<sup>318</sup> Dale Serjeantson, “Survey of animal remains from southern Britain finds no evidence for continuity from the Mesolithic period” in *Environmental Archaeology*, Vol. 19, No. 3 (2014): pp. 256-262.

<sup>319</sup> Alex Brown, “Dating the onset of cereal cultivation in Britain and Ireland: the evidence from charred cereal grains” in *Antiquity*, Vol. 81 (2007): pp. 1042-1052; Mark Collard, Kevan Edinborough, Stephen Shennan and Mark Thomas, “Radiocarbon evidence indicates that migrants introduced farming to Britain” in *Journal of Archaeological Science*, Vol. 37 (2010): pp 866-870.

<sup>320</sup> Jessie Woodbridge, Ralph Fyfe, Neil Roberts, Sean Downey, Kevan Edinborough and Stephen Shennan, “The impact of the Neolithic agricultural transition in Britain: a comparison of pollen- based land-cover and archaeological <sup>14</sup>C date-inferred population change” in *Journal of Archaeological Science*, Vol. 51 (2014): pp. 219-222.

<sup>321</sup> Collard *et al.*, “Radiocarbon evidence”: pp 866-870; Woodbridge *et al.*, “The impact of the Neolithic agricultural transition”: pp. 219-222.

<sup>322</sup> Stephen Shennan, *The First Farmers of Europe, An Evolutionary Perspective* (Cambridge University Press, 2018): pp. 189-92.

agriculture in the Bronze Age.<sup>323</sup> Climatically, these interpretations correlate with a relatively warm climate during the early Neolithic, which subsequently shifted to a cooler, wetter climate during the later Neolithic.<sup>324</sup>

In Breckland, evidence suggests that the opening up of the landscape (where it was wooded) may have been a slower, more localised process. Pollen samples from Hockham Mere do not show the trend for woodland clearance that has been seen elsewhere, but increased silting activity was interpreted as erosion from small, temporary clearings that probably regenerated to forest after a few seasons of cropping.<sup>325</sup> Peter Murphy has previously argued the soils in the vicinity of the mere would not have been suited to Neolithic agriculture, so it is possible that deforestation was relatively limited within the mere catchment.<sup>326</sup> Analysis of mollusc shells from a mineshaft excavated at Grimes Graves, although of Bronze Age date, suggest woodland in the vicinity of, or possibly covering the site.<sup>327</sup> This was thought to represent woodland regeneration after the abandonment of the mines.<sup>328</sup> This would correlate with the later Neolithic woodland regeneration discussed above, but also tends to imply at least some trees in the landscape to provide a seedbank to allow regeneration to occur, rather than the landscape being

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<sup>323</sup> Chris, J. Stevens and Dorian Q. Fuller, “Did Neolithic farming fail? The case for a Bronze Age agricultural revolution in the British Isles” in *Antiquity*, Vol. 86 (2012): pp. 707-722.

<sup>324</sup> Roberts, *The Holocene*: pp. 219-228.

<sup>325</sup> Bennett, “Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere”: p. 482.

<sup>326</sup> Peter Murphy, “Prehistoric environments and economies” in C. Barringer (Ed.) *Aspects of East Anglian Prehistory (Twenty Years After Rainbird Clarke)* (Geo Books, 1984): pp. 13-30.

<sup>327</sup> J. G. Evans and Hilary Jones, “Chapter VI: Subfossil land-snail faunas from Grimes Graves and other Neolithic flint mines” in Mercer, *Grimes Graves*: p. 106.

<sup>328</sup> *Ibid.*: p. 110.

completely open and treeless. It has been suggested that Grimes Graves may have been worked within a woodland clearing.<sup>329</sup> Archaeologically, the distribution of single recorded objects does little to resolve this issue as many of these objects consist of axes or arrowheads, artefact types which could just as easily be lost on a settlement site as in the middle of a woodland, heathland or area of agricultural fields. Scatters of Neolithic flint point towards areas of settlement or prolonged activity and W. G. Clarke states that despite the abundance of flint in Breckland, concentrated scatters are “usually limited in area.”<sup>330</sup> However, part of the problem with flint scatters that may not produce any closely datable object types is whether a scatter represents an Early or Late Neolithic site, or a site established during the subsequent expansion of settlement and farming in the Bronze Age.

Cropmarks of confirmed Neolithic date are relatively sparse across Breckland, with the key exception of the large-scale monument complex at Fornham.<sup>331</sup> Here, aerial photography has revealed two conjoined causewayed enclosures on the south-west side of the River Lark, which have subsequently been overlain by a substantial cursus nearly two kilometres in length. Two further cropmarks may represent smaller cursuses forming part of the complex.<sup>332</sup> The scale of this ceremonial landscape serves to demonstrate that while some areas of Breckland, such as the Hockham Mere catchment, appear to have contained significant tracts of woodland large areas of the landscape were also relatively open. In addition to this, the construction of such monuments is in keeping with wider trends of

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<sup>329</sup> Frances Healy, Peter Marshall, Alex Bayliss, Gordon Cook, Christopher Bronk Ramsey, Johannes van der Plicht and Elaine Dunbar, *Grimes Graves, Weeting-with-Broomhill, Norfolk, Radiocarbon Dating and Chronological Modelling*, Research Report Series no. 27-2014 (English Heritage, 2014): p. 3.

<sup>330</sup> Clarke, *In Breckland Wilds*, First Edition: p. 179.

<sup>331</sup> SHER references FAS 002, FAS 004, FAS 028 and FAS 029.

<sup>332</sup> SHER FAS 028 and FAS 029.

monument construction at the time, demonstrating a degree of shared culture and connection extending far beyond the Breckland landscape. Interestingly, the location of the Fornham Cursus also appears to fall into a transitional zone in the landscape, with the eastern end being on the edge of the Suffolk clays, while the western end is on the edge of Breckland, something that could conceivably have been intentional to create a physical marker and join between landscapes that would have had their own distinct characters and ecologies at this time.

In terms of excavated sites, the best-known are the extensive flint mines at Grimes Graves, which have seen a series excavations since the 1860s.<sup>333</sup> Beyond the mineshafts themselves, contemporary working and occupation floors have been excavated on the site.<sup>334</sup> Radiocarbon dating revealed that workings began in the Late Neolithic and continued into the Early Bronze Age.<sup>335</sup> Other possible Neolithic mines have been identified in the wider landscape around Grimes Graves,<sup>336</sup> as well as further north at Cranwich.<sup>337</sup> Elsewhere, an important Early Neolithic settlement was excavated at Hurst Fen, producing the type site for Mildenhall Ware pottery.<sup>338</sup> Further evidence of Neolithic occupation has been excavated prior to modern housing developments. A site at Kilverstone revealed pit clusters and a possible Neolithic building along with significant quantities of pottery and

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<sup>333</sup> Mercer, *Grimes Graves*: pp. 1-8.

<sup>334</sup> *Ibid.*

<sup>335</sup> Healy *et al.*, *Grimes Graves*: pp. 55-58.

<sup>336</sup> Horlock and Tremlett, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 1)*: pp. 16-18.

<sup>337</sup> Powell, Tremlett and Horlock, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region: Stage 2 and Overall Results*: pp. 25-26.

<sup>338</sup> Clark, Higgs and Longworth, "Excavations at the Neolithic Site at Hurst Fen": pp. 202-245.

struck flints.<sup>339</sup> The subsequent deposition of Bronze Age cremations in the vicinity of a Neolithic pit cluster was interpreted as people possibly making use of a long-established clearing.<sup>340</sup> Excavations at Ingham quarry in Fornham St Genevieve revealed dispersed Neolithic features with evidence for occupation continuing into the Early Bronze Age, again hinting at the potential longevity of the site as an open place in the landscape.<sup>341</sup> The same suggestion was made for the discovery of pits and flint scatters during improvement works to the A11 at Icklingham, which crucially was situated on higher ground away from the River Lark.<sup>342</sup> This serves to highlight the difficulty in establishing patterns of prehistoric occupation in Breckland, in that the recorded distribution of occupation leans towards the principal river valleys, and it is unclear whether this represents a genuine distribution of Neolithic archaeology, or whether upland areas appear blank simply because excavations in those places have been limited in extent, and thus the sites have not yet been discovered. The relatively scant nature of Neolithic and Bronze Age archaeology, as well as the often very broad date ranges for artefactual material often makes it tricky to characterise whether activity may have been a more established settlement, a short-lived phase of occupation, some other form of outlying, transient activity in a more peripheral zone, or multiple events occurring over a prolonged period that cannot be discerned archaeologically.

Taken together, the environmental and archaeological evidence points towards a pattern of settlement that was relatively localised in extent. That is, in some areas, the

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<sup>339</sup> Duncan Garrow, *Archaeological Excavations at Norwich Road, Kilverstone, Norfolk* (Cambridge Archaeological Unit, 2002), Unpublished Fieldwork Report: pp. 8-12.

<sup>340</sup> *Ibid.*: p. 11.

<sup>341</sup> A. Newton and A. Mustchin, "Archaeological Excavations at Ingham Quarry, Fornham St Genevieve" in *Proceedings of the Suffolk Institute of Archaeology and History*, vol. 43, part 3 (2015): pp. 337-369.

<sup>342</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*.

inhabitants made use of already open spaces or cleared woodland to make way for more fixed settlement and early agriculture. The settlement sites themselves would naturally have been in the most useful locations with regards to the needs of prehistoric living, and this in turn would have encouraged a longevity of these sites into the Bronze Age and the maintenance of cleared areas of landscape. In other places, such as at Grimes Graves or Hockham mere, woodland appears to either have regenerated after the site fell out of use or showed little evidence for clearance until the Bronze Age. Parts of the Breckland landscape may already have been relatively open, other areas would have been cleared of trees during the course of the Neolithic, while some places may have remained relatively wooded into the Bronze Age, when further clearance and settlement expansion would have taken place.

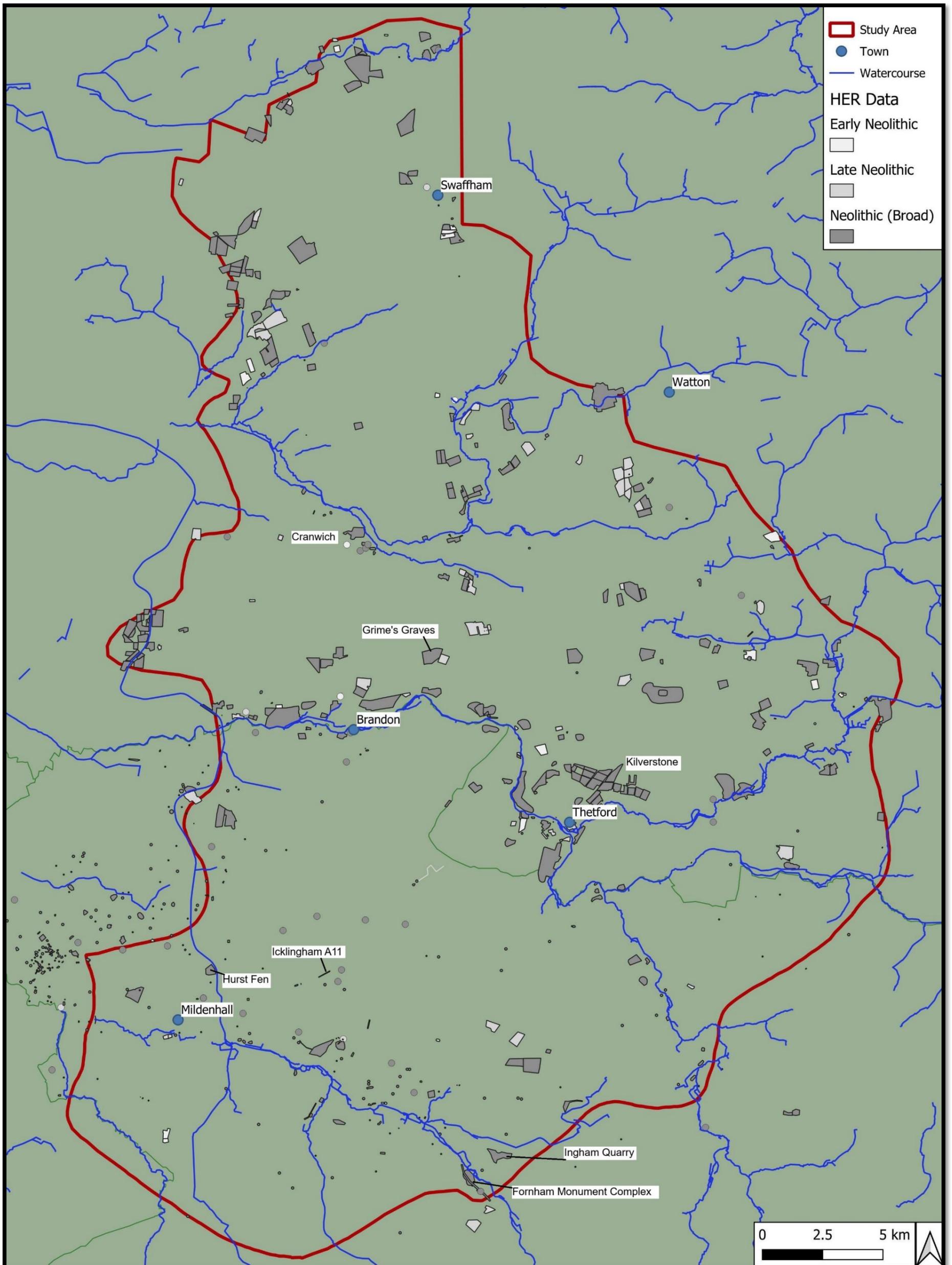


Figure 16: Neolithic sites and findspots recorded in the county HERs.

### Bronze Age Before 1000 BC (Figure 17)

The transition from the Neolithic into the Bronze Age is usually placed in Britain around 2500 BC, although the dating of this has been the subject of debate involving questions about the existence of a defined Chalcolithic period in Britain at the start of this period,<sup>343</sup> with Historic England defining the start of the Bronze Age as early as 2600 BC.<sup>344</sup> As with the Mesolithic to Neolithic transition, this was a gradual, protracted process, but as the name implies, the key development at the start of the Bronze Age was the appearance of metalwork. Some of the earliest copper objects in Britain were probably introduced from the continent as part of the ‘package’ of Beaker culture, displayed by assemblages such as that buried with the Amesbury Archer.<sup>345</sup> The introduction of Beaker culture in Britain has been the subject of much debate and, as with the beginnings of the Neolithic, this has mainly centred around the question of whether it appeared as the result of extensive migration or acculturation, and the speed and extent of this.<sup>346</sup> Recent genetic studies suggest a definite degree of migration at this period,<sup>347</sup> but Bradley has argued that the extent of this may be somewhat overstated as there are relatively few unburnt late Neolithic human bone samples in Britain to provide the necessary earlier comparison.<sup>348</sup> The style of beaker pottery also suggests that it was only the earliest types that were associated with any form of migration, with slightly

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<sup>343</sup> Michael Allen, Julie Gardiner and Alison Sheridan (Eds.), *Is there a British Chalcolithic? People, place and polity in the late 3<sup>rd</sup> millennium*, Prehistoric Society Research Paper 4 (Oxbow, 2012).

<sup>344</sup> Historic England website, *England’s Historic Periods* (2025).

<sup>345</sup> A. P. Fitzpatrick, *The Amesbury Archer and Boscombe Bowmen* (Wessex Archaeology, 2013).

<sup>346</sup> Bradley, *The Prehistory of Britain and Ireland*: pp. 150-157.

<sup>347</sup> Inigo Olalde *et al.*, “The Beaker phenomenon and the genomic transformation of northwest Europe” in *Nature*, vol. 555 (2018): pp. 190-196.

<sup>348</sup> Bradley, *The Prehistory of Britain and Ireland*: pp. 154-155.

later examples being insular variations.<sup>349</sup> The climate at the start of the Bronze Age was a continuation of relatively cooler, wetter weather that had characterised the later part of the Neolithic.<sup>350</sup> This was followed by a period of relative stability, before a shift to a warmer, dryer climate in the Middle Bronze Age and subsequent deterioration again at the start of the study period.<sup>351</sup> As discussed in the previous section, it has been argued that cereal agriculture declined in the later Neolithic before re-emerging as the dominant method of food production in the Middle Bronze Age, and it is suggested that this is linked to periods of climatic deterioration and amelioration.<sup>352</sup> At Hockham mere, there is evidence of an increasingly open landscape, suggesting a greater degree of forest clearance over this period.<sup>353</sup>

Many flint scatters across the Breckland landscape are dated to the Late Neolithic/Early Bronze Age period, as well as individual finds of arrowheads, daggers and other finely made flintwork that characterises this time. However, what must be considered in any interpretation of these objects is that in a landscape abundant with struck flint, collectors may search for the higher quality objects, such as barbed-and-tanged arrowheads and flint daggers, rather than recording the locations of scatters lacking this material. This in turn may generate the appearance of there being more Bronze Age flintwork in the landscape compared with earlier material. Similarly, large bronze objects

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<sup>349</sup> Stuart Needham, "Transforming Beaker Culture in North-West Europe; Processes of Fusion and Fission" in *Proceedings of the Prehistoric Society*, vol. 71 (2005): pp. 171-217.

<sup>350</sup> Roberts, *The Holocene*: pp. 219-228.

<sup>351</sup> Brown, "The Bronze Age climate and environment of Britain": pp. 7-22.

<sup>352</sup> Stevens and Fuller, "Did Neolithic farming fail?": pp. 718-720.

<sup>353</sup> Bennett, "Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere": p. 482.

are both collectible and easier to spot on a field surface with their green colour, and this too may contribute to the higher quantity of recorded Bronze Age material, something which Colin Pendleton drew attention to in his study of metalwork in the region.<sup>354</sup> His research concluded that the distribution of Bronze Age metalwork in this part of East Anglia was the result of modern arable farming and settlement patterns rather than necessarily representing a true distribution. That is, Bronze Age artefacts were found in modern agricultural landscapes where people would find these objects in the fields, while in areas with less ground disturbance and fewer people, such as heathland or warrens, objects were less likely to be found. The distribution patterns on the HER were thus a result of modern human activity rather than a true reflection of the prehistoric.<sup>355</sup> In Breckland, this pattern has been further exaggerated by the survival of large areas of private rabbit warren on the higher ground, which historically would have restricted the number of people accessing that landscape. Many of these warrens and other heathland landscapes subsequently transitioned into pine plantation in the first half of the twentieth century, again limiting access for archaeological investigation and covering large areas with a layer of humic, forest floor material, hiding potential finds scatters. As such, HER entries for prehistoric material within these places appears to be far sparser, when this may, in fact, be a result of more recent, rather than historic, land use patterns. A structured archaeological investigation at the landscape-scale has recently been undertaken on an area of former pine plantation in part of the former Wangford Warren, emphasising this point.<sup>356</sup> This revealed a background of metalwork spanning the Bronze Age, including the recovery of a fragment of Early Bronze

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<sup>354</sup> Colin Pendleton, *Aspects of Bronze Age Metalwork in Northern East Anglia*, Unpublished PhD Thesis, University of Nottingham (1992): pp. 82-87.

<sup>355</sup> *Ibid.*

<sup>356</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*.

Age dagger, fragments of Middle to Late Bronze Age rapier blades and fragments of Late Bronze Age socketed axes.<sup>357</sup> Most significant was the recovery of a fragment of a rare Middle Bronze Age copper alloy torc (or armlet?), of paralleled construction with a torc found on the Mildenhall Fens.<sup>358</sup> A Late Bronze Age founders hoard had been discovered by chance by warreners digging in the early part of the twentieth century, but, with this exception, no other material of any period had been recorded from the 125 hectare site. Nearby investigations at Elveden prior to the A11 road scheme found further evidence of Bronze Age occupation on more ‘upland’ areas, mainly consisting of pits and datable flint scatters.<sup>359</sup> What is demonstrated by these two sites is that, firstly, Bronze Age occupation appears to have been more widespread outside of the principal river valleys than previously recorded and, secondly, the higher density of Bronze Age material from Breckland river valleys may be partly illusory as a result of limited investigations on the higher ground. The distribution of these results in the HER data, and its implications for understanding the occupation patterns of the study period is scrutinised in more detail in Chapter Eight.

Elsewhere in Breckland, excavations on sand geology have revealed occupation features of definite Bronze Age date which are relatively slight in nature. This may appear unusual considering the quantity of flint and metalwork recovered from the region but is broadly in keeping with Early and Middle Bronze Age settlement archaeology, which may often leave few substantial below-ground remains. A reasonably high density of

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<sup>357</sup> Ibid.: pp. 67-81.

<sup>358</sup> Colin Pendleton, “A Bronze Torc from Kenny Hill” in *Proceedings of the Suffolk Institute of Archaeology and History*, vol. 36, part 2 (1986): pp, 135-137.

<sup>359</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*.

settlement activity was detected during excavations at Cavenham quarry<sup>360</sup> and Ingham quarry,<sup>361</sup> but again, these mainly consisted of pits and relatively slight posthole structures. Single features are also commonplace finds as the only evidence of activity in an area, such as a single Bronze Age pit found during an evaluation at Sweyn Close in Thetford.<sup>362</sup> More interestingly, buried soil layers of Bronze Age date have been found in several places in Breckland, including at Kilverstone,<sup>363</sup> as well as Santon Downham where the layer was interpreted as possibly being agricultural rather than occupational.<sup>364</sup> It is of notable contrast that Bronze Age archaeology consisting of substantial features is present on areas of clay geology within the study area, such as the Middle Bronze Age ditched enclosures with associated occupation on the southern side of Swaffham.<sup>365</sup>

Upstanding Bronze Age monuments generally consist of barrow cemeteries, some of which also survive as cropmarks.<sup>366</sup> Other cropmarks may be Bronze Age but are difficult to

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<sup>360</sup> Ellen Bales, *Cavenham Quarry, Cavenham, Assessment Report*, SCCAS Rep No 2005/126, (Suffolk County Council Archaeological Service, 2005), Unpublished Fieldwork Report.

<sup>361</sup> Newton and Mustchin, "Archaeological Excavations at Ingham Quarry, Fornham St Genevieve": pp. 337-369.

<sup>362</sup> Jonathan House, *Post Medieval Quarrying at Sweyn Close, Thetford, Archaeological Evaluation*, (Oxford Archaeology East, 2011), Unpublished Fieldwork Report.

<sup>363</sup> Garrow, *Archaeological Excavations at Norwich Road, Kilverstone, Norfolk*: pp. 13-16.

<sup>364</sup> James Rolfe, *Monitoring of a ducting trench and payment kiosk, Santon Downham, STN 084*, (Suffolk County Council, 2008), Unpublished Fieldwork Report.

<sup>365</sup> Kathryn Blackbourn, *A Middle Bronze Age enclosure and post-medieval activity on land west of Brandon Road, Swaffham, Norfolk*, OA Report No. 2502 (Oxford Archaeology, 2021), Unpublished Fieldwork Report; Joshua White, *Swan's Nest, Swaffham, Norfolk. Excavating the Prehistory of the Breckland Clays* (Peter Lang, 2022).

<sup>366</sup> Horlock and Tremlett, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 1)*: pp. 19-23; Powell, Tremlett and Horlock, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region: Stage 2 and Overall Results*: pp. 28-30.

date without excavation.<sup>367</sup> While some of the barrow sites may be later, or have seen re-use in later periods, excavated examples have revealed many have Bronze Age origins. The distribution and significance of prehistoric barrows in Breckland is discussed in Chapter Eight. Antiquarian interest in Breckland barrows is recorded as early as the eighteenth century and saw the excavation of a number of barrows in Breckland and wider East Anglia.<sup>368</sup> Barrows have also been excavated by chance, such as that relating to a high status burial discovered in the 1840s within what was interpreted as a barrow at Little Cressingham.<sup>369</sup> Similarly, in the 1870s an elaborate Beaker burial with a deposit of red deer antlers was discovered underneath a barrow at Mildenhall before it was removed for gravel extraction.<sup>370</sup> More structured barrow excavations have also taken place and one of the first fully published accounts of this was of Beacon Hill at Barton Mills, excavated in the early 1920s.<sup>371</sup> Further barrow investigations have taken place over the course of the last one hundred years and still continue to the present day, often as part of pre-development archaeology where the barrow is no longer visible above ground, such as an example excavated in 2017 at Red Lodge.<sup>372</sup> It must also be pointed out that contemporary burials may be found in non-barrow contexts, and Breckland examples include an Early Bronze Age child inhumation at Culford Hall School<sup>373</sup> and a pair of Middle Bronze Age cremations found

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<sup>367</sup> Powell, Tremlett and Horlock, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region: Stage 2 and Overall Results*: p. 29.

<sup>368</sup> Lawson, Martin and Priddy, *The Barrows of East Anglia*: pp. 36-38 and 67-69.

<sup>369</sup> Barton, "Antiquities Discovered at Little Cressingham, Norfolk": pp. 1-2.

<sup>370</sup> Prigg, "The Tumuli of Warren Hill, Mildenhall": pp. 287-299.

<sup>371</sup> Cawdor and Fox, "The Beacon Hill Barrow, Barton Mills, Suffolk": pp. 19-56.

<sup>372</sup> Angus Forshaw, *Archaeological Investigations at Land East of Kings Warren, Red Lodge, Suffolk*, (Archaeology South-East, 2018), Unpublished Fieldwork Report.

<sup>373</sup> Simon Cass, *Culford School Air Tennis Hall, Culford*, CUL 045, (Suffolk County Council, 2011), Unpublished Fieldwork Report.

during the A11 road scheme.<sup>374</sup> The presence of such numbers of barrows and other burials hints at a possibly extensive settlement pattern in the region where any area suitable for settlement probably saw occupation or activity for at least some amount of time in prehistory. Archaeological results from places such as Wangford Warren are starting to reinforce this.<sup>375</sup>

What this and the summaries of earlier periods has sought to demonstrate is that the Breckland landscape was already highly influenced by human activity before the start of the study period. The post-glacial proportions of woodland and open ground in the landscape had seen a significant degree of change by the Late Bronze Age. While hunting, fishing and gathering would still have formed part of the prehistoric lifestyle, as evidenced by the quantities of Neolithic and Bronze Age arrowheads found in the landscape, this had taken on a secondary role as increasingly large areas were put under agricultural use, either as arable or for the pasturing of domestic livestock. As such, settlement became more stable in the landscape from the Neolithic onwards with the next few millennia also seeing the construction of grand ceremonial and funerary monuments. By 1000 BC, the Breckland landscape already had a long history of human interaction, exploitation, and management.

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<sup>374</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*.

<sup>375</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*: pp. 105-108.

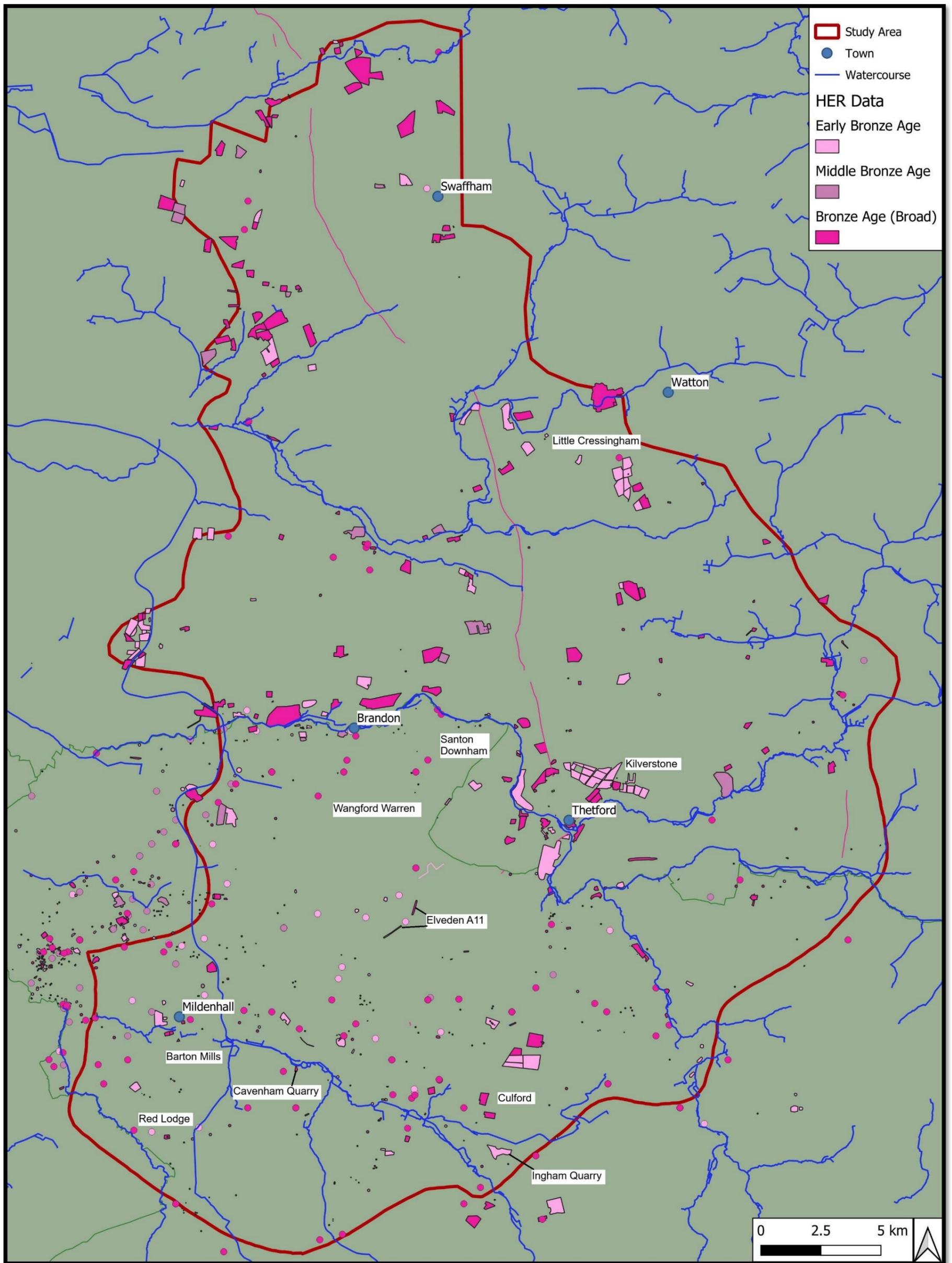


Figure 17: Early, Middle and broadly Bronze Age sites and findspots recorded in the county HERs.

## **Chapter Six: The Territorial and Administrative Structuring of Breckland**

In order to assess the extent to which climatic variation impacted human interaction with Breckland landscape it is necessary to explore a range of other factors which would have shaped the settlement and land use patterns of the area, and to compare the situation found within Breckland with that present in less 'marginal' districts. To that end, the 'administrative' structuring of Breckland and the ways in which this manifested itself in the physical landscape would benefit from analysis. This is in order to examine whether the landscape of Breckland altered the way in which people defined and divided spaces in the distant past in comparison with landscapes elsewhere, and indeed the extent to which these physical features survive to the modern day alongside any indication of subsequent alterations in the landscape. Much of the historic structuring of the landscape took the form of physical boundaries and routeways, creating clear delineations between different parts of the landscape and showing the ways in which people preferred to traverse their environment (or had these routes imposed upon them). Many of the boundaries and routeways that are traceable in Breckland appear to be of at least medieval date, but a significant amount are also apparently earlier, although precisely how early is not clear. As a result, landscape evidence of this nature covering the prehistoric period is far more limited. Therefore, to provide some insight into prehistoric administrative structuring in Breckland a different form of structure, the Iron Age fort, is also worth investigating in an effort to provide some insight into the earlier part of the study period. The principal aim of this chapter is to establish that the social and administrative division of the landscape developed in a similar way to other types of landscape in East Anglia, and therefore that any differences in land use were the result of

climatic or environmental factors and not because people were actively seeking to use the landscape in a different way from the outset.

To better understand and analyse the boundary and routeway patterns within the Breckland landscape it is first necessary to place the region within its wider topographical context and examine the administrative and territorial frameworks underpinning settlement patterns and land division in the region. The topographical details of Breckland have been discussed in depth in an earlier section of this thesis (See Chapter Two), and this landscape has historically been divided between the counties of Norfolk and Suffolk along the line of the Little Ouse River. The study area encompasses considerable parts of six Domesday hundreds, small fragments of seven other hundreds, the entirety of the lost hundred of Bradmere in Suffolk, and the borough of Thetford. Hundreds were a secular unit of administration, and their appearance is usually attributed to a wider reorganisation of the landscape as the area under Danelaw was pushed northwards over the course of the tenth century. However, it has been demonstrated that some hundreds almost certainly represent incorporations of pre-existing territorial units into this new administrative framework and the topographic considerations given to the boundaries of East Anglian hundreds suggests that relatively few of the divisions were completely new and arbitrary creations.<sup>376</sup> Within the study area, 128 historic parishes are also defined, in whole or in part. Many of the parishes in their current form are derived from earlier ecclesiastical units that would pay tithes to a

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<sup>376</sup> Christopher Scull, Martin Allen, Eleanor Blakelock, Stuart Brookes, Faye Minter, Timothy Pestell, Judith Plouviez, Eleanor Rye, Tom Williamson, Andrew Woods and Barbara Yorke, *Lordship and Landscape in East Anglia AD 400-800, The Royal Centre at Rendlesham, Suffolk and its contexts* (The Society of Antiquaries of London, 2024): pp. 263-401.

particular church, the boundaries of which have often not changed from their medieval layout. Townships or vills were a secular unit of local administrative division, which were often co-terminus with parishes but may also incorporate two or more ecclesiastical parishes within their boundaries. This is particularly true in an East Anglian context where two or more parish churches being constructed in the same village or even sharing a churchyard is not an uncommon occurrence.<sup>377</sup> Manors were a secular unit of local administration and landholding, which could again be co-terminus with the parish boundaries of a settlement, cross over the boundaries of parish and vill, or multiple manors could be present within a single vill, the numbers of which could also fluctuate for a number of reasons. As such, the somewhat fluid and disparate nature of manorial organisation in East Anglia means that the boundaries and structuring of these units will not be examined in this chapter, but the impact of manorial influence in Breckland has been studied by Bailey,<sup>378</sup> while Barlow has undertaken further analysis of manorial arrangements in Late Saxon Suffolk including the Suffolk Breckland.<sup>379</sup>

One of the key themes cited elsewhere in studies of territorial organisation is the concept of 'river-and-wold', first formulated by Alan Everitt and subsequently elaborated by Harold Fox and Charles Phythian Adams.<sup>380</sup> The core of the model argues that the

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<sup>377</sup> Peter Warner, "Shared churchyards, freemen church builders and the development of parishes in eleventh-century East Anglia", in *Landscape History*, vol. 8 (1986): pp. 39-52.

<sup>378</sup> Bailey, *A Marginal Economy?*

<sup>379</sup> George Barlow, "The Interrelationship Between Freemen and Manors in Late Anglo-Saxon Suffolk", in *Proceedings of the Suffolk Institute of Archaeology and History*, vol. 43, part 1 (2013): pp. 52-67.

<sup>380</sup> Charles Phythian-Adams, *Re-thinking English Local History* (Leicester University Press, 1987); Everitt, "River and Wold": pp. 1-19; Harold Fox, "The People of the Wolds" in M. Aston, D. Austin and C. Dyer (Eds.), *The Rural Settlements of Medieval*

primary focus of settlement tended to form first within the river valleys, often on the more fertile and easily worked soils. By contrast, the higher valley sides and interfluvies were more peripheral in nature, often containing heavier soils and seeing limited exploitation on a seasonal basis with relatively late permanent settlement. As with all models, the concepts should not be taken as a hard rule and there are often limitations and exceptions that may be found. The medieval Norfolk market town of Swaffham, for example, may be regarded as a focal point within the landscape but is sited on relatively higher ground away from any obvious surface water source or course. That said, recent studies by Tom Williamson have highlighted the strengths of this model, both in an East Anglian and broader lowland English context, as well as emphasising that the topographical influences of the river-and-wold model apply even in areas of relatively muted topography.<sup>381</sup> The second, naturally related, concept involves the way in which humans move across the landscape, and Sarah Harrison identified key differences in the form of historic routeways between 'resource-linking' routes, 'settlement-linking' routes and specific long distance routes, usually defined Roman roads.<sup>382</sup> 'Resource-linking' routes are described as those which run at right-angles across different ecological or geological zones, thus providing a community with access to a range of resources within their territory. Many historians have identified this form of routeway (sometimes as co-axial field systems) in the landscape and the routes involved usually run from the valley

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*England: Studies Presented to Maurice Beresford and John Hurst* (Basil Blackwell, 1989): pp. 77-104.

<sup>381</sup> Williamson, *Environment, Society and Landscape*: pp. 55-59.

<sup>382</sup> Sarah Harrison, *A History of Evolution and Interaction: Man, Roads and the Landscape to c. 1850* (University of East Anglia, 2005): Unpublished PhD Thesis.

floor up to the higher ground and interfluvium.<sup>383</sup> By contrast, Harrison defines 'settlement-linking' routes as those which, as the term suggests, link groups of settlements together, and the nature of historic settlement patterns usually means these routes move broadly parallel with the topography. The final type of early route is that of the longer distance routeway, and Roman roads are perhaps the best example of a type of route that was specifically intended as a more direct way of connecting two places of more significance without necessarily taking smaller settlements into account. By exploring the Breckland landscape against these background models of river-and-wold and routeway forms that have been characterised in other landscapes, it should therefore be possible to demonstrate that similar processes have shaped social, territorial and landscape organisation in Breckland.

To that end, the patterns and layout of various forms of boundary within the study area shall be examined to establish this characterisation, both in terms of physical boundaries such as watershed boundaries, roads, ditches, and hedges, as well as administrative boundaries such as parish and hundred divisions, which in some cases may preserve the line of an earlier physical feature. Indeed, some boundaries that run for any distance across the landscape may change form several times along their length but still be obviously part of the same continual boundary in the landscape. Following this, a brief discussion of Iron Age forts will be given, the intention of which is to help inform

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<sup>383</sup> Davison, *The Evolution of Settlement in Three Parishes*: pp. 73-74; Sarah Harrison, "Open Fields and Earlier Landscapes: Six Parishes in South-east Cambridgeshire" in *Landscapes*, Vol. 3, Issue 1 (2002): pp. 35-54; Peter Warner, *The Origins of Suffolk* (Manchester University Press, 1996): pp. 44-53.

understanding of the prehistoric territorial structuring of the region from a period where other forms of evidence are more disparate and not as easily compared.

### ***Watershed Boundaries***

One particular feature of the landscape that is worth examining in a Breckland context is the presence of watershed boundaries in the landscape. These are linear features, usually surviving as hedgerows, ditches, roads or trackways that broadly follow the line of the watershed between two river valleys. They may be respected by parish, hundred or other administrative boundaries along parts of their length, suggesting that many are of considerable age and prehistoric examples are known to exist as part of the Bronze Age Dartmoor Reave field system.<sup>384</sup> The presence and potential significance of linear features and boundaries on watersheds was first recognised in the early part of the twentieth century by R. Hippiesley Cox, who examined these features and suggested they formed a system of routeways that linked prehistoric monuments.<sup>385</sup> Subsequent discussions have highlighted that while a prehistoric origin for these features is unclear in many cases, many do seem to pre-date the creation of Hundred and Parish boundaries in the early part of the medieval period.<sup>386</sup>

The wider setting of these watershed boundaries links into the river-and-wold model of landscape where watersheds tended to form the natural boundaries between different social territories. In an East Anglian context, watershed boundaries may be seen on the interfluves and forming the boundaries to hundreds or even potentially earlier

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<sup>384</sup> Fleming, *The Dartmoor Reaves*.

<sup>385</sup> R. Hippiesley Cox, *The Green Roads of England* (Methuen, 1914).

<sup>386</sup> Williamson, *Environment, Society and Landscape*: pp. 89-94.

territorial units,<sup>387</sup> suggesting that these boundaries can be of considerable age in some landscapes, at least of Anglo-Saxon origin, if not earlier. As such, it is worth highlighting examples of watershed boundaries in Breckland and demonstrating that they are formed of similar structures (roads, ditches, hedges) as seen elsewhere, and that they appear to have been used to form historic administrative divisions within the study area, in order to show that social and territorial organisation in a Breckland landscape was influenced by the same environmental factors as wider East Anglia.

While not extensive across the Breckland landscape, watershed boundaries do exist, and at the very least form parish boundaries, and in some cases, hundred boundaries (Figure 18). In Norfolk, a watershed boundary running for over four-kilometres forms the boundary between Swaffham, South Acre and Sporle parishes, while shorter features form the boundaries between Cockley Cley and Hilborough, and Ickburgh and Langford. Further stretches of watershed features form the parts of the boundaries between West Wretham, Sturston and Croxton, as well as between Illington and Roudham. A watershed boundary running for more than five-kilometres forms the parish boundaries between Weeting, Cranwich and Mundford and stops abruptly at the Fossditch linear earthwork,<sup>388</sup> at the point where the topography begins to slope down towards the Fen edge. A further stretch of boundary divides West Harling from Riddlesworth and Gasthorpe. In Suffolk, a substantial watershed boundary runs for more than eight kilometres along the divide between the Rivers Lark and Little Ouse, dividing several parishes, and running between the meres of Rymer point westward to the point at which the ground begins to slope down across Eriswell towards the Fens. This

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<sup>387</sup> Scull *et al.*, *Lordship and Landscape in East Anglia*: pp. 263-401.

<sup>388</sup> NHER 1089.

boundary also partially forms the division between Blackbourne and Bradmere Hundreds.

As with watershed boundaries elsewhere, the dating of the Breckland features is not always clear, further hindered by the relatively sandy nature of the soil meaning that features may be more prone to erosion and therefore disappear more easily or require more regular upkeep, giving the impression that they may be more recent creations. It is also possible that some of these boundaries may be relatively late where they have been created to demarcate a division of common land between neighbouring parishes. That said, watershed boundaries of similar form in other landscapes have, by their very nature of being on the watershed, also been identified in historically marginal locations but appear to be of at least pre-medieval date<sup>389</sup> Indeed, a sample of maps investigated in Breckland revealed the watershed boundaries identified here to already exist as roads or field boundaries before the enclosure of those parishes.<sup>390</sup> In addition to this, many of the watershed boundaries in Breckland are of a somewhat irregular and sinuous form, rather than having the appearance of straight post-medieval planned enclosure boundaries, supporting the suggestion that they may be of some age, particularly where they were used as parish boundaries, which were often fixed in the medieval period, meaning these features could pre-date this. Two of the longer boundaries also deserve further discussion. The boundary forming the northern parish boundary for Weeting appears to abruptly end when it meets the Anglo-Saxon Fossditch, possibly suggesting it post-dates

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<sup>389</sup> Williamson, *Environment, Society and Landscape*: pp. 89-94.

<sup>390</sup> For boundaries between Cockley Cley and Hilborough see NRO FX 386/2, *Map of Cockley Cley* (1722); for between Sturston, Tottington and Wretham see NRO WLS LX/1, 429X7, *Plan of the estate of Lord Chief Justice de Grey in the parishes of Sturston and Stanford* (1780); for between Illington and Roudham see NRO MC 247/2m, *Illington and Larling, estate of Mrs Killett and Miss M. Churchman* (1772).

the creation of this earthwork, or because the landscape at this point begins to slope westwards towards the fen edge and this boundary would have become diffuse with the western end being lost after the Fossditch was constructed across it. Similarly, the long watershed boundary dividing the Lark and Little Ouse rivers appears to be respected by a number of administrative boundaries, as well as interacting with a series of coaxial routeways in the Lark Valley (see discussion below). This, too, supports the assertion that it is a relatively old feature in the landscape that has served as a marker of historic land division.

While the dating of these features is imprecise at best, the evidence suggests that some of them are of considerable age and, importantly, have been used to divide the Breckland landscape in terms of social and administrative organisation. It is possible that some of these boundaries may have prehistoric origins as some of the earliest forms of land division in Breckland, but this cannot be proven with any certainty and other examples may equally have later origins. This compares well with landscapes involving watershed boundaries elsewhere and serves to demonstrate that Breckland was subject to similar influences governing social and territorial division.

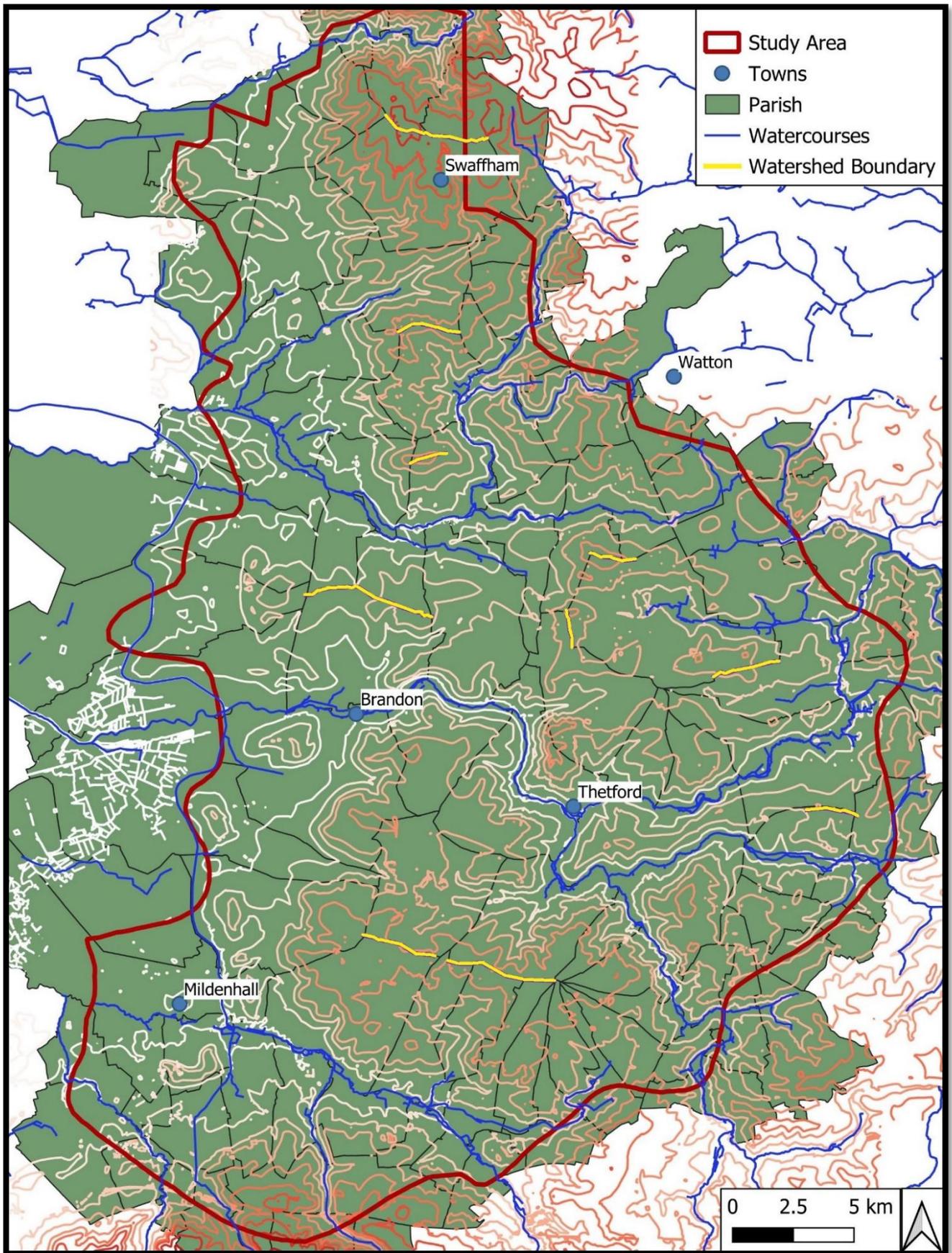


Figure 18: Surviving watershed boundaries in the Breckland landscape.

### **Resource-linking Routes**

As mentioned above, the presence of watershed boundaries in the landscape hints at a landscape that was divided and traversed (or at least attempted to be) in much the same way as elsewhere in lowland England. The same may be seen with other boundaries in the Breckland landscape, which also highlight the way in which the movement of people and division of the landscape manifested itself in similar fashion to other landscapes, and therefore that social and administrative division was not heavily altered by the distinct character of Breckland.

The layout of parish boundaries around Rymer Point has traditionally been attributed to the division of land in order to enable several different settlements sited in the surrounding valleys access to the meres in a relatively dry upland heath environment.<sup>391</sup> While this is almost certainly the intention of the parish boundaries, their morphology appears to be neither arbitrary nor highly organised and suggests an earlier origin where pre-existing features have been used for parish boundaries in the medieval period. Many of the parish boundaries exist today as roads leading from the zone of settlement on the lower ground up to Rymer Point, which itself is sited on the watershed. The plotting of these boundaries against the topography is particularly revealing (Figure 19). The parish boundaries on the north, eastern, and southern sides of Rymer run at right-angles from their respective watercourses directly up the valley side to the high plateau at Rymer, while the parish boundary running east-west away from Rymer Point, forming the parish boundary of Barnham, Wordwell and Culford follows the approximate

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<sup>391</sup> See, for example: Clarke, *In Breckland Wilds*, First Edition: p. 19; Rackham, *The History of the Countryside*: pp. 355-356.

line of the watershed. This watershed boundary continues along the line of the relatively straight valley top dividing the Lark and Little Ouse rivers, as far as Eriswell parish. The parish boundaries are therefore not arbitrary divisions to provide access to the meres but instead are formed along the lines of pre-existing resource-linking routes running at right-angles from valley floor to watershed. In this case, the topography has been the key factor in producing the radial layout, where two watercourses curve around the north-eastern and south-eastern sides of the Rymer parishes. Immediately to the west, where the River Lark runs on a straighter course, the parishes of West Stow, Wordwell and Culford take on a more co-axial layout with their parish boundaries running from watercourse to watershed. It is notable that a claimed section of the Icknield Way appears to also be a resource-linking route forming part of this rectilinear layout in the Lark valley, perhaps suggesting that particular route was of more local usage, rather than being a long-distance route, and supporting Harrison's assertion that the Icknield Way is largely based on medieval mythology.<sup>392</sup>

The presence of co-axial boundary systems and resource-linking routes on landscapes of a very different character to Breckland, most notably the Norfolk and Suffolk clays,<sup>393</sup> demonstrates that this form of land use and organisation is not confined to Breckland and does not appear to be influenced by the underlying geology or ecology of an area, but rather by the topography. The presence of boundary systems of this form, even in an area of Breckland that is characterised by a particularly sandy geology (historic mapping refers to an area in the co-axial part of the system as Icklingham Sands<sup>394</sup>) and

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<sup>392</sup> Sarah Harrison, "The Icknield Way: Some Queries" in *The Archaeological Journal*, No. 160 (2003): pp. 1-22.

<sup>393</sup> Warner, *The Origins of Suffolk*: pp. 44-53.

<sup>394</sup> RCIN 734032.ah, *Map of encampment at Cavenham Heath* (1779).

dry landscape (hence the need to share access to the meres at Rymer) supports the assertion that the Breckland landscape was organised and divided in the same way as other landscapes of different character, rather than being organised differently because of its distinct geology and ecology.

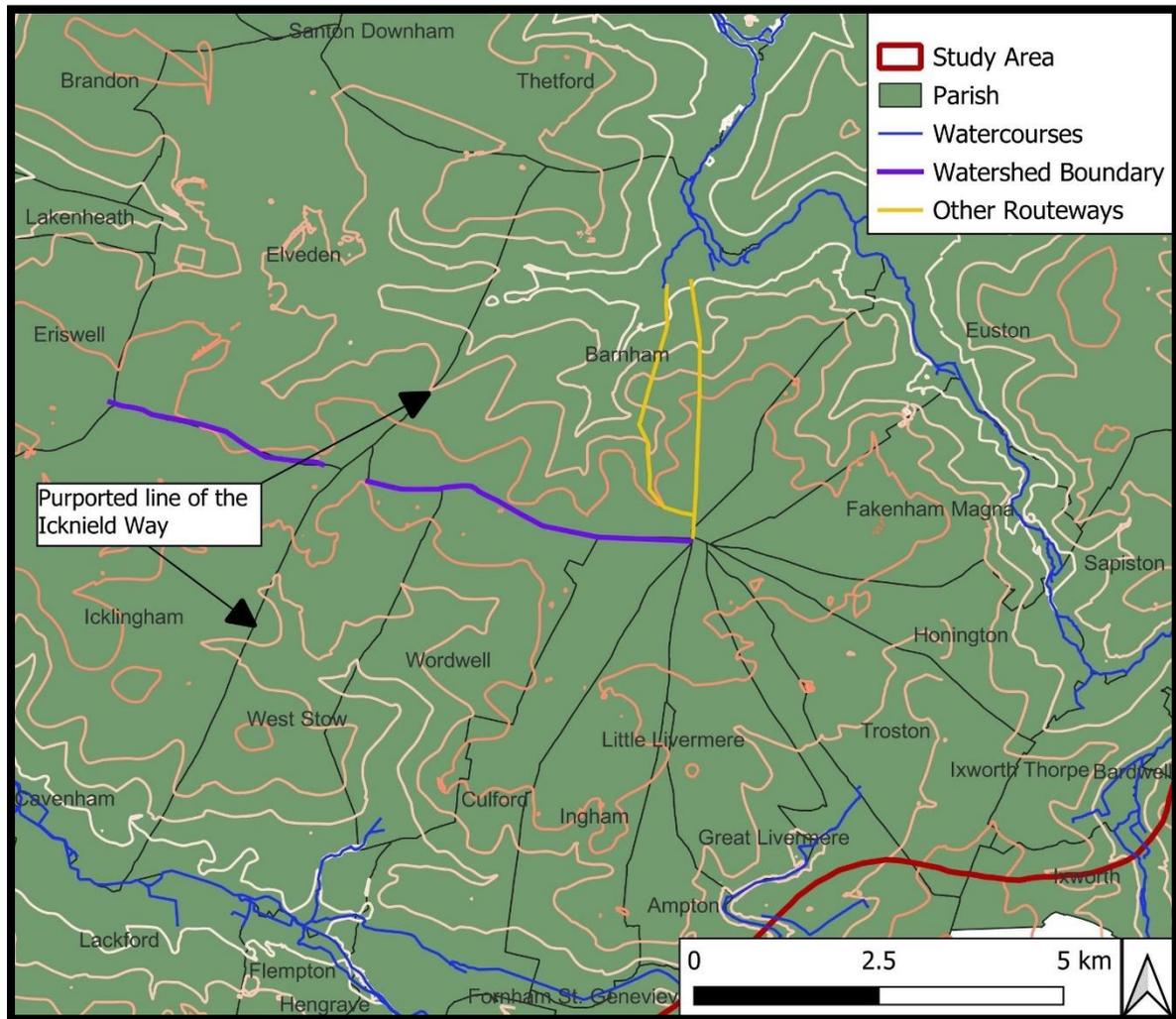


Figure 19: Boundary and routeway patterns around Rymer point and the Lark Valley.

### **Long-distance Routeways**

Harrison's third type of routeway in the historic landscape was characterised as long-distance routeways. That is, these were roads that often served a specific purpose in linking two more distant places together, rather than being used for local movement. Typical examples of these include Roman roads, which were often constructed to provide direct links between urban or military sites across Britain. As a result, these features were often terrain oblivious and took little account of the local landscapes that they crossed. This is true even in Breckland despite the sandy nature of the terrain in some places, with routes such as the Peddar's Way,<sup>395</sup> the purported line of the Ickniel Way<sup>396</sup> and the Fen Causeway<sup>397</sup> crossing a variety of different soil types and topographies with little deviation from their intended route. Similarly, the historic, possibly medieval, route of the main road from Bury St Edmunds to Brandon<sup>398</sup> passes across the co-axial routeways of the Lark Valley (see discussion above) and across the landscape with little regard for other routeways in the area (Figure 20). As has been shown with resource-linkage and watershed boundaries discussed above, this type of routeway is seen elsewhere in East Anglia (particularly through the wider Roman road network) and the presence of these features in Breckland demonstrates that the area was not seen as an obstacle to avoid when longer-distance routes were formed or constructed. As such, the area was not

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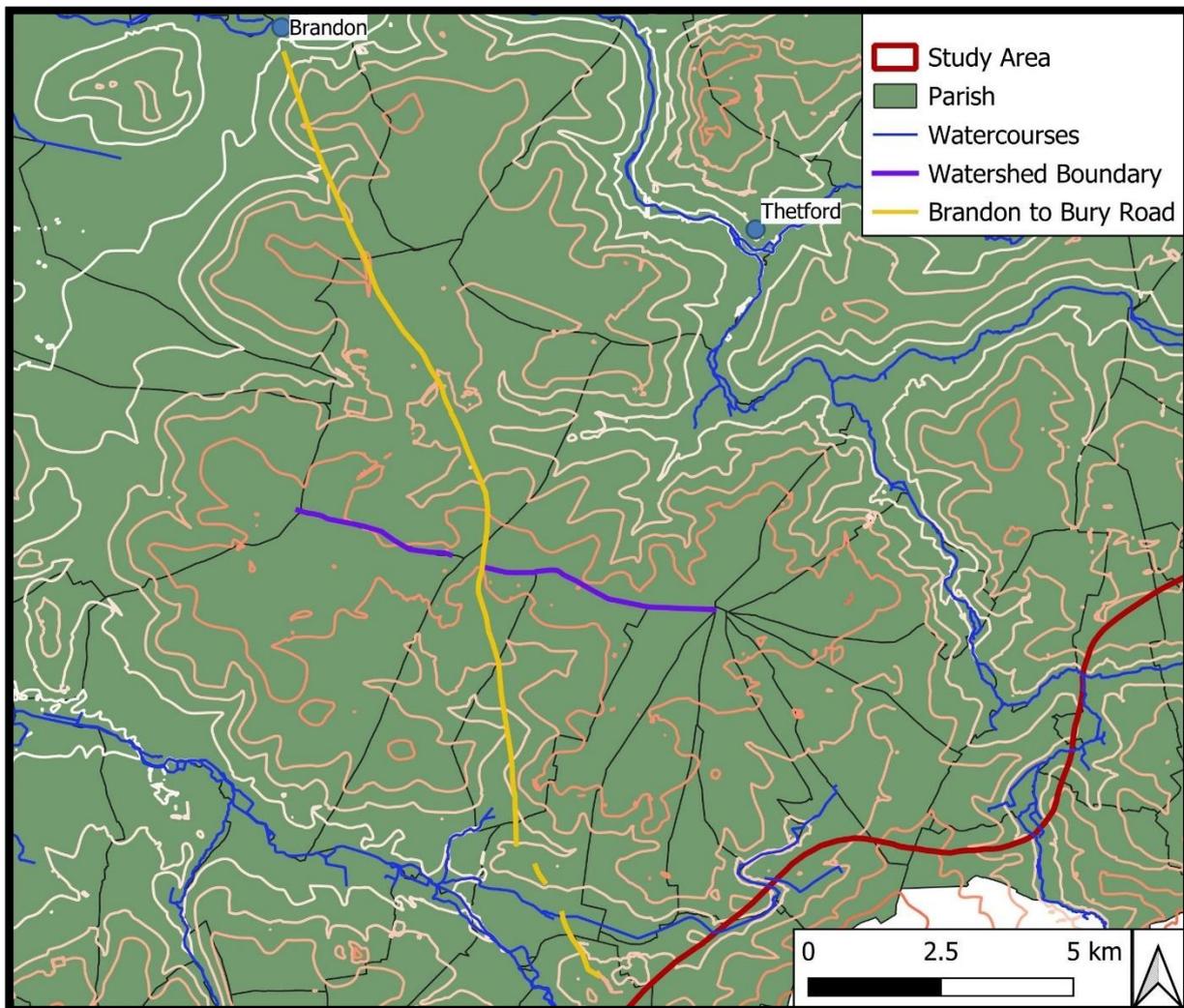
<sup>395</sup> NHER 1289, SHER BAR 027 and CNW 004.

<sup>396</sup> NHER 1398, SHER ELV 016, HIG 007, IKL 015 and LKD 035.

<sup>397</sup> NHER 2796

<sup>398</sup> SHER WRW 049. This feature appears to be more extensive on lidar than is recorded on the current HER.

treated differently as a landscape and was linked into the wider routeway network of the region, rather than being avoided due to any perceived marginality.



*Figure 20: The historic routeway between Brandon and Bury St Edmunds is oblivious to terrain and other boundaries in the landscape.*

### **Parish boundaries and antecedent structure**

The administrative boundaries in a landscape are of a somewhat different character to the more physical boundaries discussed above, but with a clear overlap between the two where a physical boundary such as a road, ditch or watercourse may form a convenient cutoff point at which to divide the landscape. As discussed above, the pattern of parish boundaries around Rymer point is a good example of probable pre-existing routeways being utilised as parish (and in some cases hundred) boundaries in the medieval period and the same may be said of the use of watershed boundaries in Breckland. Similarly, stretches of the Peddar's Way Roman road were also used for administrative division in the medieval period, indicating the topography of an area was not always prioritised for land division if there was a convenient but clear and terrain-oblivious feature surviving in the landscape, such as the parish boundary between Tottington and Thompson and East Wretham, Hockham and Illington. In other cases, by contrast, parish boundaries appear to weave their way through former open field arable landscapes, such as between Great and Little Cressingham, and Hockwold and Feltwell (Figure 21), suggesting the administrative division was solidified after the development of open fields in that area. It should be noted, however, that this form of boundary running through open field systems is not particularly common in Breckland, possibly because areas away from the core of settlement were historically less suitable for arable (see Chapter Ten) and were more likely to be used as breck or heath as a result of the underlying environmental framework of the region. Where these boundaries do exist, they can therefore be seen as implying a greater stability and intensive use of the open field in that area where a clear division was needed from a relatively early date. Other parish boundaries in Breckland also appear to be relatively late and may follow the lines of field boundaries created during post-



*Figure 21: The parish boundary (red) between Feltwell and Hockwold winds its way through systems of open field furlong banks (blue).*

medieval enclosure of common or heath where the previous division may have been undefined on open ground, marked by less permanent features, or adjusted as that part of the landscape was reorganised. Place names in relation to some parish boundaries are also worth mentioning, with parishes such as Great and Little Livermere, Icklingham St James and Icklingham All Saints, and North and South Pickenham, for example, indicating the division of an originally larger territorial unit and the boundary between these must therefore be later than the 'outer' boundary of the original larger unit. As a result, these administrative boundaries assist in providing a degree of dating evidence for features in the landscape, as well as insight into historic land use. As discussed above,

the layout and patterns of administrative boundaries can also give insight into historic territorial arrangements where other evidence may not be available and, in a Breckland context, these may be used to demonstrate that processes of administrative division in the landscape were characterised by similar processes to elsewhere in East Anglia, despite the distinct nature of the study area.

As previously discussed, the parish boundary patterns around Rymer point in Suffolk provide a good example of administrative division informing historic land use and settlement patterns in an area, and a second example worth examining that provide a different insight into the history of the study area are the parish boundaries within Grimshoe Hundred in Norfolk (Figure 22). Grimshoe Hundred covers an area of approximately 278 square kilometres (107 square miles) and is bounded on its northern side by the River Wissey, on its southern side by the Little Ouse River, while to the east it abuts Wayland and Shropham Hundreds with a boundary that runs broadly across the higher ground and incorporates two sections of watershed boundary. To the west the Hundred extends into the Fens where it abuts Clackclose and Ely Hundreds. Grimshoe Hundred is situated broadly in the centre of the study area with some of the hundred extending westward into the Fens. The Hundred contains seventeen parishes but with a noticeably uneven distribution across the Hundred. Thirteen of the parishes lie to the east of the Fossditch linear earthwork, which approximately splits the hundred in half, with the remaining four parishes lying to the west of this and the Fossditch is used as a parish boundary for the adjacent six parishes along the entirety of its length.

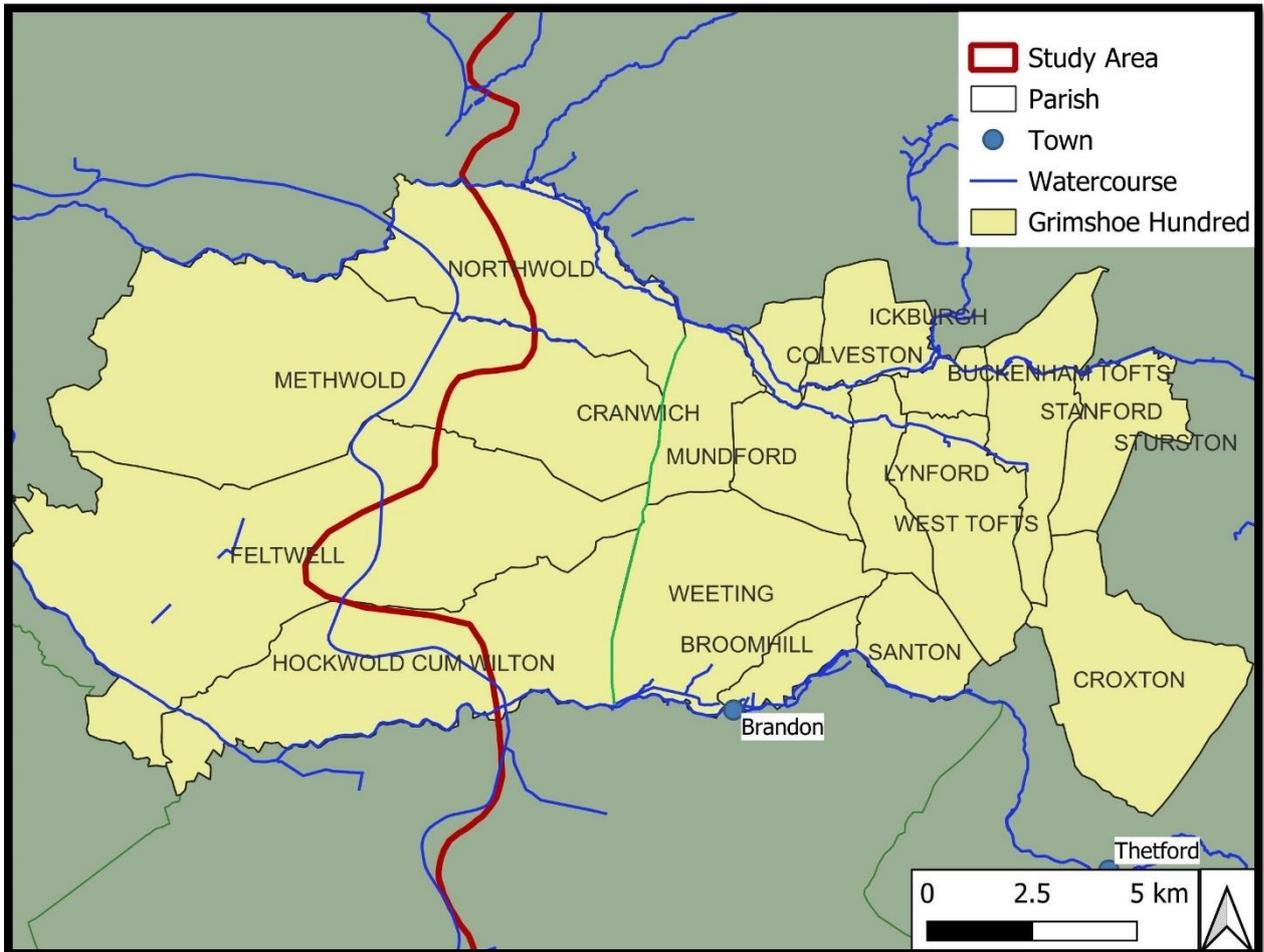


Figure 22: Parish boundary patterns within Grimshoe Hundred. The Fossditch is highlighted in green.

Place-name and documentary evidence provides some explanation for the differences in parish organisation either side of the Fossditch. In particular, the western four parishes are suggestive of an earlier arrangement, with the parish boundaries being a later result of the dividing of an earlier territory. The spatial relationship implied by the place-names of Northwold (OE ‘North wood’), Methwold (OE ‘Middle Wood’) and Hockwold (OE ‘High? Wood’ – see discussion of this in Chapter Eight) suggests these places are named in spatial relation to each other (with Hockwold being the southernmost of the three) at a scale across that half of the hundred to the west of the Fossditch, with little reference to place-names on the eastern side. So too do the parish

boundaries dividing Northwold, Methwold, Feltwell and Hockwold-cum-Wilton imply that they may represent the fission of a once larger territory with their boundaries all running in a broadly east-west direction, forming T-junctions where they meet the Fossditch and resulting in four broadly sub-rectangular parishes in the western half of the Hundred. The Domesday evidence is similarly revealing and supports this assertion. Methwold was large and important estate in the Late Saxon period, with several outlying holdings including land in Thetford and a berewick in Weeting - the parish containing the hundred court site.<sup>399</sup> When the evidence is considered together, it appears as though the western half of Grimshoe Hundred was originally a single, larger estate centred around Methwold that subsequently divided into four smaller units, while the eastern half presents a far more mixed pattern of development.

The development of parishes in Grimshoe Hundred, particularly the posited earlier territory centred on Methwold to the west of the Fossditch, is similar in character to the multiple estate model of early territorial arrangement first developed by Jones in the 1960s and 70s where larger, archaic territories would contain a number of economically specialised sub-units and settlements.<sup>400</sup> Over time, these would fission into their own individual units but may still, in some cases, owe debts of service or landholding to the 'parent' vill with the potential for place-names and boundary patterns to preserve evidence of these earlier arrangements in the landscape.<sup>401</sup> This model has been subsequently refined and applied usefully in a number of different regions in England.<sup>402</sup>

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<sup>399</sup> LDB, Folio 136: Norfolk.

<sup>400</sup> G. R. J. Jones, "Multiple Estates and Early Settlement" in P. H. Sawyer (Ed.), *Medieval Settlement, Continuity and Change* (Edward Arnold, 1976): pp. 15-40.

<sup>401</sup> For an up-to-date summary of the debates and evolution of the multiple estate model, see Williamson, *Environment, Society and Landscape*: pp. 25-30.

<sup>402</sup> *Ibid.*

In an East Anglian context, territorial arrangements fitting with the multiple estate model can be seen where a larger estate has subsequently divided into a series of smaller parishes. Good examples of this include the twelve parishes forming the South Elmhams and Ilketshalls, which has previously been identified as a historic ‘ferding’, that is, a quarter of a hundred,<sup>403</sup> as well as the parishes of Burnham in north Norfolk, which suggest a larger Anglo-Saxon territory subsequently divided into several parishes,<sup>404</sup> as well as archaeological evidence for important Middle Saxon activity.<sup>405</sup> The boundary patterns and documentary evidence for the western half of Grimshoe Hundred is comparable to these other parts of East Anglia and supports the assertion that administrative and territorial organisation within the study area developed along the same lines as wider East Anglia.

### **Iron Age Forts**

While the character of Bronze Age monuments in Breckland is dealt with in a different chapter (Chapter Eight), the presence of Iron Age monuments is somewhat more limited. In part, this is probably because of a posited reduction in population during the Early Iron Age (see page 42), and also because of a shift away from the construction of monuments such as barrows, leaving relatively limited features to survive as above-ground remains when occupation sites often consisted of buildings and features of relatively scant construction. That said, two larger forms of monument are present in Breckland – linear earthworks and forts – that are of potential or definite Iron Age date. The age of linear earthwork monuments in Britain can span the prehistoric to Anglo-Saxon period, with

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<sup>403</sup> Norman Scarfe, *The Suffolk Landscape* (Alastair Press, 1987): pp. 116-128.

<sup>404</sup> Scull *et al.*, *Lordship and Landscape in East Anglia*: pp. 375-399.

<sup>405</sup> NHER 18496.

clear periods of construction of these monuments in the Late Iron Age and Early Anglo-Saxon periods.<sup>406</sup> Within the study area, the dating of these earthworks is varied and unclear. In Suffolk, the Black Ditches running across Risby, Lackford and Cavenham are currently undated.<sup>407</sup> In Norfolk, the Fossditch in Grimshoe Hundred is thought to be Early Anglo-Saxon<sup>408</sup> while excavations across the Devil's Ditch to the west of Garboldisham suggest it had Iron Age origins and was subsequently recut in the Middle Saxon period,<sup>409</sup> while the Bichamditch or Devil's Dyke running from Beachamwell to Narborough is also currently undated.<sup>410</sup> As a result of these varied and uncertain dates, this section will instead focus on earthwork forts, which are more definitively Iron Age. The use of the term 'hillfort' is avoided here as these monuments are not generally sited on hills in an East Anglian context, but they are morphologically analogous to hillforts in other regions, even if their topographic and landscape context is noticeably different.<sup>411</sup>

Two surviving Iron Age forts are present within the study area, one at Narborough sited on the south side of the River Nar<sup>412</sup> and a second at Thetford on the northern side of the Little Ouse,<sup>413</sup> later being incorporated into Thetford Castle. A third probable fort of Middle Iron Age date was excavated in Mildenhall, sited just above the floodplain on the

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<sup>406</sup> Nicky Garland, Barney Harris, Tom Moore and Andrew Reynolds, "Exploring Linear Earthworks across Time and Space – Introducing the 'Monumentality and Landscape: Linear Earthworks in Britain' Project" in *Offa's Dyke Journal*, Vol. 3 (2021): pp. 129-150.

<sup>407</sup> SHER CAM 001, LKD 095 and RBY 002.

<sup>408</sup> NHER 1089.

<sup>409</sup> NHER 6115.

<sup>410</sup> NHER 3937.

<sup>411</sup> Davies *et al.*, *The Iron Age Forts of Norfolk*: pp. 69-72.

<sup>412</sup> NHER 3975.

<sup>413</sup> NHER 5747.

northern side of the River Lark.<sup>414</sup> Within Norfolk and Suffolk more widely, a further four surviving earthwork forts are known, one in Suffolk at Burgh<sup>415</sup> and three in north-west Norfolk at Holkham,<sup>416</sup> Warham Camp<sup>417</sup> and South Creake,<sup>418</sup> as well as possible sites at Wighton<sup>419</sup> and Saham Toney.<sup>420</sup> The earthwork enclosure at Tasburgh may be of prehistoric date but this has never been conclusively shown.<sup>421</sup> The distribution of the Norfolk forts (including Narborough and Thetford) was previously suggested as potentially representing something of a defensive line in the western part of the territory of the Iceni.<sup>422</sup> However, contemporary occupation across all of these features is unclear and it has been suggested that they represent more local developments with the aim being the control of access along particular river valleys.<sup>423</sup> The siting of the Breckland forts matches well with the wider interpretations and siting of forts in East Anglia, with forts in the relatively flat landscapes outside the study area also generally being sited within river valleys or lower-lying ground where the enclosure may have exercised control over a particular access route or waterway in the area. The fort at South Creake appears to be the only exception to this but nonetheless is sited overlooking the River Burn to the east. The construction of forts in Breckland was not carried out with any noticeably different purposes compared to other East Anglian sites and suggests that Iron Age

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<sup>414</sup> Tim Harvard, Mary Alexander and Ray Holt, *Iron Age Fortification Beside the River Lark: Excavations at Mildenhall, Suffolk*, East Anglian Archaeology Report No. 169 (Cotswold Archaeology, 2019).

<sup>415</sup> SHER BUG 002.

<sup>416</sup> NHER 1776.

<sup>417</sup> NHER 1828.

<sup>418</sup> NHER 1910.

<sup>419</sup> NHER 1113 and 2072.

<sup>420</sup> NHER 8745.

<sup>421</sup> Davies *et al.*, *The Iron Age Forts of Norfolk*: pp. 31-58.

<sup>422</sup> *Ibid.*: p. 69.

<sup>423</sup> Harvard, Alexander and Holt, *Iron Age Fortification Beside the River Lark*: p. 148.

settlement patterns in Breckland may be considered to be broadly comparable with the wider region, in turn suggesting that any differences in Iron Age activity in the study area at this time appears to be the result of local environmental factors rather than deliberate efforts to use the landscape differently.

### ***Discussion and Conclusions***

Preserved in the landscape of Breckland to differing degrees are a range of historic routeways, boundaries and monuments that provide insight into how people structured, occupied and controlled the landscape around their administrative and territorial needs. Many of the boundaries discussed here are of Anglo-Saxon or medieval origin, but some may be obviously earlier, such as Roman roads, while others are potentially prehistoric, such as watershed boundaries. By contrast, Iron Age forts represent a class of monument that is generally believed to be important in the administration and control of an area. The examination of the morphology and topographic context of these features within the study area and comparisons with similar forms of routeway, boundary and monument in wider East Anglia reveals that Breckland was subject to the same processes and structuring as elsewhere. This may not always take the form of features that are as extensive or indeed as physically durable as elsewhere in East Anglia, but where certain features are present in the landscape it is apparent that they served the same functions and intentions as is seen in landscapes of different character. The principal implication from this is that people historically viewed and sought to structure the landscape in much the same way as elsewhere, rather than treating Breckland as a distinct landscape and dividing and organising it differently. As a result, it may be said that rather than a conscious choice to purposefully treat Breckland differently during periods of settlement

and population expansion, the differences in settlement and land use patterns were primarily influenced by the local environment impacting how the landscape could best be utilised at any given time.

## **Chapter Seven: Water and Sand – Breckland Hydrology and Drift Sand Activity**

Beyond the direct implications of climatic change on settlement and land use patterns in the region, such as a change in the average annual rainfall, the underlying geological structure of Breckland is also crucial in determining how certain fluctuations may impact human activity. The hydrology, and by extension the availability of water in the landscape, is a factor that influences the choices people have made, both historically and in modern times, of where to settle, the morphology of this settlement, how the land surrounding this settlement is farmed, and how other resources may be managed or exploited. In a practical sense, distinction is also important between the availability of water for human or animal consumption, as while ponds and standing surface water may be acceptable for animals, this is less favourable for humans because of the associated health risks. Examples of humans utilising ponds on the chalk landscapes of the Yorkshire Wolds may be regarded as an exception to this rule.<sup>424</sup> Instead, flowing water sources such as natural springs and streams, along with groundwater accessed through human intervention (usually wells) tended to form the principal means by which people would access their required water supply. In Breckland, there is little evidence to suggest this is any different and the freely-draining geology that characterises the region makes the hydrology and water supply a key factor in influencing historic settlement and land use patterns, with the potential for climatic fluctuations to further impact this. The hydrology of the study area will not necessarily have been static across the study period, with raising and lowering of water tables, changes to river outfall and the associated availability of water outside of the lower valley slopes. It is therefore worthwhile to examine the hydrology of

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<sup>424</sup> Colin Hayfield and Pat Wagner, “From dolines to dewponds: a study of water supplies on the Yorkshire Wolds” in *Landscape History*, Vol. 17 (1995): pp. 49-64.

Breckland, explore how this may have changed across the study period and any impacts this may have had on settlement and land use in the region. Of particular interest are the impact of rising and lowering water tables in both the study area and adjacent Fens, as these appear to have influenced historic episodes of drift-sand activity in Breckland.

To begin, it is worth briefly summarising the wider historiographical background surrounding discussions relating to water supply and historic settlement. This will be followed by characterising the three principal forms of water supply in the region: rivers, aquifers, and perched water tables. After this, examination of the ways in which these different forms of water supply have been managed and exploited across the study period, and the extent to which human activities were impacted by this shall be given, before the impact of water tables on drift sand activity is explored in the second part of this chapter.

### ***Previous Studies of Water Supply***

While some research has argued for the significance of water supply in impacting settlement and land use in a variety of ways, others have steered away from this aspect and instead given more focus to the social and administrative aspects of society rather than environmental concerns. Williamson has pointed out that a shift away from the significance of water supply in the academic literature correlates with a shift from the mid twentieth century onwards towards far greater areas of rural settlement being connected to a mains water supply and the subsequent disregard, in practical terms, of limited water supply as a modern consideration in rural areas.<sup>425</sup> As a potential consequence of the development of this infrastructure, many historians tended to

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<sup>425</sup> Williamson, *Environment, Society and Landscape*: pp. 184-185.

downplay the role of water supply with Christopher Taylor suggesting this was a factor of no concern to those determining where to site their farms.<sup>426</sup> Similarly, Roberts and Wrathmell's study on English regionality gives water supply a passing mention on a few occasions.<sup>427</sup> As a counter to this, Williamson highlighted the importance of water supply as one of a number of factors that would influence settlement location and patterns in a region, with this supply naturally determined by the nature of the underlying geology in a region.<sup>428</sup> It can be summarised (very broadly) that in areas where water supply is more limited, settlement *tends* towards nucleation to access the same areas of limited water supply, such as that seen in Midland counties like Northamptonshire, while in areas where water may be more readily accessed settlement *tends* towards dispersal across the landscape, such as that seen on the clay soils of Norfolk and Suffolk.<sup>429</sup>

One of the challenges highlighted by Williamson is the relative lack of interest and research into historic water supplies, particularly for the medieval period.<sup>430</sup> This is also true of earlier periods where even less appears to have been written on the subject. Burgers' research into Roman water supplies provides insight into the physical structures and methods by which water would be obtained with some exploration of the distribution of these features, but the scope of his study did not cover the broader landscape context of water supply to the average Roman occupation site,<sup>431</sup> while recent larger landscape studies of rural Roman settlement are practically silent on the ways in which the

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<sup>426</sup> Christopher Taylor, *Village and farmstead: a history of rural settlement in England* (G. Phillip, 1983): p. 12.

<sup>427</sup> Roberts and Wrathmell, *Region and Place*: p. 36.

<sup>428</sup> Williamson, *Environment, Society and Landscape*: pp. 184-195.

<sup>429</sup> *Ibid.*

<sup>430</sup> *Ibid.*: p. 186.

<sup>431</sup> Alfonso Burgers, *The Water Supplies and Related Structures of Roman Britain*, BAR British Series 324 (BAR Publishing, 2001).

inhabitants of the large corpus of sites referenced would have acquired their water.<sup>432</sup> It is therefore worthwhile to emphasise that the suggested models for accessing water and the resultant impact on settlement patterns is borne out in the archaeology. Indeed, archaeological excavations on contrasting geologies highlight the differences in structures (principally wells) that were dug to access water. On settlements sited on Lowestoft formation clays, for example, a Romano-British farmstead at Leiston, Suffolk contained no distinct well features,<sup>433</sup> and similarly at Stonham Aspal, Suffolk a site of relatively dense Late Iron Age to Roman occupation also revealed no definitive wells on site.<sup>434</sup> Both of these sites were located on a clay geology that is able to provide a water supply at a relatively shallow depth (see discussion on perched water tables below for the mechanics of this), and it is possible that some of the pits excavated on site may in fact have been the bases of crude, relatively shallow wells. Indeed, the water table on parts of the Stonham Aspal excavation site was observed as appearing at between 30-50cm below the surface even in summer. It should be noted, however, that these and many of the sites mentioned here appeared to extend beyond the limits of excavated areas. Similar patterns are revealed in the medieval settlement archaeology of East Anglia, where a long-lived medieval farmstead on Lowestoft formation clay at Leiston, Suffolk contained three relatively shallow possible wells in the vicinity of the main

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<sup>432</sup> Smith *et al.*, *The Rural Settlement of Roman Britain*

<sup>433</sup> Thomas Lucking and Kerry Boughton, *Land at Johnson's Farm, Saxmundham Road, Leiston, Suffolk: Archive Report* (Pre-Construct Archaeology, 2025), Unpublished Fieldwork Report: pp. 49-58.

<sup>434</sup> Laura Desrosiers-Whalley and Thomas Lucking, *Land South of The Street, Stonham Aspal, Suffolk: Post-Excavation Assessment and Updated Project Design*, Report No. 17639 (Pre- Construct Archaeology, 2024), Unpublished Fieldwork Report.

farmhouse building,<sup>435</sup> while occupation on a similar geology at Elmswell, Suffolk also produced no identifiable wells.<sup>436</sup> By contrast, Roman occupation on the freely-draining chalk at Elveden, Suffolk revealed a well cut deep into the chalk presumably to provide direct access to the underlying aquifer,<sup>437</sup> with a similar feature cutting into the solid geology at Fornham All Saints, Suffolk.<sup>438</sup> Similarly, several wells of both Roman and Anglo-Saxon date were excavated at Brandon Road, Thetford, sited on the river terrace gravels of the Little Ouse, where the aquifer would not have been prohibitively deep to access.<sup>439</sup> At a wider level, too, relatively nucleated Iron Age and Roman settlement at Moulsoe, Buckinghamshire was sited in an area of relatively scarce water supply, and here the site contained a number of “waterholes” and “wells” cut into the clays that contained a perched water table.<sup>440</sup> The recovery of a wooden ladder from one of these features supports this suggestion as it shows people were trying to access water that may have been only accessible at depth in the feature, rather than these simply being ponds for livestock.<sup>441</sup> This particular settlement was sited on a slope where the boulder clay

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<sup>435</sup> Lucking and Boughton, *Land At Johnson’s Farm, Saxmundham Road, Leiston*: pp. 70-72.

<sup>436</sup> Laura Desrosiers-Whalley, *Land East of Ashfield Road, Elmswell, Suffolk: Post-Excavation Assessment and Updated Project Design*, Report No. R14623 (Pre-Construct Archaeology, 2021), Unpublished Fieldwork Report.

<sup>437</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 180-182.

<sup>438</sup> Michael Green, *Marham Park, Bury St Edmunds, Suffolk*, Post-Excavation Assessment Report, SACIC Report No. 2018/040 (Suffolk Archaeology, 2018), Unpublished Fieldwork Report: pp. 190-191.

<sup>439</sup> Rob Atkins and Aileen Connor, *Farmers and Ironsmiths: Prehistoric, Roman and Anglo-Saxon Settlement beside Brandon Road, Thetford, Norfolk*, East Anglian Archaeology Report No. 134 (Oxford Archaeology East, 2010): pp. 9-34.

<sup>440</sup> Chris Winnard, Conor Roycroft and Judy Mlynarska, *Milton Keynes East, Land North-East of Milton Keynes, Areas 2+3, 4, 16B, 18 West and 22, Archaeological Excavation Assessment and Updated Project Design* (Pre-Construct Archaeology, 2024), Unpublished Fieldwork Report.

<sup>441</sup> *Ibid.*

gives way to different soil types in the valley and fits the model of settlement nucleating at point where the water may have been outcropping from the superficial clays. At Rougham, Suffolk too, medieval settlement and industrial activity on the edge of former heathland was sited on an area of sand and gravel geology of similar freely-draining character to Breckland, and each of the defined enclosures contained their own wells cutting through the sand, presumably to access the aquifer in the chalk below, with machine-excavation of one example extending at least 5.5m below the excavated ground surface.<sup>442</sup> It is notable that none of these sites were in the immediate vicinity of a surface water course that may have otherwise acted as a water supply.

The key interpretation to take from these examples is that the archaeological evidence broadly appears to concord with the modelling of settlement patterns in relation to water supply. While the sites discussed above are few compared to the number of excavated settlement sites in the region, and there is almost certainly more subtlety to the overall patterns than can be shown by a small number of sites, they serve to demonstrate two key things. Firstly, that the procurement of a water supply required different approaches in different geologies depending on whether people were seeking to access groundwater in the superficial deposits or water in the underlying aquifer, and that as a result of these factors generated different archaeological features. Secondly, that where the interpretation of extant settlement patterns in the landscape suggests people were accessing water in the superficial geology (usually a clay diamicton) this is borne out in the archaeological record and, conversely, where

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<sup>442</sup> Gary Trimble, *Land at Suffolk Business Park, Rougham, Bury St Edmunds, Suffolk: Post-Excavation Assessment and Updated Project Design*, Report No. R15487 (Pre-Construct Archaeology, 2023), Unpublished Fieldwork Report: p. 34.

interpretations suggest water supplies were more limited and people would be expected to access aquifers in the solid geology or a perched water table this is also borne out in the archaeological record. The result of this is that archaeologically, occupation sites excavated in areas characterised by dispersed settlement patterns also tend to be single farmsteads or small groups of structures forming part of a larger dispersed pattern, while in areas characterised by nucleated settlement patterns, excavated occupation sites also tend to be more nucleated or at the very least restricted in distribution. This appears to be true not only for the medieval period but also as far back as the Iron Age. The overall very useful conclusion to be drawn from this interpretation is that the character of settlement patterns identified by landscape historians in a particular region (usually taken from looking at medieval village forms) is supported by the archaeological record, which often reveals occupation sites that fit these patterns across an even broader time scale. Therefore, the settlement patterns used by landscape historians to characterise an area may be said to represent genuine historic settlement pattern trends over a prolonged period, rather than being relatively late developments in a landscape. Further study of this would potentially yield interesting results for the study of both archaeology and landscape across a range of time periods, but this is beyond the scope of this thesis.

### ***The Hydrological/Geological framework***

The solid bedrock geology of Breckland is chalk within which may be found a freshwater aquifer.<sup>443</sup>The depth of this chalk below the surface varies, with some areas having only a covering of topsoil and possibly subsoil overlying the solid chalk, while other areas have

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<sup>443</sup> BGS, Geology Viewer online.

deeper superficial geologies mainly consisting of diamicton or cover sands.<sup>444</sup> Mapping of the geology shows that, broadly, the western part of Breckland has relatively little superficial geology, while the eastern half has more extensive coverings, with a higher proportion of glacial diamicton (Figure 23). This, in turn, impacts how freely-draining different parts of the Breckland landscape may be, and whether water may be accessed directly from the aquifer contained within the chalk or through perched water tables present as a result of impermeable superficial deposits in some areas.

Mapping of the groundwater depth across the study area (Figure 24) shows the aquifer in the north-eastern and south-eastern parts of Breckland as being up to 30mOD, gradually sloping down westwards to 0mOD at the fen edge.<sup>445</sup> Undulations in the overlying surface topography add a further layer of complexity to this and mean that the depth of the aquifer below the surface is more variable than simply rising up from west to east. It is unfortunate that no published datasets are currently available that map the depth of the aquifer in Breckland to any great extent. However, by comparing the (albeit broad) mapping of aquifer levels OD in the study area against the surface topography, it is possible to plot in a very broad sense the depth of the aquifer from the surface, and therefore how accessible groundwater may be in different areas (Figure 25). As said, the mapping of this is broad at best and does not show areas where there must be a clear uplift in the aquifer, such as at the fluctuating meres of Rymer Point, but does provide an original way of demonstrating the variability in aquifer depth across the study area.

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<sup>444</sup> Ibid.

<sup>445</sup> R. A. Downing, *Groundwater: Our Hidden Asset* (British Geological Survey, 1998).

What is unfortunately not clear from the data available, and indeed may not be possible to define with any level of certainty, is the impact that periods of wetter climate or higher levels in the Fens may have had on the underlying level of the aquifer. It might be reasonably assumed that periods of wetter climate with a higher average rainfall would increase the volume of water in the aquifer, particularly in a freely-draining geology where rainwater can pass unhindered down to the aquifer across large areas, but, from the data available at present, this does not appear to be measurable. Likewise, it can be suggested that because the river catchments of Breckland all drain into the Fens to the west that any increased levels of fenland inundation may slow the rate of outfall from these rivers and therefore sustain a higher volume of water in the rivers, floodplains and underlying aquifer, but again this does not appear to be measurable from the data available. As will be shown below, the settlement patterns of the region broadly correlate with areas of greater water availability in the post-medieval and modern periods, perhaps suggesting that the impact of climatic fluctuations on any changes in aquifer and river levels over the study period were limited or had limited impact on how people were using the landscape.

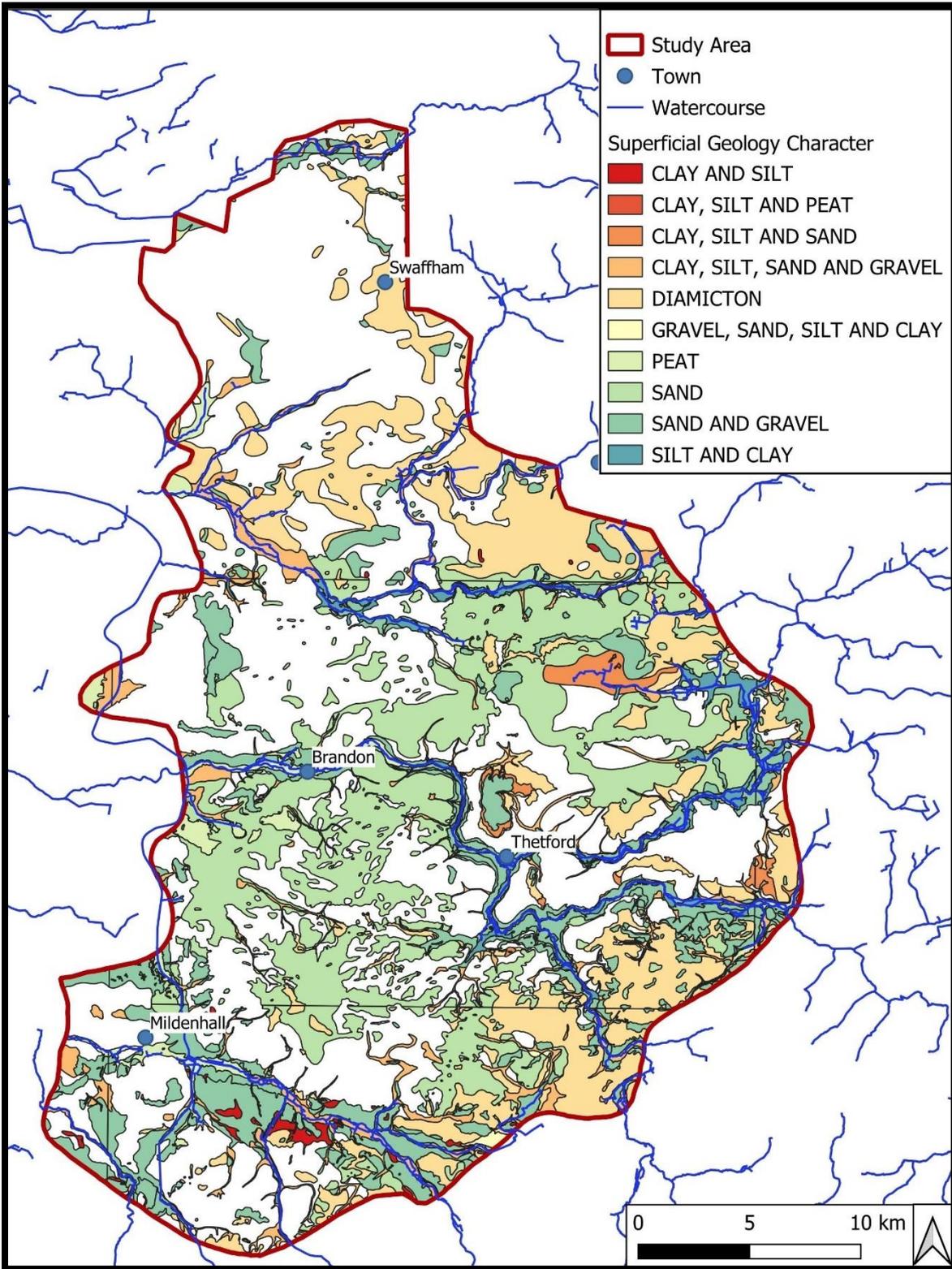


Figure 23: The character of superficial geologies in Breckland.

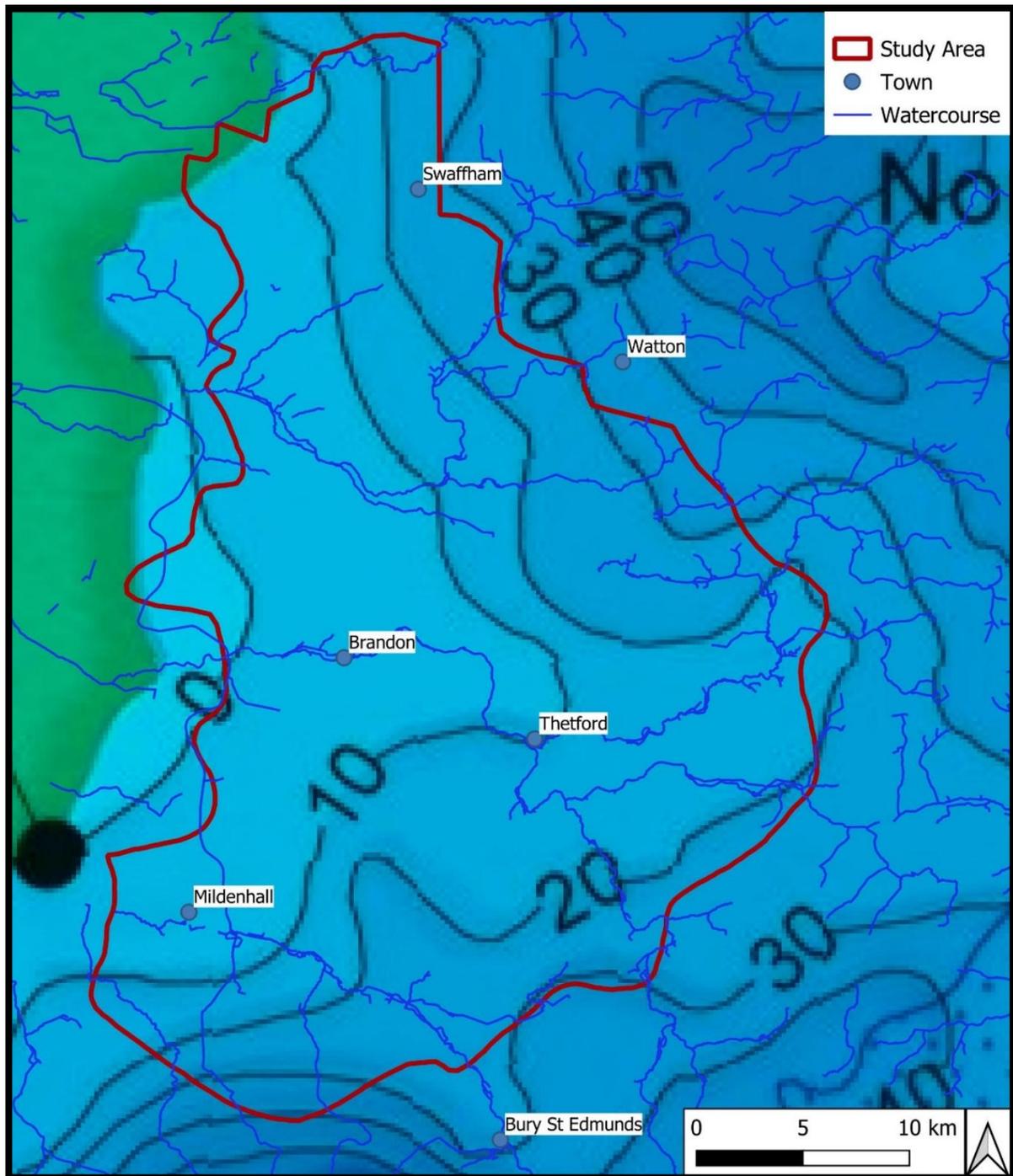


Figure 24: The broadly mapped level of groundwater above sea-level in Breckland. After Downing 1998.

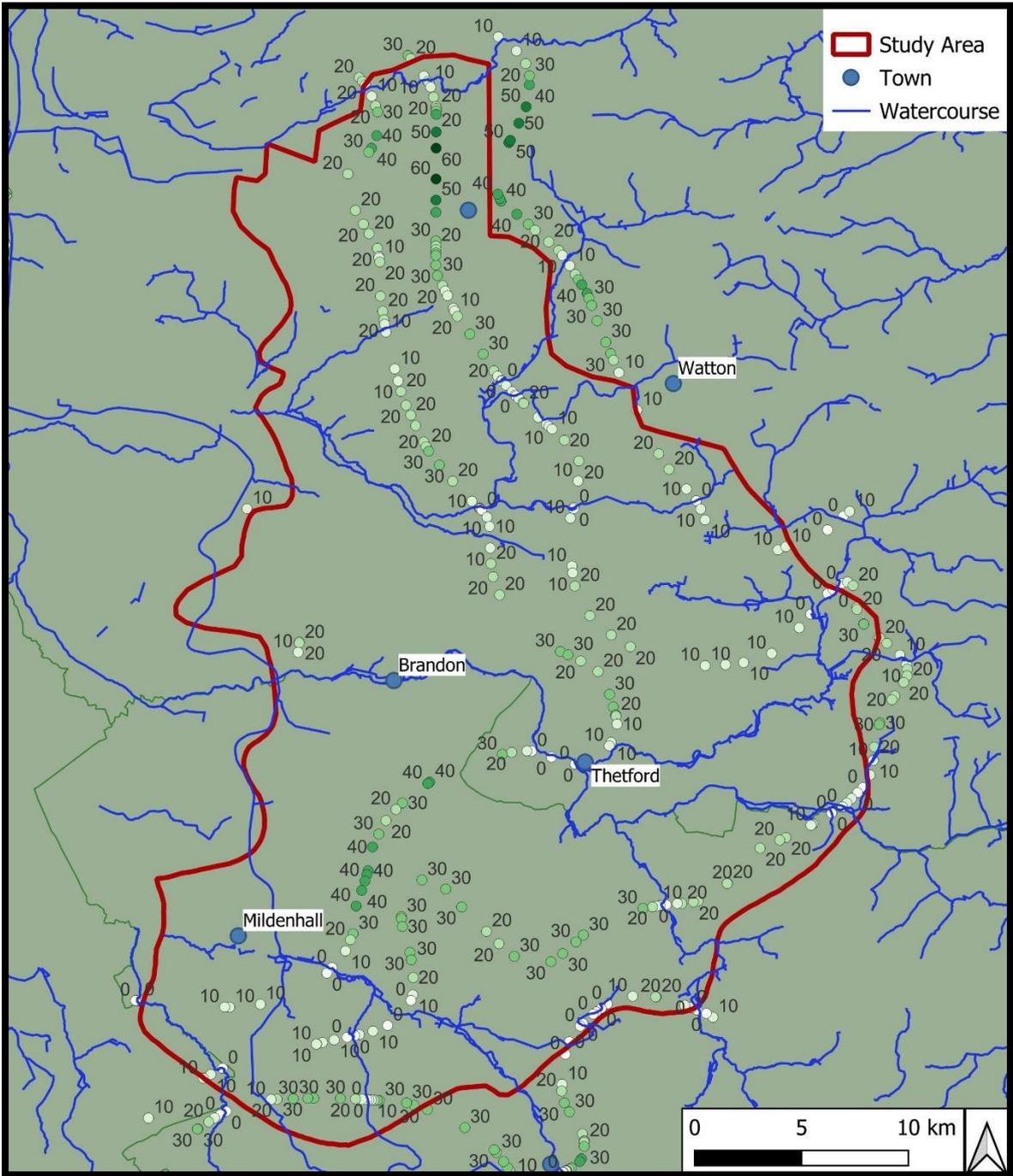


Figure 25: Point data showing the approximate depth of groundwater below the surface of Breckland. Points were measured where the groundwater levels shown in Figure 24 crossed a mapped 10m contour line.

## Rivers

The chalk geology of Breckland is dissected by a number of watercourses, most notably the Gadder, Lark, Little Ouse, Wissey and Thet. These rivers are characterised as being chalk streams, that is, they flow over the solid chalk geology and are also fed by springs in the underlying aquifer.<sup>446</sup> As a result, the water in these rivers tends to maintain itself at a constant eleven-degrees Celsius and rarely freezes.<sup>447</sup> The management of rivers and floodplains was carried out in England during the Roman period, but there is little evidence for this in Breckland and it is probable that these streams saw little serious attempts at water management until the medieval period. Prior to the medieval period, the rivers were likely to be slower flowing in natural courses, with some of the upper reaches perhaps being formed more as broad damp plains through which the water flowed rather than defined channels.<sup>448</sup> From the medieval period onwards, it is known that some rivers, such as the Lark and Linnet<sup>449</sup> were increasingly subject to human management regimes including the development of meadows on the adjacent floodplains, the cutting and clearing of banks to maintain navigability and the eventual canalisation of some areas. As a result, the Rivers Lark and Linnet have been described as bearing “little resemblance to the rivers of a millennium ago”.<sup>450</sup> Recent studies of the Breckland rivers have highlighted their role in trade, communication and industry in the

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<sup>446</sup> Libby Ranzetta, “The Rivers Lark and Linnet at Bury St Edmunds: Their Hydrology and Landscapes” in *The Journal of Breckland Studies*, Vol. 4 (2020): p. 45.

<sup>447</sup> Ibid.

<sup>448</sup> Ibid: p. 47.

<sup>449</sup> Ibid.

<sup>450</sup> Ibid.: p. 51.

region and emphasised the post-medieval efforts to improve navigability and make use of the rivers for industrial processes such as milling.<sup>451</sup>

The outfall of these rivers will naturally have been impacted by these changes, with straightened stretches and fewer obstructions to slow down the rate of flow. The modern abstraction of water, both directly from the rivers and from the aquifers that feed them, will likewise have potentially reduced the overall volumes of water flowing down the Breckland rivers. In particular, the mid-twentieth century construction of the Cut-off Channel along the western side of Breckland to carry excess water from the Lark, Little Ouse and Wissey in times of flooding means that these rivers are subject to much reduced fluctuation in their levels during times of heavy rainfall, are less likely to burst their banks onto surrounding areas, and the water within these catchments is removed much more efficiently than would have occurred historically, potentially reducing the overall groundwater levels in some areas. As such, the modern situation with the Breckland watercourses can only provide so much insight into historic river levels and their potential impacts on the surrounding landscape, but by taking these levels as a starting point on the basis that the rivers are probably lower than they may have been historically, at least in the last thousand years, and comparing them with climatic and other factors, it may be possible to extrapolate historic river conditions in the study area.

### Groundwater/Aquifers

The underlying chalk bedrock of Breckland contains a groundwater aquifer, the depth of which varies across the study area, as well as the upward movement of water towards

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<sup>451</sup> James Parry (Ed.), *Industrious Rivers: A History of the Waterways of Breckland* (The Breckland Society, 2024).

the surface depending on the thickness and permeability of any overlying confining cover.<sup>452</sup> The depth of groundwater is not uniform and may vary by following the grain of the chalk. The overlying topography of the region also influences where groundwater may be stored in a confined aquifer and where it may be able to appear at the surface as an unconfined aquifer in the form of springs or standing water, which in some cases may be at a higher point in the landscape than some drier areas at a lower altitude. This again is influenced by the confining cover in these areas preventing the water from naturally reaching its potentiometric surface level but may allow boreholes and wells excavated in these areas to act under Artesian pressure. The raised meres at Rymer (Suffolk) and Ringmere (Norfolk), many of which are fed by this movement of groundwater, provide a useful example of this. At Rymer particularly, the presence of a superficial diamicton geology (see below) over part of the area surrounding the meres may have aided in maintaining water levels through reduced drainage and the sideways movement of rainwater into the meres due to a relatively impermeable geology. The fluctuations of the aquifer-fed meres show that they are sited on the upper limits of this groundwater, which at certain times may drop below the levels needed to sustain water within the meres if water levels in the aquifer reduce. Historic aquifer levels are hard to determine, but a correlation has been noted between the impact of sea-levels on fenland inundation and drift sand activity in Breckland, with the suggestion that greater inundation of the Fens may have raised water tables in Breckland and helped to stabilise the sandy soil (see below, pages 189-203).<sup>453</sup>

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<sup>452</sup> Ibid.: pp. 42-44.

<sup>453</sup> Mark Bateman and Steven Godby, "Late-Holocene Inland Dune Activity in the UK: A case study from Breckland East Anglia" in *The Holocene*, Vol. 14, No. 4 (2004): p. 584.

Mapping of the groundwater levels within the study area have been undertaken at a broad level (Figure 25), showing the changing contours of the aquifer relative to sea-level. These can be compared against the surface topography and overlying geology to gain an insight into the depth of the water table below certain parts of the study area. The groundwater mapping is relatively broad and may not show details such as upshots in the aquifer that must surely exist at places such as Rymer despite this not being shown on the mapping.

Along the lines of the Thet and Little Ouse rivers, the aquifer is mapped as being at no more than 20mOD. Compared with the overlying topography, surface outcropping of the aquifer occurs along the level of the principal chalk watercourses of the region, which, as described above, provides much of the water that feeds these rivers, as well as at some of the chalk-fed fluctuating meres. At other locations, there may be as much as 40m between the surface and the groundwater aquifer. The relationship between aquifer access and historic settlement is discussed in more detail below.

#### Perched water tables

The presence of perched water tables is recorded in Breckland where clay diamicton, usually of Lowestoft Formation overlies the solid chalk geology.<sup>454</sup> The mechanics of a perched water table in Breckland functions through the relatively impermeable clay providing limited and often slow downward movement of surface water (mostly rainwater) with occasional, irregular pockets of more permeable sandy material intercalated within the diamicton, facilitating horizontal movement and potential storage of water in a localised table within this geology. The result of this is the potential for

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<sup>454</sup> BGS, Geology Viewer online.

freshwater to be encountered at a much shallower depth relative to the underlying aquifer, but with the trade-off of a potentially less reliable supply that is much more reliant on rainfall to maintain this.

Geological mapping of superficial deposits in Breckland, particularly the less permeable materials, may be compared with recorded surface water (meres, lakes, ponds, watercourses) on modern and historic Ordnance Survey mapping. It reveals a clear correlation between areas of surface water and deposits of less permeable superficial geology in areas outside of the lower slopes of river valleys or places where the underlying aquifer is mapped as being relatively shallow. Clear examples of this include a series of ponds to the east of the village of Elveden, located on a band of diamicton on a relatively interfluvial zone (Figure 26), and a scatter of ponds around Swaffham, which are almost entirely confined to areas of diamicton and absent on the solid chalk geology to the west (Figure 27). It must be considered that the mapping of surface water does not represent every possible place in Breckland that can maintain a perched water table, as some areas may have had features that have been subsequently removed by processes such as agriculture and the natural infilling of ponds and hollows over time. That said, the overall correlation shown by this mapping strongly suggests that perched water tables could have provided a source of accessible water in areas away from the principal river valleys and areas of relatively shallow aquifer depth. Further examination of the relationship between perched water tables and historic settlement is given in the sections below that discuss different historic periods.

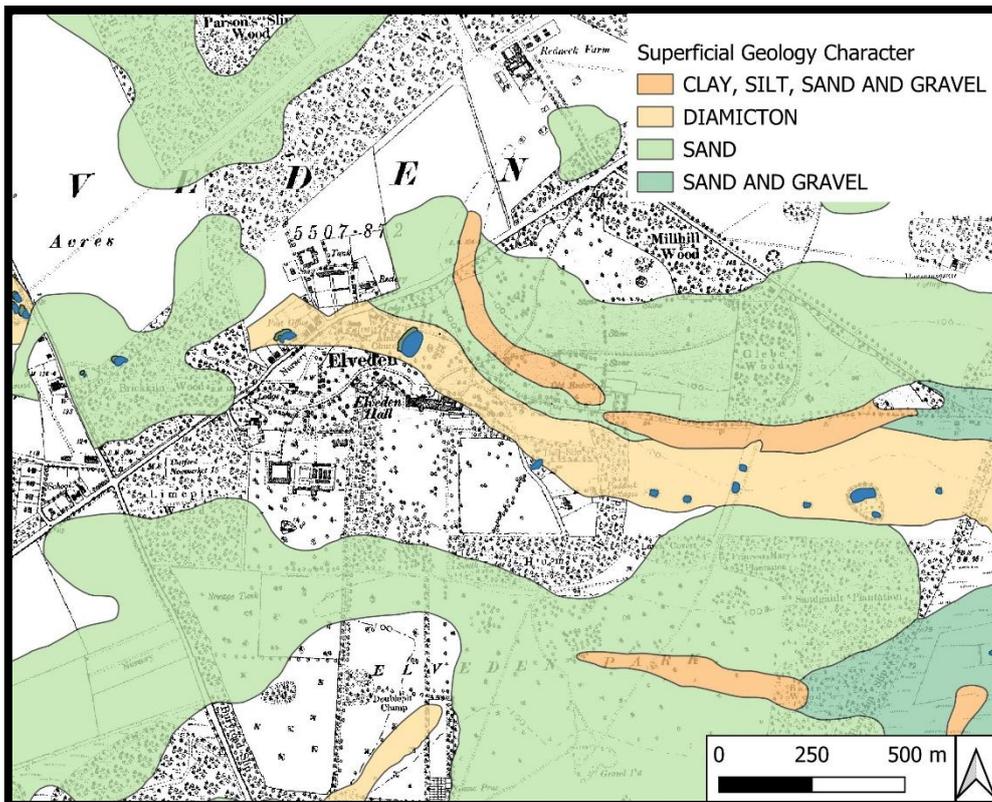


Figure 26: The relationship between surface water features and superficial geology at Elveden, Suffolk.

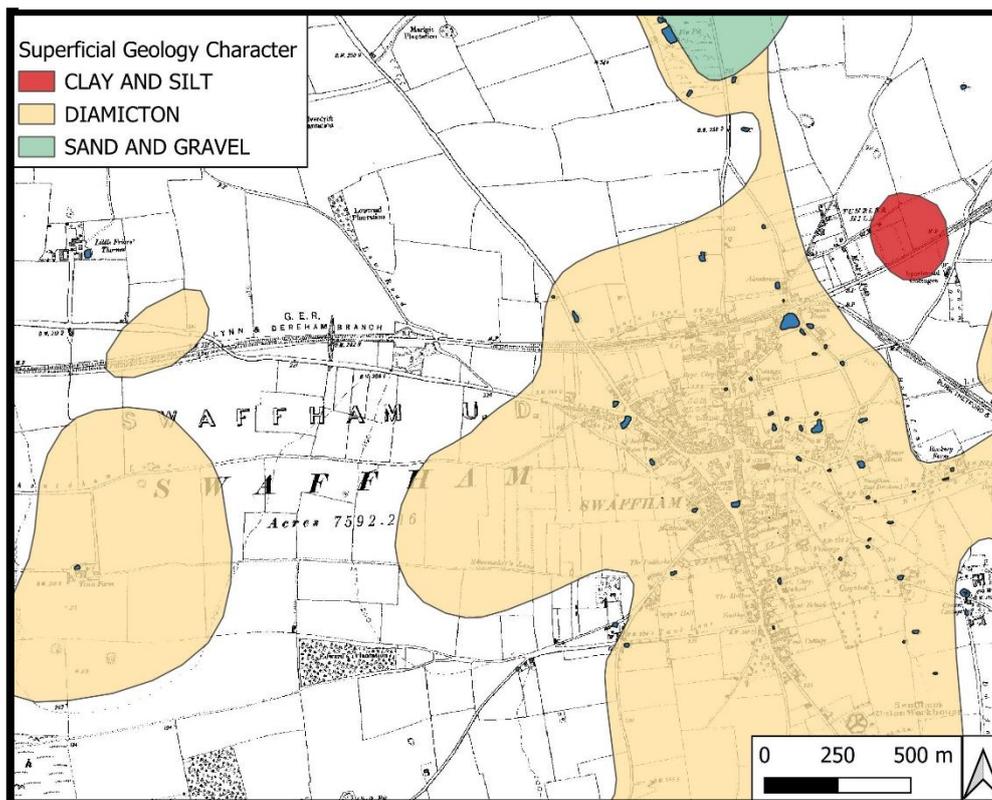


Figure 27: The relationship between surface water features and superficial geology at Swaffham, Norfolk.

Comparison of surface water distribution across the rest of Norfolk also serves to emphasise that the broad picture of limited surface water supply in Breckland is almost certainly reflective of the historic availability of water, even if some places that may have had historic surface supplies have since been lost. To demonstrate this, surface water mapped in Norfolk was processed in GIS with a 250m buffer to broadly represent an area where the geology likely made surface water more easily accessible, or where people could live within a short distance of a supply (Figure 28). When mapped in such a way, the contrast between Breckland and the surrounding landscapes is stark, with the Brecks National Character Area strongly correlating with a relative dearth in surface water features compared to the adjacent Fens and South Norfolk claylands, which by contrast show blanket coverage (and by extension accessibility) of surface water features. This correlation is perhaps unsurprising but serves to demonstrate that the availability of surface water is as much of a defining characteristic of Breckland as the other environmental factors and relatively dry climate. The significance of this in relation to medieval settlement patterns is discussed below.

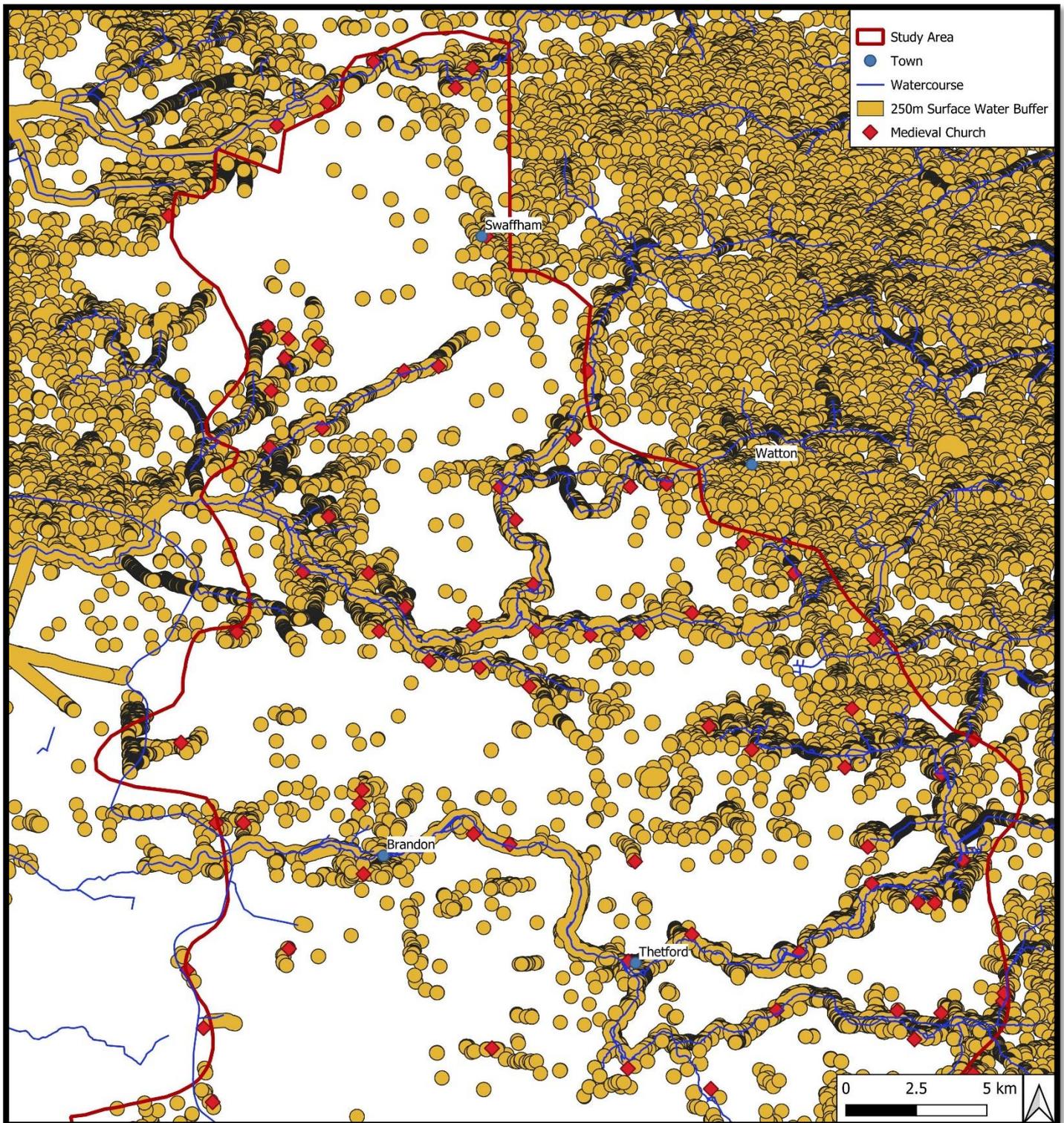


Figure 28: Buffering of surface water features in Norfolk highlights the contrast in water availability between Breckland and surrounding landscapes and the correlation of medieval churches with areas of surface water availability.

### **Settlement Patterns and Water Supply**

Now that the underlying mechanics of the hydrology of Breckland have been summarised, it is worth examining this framework against the settlement and land use patterns of the region across the study period. This will allow the relationship between water supply and human activity in Breckland to be better characterised and potentially show any impact that changes to water supply may have had on settlement and land use patterns in the region.

### **Bronze Age and Iron Age**

Bronze Age and Iron Age settlement appears to be focussed on areas with a greater availability of water, within the principal river valleys or in areas beyond these where perched water tables might be expected. In particular, the larger monuments of this period, such as the upstanding ‘hillforts’ at Thetford<sup>455</sup> and Narborough<sup>456</sup> are both sited on their respective river terraces, alongside an excavated ‘hillfort’ at Mildenhall.<sup>457</sup> An Early to Middle Iron Age enclosed site at Micklemoor Hill, West Harling is also located on a raised area overlooking the River Thet.<sup>458</sup> Environmental evidence from Staunch Meadow, Brandon also suggests a rise in water tables at this time, interpreted as a possible result of woodland clearance.<sup>459</sup> However, Bronze Age material recorded on the HER also shows a more extensive pattern of activity outside of these areas that, even when the presence of barrows is accounted for, shows slightly less correlation with water supply than succeeding periods. One reasonable explanation for this is that not all

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<sup>455</sup> NHER 5747.

<sup>456</sup> NHER 3975.

<sup>457</sup> Harvard, Alexander and Holt, *Iron Age Fortification Beside the River Lark*.

<sup>458</sup> NHER 6019.

<sup>459</sup> Tester *et al.*, *Staunch Meadow, Brandon*: p. 1.

activity need necessarily represent permanent occupation sites across what is a relatively long time period in the archaeological record. Activity detected and subsequently recorded on the HER may represent short-term, outlying areas of activity where people and animals may not have stayed for any great length of time, such as processing areas for material collected from the wider landscape, or even areas of arable manured with material from settlement sites. Despite the relatively dry landscape, nowhere within the study area is reasonably more than two or three hours walk from an area of more reliable water supply, meaning that travelling to and from these areas could easily be achieved within a single day. Indeed, the flint assemblages collected from Wangford Warren, a reasonable proportion of which may also be Neolithic, contained a notably low proportion of finished implements relative to the quantity of debitage, perhaps suggesting that people were travelling onto the site to collect surface nodules of flint, manufacture their required tools on site and then transport these back to the zones of settlement rather than these scatters necessarily being an indicator of settlement.<sup>460</sup>

### Roman

The distribution of Roman settlement taken from the county HERs shows that occupation sites were generally either within river valleys, on areas that have diamicton deposits recorded as the superficial geology, or have standing water shown on the OS maps, implying the water table is not particularly deep. At Wangford Warren, the Roman farmstead was positioned in a hollow at the base of the valley, where access to water would have been easier and the aquifer is slightly closer to the surface, and the

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<sup>460</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*: pp. 109-112.

assumption here is that wells would probably have been constructed through the chalk as was seen on contemporary activity on the nearby A11 road scheme.<sup>461</sup> The valley floor running between Wangford and Lakenheath warrens has also probably seen a degree of natural infilling over the centuries<sup>462</sup> and may therefore have been deeper and potentially damper as the ground surface would have been closer to the underlying aquifer, or would have provided a useful zone in which relatively shallow wells could be excavated. By contrast, the Roman (and other) activity at Elveden is a prime example of seeking out limited water supplies on the higher ground outside of the river valleys. A Roman well dug into the chalk on the A11 road scheme excavations<sup>463</sup> represents a clear attempt to reach the aquifer to ensure a reliable supply at a time when the labour to excavate such a structure was relatively cheap and plentiful, while the perched water table to the east of the present village may have provided some water from shallower wells tapping into groundwater within the diamicton, or as water provision for livestock from ponds/hollows.

Other records of Roman activity in Breckland, particularly those derived from fieldwalking surveys,<sup>464</sup> may not necessarily represent occupation, with the recovery of Roman pottery sherds and stray metalwork in many cases appearing to represent

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<sup>461</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 180-182.

<sup>462</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*. Removal of topsoil deposits showed that some areas near the valley floor contained apparently thicker layers of subsoil.

<sup>463</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 180-182.

<sup>464</sup> For examples, see Davison, Green and Milligan, *Illington: A Study of a Breckland Parish*: pp. 2-3; Davison and Cushion, "An Archaeological Survey of the Stanford Training Area, 2000-02": pp. 602-616.

material scattered through manuring of the arable with the associated farmsteads more likely to be adjacent to these zones, sited where domestic water supply was more easily available. Again, the more detailed survey of landscape in Wangford Warren provides a crucial example of this, with a background of Roman material generally dispersed across the 125-hectares of investigated landscape with only a single distinct occupation site present in one corner.<sup>465</sup> Similarly, as will be discussed in Chapter Nine, if cattle appeared to be the preferred livestock animal in the Roman farming regime then the increased water needs of cattle compared to sheep may have meant that the cattle were more likely to be kept closer to the farmsteads where adequate water supplies were available and/or stall-fed. Their keeping, possibly principally as traction animals and to provide an indirect source of manure (See Chapter Nine), may also have limited the desire to have them freely-grazing on the arable or heathland. Excavated enclosure and boundary systems around Roman farmsteads in the region, such as on the A11 road scheme,<sup>466</sup> at Brandon Road, Thetford,<sup>467</sup> and at Norwich Road, Kilverstone<sup>468</sup> may have therefore been intended as livestock enclosures to keep cattle relatively close to the farmsteads, rather than small enclosed arable fields. By contrast, the arable landscape may have been more open in character with reduced need to construct livestock proof ditches and other structures that might survive archaeologically if the cattle were kept closer to water supplies near the farmstead.

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<sup>465</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*: p. 109-112.

<sup>466</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 98-99.

<sup>467</sup> Atkins and Connor, *Farmers and Ironsmiths*: pp. 9-19.

<sup>468</sup> Garrow, *Archaeological Excavations at Norwich Road, Kilverstone*: pp. 26-49.

### Anglo-Saxon

Settlement patterns for the Anglo-Saxon period show much reduced activity within the study area and a broad contraction into the principal river valleys where water would be much more easily accessed, or again, seeking out areas with an overlying diamicton. Some of the HER records appear to be on drier parts of Breckland where water would be limited, but many of these are either isolated finds, which in the case of Early Anglo-Saxon (c. fifth-seventh century AD) objects are usually attributed as indicative of cemetery sites,<sup>469</sup> or in many cases are more definite cemetery sites, sometimes making use of prehistoric barrows.<sup>470</sup> An Early Anglo-Saxon cemetery at Swaffham is sited on the relatively higher ground but as discussed below settlement in this area is probably making use of the water from the overlying diamicton.<sup>471</sup> Other finds could conceivably represent stray losses or more ephemeral sites that did not leave many remains, perhaps focal points for the processing of materials gathered from the heathland before transport back to settlement. Activities such as this may not have required a water supply in close proximity. The Middle Saxon (c. seventh-tenth century AD) activity appears to continue this trend and at Wangford Warren activity of Early and Middle Saxon date was limited to a single hooked tag recovered from the vicinity of the Roman farmstead complex,<sup>472</sup> providing a clear indication that the intense agricultural use of the landscape had seemingly contracted in the post-Roman period. Late Saxon activity (c. tenth-eleventh century AD) also appears to be limited to areas where water would be more readily

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<sup>469</sup> Mary Chester-Kadwell, *Early Anglo-Saxon Communities in the Landscape of Norfolk*, BAR British Series 481 (Archaeopress, 2009).

<sup>470</sup> For examples, see SHER BNH 016 and SHER MNL 001.

<sup>471</sup> NHER 1125.

<sup>472</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*: p. 75.

available and this date appears to see the emergence of the medieval settlement patterns of the region, discussed in more detail below.

### *Medieval and early-post medieval*

Medieval and post-medieval Breckland, in contrast to much of East Anglia, is often described as being of a more ‘champion’ type landscape. That is, the agricultural landscape tended to be formed of large-scale open field agriculture with settlements that tended to be more nucleated in form, in comparison with areas such as the south Norfolk clays where settlement would often be more scattered and dispersed across the landscape, despite the clays having a higher population density at Domesday.<sup>473</sup> Studies of settlement patterns in Northamptonshire, the typically cited example of a ‘champion’ landscape, have suggested that the nucleated settlement patterns in that region were, in part, linked to a restricted availability of water and this required settlements to nucleate in areas where water was most easily available.<sup>474</sup> This is in contrast to places such as south Norfolk, where water is easily available over a much larger area and settlement could therefore disperse across the landscape without being restricted to certain places. In Breckland, the medieval settlement pattern is one that is generally more nucleated in form, correlating with the more ‘champion’ character of the landscape. Those that are more nucleated in form appear to have remained relatively stable for a prolonged period, attested to by the fact that these villages often lie in relatively close proximity to their parish church(es) (see discussion below). Outlying common-edge settlement and isolated farmsteads of pre-enclosure date are rare within the study area, with most

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<sup>473</sup> Tom Williamson, *The Origins of Norfolk* (Manchester University Press, 1993): p. 112.

<sup>474</sup> Williamson, *Environment, Society and Landscape*: pp. 186-193.

villages being clustered within a short distance of their parish church. Where churches have become isolated in the landscape, this appears to be the result of either the overall decline of a settlement, rather than it shifting to elsewhere in the parish, something attested to in East Anglia at places such as Fransham in Norfolk,<sup>475</sup> or through the incorporation of a church into post-medieval parkland and the subsequent moving of a village at this time, also seen in East Anglia at places such as at Euston in Suffolk<sup>476</sup> and Didlington in Norfolk.<sup>477</sup> That said, settlement patterns within the region are not uniform and the variation encountered in the location and morphology of villages appears, to some extent, to be influenced by the availability of water in the landscape. This settlement morphology will also influence (and be influenced by) the development of the surrounding agricultural landscape, the character of which bears a strong correlation with underlying soil types and is discussed more in Chapter Ten (pages 342-352). The medieval settlement patterns of the area bear correlation with the underlying environmental framework, with settlement generally located in areas where water was more easily accessible and the morphology of this is further influenced by how easily this water could be accessed in a given landscape. Historic maps of Cockley Cley (Figure 29)<sup>478</sup> and Oxborough (Figure 30),<sup>479</sup> for example, show more nucleated forms of settlement with the villages clustered on the lower valley slopes where water would have been more easily accessed on the damper but limited tracts of Isleham 2 soils.<sup>480</sup> By

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<sup>475</sup> Andrew Rogerson, *Fransham: People and Land in a Central Norfolk Parish*, East Anglian Archaeology Report No. 176 (Norfolk Historic Environment Services, 2022).

<sup>476</sup> SHER EUN 020.

<sup>477</sup> NHER 40234.

<sup>478</sup> NRO FX 386, *Map of Cockley Cley* (1722).

<sup>479</sup> NRO BRA 2524/1, *Map of the parish of Oxborough, showing the lands of Sir Henry Bedingfield, by Philip Wissiter*, (1722).

<sup>480</sup> Hodge *et al.*, *Soils and their Use in Eastern England*: p. 231-236.

contrast, historic mapping of Foulton (Figure 31)<sup>481</sup> shows a far more dispersed settlement pattern around a large green on an area of wetter, heavier and more extensive Wickham 2 soils in the western half of the parish,<sup>482</sup> giving the village a morphology that would not look out of place on the Norfolk clays. The easier access to water afforded by the underlying soil type around the village may therefore have allowed the occupants to disperse more widely across the landscape than elsewhere in Breckland, while in places such as Oxborough and Cockley Cley people were more restricted in where they could settle because the accessibility of water in those places was similarly limited. Likewise, at Wangford in Suffolk, the medieval village core appears detached from the main block of arable land in the parish (see chapter Ten, pages 348-349) and this is probably a result of trading-off proximity to arable soils with the need for access to water. The village is on the lower ground towards the fen edge but sited on acid sands not generally suitable for arable farming, while the open fields were located on more suitable soils on the higher ground to the east.

The location of a church is often used as a proxy indicator for the core of a medieval settlement, being a building that had a central role in the life of a village and that, in many cases, was founded in an earlier core that may have subsequently shifted away from the church. Archaeological studies of church locations in wider East Anglia have demonstrated that, even if a church has become isolated in a landscape, it was often originally within an area of focussed settlement that had its origins in the Late Saxon period with some places, such as Longham and Mileham in Norfolk, showing evidence of

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<sup>481</sup> NRO MC 86/1, *Map of the manor of Foulton belonging to Francis John Tyssen surveyed by Thomas Warren of Bury St Edmunds*, (1770).

<sup>482</sup> Hodge *et al.*, *Soils and their Use in Eastern England*: p. 351-354.

Middle Saxon settlement development.<sup>483</sup> The distribution of medieval churches within Breckland therefore provides insight into the importance of water as a factor in determining medieval settlement locations in the region. In Breckland, it is unsurprising to see many of the churches sited in the lower valley slopes, near to rivers where the topography and groundwater naturally interact, where much of the water supply for the rivers in the region is fed by the chalk aquifer,<sup>484</sup> and where the aquifer is often mapped as being 10m or less below the ground surface (Figure 32). However, on the rare occasion where a church (and by extension settlement) is located outside the lower valley slopes and where the aquifer may lie at some depth below the surface, the water supply appears to be reliant on a perched water table generated by an impermeable superficial geology. At Swaffham, for instance, the aquifer is mapped as being around 40m below the ground surface, but the town is sited on an area of relatively impermeable diamicton, and archaeological investigations around the town have revealed boulder clay in some areas.<sup>485</sup> At Elveden, too, the church and village are on an interfluvium between the rivers Lark and Little Ouse with the aquifer also potentially at some depth. However, the church and village are sited on a band of diamicton overlying the chalk, which most likely provided a perched water table as a reliable water supply, attested to by the presence of a series of modern ponds in this area to the east of Elveden Hall (26). It should be noted here that the presence of a perched water table does not necessarily mean that a

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<sup>483</sup> For examples, see: Wade-Martins, *Fieldwork and Excavation on Village Sites in Launditch Hundred*; Davison, *The Evolution of Settlement in Three Parishes in South-East Norfolk*; Davison *et al.*, *Illington: A Study of a Breckland Parish and its Anglo-Saxon Cemetery*: pp. 3-4.

<sup>484</sup> Ranzetta, "The Rivers Lark and Linnet at Bury St Edmunds": pp. 40-53.

<sup>485</sup> For example, see Thomas Lucking, *Land South of Norwich Road, Swaffham, Norfolk: An Archaeological Evaluation and Investigation*, Report No. R14004 (Pre-Construct Archaeology, 2020), Unpublished Fieldwork Report: p. 7.

settlement was reliant upon that water source, but rather that the availability of a perched water table may have provided enough of a reliable supply to allow settlement to persist long enough for the construction of deeper wells to access the underlying aquifer.

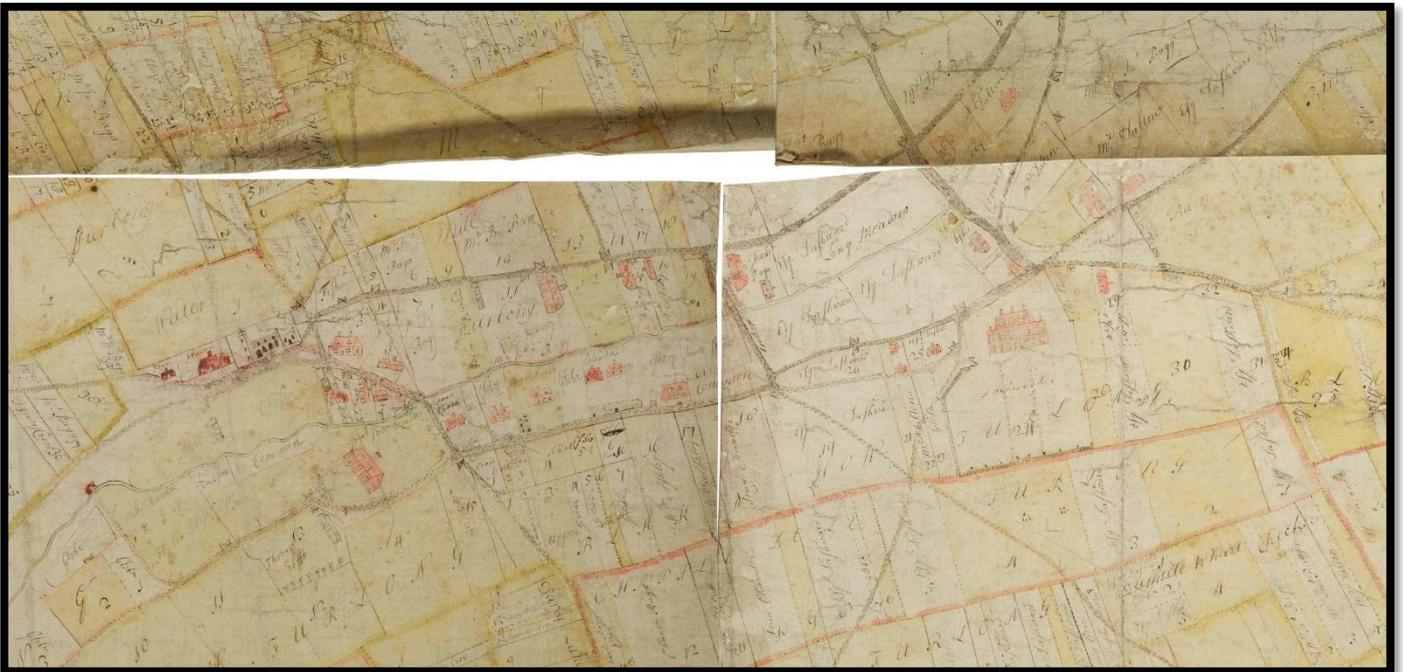


Figure 29: Nucleated settlement in the Gadder valley at Cockley Cley. NRO FX 386 (1722).



Figure 30: Nucleated settlement in the Gadder valley at Oxborough. NRO BRA 2524/1 (1722).



Figure 31: Dispersed settlement at Foulenden in relation to surface soil associations. The area of grey represents soils of the Wickham 2 association. NRO MC 86/1 (1770).



Figure 32: Extract of Faden's Map of Norfolk (1797) showing the post-medieval settlement patterns of Breckland. Most settlements are near their parish church (indicated by a +) on the lower valley slopes. A number of churches have been incorporated into landscape parks.

The overall picture that emerges of medieval settlement in the region is one of relatively nucleated settlements, the vast majority of which were sited within the river valleys of the study area, where water would have been far more easily accessed (Figure 32). The villages themselves appear to be relatively stable, often remaining close to their parish church(es) and with few common-edge settlements. This is in clear contrast to the settlement patterns of the surrounding regions, where common-edge settlement and

settlement shift occurred far more frequently, in many cases leaving the parish church standing in isolation or towards the edge of settlement in the landscape.<sup>486</sup> Water supply in these regions is accessible across far larger tracts of the landscape than in Breckland. It is also worth noting that settlements that subsequently saw desertion or significant shrinkage in the later medieval and post-medieval periods all still fall within the zones where water is more easily obtained. Timworth in Suffolk<sup>487</sup> and Cley St Peter in Norfolk,<sup>488</sup> for example, are both located on the lower valley slopes. Wordwell in Suffolk is higher up the side of the Lark Valley but located in an area of springs that form into a small tributary of the Lark.<sup>489</sup> It therefore appears that water supply was of limited contribution to patterns of medieval settlement desertion/shrinkage in Breckland, and other factors were likely of more significance.

The distribution of medieval arable in relation to this is also worth briefly commenting on. Plotting of medieval furlong boundaries and known field systems (See Chapter Ten) in the region shows no preference for permeability of the soil and it appears more likely that the location of the arable was influenced to a greater degree by the surface soil types (and their associated fertility and composition) than the freely- draining nature of the soil and proximity to water supplies.<sup>490</sup> However, one benefit of the freely draining nature of the soil is that it provides a longer ploughing window, with less disruption after heavy rain compared to clay soils, which may require more time to

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<sup>486</sup> See examples in Wade-Martins, *Fieldwork and Excavation on Village Sites in Launditch Hundred*.

<sup>487</sup> SHER TMW 011.

<sup>488</sup> NHER 2715.

<sup>489</sup> SHER WRW 003.

<sup>490</sup> See Chapter Ten for a discussion of this.

adequately dry before ploughing can take place without damaging the soil structure.<sup>491</sup> In this sense, there was an added degree of resilience in the Breckland landscape, but with the trade-off of needing to provide a greater input of fertiliser to keep the soil in good heart. In contrast, something of a correlation does appear to exist between areas of medieval arable and surface water mapped in the nineteenth century. In part, this may be because these areas are naturally limited in water supply so were historically preferred for extensive farming systems while areas with water more easily available were perhaps more likely to be used for settlement or other forms of agriculture or animal husbandry, forming the rather obvious point that agricultural land tends to fall in between the settlements. However, it may also in part be because this historic ploughing may have removed the surface pits and ponds present in these areas, creating the impression that surface water features were not present here.<sup>492</sup> The areas used for medieval arable were then generally only subsequently used for arable in the post-medieval period or given over as rabbit warren (effectively another extensive practice), so would not have required pits to be dug for water.

### **Water Supply and Settlement Discussion and Conclusions**

The environment of Breckland is one in which water is relatively limited compared to surrounding landscapes of different character, and this is principally the result of the underlying geology and topography of the region. In some parts of Breckland, the chalk aquifer may be relatively close to the surface, either as a result of valleys cutting through the chalk or because the grain of the chalk uplifts the aquifer and brings it closer to the

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<sup>491</sup> Williamson, *Environment, Society and Landscape*: p. 197.

<sup>492</sup> Hugh C. Prince, "Pits and Ponds in Norfolk" in *Erdkunde*, Bd. 16, H. 1 (1962): pp. 10-31.

surface, both of which may allow access as a water supply. In other places, superficial geologies, often clay diamicton, may provide a perched water table as an accessible water supply if the underlying aquifer is out of reach. The universal human need for fresh water means that the environment of Breckland appears to have naturally impacted the locations suitable for more permanent settlement across long periods of time and the distribution of settlement correlates broadly with river valleys, areas of the landscape where the aquifer may be at relatively shallow depth, and areas with a superficial geology providing a perched water table. As seen for the medieval and post-medieval settlement patterns of the region, the availability of water influenced not only the location and distribution of settlement, but also the morphology. Where water access was limited through geology and/or aquifer depth, settlement tended towards nucleation, as seen at Oxborough and Cockley Cley, while in the rare locations where water was more readily available, such as at Foulden, settlement could become more dispersed across the landscape. The distribution of medieval settlement with a clear focus in the river valleys of the area suggests the landscape outside of these was far less suited to settlement at this time. Even if the soils and geology were broadly similar, the challenge of locating a reliable water supply limited settlement outside of the valleys to places where perched water tables were obtainable, as seen at Elveden and Swaffham.

Over the course of the study period, shifts and fluctuations in settlement and land use patterns are present, but all appear to follow the same broad trends of being limited to certain areas of the landscape where fresh water was more readily available. While it might be reasonable to suggest certain fluctuations in climate and physical changes to the landscape may have altered the levels of groundwater and extend of floodplains in

the study area, there is little evidence or data with sufficient resolution to state anything with more than a speculative interpretation.

### ***Drift Sand Activity and its Relationship with Hydrology***

While the (un)availability of water supply in Breckland has a clear direct impact on the settlement patterns of the region, it also has implications for other events and processes in the environment, which themselves may affect how people are able to live in and make use of the landscape. One characteristic of the sandy soils of Breckland is the potential for the development of inland dune fields, the shifting of these sands and scouring of other areas during periods of windy weather. While there are few, if any, areas of active dune fields present in Breckland today, post-medieval writers such as John Evelyn<sup>493</sup> and William Gilpin<sup>494</sup> commented on the desert-like characteristics of the landscape when visiting or travelling through the region. Perhaps the best-known account of Breckland sand activity at this period is that of Thomas Wright's 1668 description of a 'Sand Flood' that overwhelmed the village of Santon Downham and disrupted navigability on the Little Ouse.<sup>495</sup> Wright described the initial activity of the sands as having begun in Lakenheath Warren, stirred up by the prevailing south-westerly winds.<sup>496</sup> The shifting of the sand was said to have covered and killed off the surface vegetation in other areas, further allowing more of the sandy soil to be shifted and added to the mass, which originally "could not cover above 8 or 10 acres of ground, which increas'd into a 1000 acres, before the Sand

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<sup>493</sup> William Bray (Ed.), *Diary and Correspondence of John Evelyn*, Vol. II (Henry Colburn, 1850): p. 115.

<sup>494</sup> William Gilpin, *Observations on Several Parts of the Counties of Cambridge, Norfolk, Suffolk, and Essex* (1809): pp. 28-29.

<sup>495</sup> Wright, "A curious and exact Relation of a Sand-Floud": pp. 722-725.

<sup>496</sup> *Ibid.*: p. 722.

had travelled 4 miles from its first aboad (sic).<sup>497</sup> He further elaborates that this body of sand first reached the bounds of the village thirty or forty years prior “where is continued for 10 or 12 years in the Out-skirts, without doing any considerable mischief to the same”.<sup>498</sup> Wright suggested that the slowing of the sand was the result of it drifting into the Little Ouse valley and being sheltered from the prevailing winds, but that where the sand was able to blow across the valley into a more exposed area it was able to travel more than a mile uphill in the course of two months.<sup>499</sup> While it is possible that Wright may have exaggerated some aspects of this account, what this serves to demonstrate is that periods of drift sand activity tend to be longer-term processes with some occasional shorter bursts of faster movement across the landscape influenced by topographic and other factors, rather than single, fast-acting events.

#### *Physical Evidence of Drift Sand Activity*

The description of such a large-scale movement of sand raises questions about the degree to which the landscape was impacted by such an event and traces of this which may survive in the landscape today, as well as the impact that earlier drift sand activity may have had, for which no documentary records survive. It is likely that the origins of the ‘Sand Flood’ were in the area of Lakenheath Warren that today mostly lies underneath the military airbase, formed of deep sandy Newport 4 soils. Excavations within the airbase have revealed areas of former sand dune that were levelled for the creation of the airfield.<sup>500</sup>

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<sup>497</sup> Ibid.: pp. 722-723.

<sup>498</sup> Ibid.: p. 723.

<sup>499</sup> Ibid.

<sup>500</sup> Rob Brooks, *F35 Expansion Excavations (Phase 2.1), RAF Lakenheath*, SACIC Report No. 2019/007 (Suffolk Archaeology, 2019), Unpublished Fieldwork Report.

Lidar imagery of the surrounding Breckland reveals areas of landscape that appear to be scarred and blown out as a result of the wind scouring out the loose soil and these may also relate to areas that saw activity during the events described by Wright. One of the key characteristics of these probable areas of scouring is that they are all broadly aligned north-east to south-west, correlating with material that would have been disturbed by a prevailing south-westerly wind. Similar features survive within Lakenheath Warren to the east of the airbase,<sup>501</sup> also on the sandy Newport soils, while to the east of this, the warren contains apparent preserved medieval field systems on the loamier Newmarket 1 soils (see Chapter Nine), suggesting relative stability of this area since the medieval period (Figure 33). The presence of areas of more extensive scouring on the crest of the ridge running the length of Wangford Warren<sup>502</sup> supports the assertion that this activity is of post-medieval date, as sections of furlong banks within the warren have been truncated by this scouring, which were in use until at least the mid-seventeenth century (see Chapter Ten, pages 332-334). This area is formed of the deep sandy Worlington soils with sandy Methwold soils on the lower ground. During the stripping away of the humic plantation topsoil within the warren it was observed how the freely draining nature of the soil meant that the bare sandy subsoil would become dry very quickly and readily begin to drift uphill on windy days (Figure 34). The implication from this observation being that it does not require prolonged periods of windy weather or exceptionally windy events to trigger the movement of sand uphill and, while this observed activity would be better described as a 'sand blow', it demonstrates how readily material will start moving under certain conditions. The machine-exposed sands within

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<sup>501</sup> National Grid Reference TL 7539 8101.

<sup>502</sup> National Grid Reference TL 7684 8264 and TL 7282 8166.

Wangford covered an area of approximately 125 hectares and it is not hard to imagine how, without the development of stabilising conditions (such as vegetation cover and wetter ground), these sand blows could eventually begin to form areas of more developed dune fields, particularly where grazing pressures might further reduce the (re)growth of vegetation.

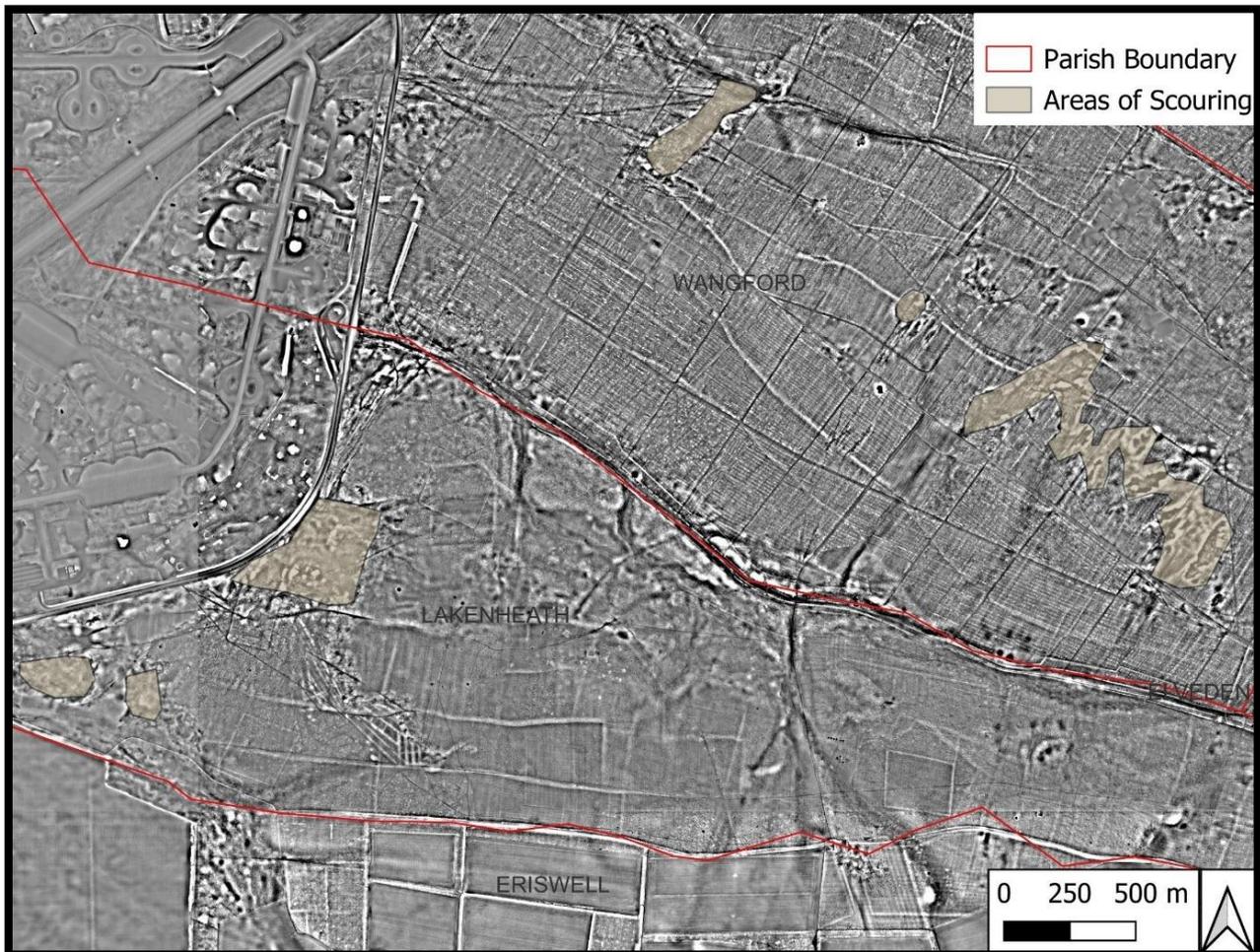


Figure 33: Areas of wind-scouring on lidar imagery of Lakenheath and Wangford, Suffolk.



*Figure 34: Sand-blow in Wangford Warren, Suffolk. 29th March 2021.*

A further area of scouring is present on the northern side of the Little Ouse in Santon parish,<sup>503</sup> again on the crest of the slope, and potentially representing further activity on the more exposed side of the valley (Figure 35). In the vicinity of Thetford Warren lodge, too, an area of scouring appears to truncate furlong banks and a possible fodder enclosure (Figure 36).<sup>504</sup> Where dating of these features is therefore possible, they appear to be of later medieval or post-medieval date. This is unsurprising as areas of scouring appear to occur in the deeper, sandier soil, which by their very nature are going to be relatively easily eroded, potentially meaning that the threshold for survival of these

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<sup>503</sup> National Grid Reference TL 8237 8808.

<sup>504</sup> National Grid Reference TL 8341 8394

features does not extend particularly far back in time and any earlier scouring events may have long-since eroded away. The distribution of these features is also restricted to areas that do not appear to have seen later post-medieval arable activity (18th century onwards), which could have ploughed away any areas of blow out. By extension, earlier periods of ploughing, such as Roman cultivation, could have removed or levelled earlier areas of sand activity. What this serves to demonstrate is that earthwork evidence of sand blow activity can survive in the Breckland landscape, but where it is datable it appears to be relatively late, suggesting that these features do not necessarily have a long-term resilience, even if these may have been common processes over the long-term. Thus, the earthwork features present in the south-western part of Breckland appear to align with the account of Thomas Wright and may represent the remains of scarring caused during the ‘Sand Flood’, while further features present in Thetford Warren show that this event was potentially more widespread than the area described by Wright.

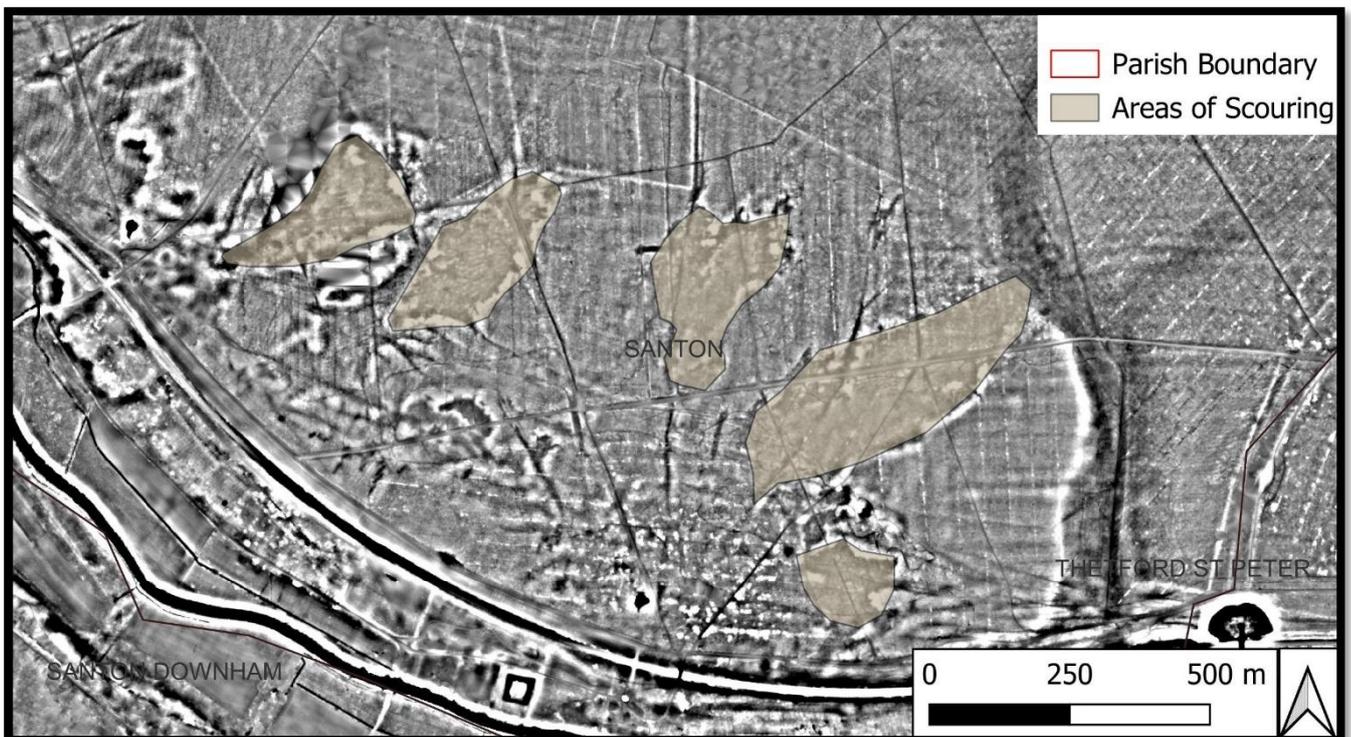


Figure 35: Areas of wind-scouring on lidar imagery of Santon, Norfolk.

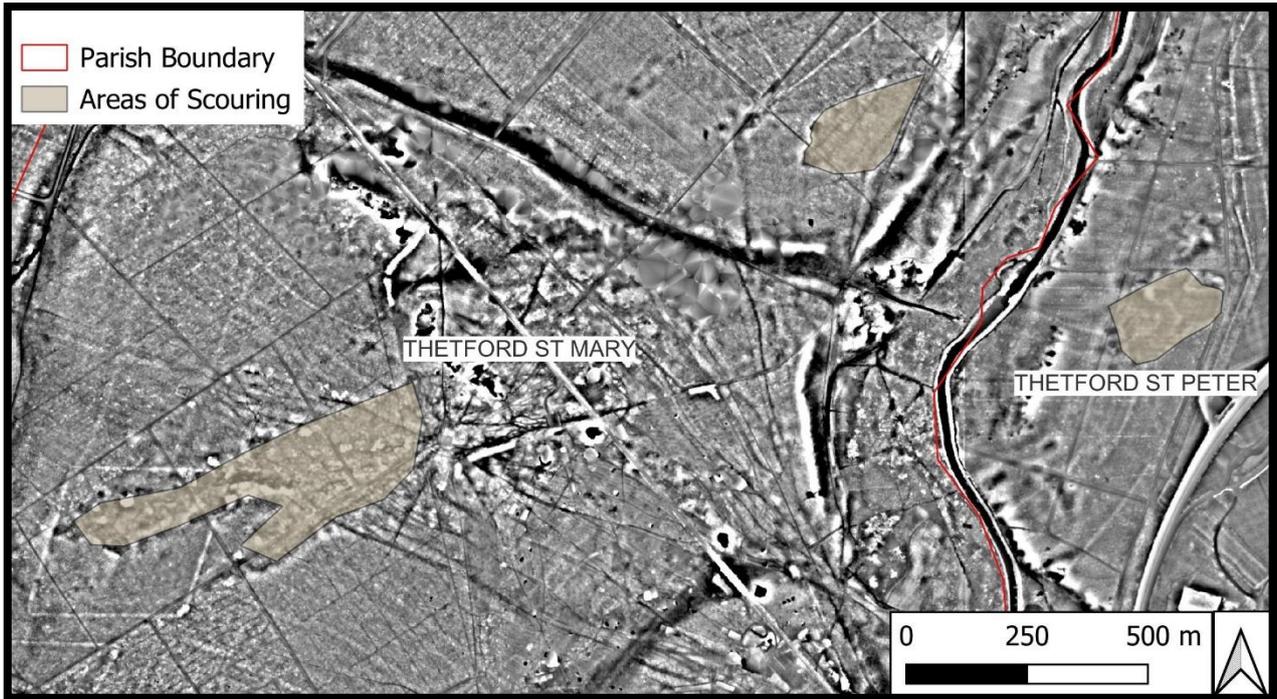


Figure 36: Areas of wind-scouring on lidar imagery near Thetford Warren Lodge, Norfolk.

The density of these features within the south-western part of Breckland is worth further consideration, as they potentially provide insight into overall patterns of stability and instability of soils in the Breckland landscape. Even taking into account factors that may erode or remove these features from the landscape, it is noticeable how this scouring appears to cluster on the south-western part of Suffolk Breckland, with relatively few areas present in Norfolk outside of the Little Ouse valley. This appears to be the case even though the western edges of both Suffolk and Norfolk Breckland lie adjacent to the flat landscape of the Fens, where the prevailing south-westerly wind has a relatively long fetch to cross without much loss of energy and therefore similar drift sand activity might be expected in Norfolk. The difference here appears to lie in variations of soil type and orientation. In Suffolk, the western edge of Breckland is predominantly formed in deep sandy soils of the Methwold, Newport 4 and Worlington associations, on which the wind scouring is present, whereas on the western edge of Norfolk Breckland the soils are predominantly formed of the shallower and loamier Newmarket

associations, with the deeper sandier soils being further ‘inland’ to the east. The distribution of medieval arable in Breckland supports the suggestion the loamier soils were more favoured for arable use (see Chapter Ten), implying a higher initial fertility and therefore stability as a soil type that could support a denser ground cover of *flora* to prevent sand movement when not under arable use. Even if cultivated, once loamier soils have initially settled their composition tends to create a thin crust on the surface which further helps to minimise the loss of material. It is therefore possible that differences in soil variation served to create a subtle distinction between Norfolk and Suffolk Breckland, with the Suffolk Breckland more susceptible to the formation of dune fields and sand movement due to the presence of deeper, sandier soils in the path of the prevailing wind blowing off the flat landscape of the Fens. By contrast, the landscape of Norfolk Breckland was of a more stable character with fewer areas that were conducive the generation of dune fields and less movement of sand.

#### *Factors Generating Drift Sand Activity*

The potential for such large quantities of sand to shift in the Breckland landscape raises questions about the factors that trigger or contribute to periods of sand dune instability or stabilisation, and whether this is driven by environmental, climatic, anthropogenic processes, or a combination of these. Two separate investigations have previously taken place in Breckland, examining the formation of an area of sand dunes in Wangford. The first, published in 2004 concluded that there were five main phases of drift sand activity, of which activity between 400-900 AD and at around 1500 AD fall within the study period.<sup>505</sup> The second, published in 2018, characterised four major phases of drift sand

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<sup>505</sup> Bateman and Godby, “Late-Holocene Inland Dune Activity in the UK”: pp. 579-588.1

activity, two of which fell within the study period for this thesis.<sup>506</sup> The first was at approximately 600 AD +/-100 and the second at 1150 AD +/- 50, as well as a third phase during the Seventeenth Century that would coincide with the great ‘Sand Flood’.<sup>507</sup> While the dating on both studies varied slightly, both were in broad concordance for a phase of Anglo-Saxon sand activity and a phase of medieval sand activity. Both of these studies attempted to link aeolian activity with climatic fluctuations, but found no clear correlation between the occurrence of drift sand activity and similar climatic conditions across long periods of time.<sup>508</sup> Instead, it was suggested that a range of factors could trigger or stabilise this activity, and that one common theme across all phases of drift sand activity was a coincidence with “reorganisations of societal structures or when a shift in land management took place”.<sup>509</sup> The suggestion being that periods of social transition and upheaval saw limited mitigation measures to drift sand activity (the planting of hedges, for example) and this allowed the activity to become more prevalent.<sup>510</sup> A similar study of drift sands in the Netherlands also emphasised the role of human land use as an important contributing factor to this activity, with no clear correlation with climate.<sup>511</sup> In Breckland, the later medieval and post-medieval increase in rabbit warrens (and related grazing pressures) may be an important contributor to drift sand activity, particularly in those warrens sited on the deeper sandy soils on the western

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<sup>506</sup> de Keyzer and Bateman, “Late Holocene landscape instability”; pp. 123-134.

<sup>507</sup> Ibid.

<sup>508</sup> Bateman and Godby, “Late Holocene Inland Dune Activity”: pp. 583-586; de Keyzer and Bateman, “Late Holocene landscape instability”: pp. 131-133.

<sup>509</sup> de Keyzer and Bateman, “Late Holocene landscape instability”: pp. 132

<sup>510</sup> Ibid.

<sup>511</sup> Harm Jan Pierik, Rowin J van Lanen, Marjolein TIJ Gouw-Bouman, Bert J Groenewoudt, Jakob Wallinga and Wim Z Hoek, “Controls on late-Holocene drift-sand dynamics: The dominant role of human pressure in the Netherlands” in *The Holocene*, Volume 28, No. 9 (2018): pp. 1361- 1381.

edge of Suffolk Breckland, where the landscape may have already been more susceptible to the movement of sand (see above).

That said, problems exist with the reasons suggested as the triggering factors for drift sand activity that need to be addressed in an attempt to reveal any greater underlying causes. The first suggestion is that sand dune activity is linked to phases of transition in settlement and land use patterns in the region, and that the activity recorded by de Keyzer and Bateman at approximately 600 AD was linked with a period when “population rose and isolated farms became clustered into nucleated village centres. Additionally, new land was exploited through the implementation of an agricultural open field system while old areas were abandoned.”<sup>512</sup> The expansion of arable would therefore have removed vegetation cover from wider areas of land, leaving the soil uncovered for part of the year, in a field system that in general had few hedges or other windbreaks. The problem with this argument is threefold. Firstly, the suggestion that the expansion of arable may have triggered drift sand activity does not correlate with a similar expansion of arable during the Late Iron Age and Roman period (see Chapter Nine), where little significant dune development is recorded in the Wangford dune cores. The Roman farming regimes of Breckland have been characterised as being relatively open arable ground but with possibly limited livestock grazing in favour of indirect manuring using waste carted from farmyards (see Chapter Nine). The lack of large numbers of livestock may reduce the potential for sand movement, alongside this phase of arable expansion not correlating with dune activity, suggesting arable expansion alone is not a triggering factor for drift sand activity. Secondly, the suggestion that the development of open fields

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<sup>512</sup> de Keyzer and Bateman, “Late Holocene landscape instability”: pp. 132

and nucleation of village centres took place around 600 AD does not necessarily appear to be the case in an East Anglian context. The origins of both medieval villages and open fields have been widely debated,<sup>513</sup> with questions over the period in which villages formed into their recognisably medieval settlement patterns, and when the concept of open field farming first appeared in Britain and subsequently developed into the large-scale systems of the medieval period. What has emerged from decades of debate is a broad understanding that medieval villages did not appear fully formed but instead gradually developed into their recognisable patterns over the course of the Middle and Late Saxon periods, with outlying farmsteads and settlement sites being abandoned piecemeal in favour of one or more focal points in a parish. Recent investigations by Tom Cox have demonstrated that in an East Anglian context settlement was somewhat unstable through the Early and Middle Saxon periods, rather than being fixed by the start of the Middle Saxon.<sup>514</sup> As such, the linking of settlement ‘nucleation’ with a drift sand event at c.600 AD is not chronologically concurrent.

Thirdly, as is explained in Chapter Ten, the development of open field arable in Breckland, whenever it developed into large-scale arable, tended to favour the loamier soils, where available, with a clear tendency to avoid the deep sandy Newport 4 soils across the entirety of Breckland. This pattern is reflected in similar landscapes such as the Sandlings,<sup>515</sup> and at a wider level in East Anglia where these soils tended not to be

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<sup>513</sup> For a summary of these debates, see Williamson, *Environment, Society and Landscape*: pp. 147-183.

<sup>514</sup> Cox, “Reassessing the Relationship Between Early Saxon Activity and Parish Boundaries”.

<sup>515</sup> Tom Williamson, *Sutton Hoo and its Landscape: The Context of Monuments* (Oxbow, 2008): pp. 32-37.

cultivated in the Anglo-Saxon and medieval period (see Chapter Eight, pages 244-250). However, it is the deeper sandy soils, particularly areas of Newport 4, where historic sand dunes appear to have formed and the dune fields sampled at Wangford lie within the tract of Newport 4 soils likely identified by Wright as the origins of the 'Sand Flood'.<sup>516</sup> It therefore seems unlikely that the formation of dune fields or triggering of drift sand activity in the Lakenheath and Wangford area was caused by an expansion of arable, because the areas of dune fields are formed in a soil type that was historically avoided for cultivation. It is possible that areas to the south-west may have suffered from a degree of sand blow that transported material towards Lakenheath and Wangford from loamier soil types that were favoured for arable expansion, but should the cultivation of loamier soils have generated drift sand activity, more extensive dune fields might be expected in Norfolk where these soil types were more widely available for cultivation and often facing to the prevailing winds crossing the Fens. It is further noticeable that areas of surviving post-medieval scouring occur exclusively on the deeper, sandier soils, with very little evidence of this even on areas of loamier soils that have not seen post-medieval arable use, further supporting the assertion that it is the deeper, sandier soil types that are conducive to drift sand activity.

The second suggestion is that drift sand activity may have been caused by the number of grazing animals being kept on the sandy heathland soils, particularly sheep and rabbits.<sup>517</sup> This is certainly a potential contributor to drift sand activity in the region - rabbits can be effective at breaking up surface vegetation and disturbing soil,<sup>518</sup>

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<sup>516</sup> Wright, "A curious and exact Relation of a Sand-Floud": pp. 722-725.

<sup>517</sup> Bateman and Godby, "Late Holocene Inland Dune Activity": p. 584.

<sup>518</sup> Ibid.

something that would be amplified in warrens containing hundreds of animals, especially in warrens sited on the deeper sandy soils. However, it is notable that drift sand activity did not occur to any significant degree in the large Norfolk warrens sited on the shallower, loamier soils, again suggesting that specific soil types in Breckland are more conducive to drift sand activity. Sheep also have an impact, although not to the same extent in large part because they do not burrow and cast spoil to the surface. Recent investigations have also highlighted the importance of livestock grazing in maintaining dune landscapes for biodiversity, rather than eroding these and creating drift sands.<sup>519</sup> Both sheep and rabbits are perhaps therefore better described as contributors to drift sand activity once it has initiated rather than causal factors. Furthermore, the role of sheep and rabbits in causing this activity only really applies to medieval and later drifting events, with the Anglo-Saxon event less likely to be impacted by the keeping of sheep, which, while beginning to show signs of specialisation in farming practice,<sup>520</sup> appear unlikely to have consisted of the large flocks of later periods and with rabbits yet to be introduced to England.

In contrast, a third causal suggestion made by Bateman and Godby may potentially shed some light on the principal trigger of drift sand activity: palaeohydrology.<sup>521</sup> While climatic factors such as hot/cold temperatures or wetter/drier periods do not appear to have any clear correlation with drift sand activity, it was argued that historic water tables had “strongly influenced sand availability/mobility”.<sup>522</sup> It was

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<sup>519</sup> Katharina Plassmann, M. Laurence, M. Jones and Gareth Edwards-Jones, “Effects of long- term grazing management on sand dune vegetation of high conservation interest” in *Applied Vegetation Science*, Vol. 13, No. 1 (2010): pp. 100-112.

<sup>520</sup> Pam Crabtree, *Middle Saxon Animal Husbandry in East Anglia*, East Anglian Archaeology Report No. 143 (Suffolk County Council Archaeological Service, 2012): p. 58.

<sup>521</sup> Bateman and Godby, “Late Holocene Inland Dune Activity”: p. 584

<sup>522</sup> *Ibid.*

argued that higher sea levels would have seen a greater level of inundation in the adjacent Fens, which in turn would raise water tables in Breckland. A correlation was seen between times of higher sea levels and periods of dune stability, and periods of lower sea levels and increased sand dune mobility.<sup>523</sup> The impact of higher water tables on the Breckland soils would potentially have maintained higher moisture levels closer to the surface compared with periods of lower water tables, and this would have prevented the surface from being disturbed by wind action as readily – damp sand tends not to blow away. In addition to this, a higher sea level creating both greater levels of inundation and overall area of wet fenland to the south and west would have meant the prevailing wind would have passed over a relatively wetter landscape, picking up a greater amount of moisture from this area before blowing across the Breckland landscape. A mass of air with a higher moisture content would then have reduced the rate of surface evaporation in Breckland, further preventing the sandy soils from becoming dry enough to be shifted by the winds so readily. On balance, it therefore seems most likely that the triggering factor for drift sand activity in Breckland is linked to relative sea levels, the impact of this on the extent and wetness of the Fens, and the knock-on effect this would have on water tables in the wider region. At times when water tables fell and the Fens retreated, the sandy soils of Breckland would have, on average, been drier compared to periods of relatively high sea levels and water tables, and this would have increased the period of time at which these soils reached the threshold of being dry enough to readily begin to drift. It is particularly interesting to note that the seventeenth-century ‘Sand Flood’ described by Thomas Wright coincided with the first large-scale Early Modern efforts to drain the Fens.

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<sup>523</sup> Ibid.

### *Drift Sand Activity Discussion and Conclusions*

The presence of relict dune fields and other features in Breckland associated with aeolian activity provide insight into the historic character of the landscape, how this landscape has changed and how people have interacted with it. The deeper, sandier soils of the region were historically more conducive to periods of drift sand activity compared to the shallower, loamier soils, which appear to have been more stable overall. The presence of these sandier soils on the western side of the Suffolk Breckland contributed to the generation of dune fields and areas of scouring in this area, compared to Norfolk where loamier soils abutted the Fen edge, providing greater landscape stability. The preference for historic arable to be sited on these loamier soils rather than the deeper sands strongly suggests that periods of arable expansion or shift had limited impact on drift sand activity. This is particularly true of the relict dunes at Wangford that have previously been selected for sampling and study, which are sited on Newport 4 soils that were historically unfavoured for cultivation. Similarly, while historic grazing pressure and ground disturbance caused by rabbits and other grazing animals may have contributed to drift sand activity, this does not appear to be the triggering factor for this process. Instead, periods of higher/lower sea level impacting the level of fenland inundation and the knock-on effect this would have had on water tables in Breckland is arguably the principal factor in triggering periods of landscape stability or instability. Higher water levels in the Fens created higher water tables in Breckland, which meant surface moisture levels were maintained to a higher level and the prevailing wind from the south-west would have collected a greater amount of moisture from the Fens, further keeping the sandier soils at a moisture level below any threshold needed to trigger drifting for a greater length of time. By contrast, periods of low water levels in the Fens would have had the opposite

effect, potentially increasing the average amount of time the sandy soils were dry enough to begin to shift more readily.

## **Chapter Eight: The Origins and Development of Breckland Heath**

Perhaps the most defining aspect of Breckland are the tracts of heathland which, until the agricultural improvements of the eighteenth and nineteenth centuries, covered a considerable proportion of the Breckland landscape. The geological framework that was conducive to the development of this type of landscape is outlined in Chapter Two, and a number of works studying the distinctive ecology of the Breckland heaths have been previously published.<sup>524</sup> There has historically been an assumption by those studying Breckland that these heathlands have a timelessness about them, with writers such as W. G. Clarke conjuring images of Neolithic hunters crossing the heaths on ancient trackways.<sup>525</sup> The maps drawn up by eighteenth-century cartographers such as Joseph Hodkinson (Suffolk, 1783)<sup>526</sup> and William Faden (Norfolk, 1797)<sup>527</sup> have often been used as a baseline measurement for the extent of heathland before the nineteenth century, but with differences in the level of detail present on these maps, with Faden attempting to map areas of heathland and warren, and distinguish them from areas under other uses such as open field, while Hodkinson makes no attempt at this in the area of Breckland between Icklingham, Brandon and Thetford. The understanding is therefore that these maps are broad at best in their delineation of heathland in the study area.<sup>528</sup> However, it is worthwhile attempting to calculate the proportion of the study area that was under

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<sup>524</sup> Trist (Ed.), *An Ecological flora of Breckland*; Dolman, Panter and Mossman, *Securing Biodiversity on Breckland*.

<sup>525</sup> Clarke, *In Breckland Wilds*, First Edition: p. 34.

<sup>526</sup> D. P. Dymond (Ed.), *Hodkinson's Map of Suffolk in 1783* (Larks Press, 2003).

<sup>527</sup> J.C. Barringer (Ed.), *Faden's Map of Norfolk, First Printed in 1797* (Larks Press, 1989).

<sup>528</sup> Martin Sanford, *Suffolk State of Nature, Heathland* (Suffolk Biological Records Centre, 2005).

heathland by c.1800, as a basis against which earlier parts of the study period may be compared.

The areas within Breckland mapped as heathland and warren by Faden in 1797 cover approximately 116 square kilometres (11,600 ha). The style and accuracy of Faden's mapping means that this number should not be used as a hard measurement of common land, but rather a guide as to the approximate proportion of heathland that survived within Norfolk Breckland to this period. The total area within the Brecks National Character Area is approximately 1,019 square kilometres (101,926 ha)<sup>529</sup> of which approximately 588 square kilometres (58,800 ha) falls on the Norfolk side of the Little Ouse. This suggests that around 20% of the Norfolk Breckland landscape was under heathland or warren in 1800. Comparison with more detailed eighteenth-century maps of specific parishes shows that common land on Faden's mapping is broadly co-terminus with these more detailed maps and may even be underrepresenting areas of common in some places, or the parishes have already been enclosed by 1797.<sup>530</sup> Contemporary mapping of Suffolk by Joseph Hodkinson<sup>531</sup> is rather less clear on land use patterns, particularly in the area of deeper sandy soils between the Lark and the Little Ouse. Calculations of the extent of heathland mapped by Hodkinson in the late eighteenth century suggest around 339 square kilometres (33,950 ha) of Suffolk Breckland was under heath or warren<sup>532</sup> out of an area of approximately 431 square kilometres (43,100 ha) forming the Suffolk Breckland, a proportion of around 78%. This is almost certainly

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<sup>529</sup> Sandford, *Suffolk State of Nature*: p. 23.

<sup>530</sup> Maps used for comparison: NRO FX 386/2, *Map of Cockley Cley* (1722); NRO WLS XVII/4; *Map of the Parish of Tottington* by H. Keymer (1774).

<sup>531</sup> Dymond (Ed.), *Hodkinson's Map of Suffolk in 1783*.

<sup>532</sup> Sandford, *Suffolk state of Nature*: p. 6.

an overestimation, as the area transcribed from Hodskinson by Sandford included areas of arable land present on early Ordnance Survey mapping, such as at Lakenheath and Icklingham<sup>533</sup> that were not mapped as arable by Hodskinson. Indeed, arable land must have been present around the village of Elveden, even if a relatively small area, yet Hodskinson makes no attempt to distinguish this from the surrounding landscape. Even with this in mind, however, it is clear that a far larger proportion of the Suffolk Breckland was under heathland in 1800 than in Norfolk and even a suggestion of 50% of the area being heath may be slightly conservative. If the suggestion of 50% for Suffolk is taken as a reasonable estimation, then the overall proportion of land in Breckland under heathland or warren in c.1800 is around 35%.

The result of using post-medieval mapping is that many of the interpretations of heathland within the study area are based upon post-medieval extents, which themselves may not necessarily have been particularly stable. Indeed, the very practice of brecking - the periodic ploughing of areas of heathland for a season or two before leaving them several years to recover - which gives the region its name would have meant the boundary between arable and heathland would have been somewhat fluid in nature. It is plausible that some areas originating as brecks may have ended up integrated into the permanent arable during periods of agricultural expansion, and similarly areas of breck and outlying arable may have 'reverted' to heath during periods of contraction. Even this idea, however, is based upon later medieval and post-medieval land use practices. Likewise, the usual interpretation of woodland in Breckland is that relatively little existed by the medieval and post-medieval periods and that areas not under arable use were of

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<sup>533</sup> BL OSD 238, *Ordnance Surveyor drawing of Feltwell St Nicholas (1813)*.

a more heathland character,<sup>534</sup> and it is worth reviewing this evidence and developing a chronology of woodland extents over the study period. This chapter therefore seeks to develop a longer-term understanding of the evolution of the physical landscape of Breckland, attempting to characterise the openness of the landscape by the start of the study period, and in doing so potentially identifying core areas of early heathland. It will then be considered how much of this early heathland may have remained as heath until the post-medieval period, or have seen periodic inclusion within later arable systems, alongside identifying broader periods of heathland expansion and contraction and whether this may be related to changes in climate or other factors. Alongside this, the changing extent, location and character of woodland in the region will be investigated to further define the character of the region over the study period.

### **Prehistoric Barrows as a Proxy for Early Heathland**

This section argues that the presence of prehistoric barrows in a landscape is a proxy indicator for the area surrounding these monuments being relatively open at the time of their construction. In a Breckland context, it is argued that this openness likely took the form of heathland due to the geological characteristics and distinctive ecology of the region as outlined in Chapter Two, insofar as areas of non-cultivated open ground in the region (outside of damp river valleys) tend to generate into heathland rather than other types of landscape. The argument that barrows are a useful proxy for minimum historic heathland extents are discussed in detail below, and may be summarised thus:

- Prehistoric round barrows were constructed in open landscapes as demonstrated by a number of barrow excavations and previous

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<sup>534</sup> Bailey, *A marginal economy?*: p. 151

landscape investigations into these monuments, both in Britain and western Europe. Environmental evidence, where available, suggests this open ground had heathland characteristics for barrows in light soil areas.

- It can be assumed that most circular mounds/ring ditches in the project area are prehistoric round barrows as morphologically similar features that have been subject to investigation have been shown to almost always be barrows and there are few other monument types that take this form in any considerable quantity. Prehistoric roundhouses are often smaller in size, and it is unlikely that medieval mill mounds were present in such numbers.
- It can therefore be postulated that areas with many round barrows were relatively open in the past. This must be nuanced with the fact that barrows were constructed across a wide time period, that not all barrows would have been in use at the same time, and that it is still possible for woodland vegetation to regenerate after the mound had been constructed.

The landscape of Breckland is dotted with more than 700 recorded prehistoric barrows, surviving either as upstanding earthworks, as cropmarks identified through aerial photography, or excavated during archaeological investigations.<sup>535</sup> Some barrows appear to be isolated in the landscape, while others are grouped together in larger cemeteries

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<sup>535</sup> Number derived from features recorded as 'barrow' or 'ring ditch' on the Norfolk and Suffolk HER databases, Scheduled Ancient Monuments and fourteen barrows or ring ditches identified during research for this thesis.

such as at Hockwold in Norfolk,<sup>536</sup> and at the boundary of Risby and Lackford in Suffolk.<sup>537</sup>

The potential use of these features as a proxy indicator of early heathland is based upon Quentin Bourgeoise's study of Bronze Age barrows in the Netherlands, which concluded that these monuments had been constructed on open heathland and, importantly, were intended to be seen in the landscape as clear visual markers.<sup>538</sup> Recent excavations of barrows within the Dutch barrow landscape at Echoput revealed them to be constructed from stacked sods of turf, while pollen analysis was interpreted as indicating that construction had taken place in an area with a minimum 200-300m radius of open, heathy landscape around the barrows.<sup>539</sup> Similar investigations on downland landscapes in southern England further demonstrated that Bronze Age barrows were constructed on areas of ground that were already relatively open in prehistory.<sup>540</sup> Investigation of two barrows at Guiting Power, Gloucestershire collected environmental samples from which it was concluded one barrow was constructed within an open area with woodland surrounding,<sup>541</sup> while the second was constructed in a more open landscape with hazel and hawthorn scrub present.<sup>542</sup> Within East Anglia, excavations of barrow mounds, such

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<sup>536</sup> NHER 61495.

<sup>537</sup> SHER FMP 002 and 003, RBY 007 and 008.

<sup>538</sup> Quentin Bourgeois, *Monuments on the Horizon, The Formation of the Barrow Landscape Throughout the 3rd and 2nd Millennium BC* (Sidestone Press, 2013): pp. 128-157.

<sup>539</sup> Marieke Doorenbosch, "A History of Open Space, Barrow landscapes and the significance of heaths – the case of the Echoput barrows" in D. Fontijn, A. J. Louwen, S. van der Vaart and K. Wentink (Eds.), *Beyond Barrows, Current Research on the Structuration and Perception of the Prehistoric Landscape Through Monuments* (Sidestone Press, 2013): pp. 197-223.

<sup>540</sup> Bradley and Fraser, "Bronze Age Barrows on the Heathlands of Southern England": pp. 15-33.

<sup>541</sup> Alistair Marshall, *Excavation, Analysis and Interpretation of Early Bronze Age Barrows at Guiting Power, Gloucestershire* (Archaeopress, 2020); pp. 57-66

<sup>542</sup> *Ibid.*: pp. 202-208.

as that at Bawsey, Norfolk allowed for the collection of pollen samples, analysis of which suggested the surrounding landscape was of a heathy or semi-open scrubland with lime and hazel the most prominent of the scrub species present.<sup>543</sup> In Breckland, the visual importance of these monuments is seen with the placement of barrows in prominent positions such as Hut Hill on Knettishall Heath,<sup>544</sup> where the mound was constructed on a ridge forming the false crest of the river valley, in order to maximise the visibility of the barrow over a greater distance. The same is true of a barrow within the former park at Culford,<sup>545</sup> located on a crest overlooking the River Lark (now within a modern pine plantation). These examples serve to emphasise that barrows in Breckland appear to be sited with the same considerations for visibility as seen in Bourgeois's study, while the environmental evidence from Britain and beyond provides support that relatively open landscapes were specifically chosen for barrow construction and that on light, sandy soils these landscapes took the form of heathland.

Bourgeois sought to use the intended visibility of barrows as a proxy for the wider landscape surrounding these monuments being relatively open as well, and used a 250m buffer zone around the barrows he was studying to produce a representation of the *minimum* extent of heathland present during the period when these barrows were being constructed.<sup>546</sup> This radius was considered a reasonable minimum taking into account the role of barrows as visual markers in the landscape, arguing that beyond this distance a barrow becomes increasingly difficult to see with the naked eye and is near

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<sup>543</sup> Robert Scaife, "Pollen Analysis of Bawsey Bronze Age Barrow" in J. J. Wymer, *Barrow Excavations in Norfolk, 1984-88*, East Anglian Archaeology Report No. 77 (Norfolk Museums Service, 1996): pp. 21-23.

<sup>544</sup> SHER KNE 001.

<sup>545</sup> SHER CUL 002.

<sup>546</sup> Bourgeois, *Monuments on the Horizon*: pp. 124-157.

indistinguishable beyond one kilometre unless exceptionally positioned.<sup>547</sup> However, as with the examples given above, it is often the case that the siting of barrows can emphasise the mounds against a skyline, extending the effective range at which a barrow is visible. A further nuance to this is that the initial size of a barrow's construction would naturally impact its visibility, with larger examples in Breckland including How Hill in Icklingham<sup>548</sup> and White Hill in Brandon.<sup>549</sup> Subsequent millennia of erosion may often make determining the original size of a barrow more challenging. In addition, the method of barrow construction by piling upturned sods of earth stripped from the surrounding area may have further contrasted the monument from the surrounding landscape, particularly on sites in Breckland where this process may have exposed the underlying chalk geology or yellow sands. It must therefore be remembered that the distance used by Bourgeoise is a model, potentially erring on the conservative side when calculating the extent of open ground and that the 250m buffering applied to this model represents the *minimum* extent of open ground surrounding a barrow and is not a hard barrier between heathland and woodland. Rather, it is better to consider the results generated as representing areas of open ground to a greater or lesser degree depending on the overall density of barrows. Where the density of barrows in the landscape is relatively high, it is reasonable to extrapolate the buffered zones into broader areas of relatively open landscape. With this in mind, it is worthwhile applying Bourgeoise's model to the barrows that fall within the Breckland study area in an effort to gain an understanding of how much

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<sup>547</sup> Ibid.

<sup>548</sup> SHER IKL 001.

<sup>549</sup> SHER BRD 123.

of the landscape was open (and of probable heathland character) by the start of the study period when the main eras of barrow construction had passed.

Although these monuments, usually dating to the Early and Middle Bronze Age<sup>550</sup> (but some can be earlier or later), fall outside the study period for this thesis, mapping of their distribution, and of cropmark ring ditches identified through aerial photography, can allow for the reconstruction of the minimum areas of open ground present in Breckland at the start of the study period. However, some nuances are required with this approach. Barrows have a relatively wide date range and without excavation most can only be broadly dated. Care must therefore be taken not to flatten the chronology when viewing a barrow landscape in the modern day. That is to say, the prehistoric landscape was not one where all barrows were in use at the same time, with all recorded monuments standing freshly constructed. Rather, it was one that, by the Middle Bronze Age (c.1600-1200 BC) for example, would have contained a mixture of relatively recent barrows, barrows from a generation or two before, barrows from a few generations before that, and Early Bronze Age barrows that would already have been several centuries old. The area surrounding a barrow would not necessarily always remain clear of woodland. It is possible that woodland could have generated in some of these areas if they saw abandonment, and evidence from the flint mines at Grime's Graves suggests woodland covered the site after it had fallen out of use, with a prehistoric barrow constructed at the edge of the site.<sup>551</sup> However, as will be discussed below (pages 238-250), the barrow

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<sup>550</sup> Lawson, *Barrow Excavations in Norfolk, 1950-82*: p .2

<sup>551</sup> J. G. Evans and Hilary Jones, "Chapter VI: Subfossil land-snail faunas from Grimes Graves and other Neolithic flint mines" in Mercer, *Grimes Graves*: p. 106.

distribution around Grime's Graves suggests that any woodland regeneration may have been relatively localised.

A further aspect to consider is how genuine any distribution of barrows in Breckland may be, and it is worth briefly outlining why the distribution discussed below is likely to be broadly real or can be expanded to include areas where barrows might be expected. The distribution of barrows in any given landscape is dependant, firstly, on the decision of the inhabitants of that landscape to construct a barrow, or number of barrows, over a prolonged period of time. As discussed above, barrow construction may occur over a considerable period, as well as potentially seeing the re-use of pre-existing monuments. The decision on where to construct a barrow is dependent upon a range of factors including the social structure and belief systems of a population, and, central to this discussion, the availability of open ground in which to place the barrow in a visually prominent position. Secondly, once constructed, a barrow must survive in some form long enough to be recognised and recorded either as an upstanding monument or as below-ground remains in the form of a ring ditch. A barrow may be partially or totally destroyed by a number of erosive processes including historic ploughing, removal of the barrow to extract materials such as gravel from the area, animal burrowing, wind erosion, and a general erosion of the surrounding landscape which, in a Breckland context, may have taken the form of drift sand activity (see Chapter Seven). The recognition that upstanding barrows may contain grave goods worth acquiring is believed to date at least as early as the fifteenth century in East Anglia,<sup>552</sup> while a 1580 map of Methwold Warren shows a number of named hills in the landscape around the warren, many of which, if not

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<sup>552</sup> Lawson, Martin and Priddy, *The Barrows of East Anglia*: p. 36.

all, may well be barrows, yet features such as ‘Halmere Doule’ near the north-east boundary of the warren is not traceable on the ground today.<sup>553</sup> Henry Prigg, writing in the mid-nineteenth century, noted that the barrows of Warren Hill in Mildenhall had already been subject to earlier antiquarian investigation.<sup>554</sup> If the mound of a barrow does not survive over time, below-ground remains often survive in the form of a ring ditch with associated burials. The recognition of these features is also dependant on their visibility in the archaeological record in the form of crop marks, which in turn is impacted by the underlying geology, the soils covering the ring ditch, and the current land use of the area. Examples in Breckland of barrows being discovered during archaeological excavation with no previous evidence for their existence include a barrow within the airbase at Lakenheath<sup>555</sup> and a barrow on an area of former heathland at Red Lodge.<sup>556</sup>

In the Netherlands, Bourgeoise suggested that recorded barrows may only represent 30% (possibly even less) of the total barrows ever constructed in those landscapes.<sup>557</sup> Evidence that a similar situation exists in Breckland can be demonstrated within this project, where survey of lidar imagery and aerial photography of the study area revealed fourteen barrows (or probable barrows) that were not recorded on the HER. This includes three at Honington which create a considerable barrow cemetery alongside three barrows already recorded on the HER (Figure 37).<sup>558</sup> Re-examination of recorded features may also provide clarity to these records, such as at Feltwell, where what was

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<sup>553</sup> PRO MPC 1/75. *Map of Methwold Warren* (1580).

<sup>554</sup> Prigg, “The Tumuli of Warren Hill, Mildenhall”: pp. 287-288.

<sup>555</sup> John Craven, *Liberty Village, RAF Lakenheath, Eriswell, Archaeological Assessment Report*, SCCAS Report No. 2012/038 (Suffolk County Council Archaeological Service, 2012), Unpublished Fieldwork Report: pp. 51-55.

<sup>556</sup> Forshaw, *Archaeological Investigations at Land East of Kings Warren*: pp. 14-16.

<sup>557</sup> Bourgeoise, *Monuments on the Horizon*: p. 40.

<sup>558</sup> SHER FKM 006, HNN 042 and TRS 004.

previously recorded as two possible Bronze Age ring ditches was revealed by lidar imagery to be three barrows surviving as low earthworks (Figure 38).<sup>559</sup> Approximately 500m to the south in Hockwold, what was recorded as a cropmark of unknown date also appears to be a ring ditch of a levelled barrow (Figure 39).<sup>560</sup> Similarly, the recognition of arbitrary gaps in the distribution of barrows hint at parts of the landscape where the remains of these monuments probably await discovery, but modern land use, particularly pine plantation, precludes this. A clear example can be seen in the Little Ouse valley around the northern part of the Suffolk parish of Euston (Figure 40). To the east and west of the parish, barrows are recorded at broadly the same height above the river at regular intervals. The same is true of the parishes to the north on the Norfolk side of the Little Ouse and indeed a possible unrecorded barrow is present as an earthwork on lidar imagery in an area of horse pasture at Snarehill, positioned on a ridge above the river. The same zone of river valley in Euston, however, has no barrows recorded, despite the landscape being of similar character to the surrounding area. This is almost certainly a result of the modern land use in that part of Euston consisting of pine plantation and grassland in private ownership, potentially reducing access to visually look for barrows while also not being conducive to generating the distinctive cropmarks of these monuments. Similarly, areas of current heathland that may have been historically cultivated, such as Knettishall Heath<sup>561</sup> and Lakenheath Warren (see Chapter Ten) may have seen the historic removal of some barrows while at the same time being under a modern land use that does not readily allow for cropmark identification. It can therefore

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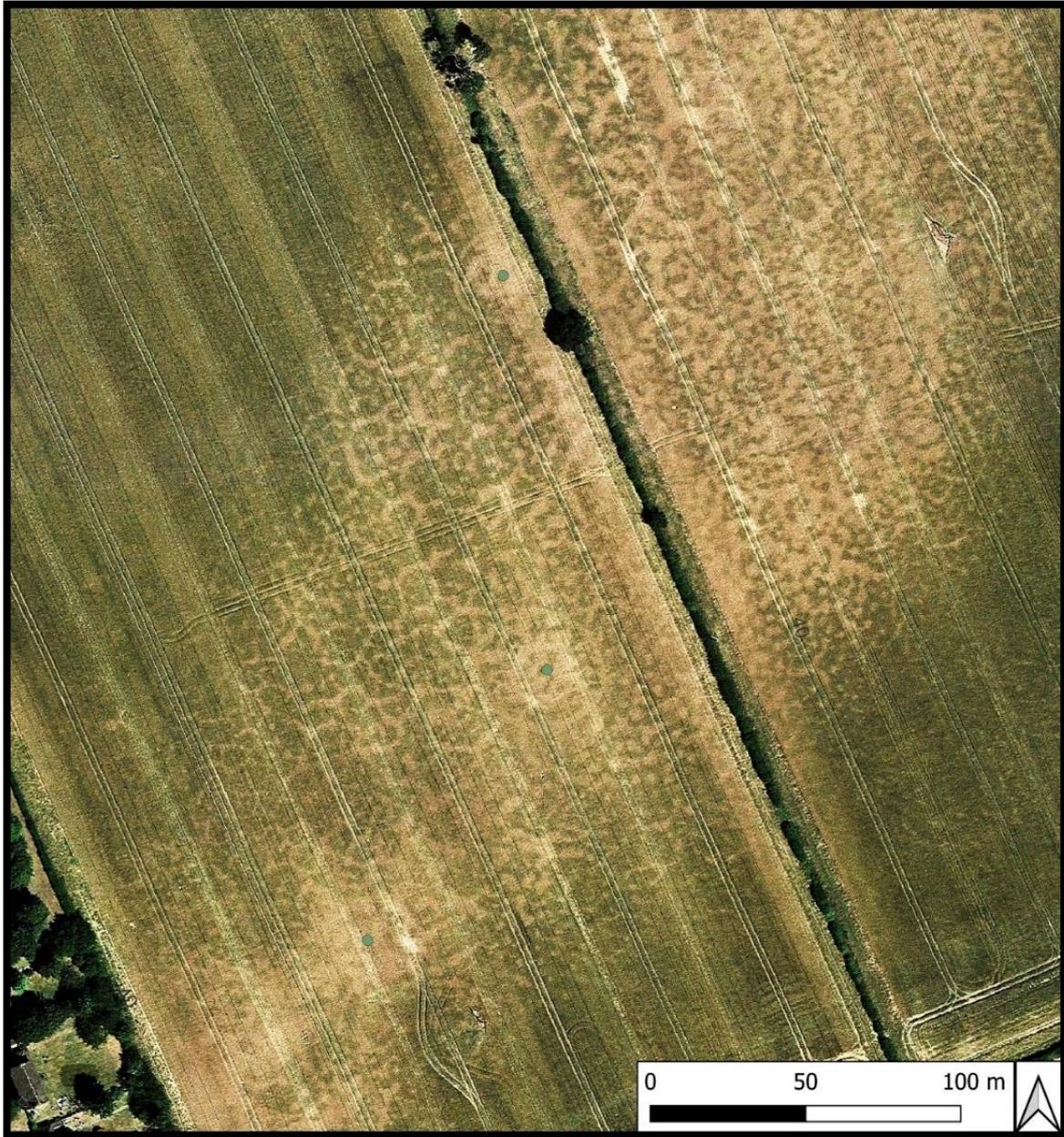
<sup>559</sup> NHER 30854.

<sup>560</sup> NHER 5458.

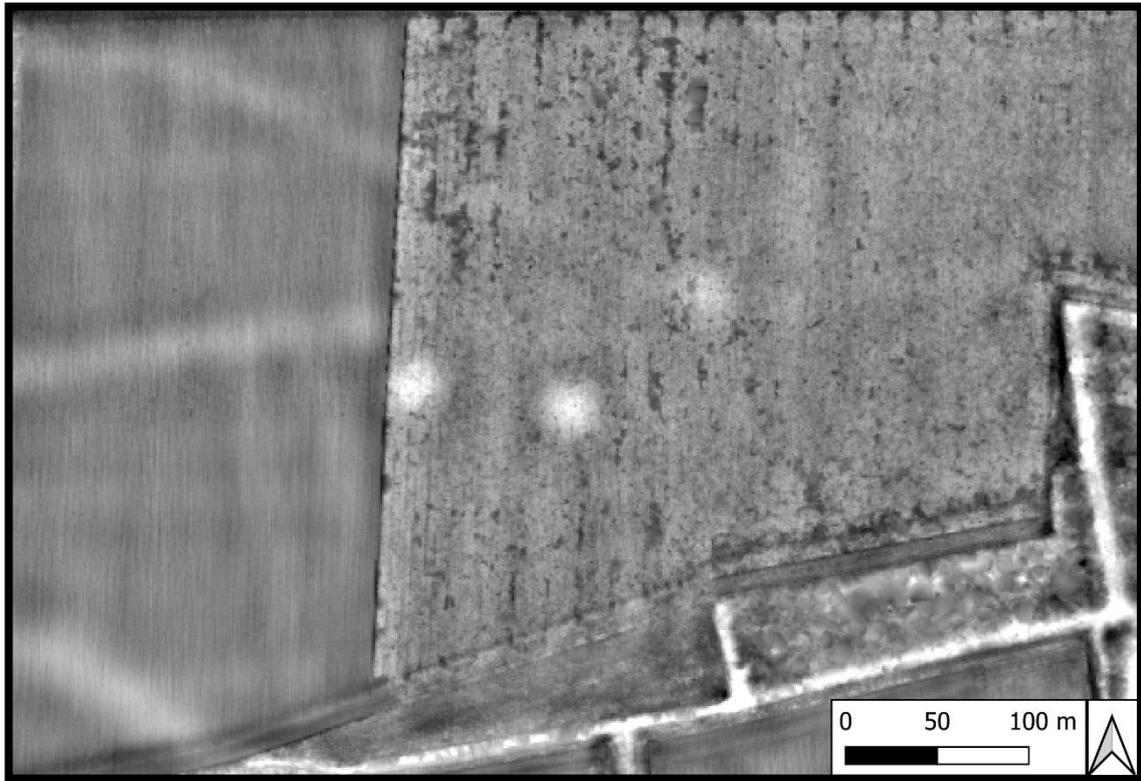
<sup>561</sup> Williamson *et al.*, “The Landscape Archaeology of Knettishall Heath”.

be inferred that more barrows likely await discovery in places such as Euston, and across other parts of Breckland, where similar gaps in the distribution exist and that the distribution of open ground suggested by the buffering of recorded barrows can be tentatively expanded into broader, more contiguous blocks where one might assume barrows (and therefore open ground) should be found.

As will be seen in the discussion below, a contrast exists in Breckland between areas that contain a reasonable density of recorded barrows and areas that have few or no barrows recorded at all. The argument that shall be made is that the distribution of the barrows of Breckland is one that is genuine and predominantly reflective of where people historically chose to construct barrows, rather than an artefact of differential preservation and/or recognition of these features in the landscape. Insight can therefore be gained into the historic openness of the Breckland landscape during prehistory.



*Figure 37: Unrecorded barrows south of RAF Honington are visible on Google Earth imagery and as low earthworks on lidar. Green dots are placed at the centre of the barrow. Grid reference TL 900 745.*



*Figure 38: Lidar imagery clarifies a series of cropmarks as three barrows in Feltwell. Grid reference TL 7345 9050.*



*Figure 39: Google Earth photography suggests an uncertain cropmark is a levelled prehistoric barrow. Grid reference TL 7343 8996.*

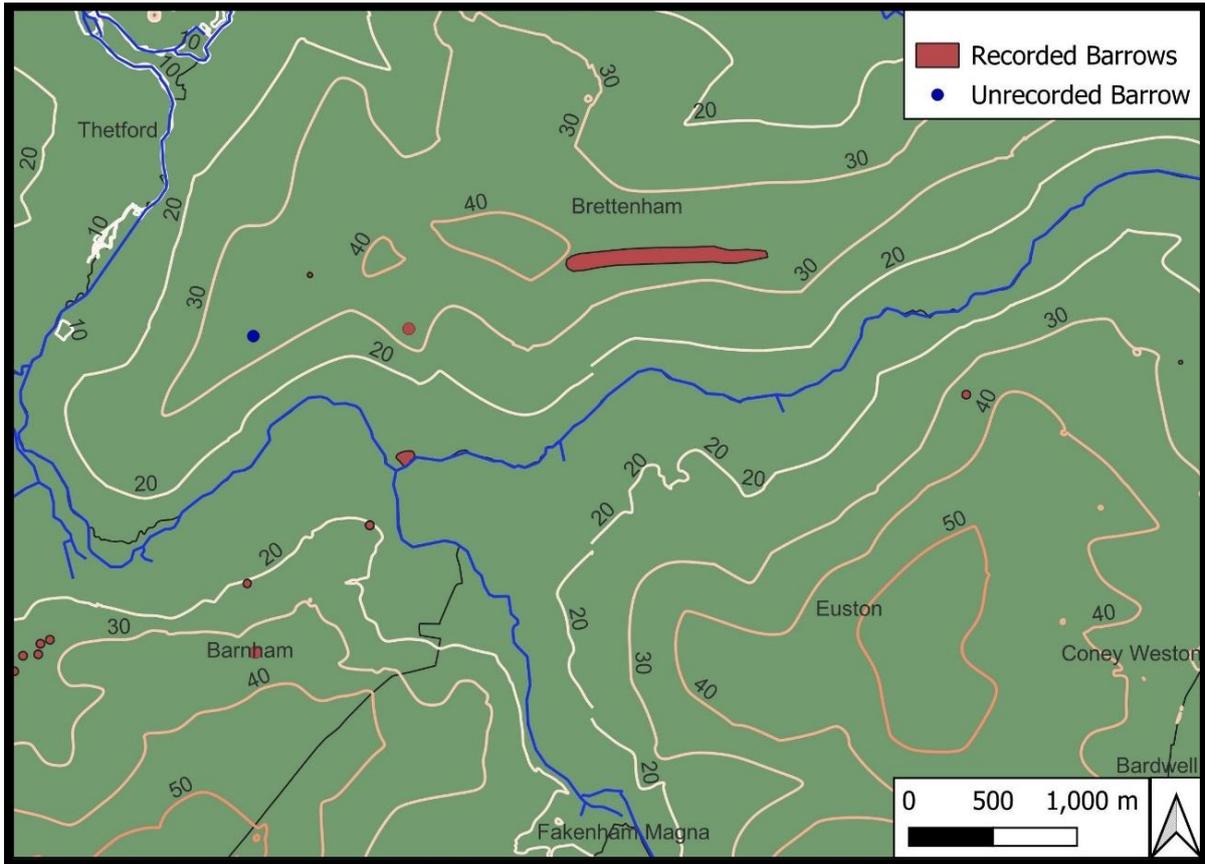


Figure 40: The distribution of barrows in the Little Ouse valley around Euston on the Norfolk/Suffolk border. Contour heights are given in metres OD.

#### The mapped distribution and buffered barrows

Figure 41 plots the distribution of all HER records falling within the study area that are described as either 'Barrow' or 'Ring Ditch' in their records, as well as Scheduled barrows and the addition of the unrecorded barrows identified during this study. Some of these records consist of single points plotted in the centre of the feature, while others are shown as polygons drawn around a feature or group of features or showing an excavation area in which a barrow/ring ditch was discovered. It must be stated that not all of these features may necessarily represent barrows. Some of the recorded ring ditches may have other functions, while some of the extant earthwork features are tentatively suggested as

barrows but may also have been constructed for a different purpose at a different period in history. For example, a series of mounds near Shaker's Lodge in Wangford Warren are recorded as possibly being barrows, pillow mounds or natural features.<sup>562</sup> That said, a clear majority of the features used in this study are recognisable as barrows (or the remains of barrows) and many of the uncertain or tentatively identified features fall within the overall distribution of the more certain barrows, further lending weight to many of these features also being probable barrows.

Across Breckland, the distribution of barrows reveals an apparent preference for river valleys or sloping ground, with relatively few monuments being constructed on the higher, flatter plateaux of the study area. The addition of a 250m buffer around the selected data begins to generate an image suggesting that these valleys were already relatively open in prehistory (Figure 42). That is not to say that they may have been completely treeless by this time, but that within the river valleys enough open space existed to make the construction of barrows in these zones desirable, with the intention being that these monuments were meant to be seen in the landscape. Perhaps the clearest example of this is present in Norfolk Breckland in the vicinity of Weeting and the surrounding parishes, where a noticeably high density of barrows suggests a considerable tract of open ground existed in prehistory (See discussion below) and/or potentially a concentration of the prehistoric population to be deposited within these barrows.

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<sup>562</sup> SHER WNG 037.

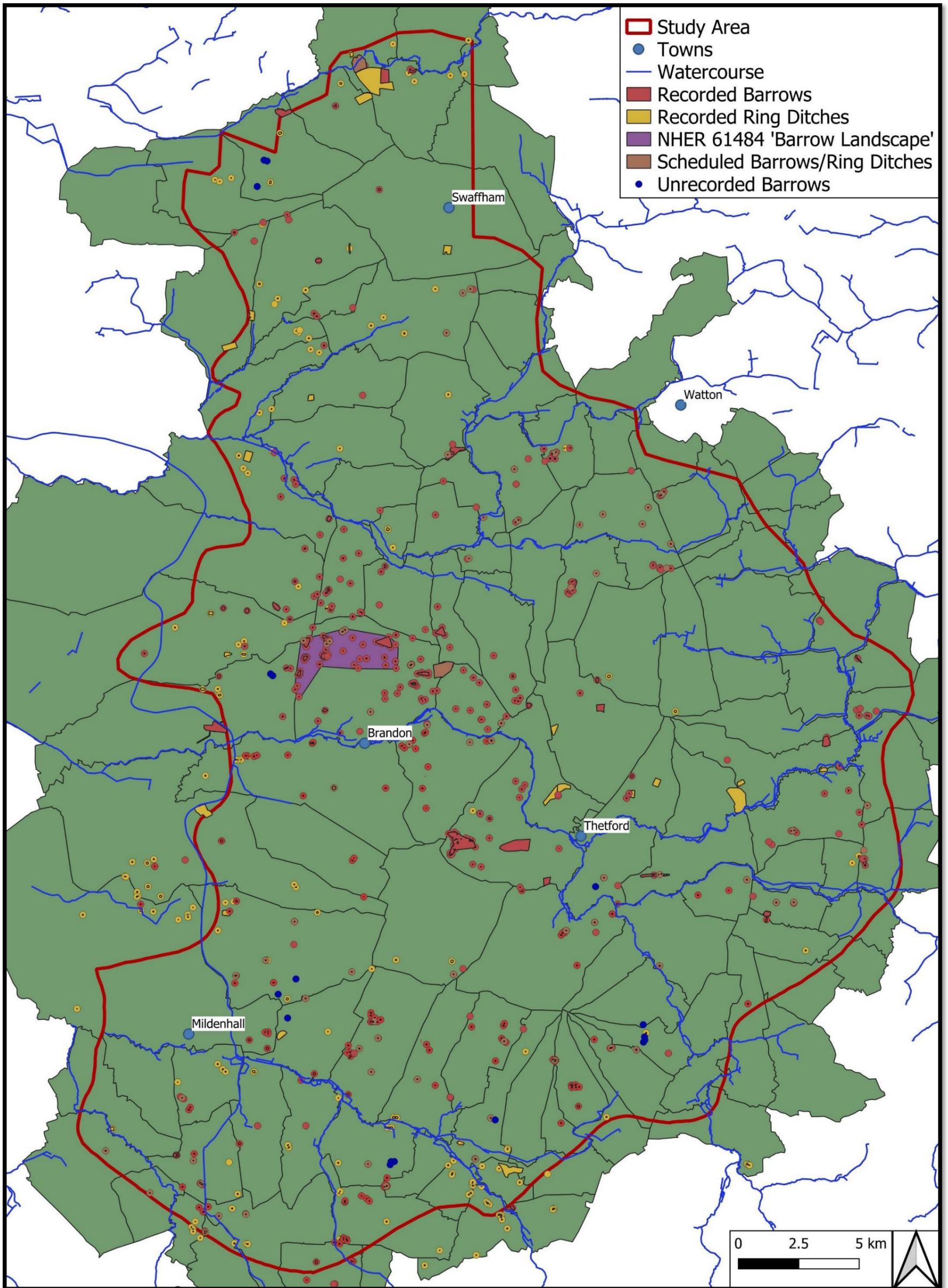


Figure 26: HER and Scheduled Monument record data for barrows and ring ditches within the study area, with the addition of previously unrecorded barrows.

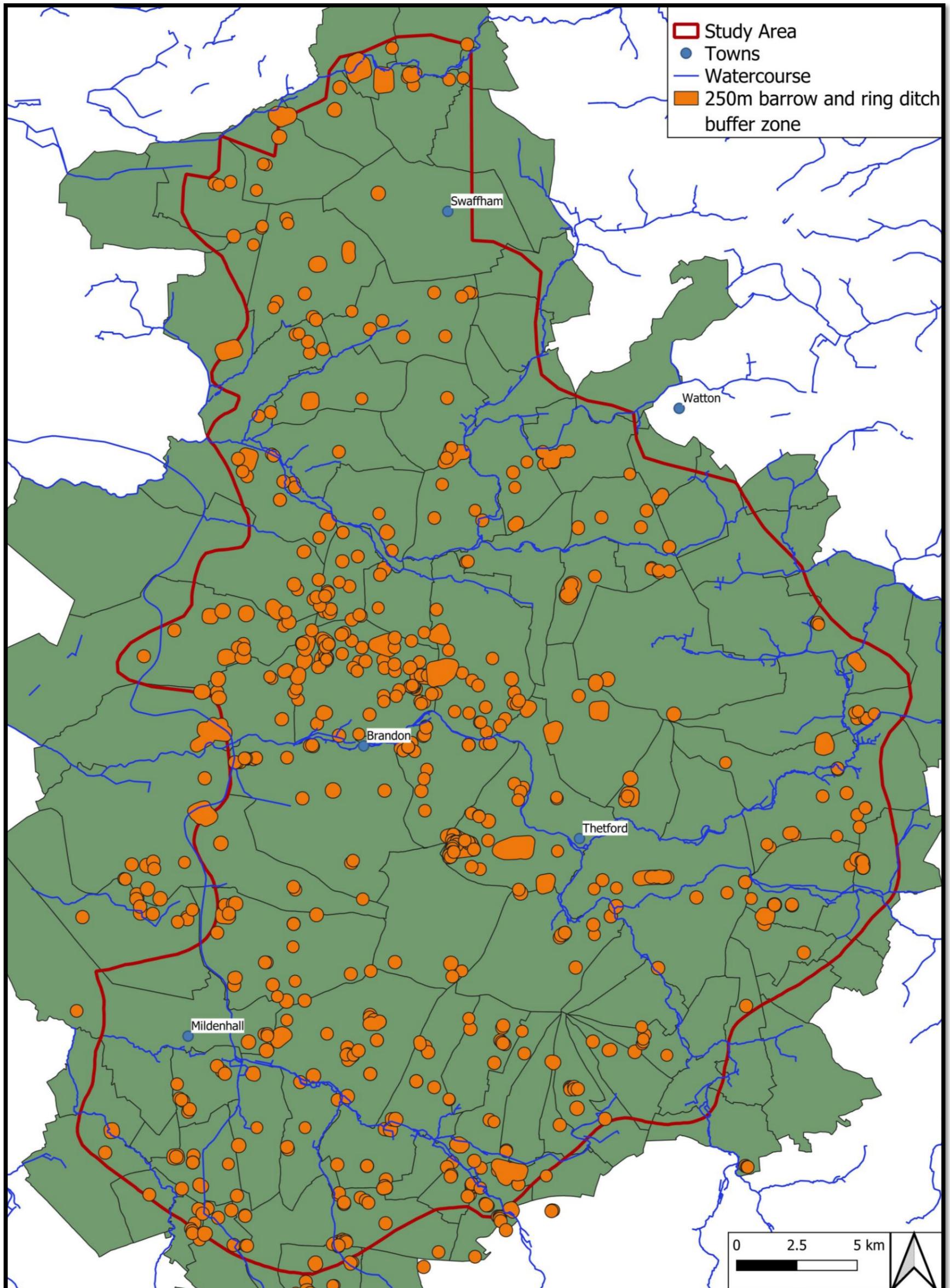


Figure 27: 250m buffering of barrows and ring ditches within the study area.

The purposes of intended visibility with these monuments are in need of consideration, as this is an important factor influencing the distribution of barrows that may be independent of the local vegetation. Beyond their primary function as a funerary monument for some members of prehistoric communities (not all individuals were buried within a barrow), barrows may also have functioned as territorial markers between different communities, as was often seen in later periods as a secondary use for these monuments,<sup>563</sup> or as ‘enclosing’ or demarking a particular part of the landscape.<sup>564</sup> They may also have acted as markers for a change in ‘zones’ of land use, although it is unclear the extent to which this was a specific intention of the barrow builders or a coincidental function of being placed at particular points on a valley side. That said, the siting of barrows is often carried out in such a way as to maximise their visibility from areas below their positions as was interpreted for barrows on the South Downs.<sup>565</sup> On the assumption that contemporary settlement was not within the immediate vicinity of a barrow, this in turn similarly implies that in a Breckland context the cores of Bronze Age settlement were focussed within the river valleys rather than the interfluves. HER data from the region shows a similar pattern, but as discussed in Chapter Three, a number of caveats must be attached to any interpretation of this data. In particular, the dating of surface scatters of flint lacking in diagnostic object types and the characterisation of other surface (including topsoil) finds such as metalwork, without excavation of these areas limits possible

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<sup>563</sup> Anwen Cooper, “Other Types of Meaning: Relationships between Round Barrows and Landscape from 1500 BC-AD 1086” in *Cambridge Archaeological Journal*, Vol. 26, Issue 4 (2016): pp. 665-696.

<sup>564</sup> Stuart Needham and George Anelay, *Barrows at the core of Bronze Age Communities, Petersfield Heath Excavations 2014-18 in their regional context* (Sidestone Press, 2021): pp. 503-504.

<sup>565</sup> *Ibid.*: p. 484.

interpretations, alongside the fact that reasonable amount of the ‘blank’ areas on the map have not been accessible for archaeological investigations. Bronze Age surface finds do not necessarily indicate a farmstead or permanent settlement without more in-depth investigation to characterise a site and may represent sites with a more seasonal or specialist role in the landscape that may not have required a completely open landscape to operate. In addition to this, the long time period forming the Bronze Age means it is unlikely that the HER data represents activity occurring at the same time, and some flint scatters, for example, may only represent occupation of a site for a generation before the area was abandoned. Overall, it appears that the main focus of settlement and corridors of movement of people in Bronze Age Breckland was within the river valleys, rather than on the higher interfluves, in a similar manner to the ‘river-and-wold’ model<sup>566</sup> often used to characterise later settlement patterns (see Chapter Two). The positioning of barrows as visual markers supports this with few on the higher, flatter ground where they would not be as readily visible. This may have been because these areas still retained a degree of woodland to further hinder visibility but also suggests that the interfluves were somewhat spatially marginal to the main cores of settlement within the valleys, where the barrows would be the most visually striking. While it may be difficult to accurately determine between areas of Breckland that were still wooded and areas that may have been open but were not considered suitable for barrow construction, one piece of evidence does support the argument that a lack of barrows in some parts of Breckland is indeed a proxy indicator of relatively wooded areas of landscape – palynological data recovered from Hockham mere.

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<sup>566</sup> See Chapter Two for a summary of this concept.

Hockham Mere was a large natural lake sited on the parish boundary between Hockham and Breckles on the eastern side of Norfolk Breckland. It was formally an open body of water, but natural sedimentation and post-medieval drainage meant that it had largely dried up or developed into peat bog by the eighteenth century. The recovery of sedimentary cores from within the infilled lakebed has provided evidence for the historic vegetation, particularly tree cover, within the mere catchment.<sup>567</sup> The evidence provided by this data suggests that after the successional development of woodland in the post-glacial period much of the catchment remained under woodland cover into the Neolithic.<sup>568</sup> It was interpreted that some human activity and small-scale clearances may have occurred during the Neolithic, but that tree cover within the catchment did not see a significant reduction until the later Iron Age and Roman period.<sup>569</sup> This would suggest that for much of the Bronze Age - the main period of barrow construction in Breckland - the catchment of the mere was relatively wooded and, as such, it would be expected that there should be few barrows within the mere catchment, because, to emphasise the point again, these were a monument type constructed in open landscapes. When the location of Hockham Mere is placed into the context of the barrows in Breckland, the lack of barrows in the vicinity of the mere and wider catchment is striking. The closest recorded barrows to Hockham Mere lie approximately two kilometres to the west in Tottington.<sup>570</sup> More significantly, to the south-west of the mere, the zone which would likely form a considerable part of the catchment with the prevailing south-westerly wind blowing

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<sup>567</sup> Bennett, "Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere": pp.

457-487.

<sup>568</sup> Ibid.: p. 482

<sup>569</sup> Ibid.

<sup>570</sup> NHER 7373 to 7378.

pollen from this area into the mere, the closest possible barrow lies approximately 6.5 kilometres away,<sup>571</sup> and it is notable how few barrows are recorded to the south and south-west of the mere until the Little Ouse valley is reached. The modern land use should also not preclude the discovery of barrows or ring ditches if they were to exist in the mere catchment, with no shortage of arable fields to provide cropmark potential and areas of heath to provide earthwork potential. Indeed, the land use of the mere catchment appears little different to other parts of Breckland where barrows are more numerous, both as upstanding earthworks and as cropmarks, and it must be concluded that the lack of barrows in this area is a genuine gap in the distribution. The Hockham Mere pollen data, then, supports the assertion that the Breckland barrows serve as useful proxy indicators of historic heathland. The pollen data suggests that the mere catchment (that is, the zone to the south and south-west of the mere extending to the Little Ouse valley) was relatively wooded for much of the Bronze Age and the lack of barrows in the mere catchment correlates with this. In turn, this suggests that other gaps in the distribution of barrows, where they appear to be genuine and not because the barrows have yet to be found, may also represent areas that were relatively wooded in the Bronze Age, although this should be tempered against the idea that areas could also have been open but unsuitable for barrow construction. The higher, flatter interfluves, upper parts of the valley sides, and the catchment of Hockham Mere thus appear to be the areas of Breckland where woodland may have been more extensive in prehistory, while the earliest cores of heath appear to be formed extending up the valley sides and areas of sloping ground. In terms of soils, a slight correlation is present between the deep sandy

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<sup>571</sup> NHER 5712.

Worlington soils and areas that fit the model of being wooded in prehistory. However, it is unclear the extent to which this soil type impacts the presence/absence of woodland and how much it is the case that the Worlington soils generally correlate with the higher valley sides and plateaux. It may also be possible that the relatively broad areas (for Breckland) of wet and peaty Isleham 2 soils within the Hockham catchment may have helped discourage the occupation and clearance of woodland in the lower slopes of valleys in this area and as discussed below (pages 251-257), there is evidence to suggest the Isleham soils may have supported some limited areas of woodland in the medieval period. As a final point relating to the Hockham Mere pollen data, it is worth emphasising that the landscape character interpreted from this data has been used historically to interpret the vegetation history of Breckland more widely, but it is quite clear, for the Bronze Age at least, that the ecology present within the mere catchment is not necessarily reflective of the landscape of the entire study area, parts of which appear to be far more open in prehistory than the area casting pollen into the mere.

The existence of relatively large tracts of open landscape in prehistory, as suggested in some places by the density of barrows, benefits from further discussion. In particular, the area of landscape in Weeting and the surrounding parishes sits in stark contrast to the Hockham Mere catchment. Part of the parish of Weeting has been described as a “barrow cemetery landscape”<sup>572</sup> but it appears from the mapping that the barrow landscape in this part of Breckland is more extensive than has previously been interpreted. The modelled buffering of barrows creates a near contiguous block of open ground from the north-western edge of Thetford parish across towards the fen edge at

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<sup>572</sup> NHER 61484.

Hockwold and Feltwell, and from the Little Ouse up to the watershed between the Little Ouse and the Wissey. The area could potentially also be extended south of the Little Ouse, covering the parish of Santon Downham and the south-western side of Thetford. As with the lack of barrows around Hockham, the density of barrows in this part of Breckland does appear to be a genuine distribution (Figure 43). Much of the area was covered by NMP/AIM mapping projects, which also surveyed parts of the study area where fewer barrows were already known, and the results of these surveys simply hardened the pre-existing distribution.<sup>573</sup> While some parts of Breckland that have not been subject to recent intensive aerial surveys have a relatively low density of known barrows in the landscape, the characteristic sandy soils with an underlying chalk geology of the region means that there is good cropmark potential in many areas and survey of both aerial photography and lidar imagery as part of this thesis revealed few additional barrows to add to the overall distribution. This is particularly notable in areas such as the northern part of Norfolk Breckland and, as discussed above, the catchment of Hockham Mere. Importantly, previously known barrows and ring ditches, as well as a few new discoveries, were generally visible on aerial photography as cropmarks despite the geology creating an underlying patterned ground in many cases. Examples of this are visible at Feltwell (TL 7345 9050)<sup>574</sup> Honington (TL 9003 7454)<sup>575</sup> and Icklingham St James

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<sup>573</sup> Ellen Bales, Alice Cattermole and Sarah Horlock with Sophie Tremlett, *The Archaeology of Thetford 'Growth Point' & Environs, Results of the Thetford Growth Point, Norfolk NMP Project 5313* (Norfolk County Council/English Heritage, 2011); Horlock and Tremlett, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 1)*.

<sup>574</sup> NHER 30854. Recorded as a possible ring ditch but aerial photography reveals a group of three barrows that still survive as low earthworks on lidar imagery.

<sup>575</sup> Previously unrecorded but visible on aerial imagery and lidar, part of a barrow group with SHER HNN 042.

(TL 7524 7546)<sup>576</sup>. Even taking into account the tracts of modern forestry plantation, large areas of arable are still present in areas with few recorded barrows and the evidence suggests that were barrows present on these areas, they would be visible as cropmarks or on lidar imagery. It appears to be the case that the distribution of barrows in Breckland, in general, is genuine and that further discoveries are more likely to harden up this distribution rather than make it more extensive. With this in mind, the dense barrow landscape covering the area described above takes on a particular significance, as it suggests that considerable tracts of the Breckland landscape were already open by the Bronze Age and probably of heathland character. This area appears to have formed a large core of early heathland, parts of which may well have remained as continual heathland through to the post-medieval period to be included on historic mapping. Archaeological investigations in Wilton, on the south-western edge of this zone, revealed little apart from sparse prehistoric (Bronze Age and earlier) activity, suggesting this area had seen limited use in the succeeding centuries and may have been relatively stable heathland, or on the periphery of any arable zones.<sup>577</sup> One interesting aspect of this interpretation is the presence of parishes with *-wold* (OE 'wood') place name elements on the western side of this distribution, which implies the existence of woodland in these areas during the Anglo-Saxon period.<sup>578</sup> This is discussed further below (see pages 253-255), but perhaps serves to emphasise the point that the landscape suggested here is

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<sup>576</sup> Previously unrecorded but visible on aerial imagery and lidar.

<sup>577</sup> House, Hockwold Heath, Norfolk.

<sup>578</sup> Keith Briggs and Kelly Kilpatrick, *A Dictionary of Suffolk Place-Names* (English Place-Name Society, 2016): p. 172.

one that was *relatively* open, principally consisting of tracts of heath- or grasslands with far-reaching views in places, but retaining some areas of woodland intermixed with this.

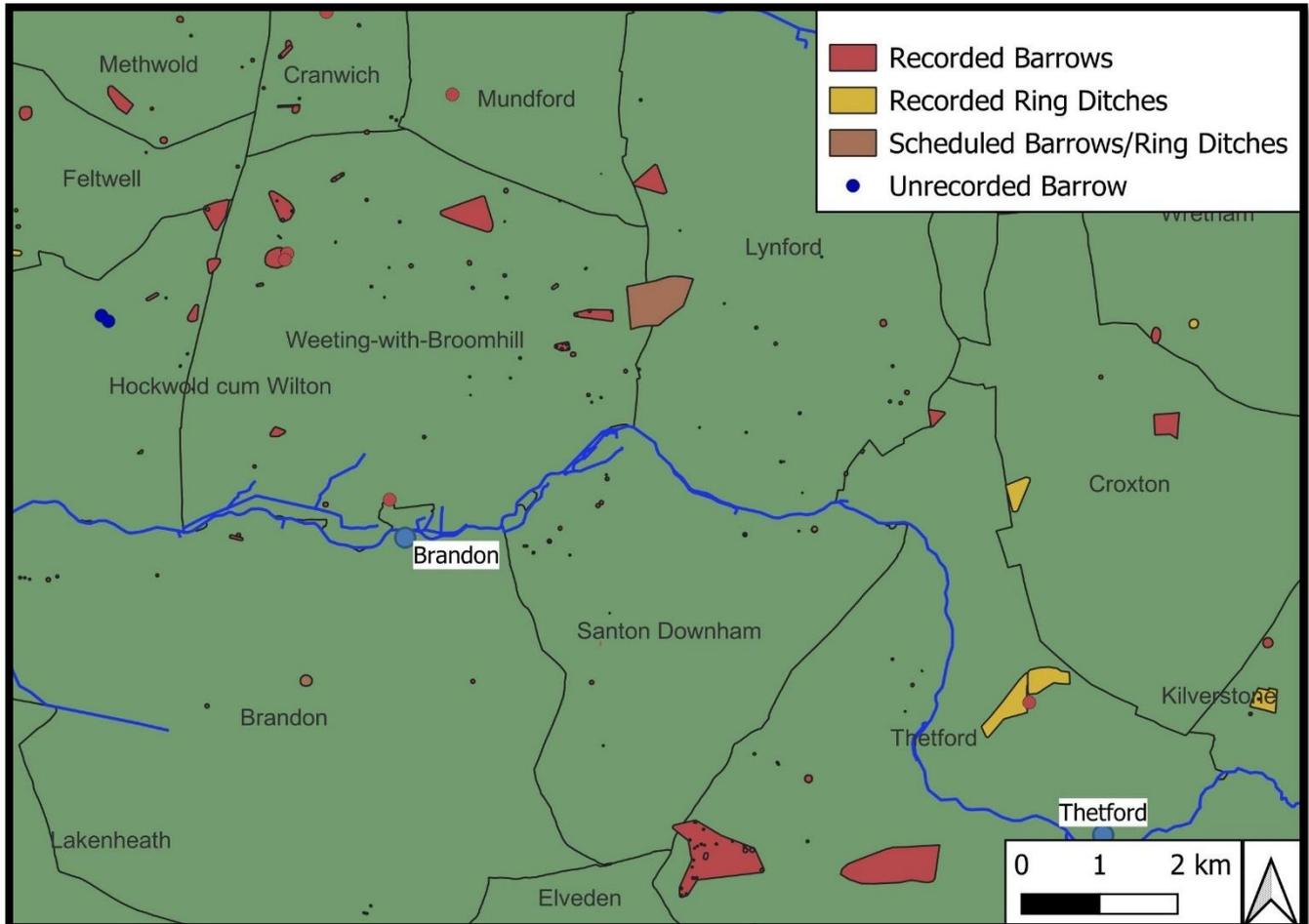


Figure 43: The suggested extensive barrow landscape in the Little Ouse Valley.

The sheer density of barrows in this part of the landscape raises an interesting possibility about the historic landscape character of this area. It suggests that this part of Breckland was a focal point for activity during the Bronze Age and, as discussed above, the chronology of woodland development from sources such as Hockham Mere cannot be applied to a landscape where evidence suggests a different ecological history. A particular consideration that is worth briefly examining, and feeds into wider discussions about the character of Breckland and indeed the post-glacial landscape of lowland

England more generally, is the point at which this barrow landscape became so open. The existence of Grime's Graves in the middle of this landscape indicates a focal Neolithic presence in the area, and HER data shows no shortage of Neolithic activity in this part of the landscape (see Figure 21). This should not be overstated, however, as struck flints may be found across many parishes in Breckland, as W. G. Clarke was clear to state.<sup>579</sup> What is unusual about this area, particularly to the north of Brandon, is that the recorded finds of Late Upper Palaeolithic<sup>580</sup> and Mesolithic<sup>581</sup> flint tools also appear to concentrate within this part of the landscape (Figure 44). It is arguable that this may be a result of fieldwalking and focussed investigations in this area collecting this material and generating this anomaly in the distribution but it is noticeable how other fieldwalking surveys covering different parts of Breckland have not recorded this material in a similar density.<sup>582</sup> Certainly, while Mesolithic flintwork may be more widespread across the study area (Figure 20), Late Upper Palaeolithic finds are much more restricted in distribution. The fieldwalking survey at Wangford Warren serves to emphasise this, which produced an assemblage of Mesolithic or Early Neolithic flints across much of the site, but only a single Late Upper Palaeolithic flint despite the methodical coverage of the area and vast quantity of over 8,600 struck flints recovered.<sup>583</sup> What this may suggest, therefore, is that if

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<sup>579</sup> Clarke, *In Breckland Wilds*, First Edition: p. 179.

<sup>580</sup> NHER 14950, 25522 and 37109.

<sup>581</sup> For example: NHER 14950, 25522, 37109 and 38098.

<sup>582</sup> For examples, see: Davison, Green and Milligan, *Illington: A Study of a Breckland Parish*; Alan Davison, "The Field Archaeology of Bodney and the Stanta Extension" in *Norfolk Archaeology*, Vol. 42, No. 1 (1994): pp. 57-79; Andrew Rogerson, Alan Davison, David Pritchard and Robert Silvester, *Barton Bendish and Caldecote: fieldwork in south-west Norfolk*, East Anglian Archaeology Report No. 80 (Norfolk Museums Service, 1997); Davison and Cushion, "An Archaeological Survey of the Stanford Training Area": pp. 602-616.

<sup>583</sup> Hinman and McIntosh, *Land at Wangford Warren Phases One through Three*: pp. 29-45.

the flints recovered from this barrow landscape do represent a genuine concentration of Late Upper Palaeolithic and Mesolithic material, this area may also have been a focal point for human activity before the Neolithic, and in turn hint that this part of the Breckland landscape was always relatively open in character and never achieved the dense climax woodland that was interpreted from the pollen data of Hockham Mere. Certainly, some of the *flora* that give Breckland its distinctive ecology require open ground to survive and are more characteristic of Mediterranean and steppe landscapes.<sup>584</sup> Species such as Spanish catchfly, spring speedwell and Breckland thyme are largely or entirely restricted to the Breckland region within Britain,<sup>585</sup> emphasising the distinctiveness of the local conditions and demonstrating that there must have been at least some proportion of open ground on the sandy soils within the study area. The presence of these species is a reasonable indicator that areas of open ground must have existed in Breckland in a somewhat continuous form since the post-glacial period, in order for these species to colonise and then survive through to the present day without being outcompeted by woodland species.

The scale and approximate locations of these open areas is not something that is easy to determine, particularly as many of the open ground plant species can survive in relatively small clearings dispersed across a larger area of woodland. The suggestion that the post-glacial English landscape may have been of a more open nature rather than relatively dense climax woodland was previously suggested by Franz Vera who interpreted the landscape as being a mosaic of open grazing ground with scattered thorny scrub in which young trees would be protected from grazing animals, alongside areas of

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<sup>584</sup> Dolman *et al.*, *Securing Biodiversity in Breckland*: p. 12.

<sup>585</sup> Plant Atlas 2020 online viewer (Botanical Society of Britain and Ireland, 2020).

more mature woodland. As the young trees within the thorny scrub grew larger and began to shade out the scrub the area below, which would then die off, areas of more closed-canopy woodland would generate. As these trees eventually died new areas of open ground would then appear, which would generate into grassland and scrub, beginning the cycle again.<sup>586</sup> Thus, in Vera's argument, the post-glacial landscape was a dynamic mosaic grassland, scrub and more mature stands of woodland, kept in balance by the grazing of wild and later domesticated animals. This interpretation was not universally accepted, but did renew debate about the nature of post-glacial tree cover.<sup>587</sup> Other studies have further nuanced and reinterpreted Vera's argument with a broader acceptance that the historic natural landscape was more dynamic than previously thought and more open in some places than the imagery of dense forest that had previously been accepted.<sup>588</sup> What is suggested here is that the barrow landscape in this part of Breckland appears to be of a historic character where it would be unsurprising for this landscape to always have been somewhat open in nature and perhaps more similar in character to Vera's grazing ground landscape rather than closed-canopy woodland. The Bronze Age evidence supports the assertion that it was a large tract of open landscape by that date, while the concentration of Late Upper Palaeolithic and Mesolithic flints also suggests it may have been drawing hunter-gatherer communities to the area compared to elsewhere in Breckland, and this may have been because it was a naturally

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<sup>586</sup> Franz Vera, *Grazing Ecology and Forest History* (CABI Publishing, 2000): pp. 13-60.

<sup>587</sup> For a summary of this debate see Williamson, *Environment, Society and Landscape*: pp. 216-219.

<sup>588</sup> Ian Rotherham (Ed.), *Trees, Forested Landscapes and Grazing Animals, A European Perspective on Woodlands and Grazed Treescapes* (Routledge, 2013).

formed landscape of relatively open grazing (and, by extension, hunting) ground, effectively a naturally generated core of Breckland heath.

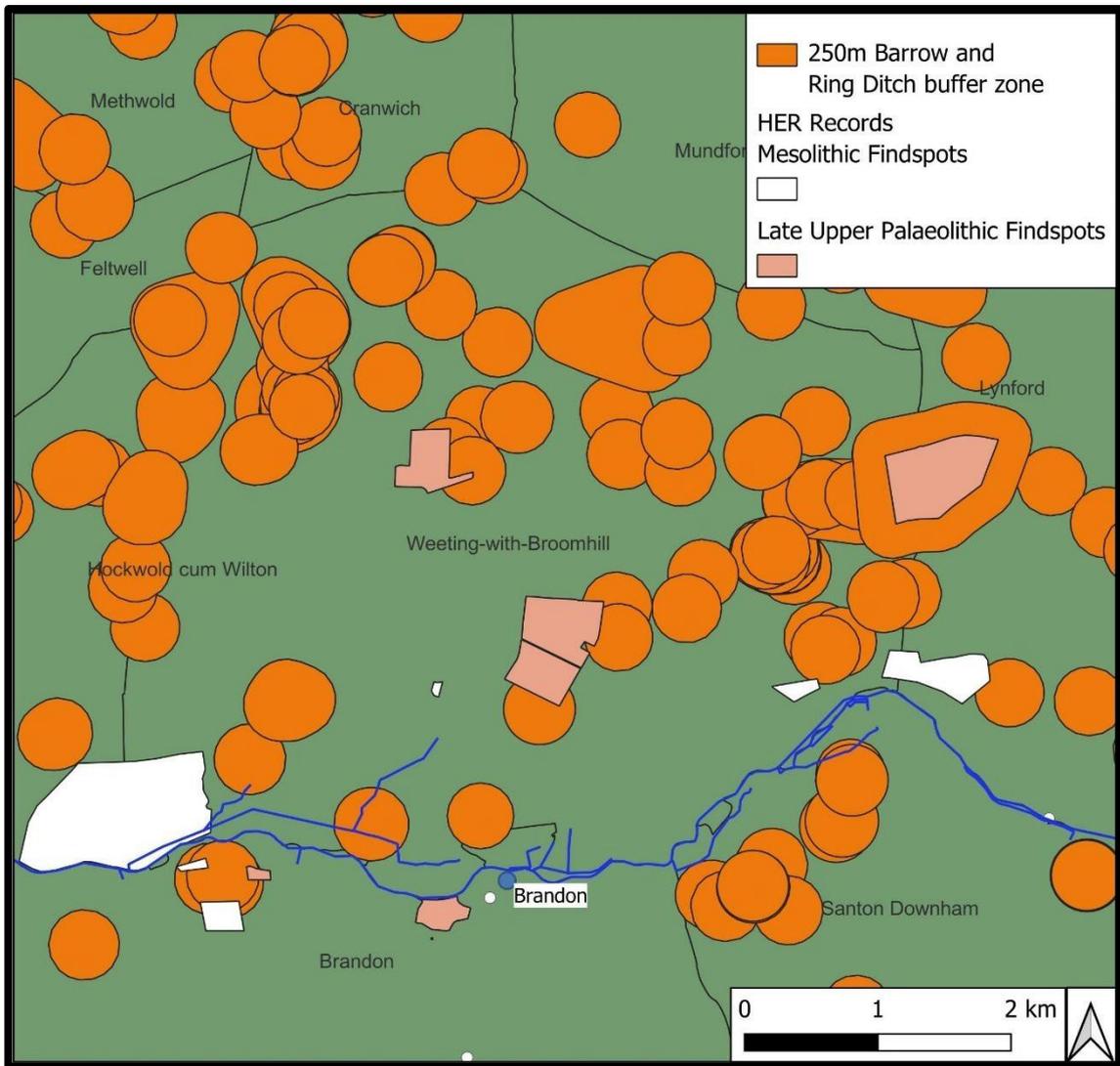


Figure 44: Recorded Late Upper Palaeolithic and Mesolithic findspots in relation to buffered open ground around barrows in the Little Ouse valley.

### **Environmental Evidence for Heathland in the Archaeological Record**

Before examining the changing nature of heathland over the course of the study period, it is worthwhile to briefly provide evidence that heathland was at least present to some extent in Breckland across the various historic periods being studied. One way of demonstrating this is through the recovery of charred heather remains from archaeological excavations, a plant species which acts as a useful proxy for the presence of heathland. Heather as a source of fuel has the characteristics of burning at a high temperature for a consistent period, and was readily used as a source of fuel for both domestic and industrial processes.<sup>589</sup> Equally, it is simply a useful fuel source for everyday use (although wood was preferable) and this means that little in-depth analysis can be carried out for the heather charcoal record in Breckland, as historically this fuel may have been gathered from a few miles away as much as it may have been adjacent to the site from which it was recovered. The presence of heather charcoal in Late Saxon and medieval urban contexts in Thetford indicates that it was being gathered from the surrounding countryside and transported into the town, for example.<sup>590</sup>

The earliest archaeological record of heather charcoal comes from a site at Mildenhall where Beaker Period remains contained charred heather, but it was uncertain whether this was as a result of use for fuel, deliberate land clearance, or wildfires.<sup>591</sup> Charred

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<sup>589</sup> Paul Warde and Tom Williamson, "Fuel supply and agriculture in post-medieval England" in *The Agricultural History Review*, Vol. 62, No. 1 (2014): pp. 65-66.

<sup>590</sup> Peter Murphy, "Plant Macrofossils from Site 1092" in Rogerson and Dallas, *Excavations in Thetford 1948-59 and 1973-80*: p. 194; Peter Murphy, "Plant Remains" in Dallas, *Excavations in Thetford by B. K. Davison between 1964 and 1970*: pp. 192-193; Val Fryer and Peter Murphy, "Plant macrofossils and molluscs" in Andrews and Penn, *Excavations in Thetford, North of the River, 1989-90*: pp. 60-63.

<sup>591</sup> Anna West, "Plant macrofossils" in Brooks, *F35 Expansion Excavations*: p. 71

heather remains are then present in varying quantities in the archaeological record throughout the Bronze Age,<sup>592</sup> Iron Age<sup>593</sup> and Roman periods.<sup>594</sup> Remains underneath a Late Iron Age to Early Roman mound at Gallows Hill were interpreted as clearing an area of heath by burning, before the construction of the mound.<sup>595</sup> This potentially provides evidence indicating expansion of farming into areas of heathland during the Roman period. A similar suggestion of deliberate clearance by burning was made for remains recovered at Staunch Meadow, Brandon alongside the use of heather to provide a firm

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<sup>592</sup> Val Fryer, “Plant macrofossils and other remains” in Cass, *Culford School Air Tennis Hall, Culford*: pp. 37-39; Val Fryer, “Plant macrofossils and other remains” in Craven, *Liberty Village, RAF Lakenheath*: pp. 120-121.

<sup>593</sup> Peter Murphy, “Plant remains and the environment” in Gregory, *Excavations in Thetford, 1980-1982, Fison Way*: p. 177; Val Fryer, “Plant macrofossils” in Andrew Tester, *Multi-use Games Area, Remembrance Playing Fields, Brandon, Archaeological Monitoring Report*, SCCAS Report No. 2008/006 (Suffolk County Council Archaeological Service, 2008), Unpublished Fieldwork Report: pp. 10-11; Val Fryer, “Plant macrofossils and other remains” in Jo Caruth, *Norwich Road and Exeter Crescent Road Realignment, RAF Lakenheath, Archaeological Excavation Report*, SCCAS Report No. 2009/125 (Suffolk County Council Archaeological Service, 2009), Unpublished Fieldwork Report: pp. 26-28; Val Fryer, “Plant Macrofossils and other remains” in Craven, *Liberty Village, RAF Lakenheath*: p. 49; Val Fryer, “Plant macrofossils and other remains” in Andrew Beverton, *Land off Lord’s Walk, Eriswell, Post-Excavation Assessment Report*, SCCAS Report No. 2012/103 (Suffolk County Council Archaeological Service, 2013), Unpublished Fieldwork Report: pp. 22-23; Fryer, “The Charred Plant Macrofossils and Other Remains” in Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 279-290.

<sup>594</sup> For examples, see Rachel Ballantyne, “Plant remains” in Garrow, *Archaeological Excavations at Norwich Road, Kilverstone*: pp. 133-146; Gary Trimble, *Report on an Archaeological Evaluation at Alpha Business Park, Mundford Road, Thetford, Norfolk*, Report Number 636 (Norfolk Archaeological Unit, 2001), Unpublished Fieldwork Report: pp. 15-16; Fryer, “The Charred Plant Macrofossils and Other Remains” in Lees, *Hinman and Stump, A11 Fiveways to Thetford Road Improvements*: pp. 279-290; John Summers, “The charred plant macrofossils and charcoal” in Antony Mustchin and Peter Thompson, *Former Smoke House Inn, Beck Row, Mildenhall, Suffolk*, Research Archive Report, Report No. 4514 (Archaeological Solutions, 2014), Unpublished Fieldwork Report: pp. 292-293.

<sup>595</sup> Richard Macphail, “Soil report on the turf stack and buried soil” in Lawson, *Barrow Excavations in Norfolk*: Microfiche 1:E.4-6.

footing on the wet waterfront.<sup>596</sup> Further evidence of charred heather occurs across the Anglo-Saxon period.<sup>597</sup> Excavated medieval contexts also show that heather was a widely used fuel across much of Breckland in both urban and rural contexts.<sup>598</sup>

While the archaeological evidence for heather can only be analysed in the broadest sense, it does provide clear evidence for the burning of this plant, almost certainly as a source of fuel, from the Bronze Age onwards. The widespread and regular occurrence of this material across a range of sites and time periods also strongly suggests that tracts of heather, and by extension heathland, existed in Breckland that were large enough to

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<sup>596</sup> Murphy and Fryer, “Valley sediments and plant macrofossils” in Tester *et al.*, *Staunch Meadow, Brandon, Suffolk*: pp. 313-330.

<sup>597</sup> Murphy, “Plant Remains” in Dallas, *Excavations in Thetford by B. K. Davison between 1964 and 1970*: pp. 192-193; Val Fryer, “Plant macrofossils and other remains” in Jo Caruth, *Consolidated Support Complex, RAF Lakenheath, ERL 116 and Family Support Complex, RAF Lakenheath, ERL 139, Archaeological Excavation Report*, SCCAS Report No. 2006/179 (Suffolk County Council Archaeological Service, 2006), Unpublished Fieldwork Report: pp. 43-45; Val Fryer, “Macrobotanical and other remains” in John Duffy, *EDF, Thetford Grid Substation, Barnham, Archaeological Evaluation and Excavation Report*, SCCAS Report No. 2008/098 (Suffolk County Council Archaeological Service, 2008), Unpublished Fieldwork Report: p. 12; Val Fryer, “Environmental samples” in John Craven and Jo Caruth, *Land to rear of 82/82A High Street, Lakenheath, Archaeological Evaluation Report*, SCCAS Report No. 2008/109 (Suffolk County Council Archaeological Service, 2008), Unpublished Fieldwork Report: pp. 16-18.

<sup>598</sup> Val Fryer, “Charred plant macrofossils and other remains” in Linzi Everett, *Site Adjacent 8, Troston Road, Honington, Archaeological Evaluation and Monitoring Report*, SCCAS Report No. 2008/131 (Suffolk County Council Archaeological Service, 2008), Unpublished Fieldwork Report; Val Fryer, “Plant macrofossils and other remains” in John Sims, *Methodist Chapel, Tuddenham, Archaeological Monitoring Report*, SCCAS Report No. 2011/091 (Suffolk County Council Archaeological Service, 2011), Unpublished Fieldwork Report: pp. 13-14; Val Fryer, “Plant Macrofossils” in Peter Crawley, *Archaeological Excavation at Spring Road, Bardwell, Suffolk, Assessment Report and Updated Project Design*, Report No. 2691a (NPS Archaeology, 2012), Unpublished Fieldwork Report: pp. 23-25; John Summers, “The Environmental Samples” in Gareth Barlow and Antony Mustchin, *80 London Road, Brandon, Suffolk, Archaeological Trial Trench Evaluation*, Report No. 4353 (Archaeological Solutions, 2013), Unpublished Fieldwork Report: pp. 21-22; Val Fryer, “Plant Macrofossils” in Peter Crawley, *Archaeological Trial Trench Evaluation, on the Route of Anglian Water Bury PZ – Barnham Cross to Little Welnetham Treated Water Main*, Report No. 2956 (NPS Archaeology, 2014), Unpublished Fieldwork Report: pp. 321-323.

warrant exploitation for fuel and/or because supplies of wood fuel in the region were limited. Heather was also easily transported and had specialised uses and some of these sites could have been gathering the material from a distance for a specific industry, but sites such as Gallows Hill<sup>599</sup> and Staunch Meadow<sup>600</sup> also show that this plant was being deliberately cleared from areas in the vicinity of settlement. These areas of heathland may have been somewhat fluid in terms of their size and probably expanded and contracted in relation to the expansion/contraction of other land uses, such as arable and woodland, over a prolonged period, which themselves would have been related to variations in human population and resultant intensity of land use. Indeed, some areas may have always been of an open nature, potentially even naturally generated heath (see above), while other areas may represent expansion over open ground as arable and/or woodland retreated in the post-Roman and medieval periods (see Chapters Nine and Ten). What is clear, however, is that heathland has formed a significant part of the Breckland landscape since prehistory, and almost certainly covered large areas of the landscape across the entirety of the study period for this thesis.

### **The Character of Woodland**

From the discussions above, it is clear that heathland and woodland, alongside arable, share a dynamic relationship, with the expansion or contraction of one type of landscape naturally impacting the extents of other landscapes in the region. In attempting to understand the historic landscape of Breckland, and the relationship of this landscape

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<sup>599</sup> Lawson, *Barrow Excavations in Norfolk*: pp. 65-69.

<sup>600</sup> Murphy and Fryer, "Valley sediments and plant macrofossils" in Tester *et al.*, *Staunch Meadow, Brandon, Suffolk*: pp. 313-330.

type with heathland and arable extents in the region, environmental evidence from archaeological deposits has the potential to shed some light on the historic nature of woodland in Breckland, the tree species present, and potentially when tracts of woodland in the region were cleared. There are three main ways in which this can be done: preservation of charred wood remains (charcoal), preservation of waterlogged or anaerobic wood remains, and preservation of pollen as a proxy for extent and species composition of historic woodland. A number of issues exist with these sources in terms of how much information can be reliably extrapolated from them, such as whether charcoal represents locally grown or imported wood fuel, and whether charcoal from a particular species may be more resilient and therefore appear more readily in the archaeological record.<sup>601</sup> This section intends to summarise the grey literature evidence for woodland in Breckland, primarily through the analysis of charcoal remains supplemented by occasionally preserved unburnt remains, palynological samples and snail shell evidence. As will be seen with the discussion on preserved cereal grains in Chapter Nine, much of this material comes from Suffolk and the Little Ouse valley, with comparatively little material available for the remainder of the Norfolk Breckland.

Charcoal is a commonly recovered material during archaeological excavations. The usual method of recovery is through environmental sampling, where a particular deposit is gathered unsorted into buckets for specialist processing off-site. Most features where organic survival is possible will contain at least a small quantity of charcoal, but much of this consists of a background of material, often too small to enable any form of species identification. In deposits where charcoal is present in higher densities, such as

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<sup>601</sup> Elani Asouti, 'Factors affecting the formation of an archaeological wood charcoal assemblage' on *Charcoal Analysis Web* (University of Liverpool, 2006).

dumps of hearth waste, burnt-down structures, disused ovens and similar contexts, larger fragments of the material can survive that may potentially be identifiable to a particular species.

Excavations at Red Lodge revealed an Early Neolithic pit containing oak and pine charcoal,<sup>602</sup> while sites at Worlington Road, Mildenhall<sup>603</sup> and Kilverstone<sup>604</sup> produced charred hazelnut shells. Charred hazelnut shells are found widely across a range of prehistoric sites from the Mesolithic onwards across much of Europe.<sup>605</sup> They potentially act as a proxy for the existence of hazel woodland in the area and hazelnut shells recovered from Late Neolithic to Early Bronze Age deposits at Lakenheath were interpreted as representing material exploited from local woodland at this time.<sup>606</sup> This requires some caution, however, as the use of hazelnuts as a staple and easily transported food in the prehistoric period raises the possibility that they may have been imported from elsewhere. Hazel also struggles to flower under closed canopy woodland

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<sup>602</sup> Stacey Adams, Martin Demicoli and Karine Le Hégarat, “The Environmental Samples” in Angus Forshaw, *Archaeological Evaluation, Phases A and B, Land East of Kings Warren, Red Lodge, Suffolk*, ASE Report No. 2018022 (Archaeology South-East, 2018), Unpublished Fieldwork Report: pp. 40-42.

<sup>603</sup> Rachel Fosberry, “Environmental Samples” in Rebecca Jarosz-Blackburn, *Land South of Worlington Road, Mildenhall*, OA East Report No. 1825 (Oxford Archaeology East, 2015), Unpublished Fieldwork Report: pp. 33-34.

<sup>604</sup> Ballantyne, “Plant remains” in Garrow, *Archaeological Excavations at Norwich Road, Kilverstone*: pp. 133-146.

<sup>605</sup> For examples see: Daniela Holst, “Hazelnut economy of early Holocene hunter-gatherers: a case study from Mesolithic Duvensee, northern Germany” in *Journal of Archaeological Science*, Vol. 37, No. 11 (2010): pp. 2871-2880; Rosie Bishop, “Experiments on the effects of charring hazelnuts and their representation in the archaeological record” in *Journal of Archaeological Science: Reports*, Vol. 26 (2019): pp. 1-17.

<sup>606</sup> West, “Plant macrofossils” in Brooks, *F35 Expansion Excavations*: p. 71.

and may actually suggest areas of semi-open scrub rather than mature deciduous woodland.

Other Bronze Age sites have also produced identifiable remains. Fragments of charcoal from Barningham were identified as oak,<sup>607</sup> and at Fornham All Saints a cremation deposit was found to contain hawthorn charcoal,<sup>608</sup> although as with hazel, this species will freely colonise open ground and scrub so is less of a woodland indicator. Iron Age deposits in the region have produced less identifiable material, with excavations at Center Parcs, Elveden being the only report of those selected to contain identifiable remains of porous wood types and possibly elm.<sup>609</sup> At the same site, a small quantity of oak charcoal was recovered from a Roman context.<sup>610</sup> Oak was also recovered from a Roman site at Brettenham, thought to be related to on-site metalworking activities,<sup>611</sup> and was also the dominant wood type identified on the site of the Former Smoke House Inn at Beck Row, Mildenhall, alongside hazel, whitebeam, hawthorn and elder.<sup>612</sup> A variety of

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<sup>607</sup> Lucy Allott and Dawn Elise Mooney, “Environmental Samples” in Ian Hogg, *Final Report on Archaeological Excavations at Land at Hopton Road, Barningham, Suffolk*, ASE Report No. 2014331 (Archaeology South-East, 2015), Unpublished Fieldwork Report: pp. 16-17.

<sup>608</sup> Anna West, “Plant macrofossils and other remains” in Andy Beverton, *Land North-West of Bury St Edmunds, Fornham All Saints, FAS 050*, SCCAS Report No. 2013/035 (Suffolk County Council, 2013), Unpublished Fieldwork Report: pp. 55-58.

<sup>609</sup> John Summers, “The Environmental Samples” in Antony Mustchin, Kamil Orzechowski, Laszlo Lichtenstein and James Fairclough, *Proposed New Arrivals Lane, Center Parcs, Elveden Forest Holiday Village, Brandon, Suffolk, Archaeological Assessment and Updated Project Design*, Report No. 4675 (Archaeological Solutions, 2014), Unpublished Fieldwork Report: pp. 30-32.

<sup>610</sup> Ibid.

<sup>611</sup> Mark Robinson, “Environmental remains Assessment” in Anon., *Melford Meadows, Brettenham, Norfolk, Romano-British and Anglo-Saxon Occupation, Post-Excavation Assessment and Publication Proposal*, (Oxford Archaeological Unit, 1994), Unpublished Fieldwork Report: pp. 30-31.

<sup>612</sup> John Summers, “The charred plant macrofossils and charcoal” in Mustchin and Thompson, *Former Smoke House Inn, Beck Row, Mildenhall*: pp. 282-300.

wood types were also recovered from a Late Roman shrine site at Red Lodge, where species included oak, hazel, yew, ash, elder and possibly sweet chestnut.<sup>613</sup> By contrast, and to emphasise the issues present with differential preservation, while wood charcoal remains were recovered from the Iron Age and Roman site at Fison Way, none was identified to species level.<sup>614</sup> Palynological evidence provides further insight and samples from a peat-filled channel at Eriswell suggested that the area within the sampling catchment was largely clear of woodland or heavily managed from the mid-Roman period through to the medieval with no evidence of woodland regeneration in the post-Roman period.<sup>615</sup> This was further reinforced with environmental data from Staunch Meadow, which was interpreted the site as being set in a very open landscape.<sup>616</sup>

Anglo-Saxon deposits containing identifiable charcoal remains are relatively limited, with a site at Brettenham representing the only Early Anglo-Saxon sample in the group, which produced oak, hazel or alder, and a member of the *rosaceae* family.<sup>617</sup> Middle Saxon deposits are also similarly sparse, represented by remains at Staunch Meadow, Brandon, where remains included oak, ash and hazel or alder charcoal.<sup>618</sup> Late Saxon remains from a burnt down cellared building in Thetford produced typical English wood varieties of oak, ash and hazel, but the use of heather and gorse/broom in nearby

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<sup>613</sup> Stacey Adams, “Environmental Samples” in Forshaw, *Archaeological Investigations at Land East of Kings Warren*: pp. 75-81.

<sup>614</sup> Murphy, “Plant remains and the environment” in Gregory, *Excavations in Thetford, 1980-1982, Fison Way*: p. 177.

<sup>615</sup> Patricia Wiltshire and John Daniell, “Palynology” in Caruth, *Consolidated Support Complex, RAF Lakenheath*: pp. 45-55.

<sup>616</sup> Tester *et al.*, *Staunch Meadow, Brandon*: p. 1.

<sup>617</sup> Robinson, “Environmental remains Assessment” in Anon., *Melford Meadows, Brettenham, Norfolk*: pp. 30-31.

<sup>618</sup> Murphy and Fryer, “Valley sediments and plant macrofossils” in Tester *et al.*, *Staunch Meadow, Brandon, Suffolk*: pp. 313-330.

kilns was interpreted as an indication of insufficient wood fuel available in the locality.<sup>619</sup> Another excavated site in Thetford produced preserved wood of oak and hazel, with the hazel recorded as possibly being used in a wattle structure.<sup>620</sup> Medieval remains in the selected sites produced little in the way of identifiable species and this is possibly a result of selection biases for the sampling of medieval material, insofar as medieval remains are often dated and characterised by other finds or environmental assemblages with recovered charcoal in environmental samples less likely to proceed to a species identification stage because of this. However, the survival of documentary and landscape evidence for Anglo-Saxon and medieval woodland in the region, does allow for some interpretation of woodland extents across these periods, and this is discussed in more detail below (see page 250-257).

The overall picture that emerges from the archaeological evidence is that the tree species available in Breckland appear to be typical of wider East Anglia and correlate with the species detected in pollen samples from sites such as Hockham Mere.<sup>621</sup> The usefulness of this data is somewhat limited, however, principally because the recovery of wood charcoal on a site does not necessarily indicate woodland in the locality. It is possible that wood fuel may have been imported to an area from elsewhere or acquired within Breckland but at some distance from where it was burned. Certainly, there is evidence for medieval timber imports into the region (see below, pages 250-251), so the importation of wood is equally likely. Similarly, wood fuel could also be acquired from

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<sup>619</sup> Murphy, "Plant Remains" in Dallas, *Excavations in Thetford by B. K. Davison between 1964 and 1970*: pp. 192-193.

<sup>620</sup> Peter Murphy, "Plant Macrofossils from Site 1092" in Rogerson and Dallas, *Excavations in Thetford, 1948-59 and 1973-80*: p. 194.

<sup>621</sup> Bennett, "Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere": pp. 457-487.

hedges present around settlements or from scattered stands of scrub or wood-pasture. In that sense, the evidence goes some way to providing insight into the tree species available in Breckland at different periods, in a similar way to the pollen evidence, and it is probable that some areas of woodland survived into the medieval period, but these appear to have been relatively small in size (see below, pages 250-251). This would fit with interpretations of woodland seen elsewhere in Norfolk, with surviving woodland often being sited on the periphery of settlement and farming activities.<sup>622</sup> Where Breckland may differ in this respect is that woodland regeneration in the post-Roman period may have been limited compared to elsewhere, possibly because of the geological framework of the region, discussed further below. The Hockham mere data indicates that woodland was increasingly cleared in the catchment from the Late Iron Age and over the Roman period as agricultural activities expanded,<sup>623</sup> and Chapter Nine argues that Roman Breckland saw extensive arable farming as part of a wider surplus production network. The reduction in arable extents at the end of the Roman period is often suggested as a period of woodland expansion and regeneration in other regions. In Breckland, however, negative archaeological evidence relating to Anglo-Saxon charcoal production in the region contrasts with other regions where medieval and post-medieval heaths may produce archaeological evidence of post-Roman woodland regeneration and subsequent exploitation in the Anglo-Saxon period.

Around the town of Thetford, where the urban nature of the settlement would have required the inhabitants to import fuel from the surrounding countryside, or by boat along

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<sup>622</sup> Williamson, *Environment, Society and Landscape*: pp. 86-88.

<sup>623</sup> Bennett, "Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere": pp. 457-487.

the Little Ouse, the lack of features relating to charcoal production is of particular interest. The hinterlands of other Anglo-Saxon urban centres in the region have produced evidence of contemporary charcoal production, often occurring on sandier soils that became common or heathland at a later date. The assumption is that this was partly to supply the respective nearby urban centre, and it is worth discussing this evidence to highlight the contrast in Breckland. Increasingly, too, similar features are being excavated from more rural contexts, such as at Buxton-with-Lammas (Norfolk),<sup>624</sup> and Leiston (Suffolk),<sup>625</sup> suggesting that this was a more widespread practice across the East Anglian landscape.

In the area surrounding Norwich, excavations at Lodge Farm, Costessey revealed a series of features interpreted as charcoal production pits with radiocarbon dating indicating an Anglo-Saxon date for these features.<sup>626</sup> All identifiable wood samples were shown to be oak, and where possible, shown to be mature, slow-growing oaks, suggesting the trees were undergoing a degree of environmental stress.<sup>627</sup> Of further significance was the presence of these features on an area of sandier geology that became part of the common between Costessey and Bawburgh during the medieval period, suggesting that this area of land may have been covered by oak woodland and was gradually cleared over the course of the Anglo-Saxon period. Interestingly, the site formed part of an enclosed landscape in the Iron Age and Roman periods, suggesting the oak woodland was a post-

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<sup>624</sup> Elizabeth Middleton, *Mayton Wood Quarry Extension, Buxton with Lammas, Norfolk, An Archaeological Evaluation*, Report No. 1432 (Cambridge Archaeological Unit, 2019), Unpublished Fieldwork Report.

<sup>625</sup> Lucking and Boughton, *Land At Johnson's Farm, Saxmundham Road, Leiston*: p. 58.

<sup>626</sup> Dan Firth and Lawrence Billington, *Lodge Farm, Costessey, Norfolk (Phase 2), Archaeological Excavation Report*, OAE Report No. 2292 (Oxford Archaeology East, 2019), Unpublished Fieldwork Report: pp. 34-35.

<sup>627</sup> *Ibid.*

Roman regeneration.<sup>628</sup> Similar evidence for charcoal production was revealed during the construction of the Norwich Northern Distributor Road where this practice had ceased by the Late Saxon or early post-Conquest period.<sup>629</sup> Pits of a similar form and age were also identified on a former area of Mousehold Heath, once a large area of common land to the west of Norwich with a place-name (*OE* 'Mouse Wood') implying the existence of historic woodland, and accounts detail how the heath did once contain tracts of woodland, which were almost completely removed by the late medieval period.<sup>630</sup> Here, too, the pits were interpreted as producing charcoal for use in ironworking.<sup>631</sup> Charcoaling pits have also been revealed on a site at Cringleford, further demonstrating the widespread nature of this practice around the Norwich hinterlands.<sup>632</sup> It was suggested that the cessation of this practice in the Late Saxon period may have been due to decrease in demand for charcoal or dwindling supplies of oak woodland in these landscapes.<sup>633</sup> A comparable pattern is also present on the former heathlands around the Middle Saxon emporium of Ipswich. Excavations on Nacton Road uncovered a series of similar pits, and the archaeological report discusses the presence of these pits on other excavated sites in the vicinity.<sup>634</sup> Further examples, dated to the Middle Saxon period were

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<sup>628</sup> *Ibid*: pp. 32-35.

<sup>629</sup> Pat Moan, *Norwich Northern Distributor Road, Norfolk, Archaeological Excavation, Volume 1* (Oxford Archaeology East, 2018), Unpublished Fieldwork Report: pp. 182-187.

<sup>630</sup> Rackham, *The History of the Countryside*: pp. 299-302.

<sup>631</sup> Barry Bishop and Jennifer Proctor, *Settlement, Ceremony and Industry on Mousehold Heath, Excavations at Laurel Farm (Phase II), Broadland Business Park, Thorpe St Andrew, Norfolk*, Monograph No. 13 (Pre-Construct Archaeology, 2011): pp. 89-94.

<sup>632</sup> Tom Woolhouse, *Land West of Round House Way, Cringleford, Norfolk: Report on Further Analysis of the Late Saxon Charcoal Pits* (Pre-Construct Archaeology, 2020), Unpublished Fieldwork Report.

<sup>633</sup> Firth and Billington, *Lodge Farm, Costessey, Norfolk*: p. 128.

<sup>634</sup> Kate Clover, *Archaeological Excavation at Site 1b, Nacton Road, Ipswich, Suffolk, IPS 718*, OA East Report No. 1507 (Oxford Archaeology East, 2013), Unpublished Fieldwork Report: pp. 14-15 and 19-23.

excavated on the former heathland at Martlesham,<sup>635</sup> with more still being revealed on the former Nacton Heath<sup>636</sup> and at Purdis Farm (although on one site the feature was mis-identified as modern).<sup>637</sup> It is reasonable to suggest that the clearance of heathland in the hinterlands of Ipswich was fuelled partly by the demand for charcoal in an urban centre and, on balance, it seems unlikely that there would be a decrease in market demand for charcoal as both Ipswich and Norwich maintained their size into the medieval period. It is perhaps more the case that by the medieval period many of these areas had either largely been cleared of usable trees, evolved into pollarded wood-pasture, or remaining areas of trees had been enclosed into private woodland or parks. The proximity of an urban centre would also have required a reasonably constant supply of building timbers, which may have discouraged the burning of older trees as was seen at Costessey (see above).

While this may seem somewhat tangential to investigations of Breckland, its purpose is to demonstrate a type of archaeological feature that implies the existence of woodland in a locality. Essentially, the production of charcoal on an (assumed) area of Anglo-Saxon waste can only reasonably happen if there are suitable trees present in that landscape, and by extension, woodland more generally. The fact that these features

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<sup>635</sup> Tom Woolhouse, *Land South of Main Road, Martlesham, Suffolk: Archaeological Excavation and Monitoring. Post-Excavation Assessment*, Report No. R11803 (Pre-Construct Archaeology, 2014), Unpublished Fieldwork Report: pp. 39-42.

<sup>636</sup> Simon Cass, *Haven Power, The Havens, Ipswich, IPS 365*, Archaeological Evaluation Report, SCCAS Report No. 2010/190 (Suffolk County Council Archaeological Service, 2010), Unpublished Fieldwork Report.

<sup>637</sup> Mark Sommers, *Proposed Lorry Park, Shepherd & Dog Farm, Purdis Farm, Suffolk, Evaluation Report*, SCCAS Report No. 2003/021 (Suffolk County Council Archaeological Service, 2003), Unpublished Fieldwork Report; John Newman, *Purdis Heath, Purdis Farm, Suffolk, Archaeological Evaluation Report* (John Newman Archaeological Services, 2011), Unpublished Fieldwork Report.

occur on areas of former common and heathland around the Norwich and Ipswich hinterlands further implies that many of these areas were wooded into the Late Saxon period, otherwise the production of charcoal could not have occurred to generate such distinctive archaeological remains. When it is therefore considered that these remains have so far not been discovered in the hinterlands of Anglo-Saxon Thetford, nor at a wider level in Breckland, the contrast is striking. By the Late Saxon period Thetford was almost certainly a burgeoning urban centre, and while not to the scale of Norwich or Ipswich, it would still have required a supply of fuel for industry and heating. There would have been a market demand for wood and timber products, and as seen around Norwich and Ipswich, charcoal was viewed as a worthwhile commodity to produce. The lack of these types of features in the landscape around Thetford is therefore heavily suggestive of the landscape in that area being relatively treeless during the Anglo-Saxon period. This is the case on excavations carried out relatively close to the town, such as at Howlett Way, Thetford<sup>638</sup> and on sites such as the A11 road scheme that lie on the wider Breckland landscape beyond.<sup>639</sup> Areas that had been utilised during the Roman period were perhaps more likely to generate into heathland after abandonment, rather than successional woodland, or that any regenerating woodland was patchy and slow to colonise the difficult soils, which, in some places, may have been exhausted of fertility from Roman arable practices which were no longer present to provide the required input of manure to maintain soil quality.<sup>640</sup> It can be reasonably argued, then, that any tracts of woodland

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<sup>638</sup> Peter Watkins, *An Archaeological Excavation Howlett Way, Thetford, Norfolk, Assessment report and updated project design*, Report No. 1171 (NAU Archaeology, 2006), Unpublished Fieldwork Report.

<sup>639</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*.

<sup>640</sup> See Chapter Nine for discussions on Roman agriculture in Breckland.

around Thetford that may have been cleared during the Roman period, as was suggested by the Hockham Mere pollen data for that catchment,<sup>641</sup> did not regenerate into woodland to any appreciable degree in the Anglo-Saxon period and this may speculatively be because the soils of Breckland at this time were not as conducive to woodland regeneration as elsewhere.

The apparent difference in woodland and heathland generation in post-Roman East Anglia appears to be a result of differences in geology and soil types impacting woodland growth, rather than any appreciable differences in climate between Breckland and wider East Anglia. The sites discussed above in the vicinity of Ipswich and Norwich mainly tend to be sited on acid sands of the Newport 4 association, alongside the loamier Burlingham 1 and Wick 2 associations.<sup>642</sup> While Newport soils form part of the characteristic geology of Breckland, they cover a relatively minor area compared to the predominant Methwold, Newmarket 1 and Worlington soils.<sup>643</sup> It is perhaps therefore more likely that the dominant Breckland soils were less conducive to woodland succession after abandonment compared to areas of heathland elsewhere, which, while similar in ecological character, had a different underlying geology. The differences in water and nutrient retention qualities may have lessened or exacerbated any changes in climate between different parts of East Anglia, where any variations in climate would have been minor and localised at best. This is particularly true of the relatively dry Early Anglo-Saxon period<sup>644</sup> where the already dry Breckland soils would have had less average

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<sup>641</sup> Bennett, “Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere”.

<sup>642</sup> Hodge *et al.*, *Soils and their Use in Eastern England*: pp. 132-135 and 346-348.

<sup>643</sup> *Ibid.*: pp. 249-253, 265-267 and 368-370.

<sup>644</sup> Lamb, “Climate from 1000 BC to 1000 AD”: p. 57; McCormick *et al.*, “Climate Change during and after the Roman Empire”: p. 181.

rainfall to retain and therefore may have provided an environment that was more conducive to open heathland generation than successional woodland.

### ***Documentary and Landscape Evidence for Woodland and Water Supply***

The evidence for Anglo-Saxon and medieval woodland extents in Breckland are somewhat clearer compared to earlier period. This is aided by the existence of documentary evidence, alongside landscape features that provide insight into the location of woodland at this period and areas that may have been more conducive to woodland regeneration and the factors causing this, which appears to be related to water tables and water supply. It is necessary to highlight the contrast between descriptions of woodland that may refer to grazed wood pasture that may potentially be held as common land, and managed woodland, usually privately enclosed and formed of coppice with standards.

Documentary evidence suggests that areas of woodland in the study area were considerably limited in extent by the Late Saxon period, and this continued into the medieval. Domesday records very limited amounts of woodland in the region,<sup>645</sup> with the only substantial area being woodland for 200 pigs at Feltwell.<sup>646</sup> The significance of this in relation to the place-names is discussed below. Mark Bailey's examination of the medieval documentary evidence for Breckland, such as manorial rolls and accounts, concluded that stands of woodland were often limited to "small clumps in peripheral villages", with central areas being "almost bereft of even the smallest copse", while

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<sup>645</sup> H. C. Darby, *Domesday Geography of Eastern England*, Third Edition (Cambridge University Press, 1972): pp. 127-128 and 182.

<sup>646</sup> LDB, Folio 162: Norfolk.

Breckland manors held by the abbey at Bury would usually import woodland from their other manors lying in more wooded regions.<sup>647</sup> Bailey further notes that much of the timber in Breckland was imported up the Little Ouse for sale at Brandon and Thetford, suggesting a lack of locally available supplies.<sup>648</sup>

Where medieval woodland does appear to have survived in the medieval period, its location tends to be in areas of soil characterised by a more ready supply of water compared to elsewhere in Breckland (Figure 45). Fakenham Wood, near the southwestern edge of the study area, appears to represent the only significant tract of medieval woodland within the study area,<sup>649</sup> but is sited on an area of Beccles 2 clays surrounded by loamy or sandy soils.<sup>650</sup> The woodland was also thought to have functioned as a deer park in the medieval period<sup>651</sup> and the relative lack of deer parks elsewhere in the study area also suggests limited areas of woodland. Medieval deer parks were effectively private areas of wood or wood-pasture used for the hunting or farming of deer, usually enclosed from areas of wooded common or waste. At Croxton, a recorded deer park represents the only park in Norfolk Breckland located with any certainty (Figure 45).<sup>652</sup> The creation date of this park is uncertain, and it does not have the ovoid form that many early parks tend to take, but it does abut a broader area of historic heathland and Blomefield refers to the keeping of deer within the park.<sup>653</sup> Its location on deeper, sandy

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<sup>647</sup> Bailey, *A marginal economy?*: p. 151

<sup>648</sup> *Ibid.*: p. 151.

<sup>649</sup> SHER EUN 022

<sup>650</sup> Hodge *et al.*, *Soils and their Use in Eastern England*: pp. 119-121.

<sup>651</sup> SHER EUN 022

<sup>652</sup> Robert Liddiard, *The Norfolk Deer Parks Project: Report for the Norfolk Biodiversity Partnership* (University of East Anglia, 2010): pp. 18-19.

<sup>653</sup> Blomefield, *A Topographical History*, Vol. 2: p. 151.

soils appears to be unusual, but the presence of ponds in the vicinity of Park Farm is suggestive of an area of impermeable geology, presumably clay, that has created a perched water table in that part of the landscape. A similar situation may explain the unusual location of Elveden on the sandy higher ground in Suffolk Breckland, where a series of ponds to the east of the village whether natural or man-made, imply an impermeable geology and perched water table reliable enough to sustain settlement on the higher ground.<sup>654</sup> Indeed, Elveden and Swaffham represent the only surviving medieval settlements not sited in the vicinity of a watercourse or fen edge. Two further deer parks, one at Hilborough<sup>655</sup> and another at Oxborough,<sup>656</sup> are located in the landscape with less certainty but Liddiard's suggested locations would partly site both parks on areas of wetter sandy Isleham 2 soils within river valleys.<sup>657</sup> That these soils were able to maintain a relatively consistent water supply in the medieval period is further attested to by the presence of medieval moated sites constructed on these soils, such as at Barnham,<sup>658</sup> Weeting<sup>659</sup> and Shropham.<sup>660</sup> Beyond the Isleham 2 soils, moated sites in Breckland are almost exclusively restricted to the similarly wetter Ollerton soils<sup>661</sup> as demonstrated by sites in Hockham<sup>662</sup> and Breckles.<sup>663</sup> Historic mapping also supports the assertion that soils with a more easily available water supply in the medieval period could

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<sup>654</sup> Ponds lie between NGR TL 8277 7953 at the western end and extend to TL 8387 7947 at the eastern end.

<sup>655</sup> Liddiard, *The Norfolk Deer Parks Project*: p. 25.

<sup>656</sup> *Ibid.*: p. 33.

<sup>657</sup> Hodge *et al.*, *Soils and their Use in Eastern England*: pp. 231-235.

<sup>658</sup> NHER BNH 022.

<sup>659</sup> NHER 64609.

<sup>660</sup> NHER 9063. An unrecorded moat is also visible on lidar imagery within the record of NHER 57439.

<sup>661</sup> Hodge *et al.*, *Soils and their Use in Eastern England*: pp. 284-285.

<sup>662</sup> NHER 9060.

<sup>663</sup> For example, NHER 9058 and 14456.

support a reasonable amount of woodland. At Undley, although just to the west of the study area, a 1581 map depicts an area of ground named as ‘Undley Woodde’ and covered in trees, while to the west of this a further area is named as ‘Undley Fryth’.<sup>664</sup> These areas are sited on loamy soils on ground that is slightly higher than the surrounding fenlands, but where water supply would not have been a problem.

The place-name Undley (*OE*, uncertain first element, *-leah* ‘clearing, wood’)<sup>665</sup> implies a clearing within or on the edge of an area of woodland, or indeed may simply be used to denote woodland in an area where relatively little exists, and this suggests that this island of slightly higher ground on the Fen edge was wooded at least as far back as the Anglo-Saxon period. A number of other place-names in Breckland suggest areas of Anglo-Saxon woodland, but these are relatively few, further emphasising the apparent lack of woodland in the Anglo-Saxon and medieval periods (Figure 45). In Suffolk, Gazeley (*OE* ‘Gaegi’s clearing’)<sup>666</sup> is sited at the very southern end of the study area. Much of the parish, including the core of settlement falls outside the study area on slightly heavier, loamier soils, which may suggest the woodland clearing being referred to with the use of the *-ley* name element did not fall within Breckland. In Norfolk, woodland place-names are similarly sparse, being limited to Northwold (‘North Wood’),<sup>667</sup> Methwold (‘Middle Wood’)<sup>668</sup> and Hockwold (possibly ‘Hock Wood’ or ‘Mallow Wood’).<sup>669</sup> Cockley Cley, too, may mean a clearing frequented by birds on the clayey soil<sup>670</sup> but in the context of a

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<sup>664</sup> PRO MPC 1/6/2, *Mildenhall and Lakenheath, Suffolk c1581* (1581).

<sup>665</sup> Briggs and Kilpatrick, *A Dictionary of Suffolk Place-Names*: p.145.

<sup>666</sup> *Ibid.*: p.58.

<sup>667</sup> James Rye, *A Popular Guide to Norfolk Place-names* (Larks Press, 1991): p. 37.

<sup>668</sup> *Ibid.*: p. 36.

<sup>669</sup> *Ibid.*: p. 16.

<sup>670</sup> *Ibid.*: p. 21.

landscape of sparse woodland the *-leah* element may be denoting the woodland itself.<sup>671</sup>

The implication of clayey soil in that particular name would further support the argument that it was areas where groundwater was more readily available, or that could support a perched water table, where woodland was present in the Anglo-Saxon and medieval periods. The place-names of Northwold, Methwold and Hockwold do suggest the existence of Anglo-Saxon woodland somewhere in the area to the east of the Devil's Dyke and their spatial and territorial arrangement have been discussed more in Chapter Four. However, it appears that any substantial areas of woodland in these villis may well have disappeared relatively quickly. Certainly, the distinct lack of woodland recorded at Domesday in Northwold and Methwold suggests these villis may already have cleared the woodland from which they were named. A 1580 map of Methwold Warren depicts only two trees in the warren and surrounding area, which may hint that these were considered an anomaly worth noting by the cartographer.<sup>672</sup> Nor do any minor field or furlong names in the Methwold open fields depicted on a 1796 map of the parish preserve any earlier memory of woodland subsequently cleared for arable.<sup>673</sup> It is of further significance that the only substantial area of woodland recorded for the region in Domesday was attached to the vill of Feltwell.<sup>674</sup> The recording of Domesday woodland in East Anglia by measurement of the number of pigs that it could support is perhaps more suggestive of wood-pasture where the pigs would have access to the pannage in the autumn, rather than dense closed-canopy woodland or coppices, and Rackham suggests that wood-

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<sup>671</sup> Williamson, *Environment, Society and Landscape*: pp. 221-223.

<sup>672</sup> PRO MPC 1/75, *Map of Methwold Warren* (1580).

<sup>673</sup> PRO MR 1/207, *Methwold Norfolk* (1796).

<sup>674</sup> LDB, Folio 162: Norfolk.

pasture probably formed the majority of the woodland recorded in Domesday.<sup>675</sup> The place-name 'Hockwold' may also suggest that the woodland in this area was more likely to be wood-pasture and there are two alternative interpretations of the name that support this. Franz Vera's investigations into woodland-related names in Europe found that in the continental Germanic languages the term '*Hockwald*', or derivations thereof, had the meaning of 'highwood', that is, stands of mature trees more suited for use as timber in contrast to the 'underwood' formed of coppice and brush.<sup>676</sup> If the place-name of Hockwold is derived from an Old English variant of this term then an area of woodland characterised by tall, mature trees may have been wood-pasture, although it could equally refer to an area of dense, mature trees. The second interpretation of the place-name 'Hockwold' is that it comes from the Old English meaning 'Hock wood',<sup>677</sup> referring to the hollyhock or mallow plant. Both of these plants prefer full sun in which to grow and if this interpretation of the name is correct it implies that the woodland in the area must have been semi-open in nature, in order to provide enough sunlight to allow sufficient hock or mallow plants to grow to characterise the area, further supporting the assertion that this place-name is denoting a wood-pasture type landscape rather than dense forest. This, in turn, would correlate with the Domesday recording of woodland in the area being suited for pannage and grazing for pigs.

While the place-names discussed here are likely to suggest the existence of woodland within the study area, it must be emphasised that these form only a handful of names, most of which occur in the western part of the Norfolk Breckland, and it is

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<sup>675</sup> Oliver Rackham, "Woodland and wood-pasture" in Rotherham (Ed.), *Trees, Forested Landscapes and Grazing Animals*: p. 16.

<sup>676</sup> Vera, *Grazing Ecology and Forest History*: p. 113.

<sup>677</sup> Rye, *A Popular Guide to Norfolk Place-names*: p. 16.

possibly precisely because these areas contained woodland, and were therefore unusual in the landscape, that such names were given to them. The name evidence for woodland elsewhere in Breckland is limited and it has been shown in wider East Anglia that places with more woodland also tend to have more woodland-denoting place-names.<sup>678</sup> Taken together, the place-name evidence and the archaeological evidence (or lack thereof) for charcoal production in the region suggests that the clearance of woodland in the Late Iron Age and Roman periods, as supported by the pollen records, was perhaps the last large-scale clearance of woodland in the study area. The evidence for regeneration of woodland in the post-Roman period is limited and while some areas would have seen a degree of woodland growth, it does appear that large parts of the Breckland landscape remained treeless over the course of the Anglo-Saxon period and into the succeeding medieval, with conditions perhaps favouring the expansion of heathland at this time.

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<sup>678</sup> Willamson, *Environment, Society and Landscape*: pp. 223-233.

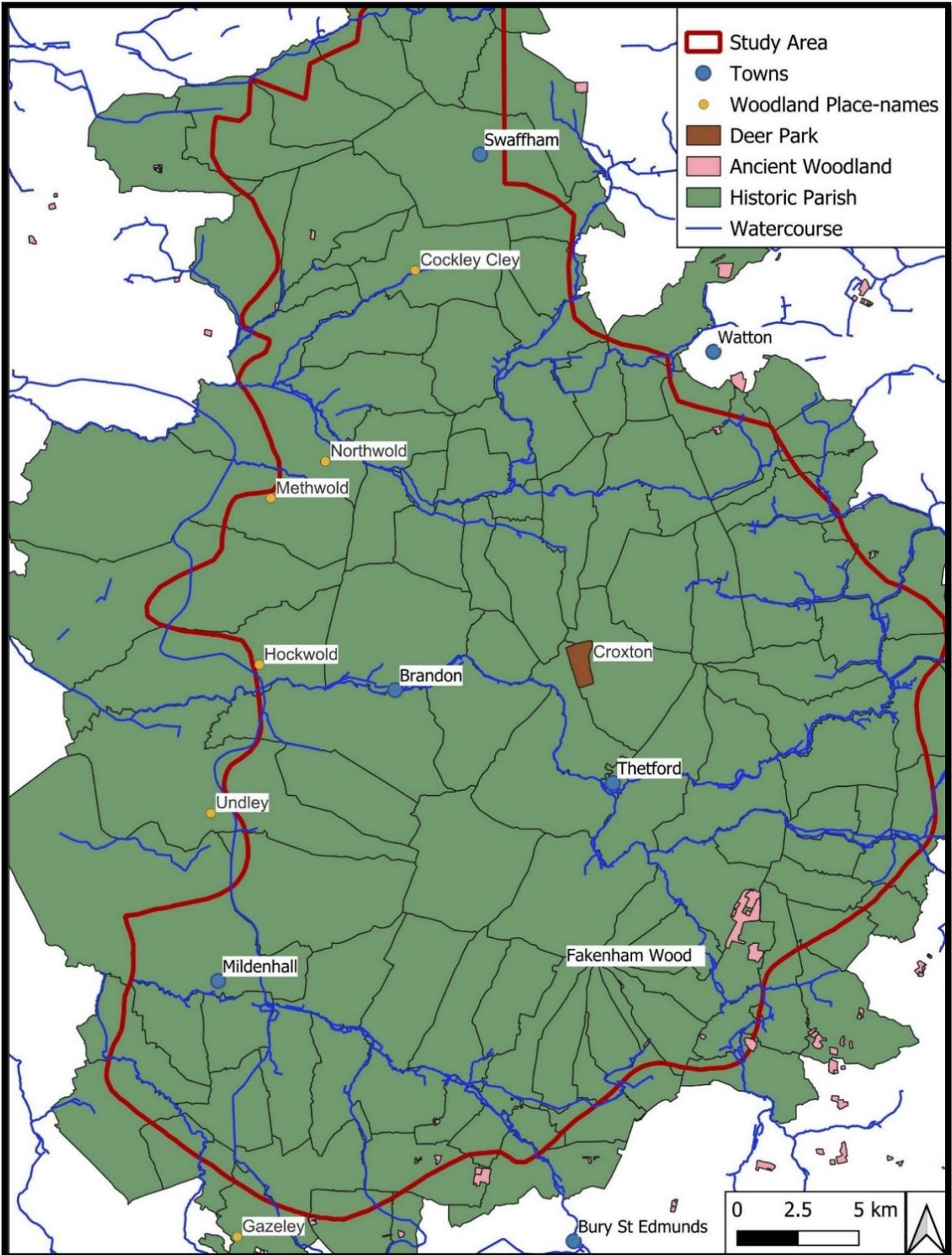


Figure 45: Ancient woodland, located deer parks and woodland place-names in Breckland.

### **Heathland and Woodland Extents Across the Study Period: A Summary**

In order to examine the impacts of climate on the study area, it is worthwhile to summarise the interpretation and general character of changing heathland and woodland extents across the study period based upon the evidence discussed above.

By 1000 BC, there appears to have been no shortage of open ground and heathland in the landscape. The river valleys and valley sides appear to be predominantly open, judging from the distribution of barrows, while the higher, flatter plateaux and the catchment of Hockham Mere appear the most likely places to see the survival of larger blocks of woodland. That is not to say the valleys would have been completely treeless, and the higher ground blanket woodland, but that the valleys were predominantly open landscapes with relatively small areas of woodland, while the higher ground was more likely to retain larger tracts of woodland. At the point of the Late Bronze Age to Early Iron Age transition there is believed to be a reduction in population at a wider level,<sup>679</sup> and this would likely see a similar contraction of settlement and associated arable land use, which in turn would suggest an expansion of heathland in the region at this time.

As population recovered over the course of the Middle and Late Iron Age and settlement once again began to expand it is likely that the area under arable cultivation also expanded. This expansion of arable appears to have continued through into the Roman period, discussed in Chapter Nine, that would have seen a reflective reduction in heathland and, as suggested by the Hockham Mere data, significant clearances of woodland and trees in the region. This is not to suggest that heathland would have

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<sup>679</sup> See discussion in Chapter Two, page 42.

disappeared entirely, and indeed some areas of Breckland, such as parts of the barrow landscape at Weeting, appear to have seen little other activity, alongside the survival of undulating ground in other areas indicating pieces of landscape that may never have seen cultivation. What is suggested here is that the Late Roman period represents the first of two clear peaks in arable land use over the study period, and that some parts of the landscape that formed heathland in the post-medieval period have produced evidence suggesting they were under arable use during the Roman period (see Chapter Nine for the full discussion of this).

As population fell during the transition from the Roman to Early Anglo-Saxon period, settlement appears to have retreated away from many areas that saw earlier occupation and into the lower slopes of the river valleys (see Chapter Nine). This would almost certainly have seen an increase in the area of landscape under heathland as areas of former arable were abandoned. Some small-scale woodland regeneration may have occurred, but as discussed above, the evidence suggests this was not on any significant scale and certainly not as extensive as is believed to have occurred in other parts of East Anglia. Instead, it appears likely that most of the abandoned Roman arable extents generated into heathland over this period, in part because the soil types may not have been particularly conducive to woodland regeneration, and possibly with soil fertility exhausted and no longer receiving the required inputs of manure. Place-name evidence supports the assertion that there were relatively few notable areas of woodland in the region during the Anglo-Saxon period.

In a similar pattern to the Middle and Late Iron Age, the Middle and Late Saxon period probably saw a retreat of heathland as settlement and the area under arable use

once again began to expand. It was during this time that much of the long-term administrative structuring within the region began to emerge (see Chapter Four) and open field systems began to expand across more extensive parts of the landscape (see Chapter Ten), some of which recolonised former Roman arable zones, such as at Wangford Warren, as the social and agrarian regimes of Breckland began to emerge towards more recognisable forms.

A further rise in population during the high medieval period would have seen arable extents in Breckland reach their second peak in the study period, with heathland again reducing in extent. The development of Brecking, something that would be further refined in the later medieval period, was also a response to the need to expand arable on mixed and sometimes poor soils, some of which could not sustain fertility for more than a few seasons. This peak of population and arable land use came to an end from the fourteenth century, and the archaeological evidence discussed in Chapter Ten indicates a contraction of arable in the region from this time through until at least the mid-seventeenth century. In some places, this reduction represented a considerable proportion of the arable associated with a particular village and the subsequent incorporation of many of these areas into rabbit warrens in the later medieval and post-medieval periods suggests they reverted to heathland once the arable was no longer in use.

The historic maps of Breckland that were produced from this time very much show the post-medieval picture of heathland extents in the region, which appear to have expanded from late medieval period and at least as late as the mid-seventeenth century as areas under arable contracted. The overall patterns across the study period appear to

be one of periodic long-term processes of expansion and contraction of heathland in response to human population pressures and associated land use, alongside a general decline in the area under woodland as time progressed.

## **Chapter Nine: Reconstructing Breckland Agricultural Practices**

The farming preferences and regimes of historic Breckland are markedly different from the highly mechanised and technologically driven practices seen in the landscape today, where various methods have been employed to improve soils on a large scale and provide water to places where access to this would have been historically limited.<sup>680</sup> While the medieval and early post-medieval systems of agriculture in Breckland have been well characterised as operating a developed and complex foldcourse system centred on the production of barley as the principal crop with sheep as the preferred source of manure,<sup>681</sup> relatively little work has been done to characterise earlier periods. For example, Roman practices across England have been more broadly characterised using archaeological datasets<sup>682</sup> and for the Anglo-Saxon period work has been done to characterise animal husbandry patterns in East Anglia,<sup>683</sup> but there has been no cohesive study in a Breckland or wider East Anglian context to chart the evolution of farming practices across the long term. The purpose of this chapter is to do just that and investigate changes in agricultural practice in Breckland across the entirety of the study period. Archaeological datasets, principally plant remains and animal bones, will be used to characterise preferences in crop and animal selection, alongside an analysis of earthwork

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<sup>680</sup> See Chapter Seven for discussion on Breckland hydrology.

<sup>681</sup> Bailey, *A Marginal Economy?*; Belcher, *The Foldcourse and East Anglian Agriculture and Landscape 1100-1900*; Peter Goulding and James Parry, *Sheep in The Brecks* (The Breckland Society, 2017).

<sup>682</sup> Martyn Allen, Lisa Lodwick, Tom Brindle, Michael Fulford and Alexander Smith, *The Rural Economy of Roman Britain*, Britannia Monograph Series No. 30 (Society for the Promotion of Roman Studies, 2017).

<sup>683</sup> Pam Crabtree, *West Stow, Suffolk: Early Anglo-Saxon Animal Husbandry*, East Anglian Archaeology Report No. 47 (Suffolk County Council, 1989); Crabtree, *Middle Saxon Animal Husbandry in East Anglia*.

remains and artefact scatters in the Breckland landscape. The scale of the study period means that discussion will remain relatively broad but provide an overview of the changes that occurred from later prehistory to the post-medieval, which can then be considered against other changes in Breckland and climatic fluctuations more widely (See Chapter Eleven for this discussion). To begin, the cereal grain evidence from archaeological investigations in Breckland shall be analysed to reveal changes in arable practices with a focus on wheat and barley proportions in the region. This is followed by an investigation of animal bones recovered from archaeological investigations, which reveal changes in the proportions of different livestock animals, focussing on cattle and sheep. Artefact scatters in the landscape will then be summarised as a proxy for the extent of arable in Breckland at different periods. This is alongside a brief mention of earthwork evidence for arable landscapes, but the results of this were of particular significance so are discussed in detail in Chapter Ten and only briefly outlined here in the overall interpretations.

### **Breckland Agriculture: The Cereal Grain Evidence**

An ever-increasing resource in British archaeology is the production of grey literature reports, and occasional fully published monographs resulting from archaeological investigations, predominantly as part of the planning process.<sup>684</sup> Many of the grey literature reports are made freely and publicly available through the Archaeology Data Service (ADS),<sup>685</sup> and as of January 2021 more than seven hundred reports covering the Norfolk and Suffolk Breckland parishes were available through this service. It should be

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<sup>684</sup> See Chapter Three for further discussion of this.

<sup>685</sup> Archaeology Data Service website (Archaeology Data Service, 2024).

noted that this number is based upon reports listed as falling within the parishes covered by the study area, with parts of many parishes falling outside the study area, meaning that not all of these reports will fall within Breckland. That said, a significant number of these reports do fall within, or near to the periphery of the study area and this provides a resource of potential significance for understanding the environmental history of Breckland. Further reports were downloaded from the Oxford Archaeology<sup>686</sup> online library and through access to the report archives of Pre-Construct Archaeology. To that end, an examination of environmental reports contained within the grey literature was undertaken, with a particular focus on plant macrofossils and charcoal remains, to assess whether trends could be established in terms of historic crop production, the extent of heathland, and the extent/availability of wood and timber at different historic periods. The characterisation of historic heathland and woodland in Breckland has already been undertaken in Chapter Eight and this chapter will therefore focus on establishing the character of historic agrarian regimes within the study area.

Of the grey literature reports covering Breckland in January 2021, 134 contain environmental reports concerning plant macrofossils and charcoal covering 115 different sites, which for the purposes of this investigation has been supplemented with environmental reports in a number of selected monograph publications. The locations of the investigations from which these reports are drawn is shown in Figure 46. Those reports directly referenced in this chapter are included in the main bibliography, while the remaining reports used to generate Figure 46 are listed in Appendix 1. Whilst this will likely not represent the total number of environmental samples taken in Breckland for reasons

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<sup>686</sup> Oxford Archaeology Online Library (Oxford Archaeology, 2024).

discussed below, this still forms a considerable dataset from which it is possible to draw inferences about land use and animal husbandry at different historic periods.

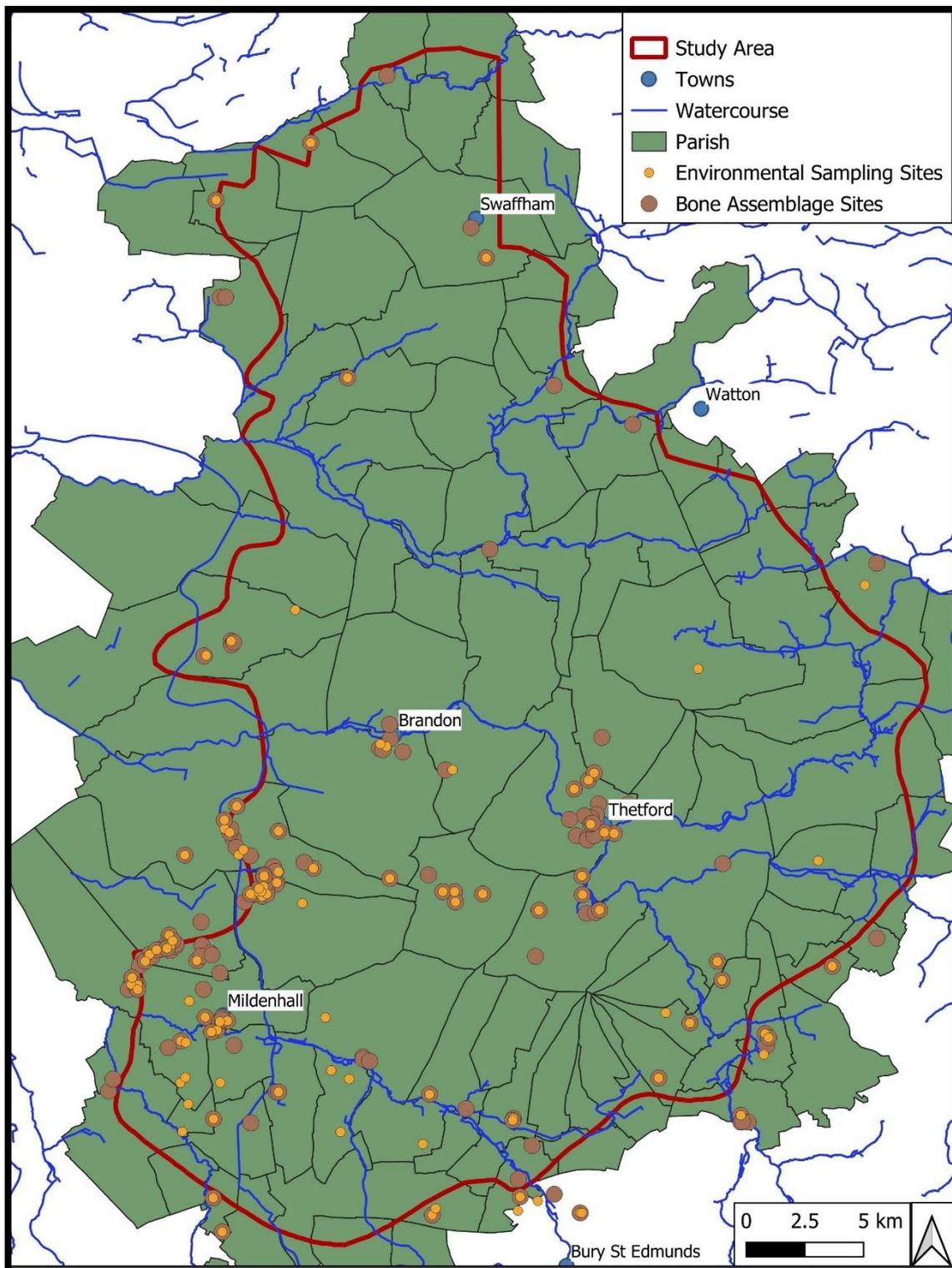


Figure 46: Archaeological sites containing environmental samples and animal bone assemblages in Breckland.

### Assessment of the data

Before an in-depth analysis of the data is undertaken, it is worthwhile assessing the usefulness of the data itself and any potential limitations that may exist to avoid overstating what may not necessarily be shown.

Firstly, the on-site collection of environmental samples may be done in a variety of ways, but the usual method which allows for the quantification and analysis of charred and waterlogged remains is bulk sampling of deposits, usually by hand collection in buckets of between ten and forty litres volume of a particular deposit. The method and strategy for sampling a feature or site is usually developed upon guidance issued by Historic England,<sup>687</sup> alongside regional research frameworks, the most recent online version covering Breckland having been updated between 2018 and 2020.<sup>688</sup> These overarching frameworks have the benefit of generally ensuring that the range of archaeological organisations operating within Breckland all collect environmental samples in a broadly consistent way, and that the processing, interpretation and reporting of this is also generally similar. The principal drawback, however, is one of on-site selection of the features to be sampled, in that it is often the most interesting looking features that get sampled, such as dark occupation or midden-type deposits, features with high levels of environmental remains visible to the naked eye, or waterlogged deposits. The positive aspect of this approach is that specific industries or processes occurring on site can often be detected, but the avoidance of sampling deposits of a

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<sup>687</sup> David Jones (Ed.), *Environmental Archaeology, A Guide to the Theory and Practice of Methods, from Sampling and Recovery to Post-excavation*, Second Edition (English Heritage, 2011).

<sup>688</sup> East of England Regional Research Framework online (ALGAO East of England, 2024).

more sterile appearance often fails to establish the background level of remains present on a site during a certain phase. This, in turn, means that samples with relatively few surviving remains become less certain in their interpretations, as in theory they may represent the 'background' levels of site, but may also represent higher intensity activity on a site where overall organic survival may be very low. Overall, however, the value of this method of sampling is widely tested and shown to produce worthwhile, informative results.

The second consideration is the spatial distribution of available sampling data across the Breckland landscape. It is unlikely that the grey literature deposited onto the ADS at the time it was downloaded represents every modern investigation of Breckland. It is common in development-led archaeology for a lag to exist between the investigation of a site, the production of a grey literature report and its deposition into the ADS archives. In some cases, several years may pass before a final report is produced and deposited and it is perhaps fair to say that not every commercial archaeological unit may upload reports to the same consistency. That said, evidence from more than one hundred sites within or on the periphery of the study area represents a considerable quantity of sites from which broader inferences can be made.

The quantity of data recovered from each site is widely varied, ranging from small-scale sites where a single feature may have been sampled, to large-scale excavations where dozens of samples may have been taken from a range of features of different periods. The quality of this data is also important to consider, with many sites producing a low level of background material, some of which could conceivably have been incorporated from earlier activity or be intrusive through rooting and animal activity in the

light Breckland soils. Quantitative and qualitative reviews of the archaeobotanical data for the Iron Age, Roman and medieval periods have been undertaken by van der Veen *et al.* in several articles and broadly concluded, across all of these periods, that the quality of data and the degree to which it had been interpreted at the reporting stage is crucial in developing an understanding of past environments and agricultural practices.<sup>689</sup> As such, interpretation of the Breckland data across the study period will predominantly focus on sites that have produced assemblages diagnostic of certain practices and that have been subject to a more in-depth analysis at the reporting stage. The results below therefore reflect a *qualitative* synthesis of the available material rather than attempting to quantify data from such a diverse range of sites.

The sampling sites across Breckland are not evenly distributed and, as many relate to pre-development archaeology, mostly occur in places that are being developed in modern times, often in the vicinity of modern settlements. The majority of sites lie within Suffolk, with only a handful of sites occurring sporadically in Norfolk. Clusters of sampling sites are present in the vicinity of Thetford and within the airfields at RAF Lakenheath and Mildenhall. More generally, the sampling sites are reflective of material collected within the valleys of the Lark and Little Ouse, and along the Fen edge. Interpretation of this material is perhaps best summarised as representing historic activity of Suffolk Breckland, characterised by soils of the Methwold, Newport 4 and

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<sup>689</sup> Marijke van der Veen and Glynis Jones, "A re-analysis of agricultural production and consumption: implications for understanding the British Iron Age" in *Veget. Hist. Archaeobot.*, vol. 15 (2006): pp. 217-228; Marijke Van Der Veen, Alexandra Livarda and Alistair Hill, "The Archaeobotany of Roman Britain: Current State and Identification of Research Priorities" in *Britannia*, vol. 38 (2007): pp. 181-210; Marijke Van Der Veen, Alistair Hill and Alexandra Livarda, "The Archaeobotany of Medieval Britain (c ad 450-1500): Identifying Research Priorities for the 21st Century" in *Medieval Archaeology*, vol. 51, no. 1: pp. 151-182.

Worlington associations,<sup>690</sup> rather than Norfolk Breckland, which, while similar, contains larger areas covered by soils of the Newmarket 1 association.<sup>691</sup> The importance of case study selection, and the examination of evidence of specific activities at certain sites therefore comes to the fore. This is why the succeeding discussions focus on the cereal grain evidence, with an emphasis on processing sites where possible, as a method of extrapolating information about previous arable practices and extents, alongside an examination of changes in wood and heather charcoal occurrences across time undertaken in Chapter Eight, as a possible proxy for the changing proportions of woodland and heathland.

### *The Cereal Evidence*

One of the key pieces of evidence that can be produced through environmental sampling is the presence of charred cereal grains, and sometimes chaff, within the sampled deposit. Publications to aid in the identification of cereal varieties are freely available and widely used.<sup>692</sup> Grain has been a staple food product in England since prehistoric times and the quantity and proportions of different cereal grains recovered from a site can provide insight into consumption habits, any potential processing occurring on site, and can reveal information about arable cropping practices in the surrounding landscape.

### *1000 BC to 43 AD*

The environmental evidence from Breckland contains information from sites covering much of the study period. Prehistoric samples generally contained cereal grains in what

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<sup>690</sup> Hodge *et al.*, *Soils and their Use in Eastern England*: pp. 249-253, 277-279 and 368-370.

<sup>691</sup> *Ibid.*: pp. 265-277.

<sup>692</sup> Stefanie Jacomet, *Identification of cereal remains from archaeological sites*, Second Edition (Basel University, 2006).

has been interpreted as background levels reflecting the day-to-day consumption, with limited evidence for cereal processing, the exception to this being Gate 2 RAF Lakenheath.<sup>693</sup> The proportions of identifiable cereal remains show that wheat, mainly spelt and emmer, was generally predominant over barley at a number of sites, but many of these samples only produced small quantities of grain.<sup>694</sup> Elsewhere, excavations at Howlett Way, Thetford<sup>695</sup> and Lord's Walk, Eriswell<sup>696</sup> produced barley as the dominant grain on site. It was also suggested that the Howlett Way site may have lain within a larger area of heathland at the time the site was occupied.<sup>697</sup> The cereal crop trends for the Late Bronze Age and Iron Age periods provide a mixed picture, with most sites generally showing wheat as dominant, but with barley being the principally recovered crop in other places. It is unfortunate that the material recovered for this period is often in small quantities that makes any in-depth analysis difficult, but it does appear reasonable to suggest that the cereal economy of prehistoric Breckland was based on the growing of spelt wheat and barley. This is a trend that continues into the Late Iron Age and Roman period, but here there is a larger body of evidence to allow for more in-depth analysis.

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<sup>693</sup> Val Fryer, "Plant macrofossils" in John Craven, *New Access Control, Gate 2, RAF Lakenheath*, SCCAS Report No. 2005/27 (Suffolk County Council Archaeological Service, 2005), Unpublished Fieldwork Report: pp. 28-31.

<sup>694</sup> See, for example, Tim Harvard and Ray Holt, *Land at Recreation Way, Mildenhall, Suffolk*, CA Report No. 12114 (Cotswold Archaeology, 2013), Unpublished Fieldwork Report: pp. 68-69; John Summers, "The Environmental Samples" in Mustchin *et al.*, *Proposed New Arrivals Lane, Center Parcs, Elveden Forest Holiday Village, Brandon*: pp. 30-32; Lucie Allott and Dawn Mooney, "Environmental Samples" in Hogg, *Final Report on Archaeological Excavations at Land at Hopton Road, Barningham*: pp. 16-17.

<sup>695</sup> Val Fryer, "Plant Macrofossils and Other Charred Remains" in Watkins, *An Archaeological Excavation at Howlett Way, Thetford, Norfolk*: Appendix 9.

<sup>696</sup> Val Fryer, "Plant macrofossils and other remains" in Beverton, *Land off Lord's Walk, Eriswell*: pp. 22-23.

<sup>697</sup> Fryer, "Plant Macrofossils and Other Charred Remains" in Watkins, *An Archaeological Excavation at Howlett Way, Thetford, Norfolk*: Appendix 9.

### Late Iron Age and Roman

Peter Murphy has previously interpreted the landscape of Breckland during the Late Iron Age and Roman periods are one where the area under arable was increasing,<sup>698</sup> with pollen evidence from Hockham Mere also showing a reduction in tree cover in the catchment during this period.<sup>699</sup> Further to this, Murphy interpreted that spelt was the predominant crop across much of Breckland until the end of the Roman period, before a reduction in the area under arable in the Early Anglo-Saxon period and a change towards the use of more free-threshing wheats.<sup>700</sup> The presence of spelt wheat in Early Anglo-Saxon deposits at West Stow was interpreted as a transitional phase where Roman crop varieties were still in wider use.<sup>701</sup> Climatically, Murphy suggests that periods of wetter weather, such as the Middle to Late Iron Age and the Middle Saxon period may have encouraged the expansion of arable in Breckland because the low water retention properties of the Breckland soils would have limited arable potential until periods of wetter climate could maintain moisture levels.<sup>702</sup> Arable was also thought to be restricted to the terraces and lower slopes of the Breckland valleys, with the higher ground above 30m not considered suitable for cropping.<sup>703</sup> On this basis, an increase in summer rainfall during the third and fourth centuries AD<sup>704</sup> may also have facilitated further arable

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<sup>698</sup> Murphy, "Plant remains and the environment" in Gregory, *Excavations in Thetford, 1980- 1982, Fison Way*: p. 175-181.

<sup>699</sup> Bennett, "Devensian Late-Glacial and Flandrian Vegetational History at Hockham Mere": pp. 457-487.

<sup>700</sup> Peter Murphy, "Iron Age To Late Saxon Land Use In The Breckland" in Martin Jones (Ed.), *Integrating the Subsistence Economy*, BAR International Series 181 (BAR Publishing, 1981): p. 187.

<sup>701</sup> Peter Murphy, "The Cereals and Crop Weeds" in West, *West Stow, The Anglo-Saxon Village*: pp. 100-108.

<sup>702</sup> Murphy, "Iron Age to Late Saxon land use in the Breckland": pp. 177-209.

<sup>703</sup> Ibid.

<sup>704</sup> McCormick *et al.*, "Climate Change during and after the Roman Empire": p. 186.

expansion and surplus production in Breckland during the Late Roman period, discussed in more detail below.

Murphy's interpretations at the time made use of a relatively limited number of Breckland sites where environmental data was available, under the traditional belief that Roman agricultural practices in Britain centred on two core outputs: an arable regime focussed on the production of spelt wheat as the primary crop and barley second (other crops such as rye and oats can be present in minor proportions), and a livestock regime focussed primarily on cattle with sheep second (livestock such as pigs tend to be present in minor numbers). Recent regional-level studies of the environmental data in other parts of Britain have confirmed this trend elsewhere, with spelt wheat being the predominant crop across almost all the regions surveyed.<sup>705</sup> Spelt saw a slight increase across much of the Roman period, at the expense of both emmer and barley, with a very slight increase in the occurrence of free-threshing wheats during the Late Roman.<sup>706</sup>

In the light, acid sands of Breckland, where medieval arable practices centred on the production of barley, much of what Peter Murphy suggested in the 1980s has been supported by subsequent evidence. The pattern of Roman cultivation is in step with trends seen across Britain more widely. Spelt wheat is predominant in Iron Age and Roman deposits and the pattern appears to have hardened with the addition of the sampling sites being discussed here. This is true of sites where the material is present in

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<sup>705</sup> Allen *et al.*, *The Rural Economy of Roman Britain*: pp. 16-21.

<sup>706</sup> *Ibid.*

background quantities, such as at Mundford Road, Thetford,<sup>707</sup> and Mildenhall,<sup>708</sup> as well as at sites where evidence of possible on-site crop processing, such as at Eriswell,<sup>709</sup> Weeting,<sup>710</sup> excavations on the route of the A11 road scheme near Elveden,<sup>711</sup> and Wangford Warren.<sup>712</sup> Indeed, spelt wheat was the preferred cereal crop being processed at a malting complex at Beck Row,<sup>713</sup> a trend seen on other Roman malting sites, such as at Nonington in Kent<sup>714</sup> and Weedon Hill, Buckinghamshire.<sup>715</sup> In that sense, the crop proportions seen in Breckland appear to correlate with wider Roman agricultural practices seen across lowland England, which in turn suggests that Breckland was not regarded as agriculturally marginal at this period.

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<sup>707</sup> Trimble, *Report on an Archaeological Evaluation at Alpha Business Park*: pp. 15-16.

<sup>708</sup> Anna West, "Plant macrofossils" in John Craven, *West Row Primary School, Mildenhall, Suffolk*, Archaeological Evaluation Report, SACIC Report No. 2015/050 (Suffolk Archaeology, 2015), Unpublished Fieldwork Report: pp. 16-18.

<sup>709</sup> Val Fryer, "Plant macrofossils and other remains" in John Craven, *Thunderbird Way, ERL 211 & Nato Place/Kennedy Street, ERL 212, RAF Lakenheath, Eriswell, Suffolk*, SCCAS Report No. 2010/189 (Suffolk County Council Archaeological Service, 2010), Unpublished Fieldwork Report: pp. 65-68.

<sup>710</sup> Peter Murphy, "Plant Remains" in Tony Gregory, *A Romano-British Farmyard at Weeting, Norfolk*, East Anglian Archaeology Occasional Paper No. 1 (Norfolk Museums Service, 1996): pp. 35-36.

<sup>711</sup> Fryer. "The Charred Plant Macrofossils and Other Remains" in Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp 279-290.

<sup>712</sup> Tegan Abel and Kath Hunter, "Environmental archaeology" in McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*: pp. 88-95.

<sup>713</sup> Val Fryer, "Charred Plant Macrofossils and other remains" in Ellen Bales, *A Roman Maltings at Beck Row, Mildenhall, Suffolk*, East Anglian Archaeology Occasional Paper No. 20 (Suffolk County Council, 2004): pp. 49-54.

<sup>714</sup> Richard Helm and Wendy Carruthers, "Early Roman Evidence for Intensive Cultivation and Malting of Spelt Wheat at Nonington" in *Archaeologia Cantiana*, Vol. 131 (2011): pp. 353-372.

<sup>715</sup> Gail Wakeham and Philippa Bradley, "A Romano-British Malt House and Other Remains at Weedon Hill, Aylesbury" in *Records of Buckinghamshire*, Vol. 53 (2013): pp. 1-44.

What these sites show is the extent to which arable production was more widespread across Breckland than had previously been assumed, and fieldwalking and metal detecting surveys in Wangford Warren produced a background of Roman metalwork suggesting that much of the 126 hectare (330 acre) site was being scattered with domestic rubbish as manuring of arable land.<sup>716</sup> Archaeological finds and HER data show that this part of Breckland contained further Iron Age and Roman activity within the small valley which contained the investigated Wangford site (Figure 47), indicating that this part of the landscape was not the sparsely populated heathland of the medieval and post-medieval periods. This is further supported by evidence from the A11 road scheme excavations, with the Late Roman archaeology being interpreted as a grain processing hub,<sup>717</sup> implying the existence of an organised surplus-producing farming system in the surrounding landscape.

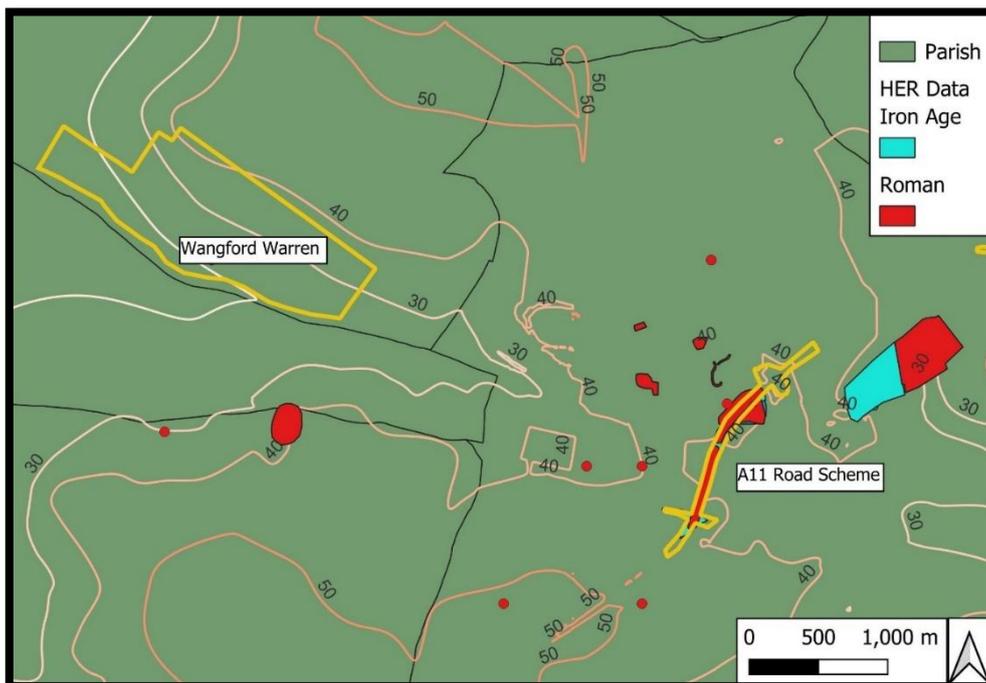


Figure 47: Iron Age and Roman activity in the same valley as the Wangford Warren site. Contour heights are given in metres OD.

<sup>716</sup> Thomas Lucking, “Metalwork” in McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*: pp. 67-81.

<sup>717</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: p. 289.

A second important point is made by Val Fryer in her interpretation of the environmental remains from the A11 road scheme, where she highlights the fact that the Romans tended not to grow much barley as it was considered a fodder crop rather than being for human consumption.<sup>718</sup> On the A11 site, however, even though wheat was the predominant crop, barley was still considered to be present in a higher-than-expected quantity, and Fryer attributed this to the light soils of Breckland being better suited for the growing of barley.<sup>719</sup> While the status of barley as a fodder crop in Britain has been questioned somewhat in recent years, most notably by discussions pointing out that this attitude towards the crop tended to be a continental Roman preference and not necessarily a British one,<sup>720</sup> as well as evidence showing that barley was consumed in some cases,<sup>721</sup> it is the proportion of barley in the assemblage that was considered unusual in this case. Other sites where in-depth analysis of crop assemblages has taken place, such as the maltings site<sup>722</sup> and the site of the former Smoke House Inn,<sup>723</sup> both at Beck Row have shown that barley, while still the second most common cereal present behind spelt, still formed a proportion higher than the trends identified in other parts of Roman Britain.<sup>724</sup> Conversely, Roman settlement archaeology on the nearby airbase in Mildenhall produced a cereal grain assemblage where barley was present in such low

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<sup>718</sup> Fryer, “The Charred Plant Macrofossils and Other Remains” in Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: p. 280.

<sup>719</sup> Ibid.

<sup>720</sup> Allen *et al.*, *The Rural Economy of Roman Britain*: p. 18.

<sup>721</sup> Kate Britton and Jacqui Huntley, “New evidence for the consumption of barley at Romano- British military and civilian sites, from the analysis of cereal bran fragments in faecal material” in *Veget. Hist. Archaeobot.*, Vol. 20 (2011): pp. 41-52.

<sup>722</sup> Val Fryer, “Charred plant macrofossils and other remains” in Bales, *A Roman Maltings at Beck Row, Mildenhall, Suffolk*: pp. 49-53.

<sup>723</sup> John Summers, “The charred plant macrofossils and charcoal” in Mustchin and Thompson, *Former Smoke House Inn, Beck Row, Mildenhall, Suffolk*: pp. 282-300.

<sup>724</sup> Allen *et al.*, *The Rural Economy of Roman Britain*: pp. 21-33.

quantities that it was interpreted as a possible fodder crop rather than for human consumption.<sup>725</sup> Other Late Iron Age and Roman sites in the region were also thought not to be engaging in arable production, and an excavated settlement at Brandon Road, Thetford was thought to be centred around pastoral husbandry rather than cereal crops.<sup>726</sup> The pattern that emerges in Breckland is something of a mixed picture, but one where arable production broadly conforms to the patterns seen elsewhere in Britain. Spelt wheat was the predominant crop variety being grown in the region, but it is possible that the sandy soils meant that barley was being grown in higher proportions than has been seen elsewhere, while the recovery of crop processing waste from a number of sites alongside the possible Late Roman processing hub at Elveden indicates the region was engaged in a form of organised surplus production.

The growing of barley as part of this surplus producing network and the presence of this crop in relatively high proportions in some assemblages may have implications for the way in which the arable landscape of Breckland was managed during the Roman period, particularly if the principal use for this crop in the Roman world was for animal fodder. This is something that has not previously been characterised for historically ‘marginal’ landscapes. While the area under arable during this period appears to have been comparable (if not greater than) the extent of arable during the medieval period (see below, pages 282-285), there is no evidence to suggest soil fertility was noticeably higher, yet the archaeological evidence also suggests that at least some parts of Breckland were

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<sup>725</sup> Rachel Fosberry, “The plant macrofossils” in Andrew Tester, *Washington Square, RAF Mildenhall, MNL 639*, Post-Excavation Assessment Report, SCCAS Report No. 2012/133 (Suffolk County Council, 2012), Unpublished Fieldwork Report: pp. 46-49.

<sup>726</sup> Val Fryer, “Charred Plant Macrofossils and Other Remains” in Atkins and Connor, *Farmers and Ironsmiths*: pp. 102-105.

being farmed to produce surpluses of spelt wheat. As mentioned above, one interpretation of higher rainfall in the Late Roman period was the potential to expand the arable areas in Breckland, but the problem arising from higher rainfall in such free-draining soils would be an increase in the washing out of nutrients from the surface. To counteract this, it would therefore be necessary to increase the input of nutrients back into the soil. There were a number of ways that this could be achieved that are detailed in Roman texts, including the use of marl and chalk.<sup>727</sup> Roman pits cut into the chalk at sites such as Wangford Warren<sup>728</sup> and the A11 road scheme<sup>729</sup> could conceivably have been excavated to provide marl for the adjacent arable, although chalk has a wide range of other potential uses. The scattering of domestic pottery and metalwork, presumably mixed in with farmyard manure, over extensive areas in places such as Wangford,<sup>730</sup> Illington,<sup>731</sup> and the Stanford Training Area<sup>732</sup> shows that human labour was both available and economic in efforts to keep the arable in good heart. Indeed, the key way in which fertility could be maintained would be through the use of animal manuring, either indirectly through the carting of this waste from surrounding farmyards, or directly through the grazing or folding of livestock on the fallow. As will be discussed below, the Roman preference tended towards the use of stall-fed cattle to provide indirect manuring. Because of the easily leached nature of the soil, and the increase in rainfall

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<sup>727</sup> Allen *et al.*, *The Rural Economy of Roman Britain*: pp. 37.

<sup>728</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*: pp. 24-25.

<sup>729</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 149, 156, 157 and 176.

<sup>730</sup> McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*: pp. 109-112.

<sup>731</sup> Davison *et al.* *Illington: A Study of a Breckland Parish*: pp. 2-3.

<sup>732</sup> Davison and Cushion, "An Archaeological Survey of the Stanford Training Area": pp. 609-615.

during this period, it may have been necessary to maintain larger herds of livestock in order to ensure the arable remained viable for the cultivation of spelt wheat. Part of this system would then have involved taking a larger proportion of cattle through the winter, rather than reducing stock at this point, to ensure high numbers in the spring to maximise manuring onto the arable. Because of these higher numbers, there would be a greater need for winter fodder, which in turn would encourage the growing of barley in higher proportion than elsewhere. This would have allowed the maintenance of larger numbers of livestock, and in turn would have helped to maintain fertility on the arable with the overall aim being the production of a surplus of spelt wheat.

A number of nuances must be added to this model in a Breckland context. It is important to note that the extent of land under arable cultivation would not necessarily produce equivalent yields per acre compared with soil types in adjacent landscapes. Roman arable in Breckland may have consisted of extensive but low-yield areas under cultivation in order to produce the desired quantities of grain, not dissimilar to medieval practices. It is unfortunately not easily possible to quantify this. Part of the reason for keeping greater numbers of cattle would therefore also be to provide the required traction to plough extensive areas of land under this regime. It is also the case that the cereal regimes and rotations in the region may not necessarily have been uniform across the landscape. While spelt wheat tends to be more tolerant of acid soils compared to other wheat varieties,<sup>733</sup> this is not by a significant degree and, of the cereal crops available, barley is still the best (or least worst) for tolerating Breckland soils. As such, for some of the soils in Breckland, barley may have been the only worthwhile crop to grow, and it is

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<sup>733</sup> Martin Jones, "The Development of Crop Husbandry" in Jones and Dimbleby (Eds.), *The Environment of Man*: pp. 106-107.

possible that these areas of land may have seen more of a focus on barley production to allow the slightly better soils to be prioritised for the growing of spelt. Conversely, some areas, as seen with later periods, were also likely to simply be too low in fertility to be worth attempting to farm even under such an organised farming system.

### *The Anglo-Saxon Period*

Environmental evidence covering the fifth to eleventh centuries is far more limited compared with the preceding Roman material. In part, this may be due to the more ephemeral nature of Early Anglo-Saxon settlement, and because much Middle and Late Saxon evidence probably lies under currently occupied villages, but also because the end of the Roman period is interpreted as a point of population reduction into the fifth and sixth centuries.<sup>734</sup> In Breckland, as seen in many other places, settlement also appears to have retreated from the more upland areas that had formed part of the surplus producing farming complexes of the Late Roman period, and instead focussed on the lower slopes and river terraces of the region. The other major change of this period is a reduction in the amount of spelt wheat being cultivated and a shift towards the use of more free-threshing varieties of wheat.<sup>735</sup>

The best-known Early Anglo-Saxon site in Breckland is the village at West Stow, on a gravel terrace sited above the River Lark.<sup>736</sup> The site was excavated between 1965 and 1972 and, while not carried out to the same standard as modern processes,

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<sup>734</sup> Roberts and Wrathmell, *Region and Place*: p. 41.

<sup>735</sup> Ann Hagan, *Anglo-Saxon Food and Drink: Production, Processing, Distribution and Consumption* (Anglo-Saxon Books, 2010): p. 32; Mark McKerracher, *Anglo-Saxon Crops and Weeds, A Case Study in Quantitative Archaeobotany* (Archaeopress, 2019): pp. 6-8.

<sup>736</sup> SHER WSW 002.

environmental remains were recovered from which analysis could be made of cereal remains.<sup>737</sup> At West Stow, spelt wheat was present in a fifth-century context, and Murphy interpreted this as being a transitional phase where the variety was still in use, and suggested that spelt therefore fell out of cultivation at some point between the Early and Middle Saxon periods.<sup>738</sup> A deposit of processed, charred rye grains was also considered to be a result of favouring this crop, which can tolerate the Breckland soils.<sup>739</sup> Weed seed assemblages from the site were also interpreted as indicating little change between the Roman and Early Anglo-Saxon period in the type of ground being cultivated in the area.<sup>740</sup> Adjacent excavations on the site of the museum store produced predominantly barley, again perhaps suggesting a degree of continuity of earlier arable practices, at least in the Lark Valley.<sup>741</sup> By contrast, Early Anglo-Saxon features at Redcastle Furze, Thetford produced short-grained varieties of wheat, but no spelt,<sup>742</sup> and a similar reduction in spelt and increase in free-threshing wheat was seen in excavations at Kilverstone.<sup>743</sup> At both of these sites, barley was still the second most common cereal recovered.

The Middle Saxon period is similarly limited in available cereal grain evidence but does show a continuing trend of a reduction of spelt wheat, increase in free-threshing and bread wheat varieties, and occasions where barley is more numerous

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<sup>737</sup> Murphy, "The Cereals and Crop Weeds" in West, *West Stow, The Anglo-Saxon Village*: pp. 100-108.

<sup>738</sup> *Ibid.*: p. 103.

<sup>739</sup> *Ibid.*: pp. 103-104.

<sup>740</sup> *Ibid.*: pp. 104-105.

<sup>741</sup> Val Fryer, "Charred plant macrofossils and other remains" in Gill and Riddler, *New Museum Store, West Stow Country Park*: pp. 52-55.

<sup>742</sup> Peter Murphy, "Plant Macrofossils" in Andrews, *Excavations at Redcastle Furze*: pp. 131- 135.

<sup>743</sup> Rachel Ballantyne, "Plant Remains" in Garrow, *Archaeological Excavations at Norwich Road, Kilverstone, Norfolk*: pp. 133-145.

than wheat. At the Old Bell, Marham, environmental evidence from Middle to Late Saxon deposits showed that bread wheat was the most abundant cereal on site, with barley being the second-most and this was regarded as typical of Anglo-Saxon to medieval crop assemblages.<sup>744</sup> Small quantities of free-threshing wheat were also the dominant crop variety from broadly Anglo-Saxon features at Mildenhall.<sup>745</sup> At the high-status site of Staunch Meadow, barley was the predominant cereal crop recovered, with bread wheat also present.<sup>746</sup> As with West Stow, rye was also seen to form a notable part of the cereal economy of the site.<sup>747</sup> Wheat and barley grains were also recovered from Middle Saxon contexts at RAF Lakenheath, but in low quantities.<sup>748</sup> Spelt wheat was recorded from a Middle Saxon context at Thetford but this was assumed to have been redeposited material from underlying Roman contexts on a site with dense Roman archaeology.<sup>749</sup>

Environmental evidence from the Late Saxon period is similarly limited but continues the trend of free-threshing wheats and barley being present. A number of Late Saxon sites in Thetford have been excavated but many of these produced little more than a general background of cereal remains, with the exception of a cellared building, which

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<sup>744</sup> Rob Scaife, "The charred plant remains and other environmental material from flotation" in Andrew Newton, *Saxon and Medieval Settlement at the Old Bell, Marham, Norfolk, Research Archive Report*, Report No. 3458 (Archaeological Solutions, 2009), Unpublished Fieldwork Report: pp. 63-67.

<sup>745</sup> Sarah Cobain, "Appendix 17: The Plant Macrofossils and Charcoal Remains" in Harvard and Holt, *Land At Recreation Way, Mildenhall, Suffolk*: pp. 98-100.

<sup>746</sup> Peter Murphy and Val Fryer, "Valley sediments and plant macrofossils" in Tester *et al.*, *Staunch Meadow, Brandon, Suffolk*: pp. 313-330.

<sup>747</sup> Ibid.

<sup>748</sup> Val Fryer, "Plant macrofossils and other remains" in Caruth, *Consolidated Support Complex, RAF Lakenheath*: pp. 43-45.

<sup>749</sup> Fryer, "Charred Plant Macrofossils and Other Remains" in Atkins and Connor, *Farmers and Ironsmiths*: pp. 102-105.

contained a notable deposit of rye straw, possibly the remains of thatch.<sup>750</sup> As mentioned above, Middle to Late Saxon deposits at Marham contained bread wheat as the most abundant crop,<sup>751</sup> while at Troston a small amount of wheat was recovered from a Late Saxon feature on a small site.<sup>752</sup> Unusually, a deposit of tentatively-identified spelt wheat was recovered from a Late Saxon context at Feltwell alongside barley.<sup>753</sup> The specialist considered this to be typical of an Anglo-Saxon assemblage, although other works suggest this is not the case.<sup>754</sup> This deposit may represent redeposited Roman material on a site with dense Roman archaeology, or perhaps a very late survival of a crop type grown locally because the soil conditions were better suited to it. Even if this is true, the unusual nature of this deposit serves as an exception to highlight the wider evidence indicating that free-threshing varieties were the dominant wheat crop by this period.

### *The Medieval Period to 1600*

Arable regimes in medieval Breckland are far better characterised than previous periods, through a mixture of both historic landscape and geographical study by writers such as

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<sup>750</sup> Peter Murphy, "Plant Remains" in Dallas, *Excavations in Thetford by B. K. Davison*: pp. 192- 193.

<sup>751</sup> Scaife, "The charred plant remains and other environmental material from flotation" in Newton, *Saxon and Medieval Settlement at the Old Bell, Marham, Norfolk*: pp. 63-67.

<sup>752</sup> Anna West, "Plant macrofossils and other remains" in Dennis Payne, *Archaeological Evaluation On Land to the East of The Old Bull, Troston, Suffolk* (Dennis Payne Archaeological Services, 2015), Unpublished Fieldwork Report: pp. 13-15.

<sup>753</sup> Rachel Fosberry, "Environmental Remains" in Aileen Connor and Liz Muldowney, *Romano- British and Anglo-Saxon buildings at the Old School, Feltwell, Norfolk, Post-Excavation Assessment*, CCC AFU Report 925 (Cambridgeshire County Council, 2006), Unpublished Fieldwork Report: pp. 38-40.

<sup>754</sup> McKerracher, *Anglo-Saxon Crops and Weeds*: pp. 6-8.

Allison and Postgate,<sup>755</sup> as well as through Bailey's use of documentary evidence to provide insight into the agricultural economy of the region.<sup>756</sup> More recently, John Belcher has explored the foldcourse system of arable husbandry in East Anglia, a system of complex grazing and farming rights usually centred on the grazing of large flocks of sheep on common land during the day, before close-folding them on the arable at night to provide direct manuring into the soil.<sup>757</sup> The use of this system in Breckland naturally formed a considerable part of his discussions. To briefly outline current understanding of medieval Breckland, it is argued that by the medieval period soils had reduced in fertility to the extent that the wheat varieties available were not considered to be worth the additional input required to make them a crop worth growing to the same extent as elsewhere.<sup>758</sup> Barley, however, was more tolerant of the Breckland soils and thus became the principal arable crop, which Bailey argues was predominantly used for malting and heavily linked to the needs of the monastic estates such as the abbey at Bury St Edmunds.<sup>759</sup> That is not to say that wheat disappeared from the region entirely, but that barley was the predominant cereal crop, particularly on the more difficult soils. The fertility of the arable was maintained through a system of sheep-corn husbandry, where large flocks of sheep would graze on the extensive tracts of heathland during the day, before being close folded on the arable overnight, providing a direct source of manure to

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<sup>755</sup> K. J. Allison, "The Sheep-Corn Husbandry of Norfolk in the Sixteenth and Seventeenth Centuries" in *Agricultural History Review*, Vol. 5, No. 1 (1957): pp. 12-30; Postgate, *Historical Geography of Breckland*.

<sup>756</sup> Bailey, *A Marginal Economy?*

<sup>757</sup> Belcher, *The Foldcourse and East Anglian Agriculture*.

<sup>758</sup> Bailey, *A Marginal Economy?:* pp. 138-142.

<sup>759</sup> *Ibid.*: pp. 136-142.

keep the soil in good heart. In Breckland and elsewhere, this was integrated into wider manorial rights and customs of the foldcourse.<sup>760</sup>

Cereal remains from medieval contexts present a somewhat mixed picture, but the quantities of grains recovered from many of these assemblages are often small and not necessarily reflective of wider practices. Wheat grains, therefore, outnumber barley grains on sites in places such as Spring Road, Bardwell,<sup>761</sup> 16 Mill Street, Mildenhall,<sup>762</sup> and The Walnut Tree, Worlington,<sup>763</sup> while barley was the dominant grain on sites at School Road, Risby<sup>764</sup> and Worlington Road, Mildenhall.<sup>765</sup> Again, however, it must be stressed that these are from small assemblages that may reflect random survival of grains rather than definite patterns. On the basis that these assemblages may reflect real proportions of cereals on some sites, one explanation for the dominance of wheat is that the excavated sites generally represent rural occupation sites, where wheat would have formed part of the everyday diet, while much of the barley grown in Breckland may have

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<sup>760</sup> Belcher, *The Foldcourse and East Anglian Agriculture*: pp. 1-7.

<sup>761</sup> Val Fryer, "Plant Macrofossils" in Crawley, *Archaeological Excavation at Spring Road, Bardwell*: pp. 23-25.

<sup>762</sup> Anna West, "Plant macrofossils and other remains" in Kieron Heard, *16 Mill Street, Mildenhall, Suffolk, Archaeological Post-Excavation Assessment & Updated Project Design*, SCCAS Report No. 2013/051 (Suffolk County Council, 2013), Unpublished Fieldwork Report: pp. 45-47.

<sup>763</sup> Anna West, "Plant macrofossils and other remains" in Rob Brooks, *The Walnut Tree, Worlington, Archaeological Evaluation Report*, SCCAS Report No. 2014/078 (Suffolk County Council, 2014), Unpublished Fieldwork Report: pp. 13-15.

<sup>764</sup> John Summers, "Plant Remains" in Matthew Adams and Pete Thompson, *Land South of School Road, Risby, Bury St Edmunds, Suffolk, An Archaeological Evaluation*, Report No. 3939 (Archaeological Solutions Ltd, 2011), Unpublished Fieldwork Report: pp. 26-28.

<sup>765</sup> Alex Livarda, "The environmental samples" in Matthew Adams, Martin Brook, Tom Woolhouse, Andrew Newton and Anthony Mustchin, *Bridge House Dairies, Worlington Road, Mildenhall, Suffolk, Research Archive Report*, Report No. 3569 (Archaeological Solutions Ltd, 2010), Unpublished Fieldwork Report: pp. 92-96.

been produced as a surplus for malting.<sup>766</sup> Thus, wheat appears dominant in domestic sites because of its regular processing and consumption, whereas barley, despite being the main cereal crop, was not necessarily used as readily in a rural domestic setting.

### Discussion

What the cereal grain evidence reveals is that across the study period the arable practices in Breckland underwent a significant change. In the prehistoric period, regimes centred on the cultivation of spelt wheat and barley, and this intensified during the Roman period when the area appears to have been part of wider networks of surplus production for spelt wheat. Other wheat varieties alongside barley were grown but spelt was the preferred crop. Indeed, while the soils of Breckland may have been better suited for the growing of barley, the Roman desire to cultivate spelt may have impacted agricultural practices in the region to ensure the viability of growing spelt. A transition then occurred in the Early Anglo-Saxon period where spelt wheat was superseded by more free-threshing varieties, which subsequently became the dominant type of wheat in use alongside a continuation of barley. As agricultural practices evolved in the Late Saxon and medieval period, the arable economy of the region switched towards a focus on barley as the primary crop in a system of foldcourse husbandry. In contrast to the Roman period, rather than changing practice to maintain an output of spelt wheat, the farmers of medieval Breckland instead adapted to conditions by centring their output on barley as a crop that was more tolerant of the acidic, low nutrient soils of the region and therefore economical, to maximise arable productivity.

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<sup>766</sup> Bailey, *A Marginal Economy?*: pp. 136-142.

Underlying this summary is something of a paradox regarding arable production in Breckland over the study period, namely that Roman farming was able to produce a surplus of wheat, when previous interpretations of the region have argued that the acidic soils were better suited for the growing of barley, hence the specialisation into this crop during the medieval period.<sup>767</sup> The answer to this lies in the varieties of wheat in use at different times and their subsequent availability. Free-threshing wheats are not suited to the acid sands of Breckland, preferring clay soils, but spelt wheat is slightly more tolerant of light lands,<sup>768</sup> not by a large degree, but potentially enough that it was viable in the right conditions in Roman Breckland under a complex and well-developed farming system. The shift away from spelt wheat during the Anglo-Saxon period, a trend seen broadly across England,<sup>769</sup> means that spelt had gone out of use by the medieval period and the most common wheat varieties available were free-threshing and bread wheats. This, in turn, would have meant that deterioration in soil quality would not have been necessary to reduce the viability of wheat production in the region, but because wider agricultural trends in England meant the wheat varieties available were no longer as tolerant of the dry, acid sands that characterise the region. Thus, the perceived agricultural ‘marginality’ of Breckland has its origins in the Anglo-Saxon period, when population contracted and settlement retreated away from the higher ground and into the more fertile river valleys, while at the same time spelt wheat was superseded by free-threshing varieties. When population and settlement then began to expand from the later Saxon period, the dominant wheat varieties were no longer a viable crop to grow on the same soils that had

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<sup>767</sup> Bailey, *A Marginal Economy?*: pp. 138-142.

<sup>768</sup> Jones, “The Development of Crop Husbandry”: pp. 106-107.

<sup>769</sup> Hagan, *Anglo-Saxon Food and Drink*: p. 32.

been able to sustain a surplus of spelt in the Roman period, pushing the medieval farmers of Breckland towards barley as the principal crop.

### **Breckland Agriculture: The Animal Bone Evidence**

One of the more common types of objects recovered during archaeological investigations are assemblages of animal bones. This can include bones from both wild and domesticated species and analysis of these assemblages has the potential to throw light on the species of animals being kept or hunted in the area, the numbers and proportions of animals kept, as well as the ages at which animals were culled and which parts of the animal were subsequently used, all of which can determine the main purpose (e.g. meat, milk, traction) for the keeping of particular animals on a site. Analysis of these assemblages is usually carried out to a standardised method,<sup>770</sup> and this particular discipline has seen a great deal of evolution and debate over the years about the most effective and insightful ways of assessing bone assemblages.<sup>771</sup>

The usefulness of these assemblages when carrying out investigations into historic landscapes is that they can reveal details about changes in agricultural regimes across different periods, and, when interpreted alongside evidence for arable practices in a region, provide a far more rounded picture of agriculture in a study area. The dominance of one species at a particular period can have further implications for interpreting arable practices in the region, especially with regards to manuring regimes

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<sup>770</sup> Polydora Baker and Fay Worley, *Animal Bones and Archaeology, Recovery to archive* (Historic England, 2019).

<sup>771</sup> For examples, see: Fiona Marshall and Tom Pilgram, “NISP vs. MNI in Quantification of Body- Part Representation” in *American Antiquity*, Vol. 58, No. 2 (1993): pp. 261-269; Michael Cannon, “NISP, Bone Fragmentation, and the Measurement of Taxonomic Abundance” in *Journal of Archaeological Method and Theory*, Vol. 20 (2013): pp. 397-419.

and the amount of traction animals available at any one time, something discussed in more detail below (see pages 297-298).

As will be seen below, the livestock assemblages across all periods are dominated by either cattle or sheep/goat in differing proportions at different times. Horses and pigs are present on many sites but often in far lesser numbers, suggesting they played a more minor role in the husbandry practices of the region. The general trends of the animal bone assemblages shall be outlined across the study period, before certain aspects of this are discussed to establish what this suggests about changing agricultural practices in Breckland.

Despite the relatively standardised methods by which animal bone assemblages are analysed, it is widely recognized that these methods are not without their drawbacks. In particular, the use of Number of Identified Specimens (NISP) and Minimum Numbers of Individuals (MNI) can only provide limited insight into actual numbers of animals being kept on a site.<sup>772</sup> In particular, because NISP was based upon fragment count, it was suggested that as individual bones within an assemblage become more fragmented, the NISP count for certain taxon initially increases despite there being no overall increase in total bone quantities, before the NISP decreases after a certain level of fragmentation when bones become too fragmented to identify to taxon-level.<sup>773</sup> Subsequent experiments with bone assemblages have supported this hypothesis.<sup>774</sup> In practice, this

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<sup>772</sup> Marshall and Pilgram, "NISP vs. MNI in Quantification of Body-Part Representation": pp. 261- 269.

<sup>773</sup> Ibid.

<sup>774</sup> Cannon, "NISP, Bone Fragmentation, and the Measurement of Taxonomic Abundance": pp. 397-419.

means that where the proportions of two different taxon may be relatively close in an assemblage when counted by NISP, such as cattle and sheep/goat in the case of some of the sites discussed below, interpretation must be limited to only general trends with regards to the numbers and ratio of cattle to sheep/goat kept on a particular site. This is because the variables caused by the impact of fragmentation on the NISP count may mean that certain taxon in certain conditions can be under- or overrepresented. For example, a site may have a greater ratio of sheep to cattle, but sheep bones may not survive compared to larger cattle bones or may fragment to such an extent that many cannot be identified for inclusion in NISP counting. In addition, if cattle were being routinely butchered on site and bones broken for marrow extraction, this would increase the NISP for cattle bones and the overall proportions could potentially be interpreted as a cattle dominant assemblage. A degree of care is therefore needed when interpreting assemblages, and greater insight for historic husbandry practices may be found through examination of aspects such as animal age profiles in the assemblage, or where assemblages of a certain period consistently display similar proportions of particular taxon, especially across a range of site types with the potential for differential preservation conditions. The clearest example of this in Breckland, as will be seen below, is the dominance of cattle as the principal stock animal in the Iron Age and Roman periods. Assemblages from other periods may provide insight into practices on a particular site, but the numbers of assemblages available for the Anglo-Saxon, medieval and post-medieval periods in Breckland are limited such that broader trends can only be speculative, and, in the case of the medieval period, assemblages may contradict what is known about regional husbandry practices through documentary evidence. The animal bone evidence is, overall, more limited in the insight it can provide about historic

agricultural practices compared to the cereal grain evidence, but it is still worthwhile to briefly outline the evidence available across the study period and the information that can be inferred from this.

It should further be borne in mind that most of the bones in these assemblages represent butchery and consumption waste, and this alone may be enough to generate biases in the perceived proportions of animals on site, in terms of understanding the population and proportions of different animals kept in the historic landscape. This is particularly true of medieval assemblages in Breckland, where cattle appear to be represented in near similar proportion to sheep in a region where sheep were known to be the dominant livestock. The authors of the reports summarised below have, in many cases, attempted to nuance interpretations by looking at ageing profiles of the assemblages, evidence of pathology, and which skeletal elements are present on site for certain taxon to determine whether rearing of animals for meat was the principal purpose for their keeping, or whether this was effectively a by-product at the end of the working life of an animal. This section does not seek to challenge these interpretations but, rather, draw these together into a broader *qualitative* synthesis of historic livestock husbandry in Breckland in a similar manner to the cereal grain evidence above. This material will then be further interpreted alongside the cereal grain and other evidence to produce a broad overview of historic land use and agricultural practices across the study period.

### *The Archaeological Source Material*

Assessments of the vast majority of animal bone assemblages in the region are present within unpublished grey literature reports,<sup>775</sup> as well as number of published monographs for some of the more significant or substantial sites within the study area. As discussed in Chapter Three, more than 700 grey literature reports from the parishes forming the study area are available through the Archaeology Data Service, and this body of material has been supplemented with a small quantity of other reports available through the Oxford Archaeology online library and Pre-Construct Archaeology archives. Of the reports available, 189 contain discussions of recovered animal bone from within the study area (Figure 46), and those reports directly referenced in this chapter are included in the main bibliography, while the remaining reports used to generate Figure 46 are listed in Appendix 1. However, the majority of these assemblages are relatively small or fragmentary, limiting scope for taxon identification or proportions of animals present on site much beyond basic quantification of the assemblage. The potential pitfall of small assemblages is that the recovered bones may represent random patterns of recovery rather than emergent trends on the site. As such, interpretations in this section focus primarily on reports with larger assemblages that have been assessed in more detail, alongside a number of published monographs.

As with the environmental data discussed above (see pages 267-270), the distribution of animal bone assemblages is heavily skewed towards material recovered from Suffolk, particularly around the two airbases and the urban environment of Thetford, with limited material from rural contexts in Norfolk. The interpretations given in this

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<sup>775</sup> See Chapter Three for a summary definition of this type of report.

section should therefore be viewed as more representative of Suffolk Breckland and may not be entirely representative of Norfolk Breckland.

#### Earlier Prehistoric (Pre-study period) Material and Differential Preservation

It is notable that no significant assemblages of earlier prehistoric material were present in the reports studied. This is true even on sites such as Norwich Road, Kilverstone,<sup>776</sup> where significant prehistoric archaeology and other finds types were present in the vicinity of later, particularly Roman, features where animal bone was recovered. This is not to say that features of this period are totally devoid of bone, as some sites such as at Kings Warren, Red Lodge<sup>777</sup> and Worlington Road, Mildenhall<sup>778</sup> did produce some prehistoric material. By contrast, some later sites have produced very little surviving bone due to poor soil conditions, the most striking example being the excavations at Fison Way, Thetford where very little bone survived on this large-scale Iron Age and Roman site despite a wealth of other finds.<sup>779</sup> It is perhaps more the case that different soil conditions play a role in where these assemblages survive and that this occurs alongside a natural tendency for bone to decay over time, meaning that as features get older in date, bone is less likely to survive. It may also be the case that the keeping of livestock was done in numbers smaller than in later periods, where significant numbers of animals generated larger quantities of bone, but this can only be speculation because of a lack of

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<sup>776</sup> Andy Clarke, "Animal Bone" in Garrow, *Archaeological Excavations at Norwich Road, Kilverstone, Norfolk*: pp. 128-132.

<sup>777</sup> Hayley Forsyth-Magee, "Animal Bone" in Forshaw, *Archaeological Investigations at Land East of Kings Warren*: pp. 61-68.

<sup>778</sup> James Morris, "The Animal Bone" in Adams *et al.*, *Bridge House Dairies, Worlington Road, Mildenhall, Suffolk*: pp. 76-92.

<sup>779</sup> Terry O'Connor, "Small vertebrate remains" in Gregory, *Excavations in Thetford 1980-1982, Fison Way*: p. 175.

contemporary assemblages. As such, interpretations of earlier prehistoric hunting and husbandry practices in Breckland using animal bone assemblages are limited, predominantly because larger assemblages of bone from this early period are difficult to find.

### Late Bronze Age and Iron Age

Assemblages of Late Bronze Age date are limited in a similar way to earlier periods with few sites producing assemblages that can be analysed in greater detail. However, more material exists from Iron Age contexts and it is across this period where the quantity of preserved bone assemblages increases noticeably. This is particularly true towards the later Iron Age, suggesting that the threshold for animal bone survival in Breckland soils is broadly 2,500 years, taking into account variation for areas with better or worse conditions for survival.

The only Late Bronze Age assemblage where any form of detailed analysis could be carried out was from Culford, where sheep/goat were interpreted as the most common animal in the assemblage with cattle the second most common.<sup>780</sup> Age profiles of the assemblage suggested possible autumn culling of some young sheep to allow continued milking of the mothers, with sheep seen as being more commonly kept for milk than cattle at this period.<sup>781</sup> A small assemblage from Recreation Way, Mildenhall also contained sheep/goat and cattle bones but no in-depth analysis was carried out on the relatively low quantities of bone recovered from this period.<sup>782</sup>

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<sup>780</sup> Julie Curl, "Animal Bone" in Cass, *Culford School Air Tennis Hall, Culford*: pp. 35-37.

<sup>781</sup> Ibid.

<sup>782</sup> Jonny Geber, "The Animal Bone Assemblage" in Harvard and Holt, *Land at Recreation Way, Mildenhall, Suffolk*: pp. 76-89.

Assemblages of Early Iron Age date are also relatively limited, but material recovered from excavations on the A11 road scheme suggested that cattle were thought to be the main contributor to the diet of people living on site, with sheep/goat second.<sup>783</sup> The Middle Iron Age also has few significant assemblages, with the reports usually grouping this material more broadly as 'Middle to Late Iron Age'. As such, assemblages of this date are discussed below as part of the Late Iron Age and the interpretations and practices seen in the Late Iron Age are perhaps best described as developing and evolving from the Middle Iron Age onwards.

Sites with useful assemblages dated to the Late Iron Age present something of a mixed picture. At Worlington Road, Mildenhall, in Middle to Late Iron Age contexts, cattle bones were the dominant species recovered, with sheep second, although a count of the MNI shows that cattle and sheep/goat were of similar numbers.<sup>784</sup> The ageing data for the assemblage suggested that cattle were kept for their secondary products other than meat.<sup>785</sup> Sheep were also kept for secondary products but with evidence for some culling for meat between two to four years of age.<sup>786</sup> Cattle were also the most common species recovered from excavations on the A11 road scheme for this period,<sup>787</sup> as well as at the nearby Center Parcs.<sup>788</sup> By contrast, sheep/goat were most commonly recovered, with

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<sup>783</sup> Kevin Reilly, "The Animal Bone" in Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 265-266.

<sup>784</sup> Morris, "The Animal Bone" in Adams *et al.*, *Bridge House Dairies*: pp. 76-92.

<sup>785</sup> *Ibid.*

<sup>786</sup> *Ibid.*

<sup>787</sup> Reilly, "The Animal Bone" in Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 267-271.

<sup>788</sup> Julie Curl, "Animal Bone" in John Craven, *New Executive Villas, Center Parcs, Elveden, ELV 067, Archaeological Excavation Report*, SCCAS Report No. 2010/012 (Suffolk County Council Archaeological Service, 2010), Unpublished Fieldwork Report: pp. 91-93.

cattle second, on a site at Mildenhall where the evidence suggested they were mainly being kept for meat.<sup>789</sup> At Ford Place, Thetford, sheep were also dominant in Late Iron Age contexts, being twice as common as the remainder of the assemblage, with this material suggested as possible religious deposits related to feasting events on site.<sup>790</sup> A similar feasting event or autumn culling of sheep was interpreted from remains at Lakenheath.<sup>791</sup>

### Roman

Roman period sites have provided the highest number of assemblages where detailed examination could take place and show a marked trend in the region towards a dominance of cattle as the principal livestock species, with sheep/goat in second. At Beck Row, Mildenhall, cattle were the most common across all Roman phases on site, with some evidence for an increase in the size of cattle being kept over this period.<sup>792</sup> Likewise, at Recreation Way, Mildenhall,<sup>793</sup> cattle dominated the Roman assemblage, a trend that repeats for sites at nearby Beck Row,<sup>794</sup> West Row<sup>795</sup> and Lakenheath.<sup>796</sup> In the

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<sup>789</sup> Geber, “The Animal Bone Assemblage” in Harvard and Holt, *Land at Recreation Way*: pp. 76- 89.

<sup>790</sup> Julie Curl, “Faunal Remains” in Giles Emery, *Assessment Report and Updated Project Design for an Archaeological Excavation at Ford Place Nursing Home, Thetford*, Report No. 1005 (Norfolk Archaeological Unit, 2005), Unpublished Fieldwork Report: pp. 12-14.

<sup>791</sup> Julie Curl, “Animal Bone” in Craven, *Liberty Village, RAF Lakenheath*: pp. 44-48.

<sup>792</sup> Julie Curl and Julia Cussans, “The animal bone” in Mustchin and Thompson, *Former Smoke House Inn, Beck Row, Mildenhall, Suffolk*: pp. 243-276.

<sup>793</sup> Geber, “The Animal Bone Assemblage” in Harvard and Holt, *Land at Recreation Way*: pp. 76- 89.

<sup>794</sup> Alexis Willett, “Animal Bone” in Bales, *A Roman Maltings at Beck Row, Mildenhall, Suffolk*: pp. 45-49.

<sup>795</sup> Vida Rajkovača, “Faunal Remains” in Kathryn Nicholls, *Land off Beeches Road, West Row, Suffolk*, OA East Report No. 1838 (Oxford Archaeology East, 2015), Unpublished Fieldwork Report: pp. 86-89.

<sup>796</sup> Laszlo Lichtenstein, “Faunal Remains” in Rob Brooks, *Rochester Road Soak-away, RAF Lakenheath, Archaeological Excavation Report*, SACIC Report No. 2015/005 (Suffolk Archaeology, 2015), Unpublished Fieldwork Report: pp. 47-54.

Little Ouse valley, cattle bones were also the most commonly recovered from a farmstead at Weeting<sup>797</sup> and from excavations at Brandon Road, Thetford.<sup>798</sup> Away from the fen edge and river valleys, cattle were also found to be dominant on the A11 road scheme excavations, and it was highlighted that this appeared to be unusual compared with other Romano-British sites in England where sheep usually have a period of dominance in the Late Iron Age, something that was not present in these assemblages.<sup>799</sup> It was noted that the maintenance of cattle as the dominant species was something of an East Anglian trend.<sup>800</sup> By contrast, cattle and sheep bones were present in nearly equal proportion at nearby Wangford Warren, although quantities were biased by the deliberate deposit of a complete, articulated sheep as well as other possible placed sheep deposits in a different feature.<sup>801</sup> At both Wangford and the A11 road scheme, bone survival conditions were generally good, reducing post-depositional fragmentation and lending weight to these two assemblages being reliable indicators of kept livestock proportions. The assemblages recovered from the Roman town at Icklingham were also dominated by cattle bones of what was interpreted as a larger, improved breed.<sup>802</sup> The age profiles in this assemblage also showed no juvenile cattle were being consumed in the town,<sup>803</sup> suggesting the cattle were not being raised primarily as beef stock. By contrast, while

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<sup>797</sup> Nick Winder, "Animal Bone" in Gregory, *A Romano-British farmyard at Weeting, Norfolk*: p. 35.

<sup>798</sup> Ian Baxter, "Animal Bone" in Atkins and Connor, *Farmers and Ironsmiths*: pp. 87-101.

<sup>799</sup> Reilly, "The Animal Bone" in Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*: pp. 271-279.

<sup>800</sup> *Ibid.*: p. 277.

<sup>801</sup> Kevin Rielly, "Animal Bone" in McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*: pp. 81-85.

<sup>802</sup> Crabtree, *Middle Saxon Animal Husbandry in East Anglia*: pp. 8-10.

<sup>803</sup> *Ibid.*

cattle and sheep bones were broadly equal in Late Roman contexts in St Nicholas Street, Thetford, the MNI showed that sheep were better represented overall.<sup>804</sup>

Case studies in *The Rural Economy of Roman Britain* found that in the West Anglian Plain and Kent and Thames Estuary regions, farming regimes were generally dominated by cattle, with sheep second, followed by horses and then pigs.<sup>805</sup> The arable focus was on the production of spelt, and it is argued that the area under arable expanded during the course of the Roman period.<sup>806</sup> Ageing and culling data for these regions suggested cattle were not being kept for meat, as many were found to have been culled at an age well beyond prime meat bearing age. It was argued that this was probably because more cattle were being used as traction animals as the area under arable expanded.<sup>807</sup> The Breckland animal bone data extracted from the sites mentioned above suggests a similar trend for Breckland, with cattle being the predominant species, followed by sheep, and proportions of cattle appearing to increase in the Middle to Late Roman period compared to the Late Iron Age. This would correlate with a similar expansion of arable and the need for more traction animals, but also potentially the desire to keep more cattle for a manuring regime on the light soils (see pages 276-278). It is arguable that the keeping of cattle into relative old age may have been because one of their main values was in producing manure to keep the fields in good heart for spelt production, so culling was limited to when it was necessary. Overall, Roman trends

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<sup>804</sup> Rachel Hutton MacDonald, "Animal Bones from St Nicholas' Street and Guildhall Street" in Phil Andrews and Kenneth Penn, *Excavations in Thetford, North of the River, 1989-90*, East Anglian Archaeology Report No. 87 (Norfolk Museums Service, 1989): pp. 75-77.

<sup>805</sup> Allen *et al.*, *The Rural Economy of Roman Britain*: pp. 147-157.

<sup>806</sup> *Ibid.*

<sup>807</sup> *Ibid.*

appear to be consistent with that seen elsewhere in lowland England, based upon a 'cattle and spelt' agricultural regime.

### Anglo-Saxon

After a wealth of sites providing data for the Roman period, Anglo-Saxon assemblages in the region are far more limited in the number available for study but appear to show a mixed picture for the earlier Anglo-Saxon period, trending towards sheep becoming the dominant species by the Late Saxon period. This would correlate with previous interpretations of medieval Breckland based upon documentary evidence, where sheep were the dominant livestock of the region.<sup>808</sup> Likewise, Domesday records for Breckland show that large flocks of sheep were being kept in the Late Saxon period, compared to relatively few cattle. For example, Wangford is recorded as having 413 sheep compared with eighteen cattle and twenty-six pigs,<sup>809</sup> Methwold as having 800 sheep compared with twelve cattle and eighty-four pigs,<sup>810</sup> and Icklingham as having 500 sheep compared with three cattle and four pigs.<sup>811</sup> Their recording in Domesday hints at their perceived value as part of the surveyed holdings and their quantities in the region suggest that their value as part of a manuring system of sheep-folding was already well-established by the eleventh century.

The best-known Early Anglo-Saxon material from the region is that from West Stow, where the original excavations provided a substantial assemblage where sheep

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<sup>808</sup> Bailey, *A Marginal Economy?*: pp. 65-96.

<sup>809</sup> *LDB*, Folio 358v: Suffolk.

<sup>810</sup> *LDB*, Folio 135v: Norfolk.

<sup>811</sup> *LDB*, Folio 289: Suffolk.

were the dominant species, followed by cattle and pigs.<sup>812</sup> This was further reinforced by more recent excavations on the site of the new museum store, which also showed that sheep were the dominant species with cattle second, and the animal economy of the site was considered to be based upon sheep husbandry.<sup>813</sup> By contrast, cattle were the dominant species recovered from excavations at Redcastle Furze,<sup>814</sup> Brandon Road, Thetford<sup>815</sup> and Melford Meadows, Brettenham.<sup>816</sup> At Recreation Way, Mildenhall, Anglo-Saxon contexts produced approximately equal proportions of cattle and sheep, with the interpretation that the keeping of cattle for milk was an established practice on this site.<sup>817</sup> It may be that as agricultural regimes moved away from the organised surplus producing economy of the Late Roman period and towards a subsistence-based model, variations developed depending on the needs of the local communities and, perhaps to an extent, the availability of certain livestock in the post-Roman period alongside a re-shaping of arable practices.

Middle Saxon assemblages are further limited, with the high-status site of Staunch Meadow, Brandon producing a large assemblage with sheep as the dominant species, and cattle second.<sup>818</sup> The presence of all major body parts on site was

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<sup>812</sup> Pamela Crabtree, "The Faunal Remains" in West, *West Stow, The Anglo-Saxon Village*: pp. 85-96.

<sup>813</sup> Pam Crabtree and Douglas Campana, "Animal Bone" in Gill and Riddler, *New Museum Store, West Stow Country Park*: pp. 49-51.

<sup>814</sup> Tristan Wilson, "Animal Bones" in Andrews, *Excavations at Redcastle Furze*: pp. 121-128.

<sup>815</sup> Ian Baxter, "Animal Bone" in Atkins and Connor, *Farmers and Ironsmiths*: pp. 87-101.

<sup>816</sup> Adrienne Powell and Kate Clarke, "Animal Bone Assessment" in Anon., *Melford Meadows, Brettenham, Norfolk*: pp. 26-28.

<sup>817</sup> Geber, "The Animal Bone Assemblage" in Harvard and Holt, *Land at Recreation Way*: pp. 76- 89.

<sup>818</sup> Pam Crabtree, "Animal Bone" in Tester *et al.*, *Staunch Meadow, Brandon*: pp. 296-312.

interpreted as evidence that the animals were being slaughtered for consumption on site, rather than butchered meat being imported from elsewhere.<sup>819</sup> A suggestion was also made that Middle Saxon husbandry practices were beginning to show a degree of specialisation at this time.<sup>820</sup>

Late Saxon assemblages are mainly confined to the urban environment of Thetford, where a degree of care is needed in interpreting assemblages that are almost certainly represented by animals imported from the surrounding countryside, which may introduce certain biases, rather than raised on site. Assemblages from Late Saxon contexts in Thetford show that sheep and cattle are either approximately equal in terms of quantities of material recovered, or sheep were slightly more numerous.<sup>821</sup> In terms of Minimum Number of Individual counts, sheep were shown to be dominant.<sup>822</sup> A rural assemblage of Middle to Late Saxon material collected from Marham produced a similar pattern, with cattle bones being slightly more numerous, but more individual sheep identifiable in the assemblage.<sup>823</sup>

### Medieval and post-medieval

Significant assemblages of medieval animal bone are largely confined to urban contexts in Thetford, where sites such as St Nicholas' Street produced a dominance of cattle bones in terms of the NISP recovered, but with sheep/goat dominating the MNI count.<sup>824</sup>

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<sup>819</sup> Ibid.

<sup>820</sup> Crabtree, *Middle Saxon Animal Husbandry in East Anglia*: p. 58.

<sup>821</sup> MacDonald, "Animal Bones from St Nicholas' Street" in Andrews and Penn, *Excavations in Thetford*: pp. 77-78.

<sup>822</sup> Ibid.

<sup>823</sup> James Morris and Stephany Leach, "Animal Bone" in Newton, *Saxon and Medieval Settlement at the Old Bell, Marham, Norfolk*: pp. 49-63.

<sup>824</sup> MacDonald, "Animal Bones from St Nicholas' Street" in Andrews and Penn, *Excavations in Thetford*: pp. 78-82.

Similarly, cattle bones were slightly dominant by NISP on a site at Mildenhall,<sup>825</sup> while post-medieval assemblages recovered from Beck Row show sheep as clearly being dominant in the rural landscape.<sup>826</sup> While the assemblages present for this period are limited in availability, it is fortunate that a variety of documentary evidence exists that has already been well-studied for this part of Breckland history, that provides insight into animal husbandry practices in the region.<sup>827</sup> As with the cereal grain evidence discussed above, there is something of a discrepancy between the known documentary evidence, which reveals the clear dominance of sheep as the principal animal kept across Breckland, and the archaeological evidence, which shows closer proportions between cattle and sheep than might be expected, albeit from a very limited sample size. In large part, this is due to the urban bias in medieval assemblages, with cattle being kept for a range of reasons including meat, milk and leather, which would see them more likely to be driven into towns for sale and processing and therefore a concentration of cattle bones in these places. By contrast, sheep were predominantly kept to provide manure with their resources of milk, meat and wool being more of a by-product in a Breckland context. As such, they would also have been kept into older age making them less desirable as a meat source when they were culled or died, while wool is easier to shear on-site and transport as a raw product, all of which reduces the reasons to transport sheep into an urban context. That is not to say that sheep were not present in urban environments and cows in rural, and clearly the archaeological evidence demonstrates that they were being kept and/or consumed in both contexts, but that the seemingly

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<sup>825</sup> Julie Curl, "Animal Bone" in Heard, *16 Mill Street, Mildenhall, Suffolk*: pp. 41-44.

<sup>826</sup> Alexis Willett, "Animal Bone" in Bales, *A Roman Maltings at Beck Row, Mildenhall, Suffolk*: pp. 45-49.

<sup>827</sup> Bailey, *A Marginal Economy?*: pp. 65-96.

higher proportion of cattle present in urban contexts in a landscape known for its system of sheep-corn husbandry is a result of consumption practices rather than any deviation in expected livestock populations from the documentary evidence.

### Discussion

The animal bone data from Breckland reveals that a contrast exists between the Prehistoric and Roman livestock practices and the later Anglo-Saxon and medieval practices. In the prehistoric period, livestock regimes appear to have favoured cattle as the dominant species, with sheep second. This intensified during the Roman period with a farming regime focussed on the production of a spelt wheat surplus and the preference of cattle to provide the necessary manure to keep the arable in good heart. That is not to say that sheep did not play a role in this, but that the proportions of livestock leant towards a clear preference for cattle, in keeping with other regions of lowland England. The Early Anglo-Saxon period then appears to have been one of transition, with a mixed picture across Breckland, with livestock proportions perhaps reflecting local needs and practices in a more subsistence-based economy. The shift towards a sheep-dominated regime may have its origins in the Middle Saxon, although a lack of assemblages of this period limits the analysis, but is identifiable in Late Saxon animal bone assemblages, with the proportions of sheep and cattle recorded in Breckland at Domesday indicating a livestock regime that was already well-established by this time. A further hardening of this system of sheep-corn husbandry then developed and evolved over the course of the medieval and post-medieval periods as the preferred way to keep the arable in good heart, using sheep as the way by which nutrients from the commons and heaths would be concentrated and transported back to the arable.

### **Other Archaeological Evidence for Agricultural Practices**

Beyond the cereal grain and animal bone assemblages, other archaeological evidence can provide insight into historic land use and agricultural regimes, particularly during the Roman and medieval periods and consists of two main aspects: artefact scatters and earthworks. The earthwork evidence for arable extents in Breckland is more significant than previously identified and has therefore been split into its own chapter to allow this to be investigated in appropriate detail (see Chapter Ten). However, the results of this are included in the interpretation and discussion below.

#### **Artefact Scatters**

The presence of a range of historic artefacts, such as pottery sherds and metalwork, in the ploughsoil of a field can, in some cases, provide a clear indication of the nature of previous activities on a certain field. It has long been recognised that the distribution of pottery sherds across a landscape can provide an indication of areas of core arable land and proximity to sites such as medieval villages,<sup>828</sup> while surveys at Rendlesham in Suffolk demonstrated that the presence of metalwork scatters could define similar areas of activity alongside a contrasting lack of artefacts defining the limit of areas of common and green.<sup>829</sup> In addition to this, the presence or lack of artefact scatters on an area of arable land may also be an indicator of the *type* of manuring regime taking place. That is, where artefact scatters are present, their origins lie in midden heaps generated at

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<sup>828</sup> Richard Jones, “Signatures in the Soil: The Use of Pottery in Manure Scatters in the Identification of Medieval Arable Farming Regimes” in *The Archaeological Journal*, Vol. 161, No. 1 (2004): pp. 159-188.

<sup>829</sup> Faye Minter, Jude Plouviez and Christopher Scull, *Rendlesham Survey 2008-2014: Assessment Report*, Historic England Project Reference 6471 (Suffolk County Council Archaeological Service, 2016), Unpublished Fieldwork Report: p. 59.

domestic occupation sites where this material has been mixed with waste cleared from animal byres, subsequently transported to the fields and scattered by hand. This is a form of indirect manuring, which is often associated with the keeping of stall-fed animals, usually cattle. By contrast, practices such as the close folding of sheep on the arable is a form of direct manuring that does not usually incorporate the mixing of domestic and animal waste. This is a much more difficult method to detect because it does not produce much traceable archaeological evidence, and if a community was engaged in a mixture of the two practices, that is to say they kept both cattle and sheep, fields that would be predominantly manured through sheep-folding may also see occasional scattering of farmyard manure, generating an artefact scatter in the soil. In Breckland, this presents further challenges in defining the expansion and contraction of arable, particularly in the medieval period where the dominant form of manuring was through the folding of sheep directly on the arable. This, in turn, may not generate a distinctive artefact scatter, which raises uncertainties about whether an area may have been part of the arable, a periodically ploughed Breck, or more permanent heathland.

Within the study area, surveys in part of Wangford Warren provide a useful case study, the basis of which can be used to infer wider patterns of land use in the area.<sup>830</sup> The 125-hectare site was subject to both a systematic 10% metal detecting survey prior to the removal of topsoil, and a 10% rapid fieldwalking survey after the removal of topsoil. Earthwork evidence suggests that almost the entirety of Wangford Warren was under arable cultivation in the earlier part of the medieval period until at least the mid-seventeenth century (see Chapter Ten), while artefact scatters suggest that the area

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<sup>830</sup> Hinman and McIntosh, *Land at Wangford Warren Phases One through Three*.

surveyed was under arable cultivation for much of the Roman period, with an intensification during the Late Roman. A background of Roman period metalwork and pottery was recorded across much of the site,<sup>831</sup> suggesting the area was being manured using material carted from farmyards, which incorporated some domestic rubbish. This, in turn, suggests the keeping of stall-fed animals to generate the quantities of farmyard manure that would be used to maintain arable fertility, correlating with the animal bone evidence discussed above and wider arguments that cattle were the principal livestock kept in Roman Britain.<sup>832</sup> In stark contrast, and despite the earthwork evidence indicating the area was under arable cultivation in the medieval period, Anglo-Saxon objects were limited to two metal finds and two sherds of Thetford ware,<sup>833</sup> with medieval metalwork limited to a small number of objects mostly concentrated in the north-western part of site and a sparse scatter of pottery.<sup>834</sup> The implication here is that the manuring regime at Wangford during the medieval and post-medieval period was a more direct form, that is, the close folding of sheep, with only occasional transportation of farmyard manure out to the fields. This evidence, then, supports the understanding of medieval manuring regimes in Breckland centring on the use of sheep, and indeed Domesday records 413 hundred sheep in the vill in 1086, compared to only eighteen cattle.<sup>835</sup> What is perhaps most intriguing, however, is that without the recognition of surviving furlong boundaries being present in the landscape, this lack of material would likely have been assumed as the landscape being of a heathland character in the medieval period, rather than directly

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<sup>831</sup> *Ibid.*: pp. 72-75.

<sup>832</sup> Allen *et al.*, *The Rural Economy of Roman Britain*: pp. 147-157.

<sup>833</sup> Hinman and McIntosh, *Land at Wangford Warren Phases One through Three*: pp. 60-62 and 75.

<sup>834</sup> *Ibid.*: pp. 60-62 and 75-76.

<sup>835</sup> *LDB*, entry for Wangford, Folio 358v: Suffolk.

manured arable. This highlights one of the key limitations of using artefact scatters to try to define arable extents in landscapes where direct manuring through sheep was the preferred method. That is not to say no artefacts would be present on these sites, and it is likely that periodic scattering of farmyard manure would take place alongside causal losses of objects, but that this may have been so occasional as to make detecting any of this material consistently a considerable challenge. A scatter of later medieval and early post-medieval metalwork in the north-west part of the site may have seen more regular applications of indirect manuring, being marginally closer the village and more easily accessed by cart, with material concentrated in this area while only occasionally being sparsely scattered on the more outlying areas.

At a wider level, fieldwalking and metal detecting evidence recorded on the Norfolk HER show considerable overlap between fields that produced Roman and medieval finds scatters (Figure 48). While this may not show the full extent of Roman arable in Norfolk, it does suggest that the extent of arable was at least as great as the maximum extent of medieval arable and made use of broadly the same soils.

Evidence from elsewhere in Breckland supports the argument that the extent of arable pre-1350 was greater than post-1350, and that the understanding of arable extents in the medieval period was based on areas of later survival, rather than, for instance, the extent of arable in 1250. Thus, at West Stow, earlier medieval ridge-and-furrow was found underneath a layer of windblown sand, with pottery suggesting it had fallen out of use

around 1350.<sup>836</sup> Other documentary evidence also suggests tracts of arable land being taken into rabbit warrens in the later medieval period.<sup>837</sup>

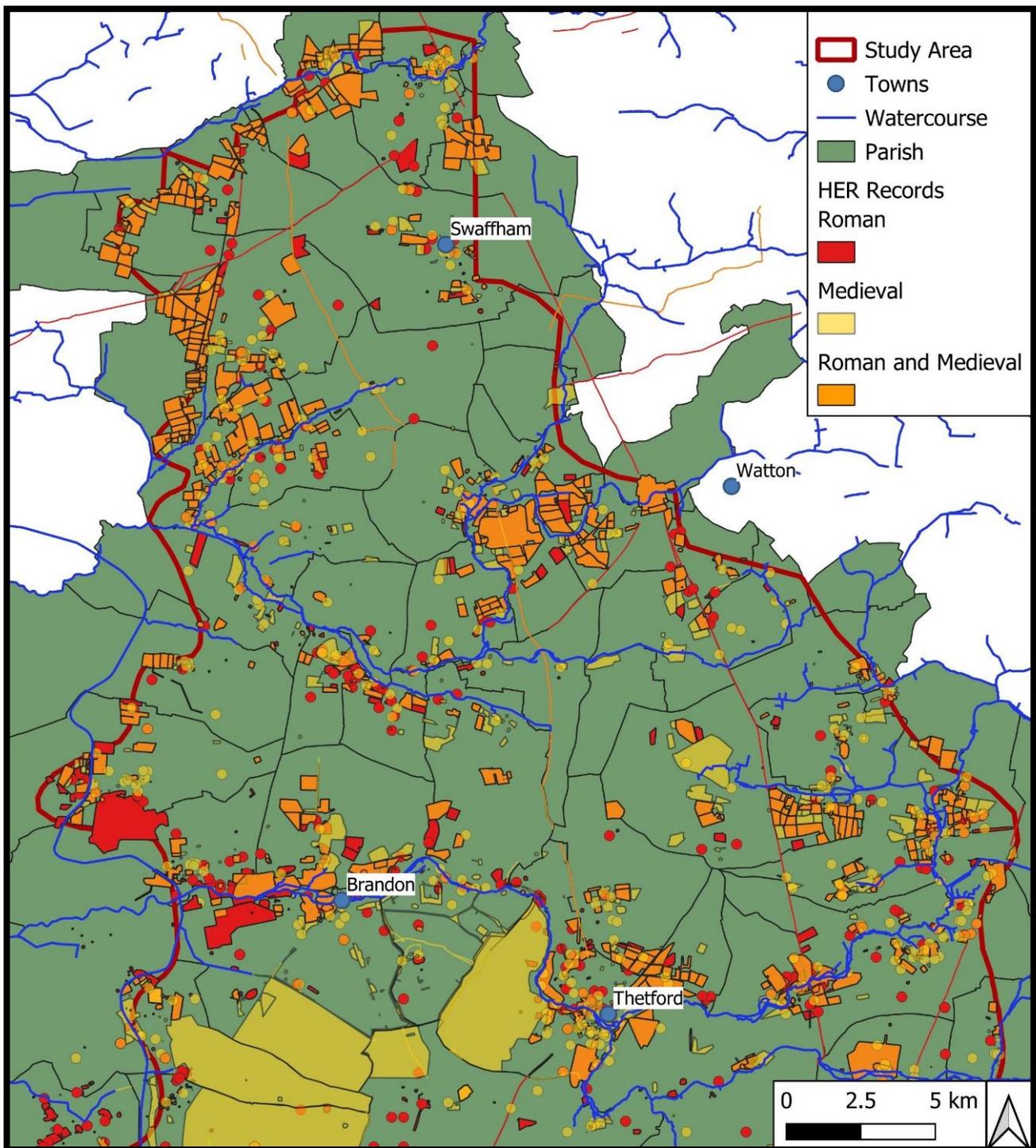


Figure 48: HER records for Norfolk reveal a considerable overlap between Roman and medieval activity, particularly in areas of fieldwalking survey.

<sup>836</sup> West, *West Stow: The Prehistoric and Romano-British Occupations*: p. 40.

<sup>837</sup> Mark Bailey, "The Rabbit and the Medieval East Anglian Economy" in *The Agricultural History Review*, Vol. 36, No. 1 (1988): p. 9.

## Discussion

The recovery of historic artefacts from the Breckland landscape can, in some cases, provide evidence that an area was under arable cultivation at a certain point in time, and that areas of the landscape saw periodic expansion and contraction of arable depending on farming regime and population levels. The evidence from Breckland suggests that the area under arable cultivation during the Roman period was greater than had previously been assumed, with areas usually considered to be historic heathland and/or warren producing assemblages of manure-scattered Roman artefacts, which further support the suggestion of a livestock regime centred on stall-fed cattle to produce manure. The medieval evidence suggests a similar underestimation of arable extents, but with much more limited artefact scatters due to the use of sheep as a form of direct manuring, limiting the amount of farmyard waste spread on the fields. Instead, arable extents are revealed by the presence of relict medieval furlong boundaries and/or plough ridging that in some cases are still under arable use today, while other areas appear to have fallen out of use across the later medieval and post-medieval periods as part of broader, prolonged processes of arable contraction and/or land use change (see Chapter Ten).

## **Overall Discussion and Conclusions**

The agricultural regimes employed in Breckland across the study period are varied and changeable, in terms of arable extents, crop selection and pastoral regimes. The prehistoric preference appears to be for the use of cattle as the principal livestock animal, with sheep second, with a near-subsistence based arable regime focused on the production of wheat (mostly spelt) followed by barley. The precise extents and areas used for arable are not clear and it is possible that this may have seen a degree of periodic

shifting in the landscape depending on soil fertility and other factors. Local variation in the needs of the population would also have influenced the proportions of different crops grown and animals kept. The Late Iron Age landscape saw an expansion of the area under arable, coinciding with a period of stable climate and this perhaps facilitated the creation of more organised and ambitious farming systems in the Early Roman period. The Roman pattern is, by and large, a more highly organised continuation of the prehistoric practices with a preference for the growing of spelt wheat (with barley second) and keeping of cattle (with sheep second) in order to produce a surplus of grain. In a Breckland context, the keeping of cattle may have been as much for the production of manure to keep the arable in good heart as it was for the animal products themselves, as well as the need for traction animals to plough under an extensive farming regime. The proportion of barley being produced in Breckland at this time appears to be higher than seen elsewhere in lowland England, which in part may be reflective of the local conditions but may also have been to provide additional livestock feed for the maintenance of larger herds. This, in turn, was intended to produce sufficient manure to keep the arable in good enough condition to support the large-scale production of spelt wheat. The extent of land under arable at this time would also have peaked compared to previous periods and it is also possible that many of the enclosure systems in the immediate vicinity of Roman farmstead sites, as seen on both the A11 road scheme and Wangford Warren Roman sites, may have been for the keeping of livestock rather than crops.<sup>838</sup> This highly organised system appears to have reached its most developed phase during the fourth century, before breaking down in the fifth century after the end of Roman administration

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<sup>838</sup> Lees, Hinman and Stump, *A11 Fiveways to Thetford Road Improvements*; McIntosh and Hinman, *Land at Wangford Warren Phases One through Three*.

in Britain. The succeeding Early Anglo-Saxon farming regime in Breckland presents a more mixed picture, with an overall reduction in the area under arable cultivation alongside a general shift away from the use of spelt wheat and towards more free-threshing varieties. This perhaps reflects a reversion to a subsistence-based economy with different preferences depending on the needs of local communities during a period of climatic cooling and instability. It may have been during the Middle Saxon period, but certainly by the Late Saxon period that a clear shift had been seen both away from the cultivation of wheat and towards barley as the principal crop, and away from cattle towards sheep as the principal livestock and source of manure. By Domesday, the agricultural systems of Breckland were already well developed and this continued to evolve into the medieval period and beyond, presenting itself as a system of sheep-corn husbandry integrated with a foldcourse system of complex grazing and farming rights in the landscape. The extent of medieval arable in Breckland pre-1350 was greater than previously assumed but saw a prolonged process of relatively large-scale contraction in some places from the mid-fourteenth century through to the post-medieval (see Chapter Ten), with some areas becoming heathland and/or warren. Where the arable remained, the systems of sheep-corn husbandry continued into the post-medieval period before agricultural 'improvements' began to transform these systems towards the scale and types of farming seen in the landscape today.

## **Chapter Ten: Earthwork Evidence of Arable Extents and the Decision of Where to**

### **Plough**

One by-product of post-medieval land use patterns in Breckland is the potential, in some areas, for the preservation of historic earthworks. This is particularly true of areas that have seen relatively limited or late arable use, or areas that require less intensive forestry methods to control disease and manage the plantations.<sup>839</sup> It is also the case that more substantial earthworks will naturally be more resilient as well as being more readily detected during field or desk-based survey. Chapter Nine dealt with several other aspects of reconstructing the historic agricultural landscape of Breckland, including analysis of preserved cereal grains, animal bones and artefact scatters. The earthwork evidence for arable extents in the region is also key to building a greater understanding of the historic landscape and the results of investigating this in a Breckland context revealed evidence for medieval arable extents in areas that would usually be considered to be of a more heathland character, as well as an apparent hierarchy of preferred soil types for arable cultivation. As such, this analysis has been placed within its own chapter to allow this to be discussed with the greatest possible clarity, but the evidence from this chapter has been incorporated into the overall discussions given in Chapter Nine.

The preservation of earthworks in Breckland has the potential to inform the understanding of historic arable extents in the region, particularly through the recognition of features that appear to represent former medieval open field systems. This is especially true in areas that have traditionally been viewed as long-term heathland or

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<sup>839</sup> John Gibbs, Brian Greig and John Rishbeth, "Tree diseases of Thetford Forest and their influence on its ecology and management" in Ratcliffe and Claridge (Eds.), *Thetford Forest Park, The Ecology of a Pine Forest*: pp. 26-32.

warren, where the presence of these earthworks indicates a reduction or shift in areas under arable cultivation in the medieval period. Indeed, Clark mentions in passing that “documents prove that land which is now apparently primitive heathland was profitably cultivated in the thirteenth, fourteenth and fifteenth centuries” and that “parts of almost every heathland were at one time cultivated” but entirely neglects to say which documents and places are referred to, while some of the earthwork banks on the heathland “are the boundaries of the ancient common fields”.<sup>840</sup> It is therefore well worth investigating this further to define both former arable extents in the study area and the character of the places that subsequently became heathland.

There are two principal forms of earthwork that may represent historic arable: ‘ridging’ and furlong boundaries/banks. It must be clarified that while these practices and earthworks are considered to be medieval in origin, their use often continued into the post-medieval period, helping them to survive and subsequently be preserved within places such as landscape parks (see below, pages 319-321). In a Breckland context, cartographic evidence suggests their survival into at least the later eighteenth century in some places, such as at Tottington where areas of fragmented open field were present in 1774,<sup>841</sup> in Foulton where tracts of open field were surveyed in 1770,<sup>842</sup> and most strikingly in Methwold where extensive tracts of open field were surveyed in detail in 1796.<sup>843</sup> In all three cases, these parishes were enclosed in the following decade.<sup>844</sup> While

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<sup>840</sup> Clarke, *In Breckland Wilds*, First Edition: pp. 20-22.

<sup>841</sup> NRO WLS XVII/4, *Map of the Parish of Tottington by H. Keymer* (1774).

<sup>842</sup> NRO MC 86, *Map of the manor of Foulton belonging to Francis John Tyssen surveyed by Thomas Warren of Bury St Edmunds* (1770).

<sup>843</sup> PRO MR 1/207, *Map of the Parish of Methwold, Norfolk* (1796).

<sup>844</sup> NRO MC 62/27, *Copy of Inclosure Award for Methwold* (1806); NRO WLS XLIV/58, 424X9, *Tottington Inclosure Award (no map)* (1774); NRO MC 66/59, 510X8, *Foulton Inclosure Act* (1780).

some of these features may potentially represent the late creation of this type of field system, their form and method of ploughing is very much medieval in character. Thus, the preserved elements of open field at Icklingham (see below) represent fragments of open field arable that were taken out of cultivation in the post-medieval period and put under grass without subsequently being placed back under more modern arable or intensive forestry.

While this chapter focusses on the medieval open field landscapes of Breckland, it is useful to briefly mention the other types of field boundary systems that may be encountered, some of which help preserve (or actively remove) evidence of medieval arable extents. The clearest evidence of open field preservation in field boundary patterns is where groups of strips have been taken directly from the open field and enclosed through piecemeal means, thus preserving the typical reversed-S shape of the strips as well as the ‘grain’ of the furlong systems in an area.<sup>845</sup> The second large-scale form of enclosure is that of general enclosure, when a larger part of a landscape is divided and enclosed in a single, organised event, which was often undertaken in the later eighteenth and nineteenth centuries.<sup>846</sup> In many cases, this process involved the enclosure of common land and open field, with little regard to pre-existing boundaries and often tidied up roads and routeways in the landscape at the same time, removing the evidence of former open field extents. However, in some cases, where these new enclosures were put under grassland this could fossilise parts of the former open fields

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<sup>845</sup> Tom Williamson, “Understanding Enclosure” in *Landscapes*, Vol. 1, No. 1 (2000): pp. 56-79.

<sup>846</sup> *Ibid.*

as earthworks. Both forms of enclosure are present in Breckland and are seen and referred to in the examples discussed below.

Many of the features discussed in this chapter have been recognised and recorded through NMP/AIM survey of the region, and where this is the case, the relevant report is referenced. However, much of the study area has not been subject to such survey and, as a result, it was decided to undertake survey of available lidar data for the study area, complemented with historic mapping where available, in an effort to identify unrecorded features that may provide insight into historic settlement and land use patterns. Lidar tiles were downloaded from the Environment Agency's National Lidar Programme<sup>847</sup> and processed into both Hillshade and Lidar Relief Model (LRM) imagery. It was found that while LRM imagery can produce a flattened effect, it was more effective at revealing shallower, less obvious earthworks in the landscape, particularly relict field boundaries and systems. Recognised features were traced into GIS vector imagery to allow them to be translated into contexts outside of lidar imagery and place them into the wider landscape more effectively. Where necessary in the discussions below, grid references and/or figures have been provided.

### ***Ridging***

The use of the term 'ridging' bears some clarification, and essentially refers to the East Anglian method of ploughing arable strips into low, sometimes irregular ridges, often known as 'stetch' or 'stitch' ploughing.<sup>848</sup> This is in contrast to the more regular method of ridge-and-furrow ploughing, best known and examined in Midland counties such as

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<sup>847</sup> National Lidar Programme website (Environment Agency, 2021).

<sup>848</sup> Martin and Satchell, *Where Most Inclosures Be*: pp. 29-34.

Northamptonshire.<sup>849</sup> The reasons for the regional differences in ploughing method and survival of features has been widely debated, particularly because both regions operated systems of large-scale open fields divided into strips, but of relevance to this study is the apparent relationship between particular types of clay soils and the use of Midland-type ridge-and-furrow.<sup>850</sup> It has been argued that the ridging of fields was a far more widespread practice in medieval East Anglia, but that the extent of post-medieval arable farming removed most traces of these from the landscape.<sup>851</sup> The contrast in form between East Anglian ridging and Midland-type ridge-and-furrow is also best demonstrated in the archaeological record, where excavations on former open field in areas such as West Cambridgeshire<sup>852</sup> and Buckinghamshire<sup>853</sup> regularly expose large areas of medieval furrows cut into the natural geology, while excavations on former open field in Norfolk and Suffolk produce no such features. As such, this thesis will refer to this ploughing practice simply as ‘ridging’ due to the fact that this method did not produce furrows substantial enough to noticeably disturb deeper soil levels or geology, and to remove any connotations associated with Midland-type ridge-and-furrow.

Both of these methods tend to produce relatively broad ridges within the arable, although it is notable that the East Anglian form of ridging tends to be more irregular in width, perhaps as a result of irregular land-holding patterns within the open fields,

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<sup>849</sup> Williamson, Liddiard and Partida, *Champion*.

<sup>850</sup> *Ibid.*; Williamson, *Environment, Society and Landscape*: pp. 147-151.

<sup>851</sup> Liddiard, “The Distribution of Ridge and Furrow in East Anglia”: pp. 1-6.

<sup>852</sup> For example, see Kathryn Blackbourn, *Middle Iron Age Settlement at Highfields Caldecote, Cambridgeshire*, OA East Report No. 2316 (Oxford Archaeology East, 2019), Unpublished Fieldwork Report. The author of this thesis recalls that the furrows on this site were particularly well preserved to the extent that individual historic plough scars could be seen within the fills of the furrows.

<sup>853</sup> Winnard, Roycroft and Mlynarska, *Milton Keynes East, Land North-East of Milton Keynes, Areas S+3, 4, 16B, 18 West and 22*.

meaning groups of adjacent strips held by one person may have been ploughed in one event, creating a single, relatively wide ridge. Post-medieval mapping of Mildenhall shows well the open field systems with irregular patterns of landholding across them (Figure 49).<sup>854</sup> Indeed, Postgate highlights historic accounts of amalgamated strips being ploughed together as a result of piecemeal enclosure,<sup>855</sup> but the often irregular pattern of medieval landholding in the East Anglian open fields would make an earlier origin for this practice unsurprising. This contrasts with the Midland form where the strips were held in more regular order, often meaning an individual's strips were more evenly distributed across the field, such as in the surviving open field system at Laxton in Nottinghamshire.<sup>856</sup> Care must also be taken in identifying these earthworks against other forms of ridging, such as narrow or cord rig that is considered to be a more a more prehistoric form, surviving mainly in upland areas, later post-medieval ridging created through the use of steam ploughs that create straight rather than reversed S-shape ridges, and ridges that may be associated with forestry plantings.<sup>857</sup> A further distinction was made by Martin and Satchell, who stated that with 'classic' ridge-and-furrow "the ridges were high and permanent; in stech ploughing the ridges were low and could be 'broken' at each ploughing by simply splitting the central clashing furrows."<sup>858</sup> The desire to break the East Anglian type ridges to prevent them reaching any great height perhaps suggests a limited intent to ridge the fields in some cases and it is possible that some of

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<sup>854</sup> M. R. Postgate, "The Field Systems of Breckland" in *The Agricultural History Review*, Vol. 10, No. 2 (1962): p. 84.

<sup>855</sup> CUL Maps.Ms.Plans.7, *Plan of a tithing and estate at Westrow within the manor of Mildenhall in the county of Suffolk belonging to Biscoe Esq.* (1776).

<sup>856</sup> J. V. Beckett, *A History of Laxton: England's Last Open-Field Village* (Basil Blackwell, 1989).

<sup>857</sup> Martin and Satchell, *Where Most Inclosures Be*: pp. 32.

<sup>858</sup> *Ibid.*: p. 32.

the low ridges identified in Breckland may be by-products caused by the method of ploughing an open field strip, rather than being an intentionally generated earthwork.



Figure 49: Landholding patterns around West Row, Mildenhall. Each colour represents a different landholder. Data taken from CUL Maps.Ms.Plans.7 (1776).

In terms of identifying traces of these earthworks in Breckland, excavations at the Anglo-Saxon village of West Stow revealed a medieval arable soil formed of relatively shallow, irregular ridges crossing the site.<sup>859</sup> These had been covered by a layer of windblown sand and it was suggested that these fields had fallen out of use in the fourteenth century as this was the latest date of pottery present in the soil.<sup>860</sup> At the time, these were considered

<sup>859</sup> West, *West Stow: The Prehistoric and Romano-British Occupations*: p. 40.

<sup>860</sup> *Ibid.*

to be one of the only recorded examples of this practice in the region. Lidar imagery of West Stow Heath, to the west of the excavation area appears to show some form of irregular ridging or linear 'grain' in the landscape, on the same broadly north-south alignment as that seen during the excavations, suggesting that this area of arable may have extended further to the west, before falling out of use and developing into heathland (Figure 50).

Further areas with high potential for earthwork survival are formal post-medieval parklands that have seen little ground disturbance since the creation of the park. AIM surveys have identified areas of ridging in in Culford Park that show well the low-ridged arable strips between furlong boundaries.<sup>861</sup> Other examples may be seen in Hengrave Park (Figure 51), Cavenham Park (Figure 52) and Euston Park (Figure 53). In all three cases, the associated relict furlong boundaries are visible continuing beyond the limits of the parkland, demonstrating that these parks were taken out of larger tracts of arable (or former arable) landscapes. With these examples providing evidence of this practice occurring within the study area, it should then be possible to seek other surviving examples outside of post-medieval parks. Within NMP/AIM survey areas, several examples of ridging were recorded in areas of pine plantation and former rabbit warren, but caution was exercised in pointing out uncertainties as to whether these ridges represented former arable, or related to early forestry methods.<sup>862</sup> This is particularly difficult where modern forestry compartments are on the same alignment as possible earlier earthworks, although examples of relict medieval ridging do appear to exist

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<sup>861</sup> Powell, Tremlett and Horlock, *Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region: Stage 2 and Overall Results*: p. 74.

<sup>862</sup> *Ibid.*: pp. 45-46.

underneath forestry plantations in Thetford on a different alignment to the modern compartments (Figure 54). Areas of more convincing ridging survive within piecemeal enclosures at Icklingham (Figure 55), where the Ordnance Survey drawings of early nineteenth-century date label the area as 'Icklingham Field'.<sup>863</sup> Similarly, in Fakenham, areas of plantation or heath named as Fakenham Heath, Ash Pin and Fakenham Spinney may also show ridging (Figure 56), and this along with the West Stow evidence suggests that some areas of heathland present in the nineteenth century may generate after a phase of arable contraction in the region post-1350 and subsequent stagnation of population and farming extents. Within an area of woodland to the west of Brandon, traces of possible ridging survive with the area previously being part of Brandon Field (Figure 57). Earthwork surveys in Lakenheath Warren identified a series of possible fodder enclosures, some of which also contained traces of ridging,<sup>864</sup> although, as will be discussed below, these features appear to be at least later medieval in date. However, documentary evidence further supports the existence of ridging preserved within rabbit warrens providing evidence of former arable extents in one particular case, with a deposition of 1612 concerning Brandon warren stating that "it doth appeare by ridge and furrow that itt hath bene shiftfield, though now used as warren (sic)".<sup>865</sup> This area was possibly the "Oxwickfield" that was recorded as having been incorporated into the warren

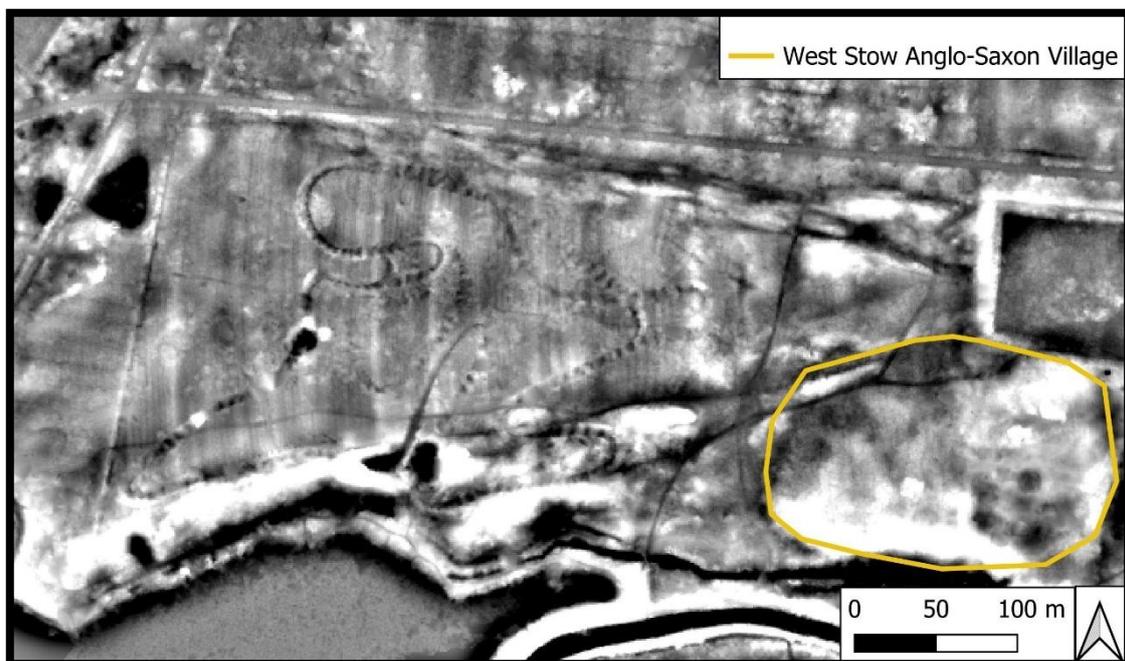
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<sup>863</sup> OSD 238, *Ordnance Surveyor Drawing of Feltwell St Nicholas* (1813).

<sup>864</sup> G. Crompton and C. Taylor, "Earthwork Enclosures on Lakenheath Warren, West Suffolk" in *Proceedings of the Suffolk Institute of Archaeology*, Vol. 32, Part 2 (1972): pp. 113-120.

<sup>865</sup> PRO E134/10 Jas 1/East 27, *H. Hall and Barbara his wife, Benjn. Walden, Edmd. Cartwright, John Racke. v. Thos. Pleasance, Wm. Pleasance, John Seagoe.: Town, manor, and warren of Brandon otherwise Brandon Ferry. Meets and bounds. Common of pasture. Customs of manor. Free Warren.: Suffolk*, (1612).

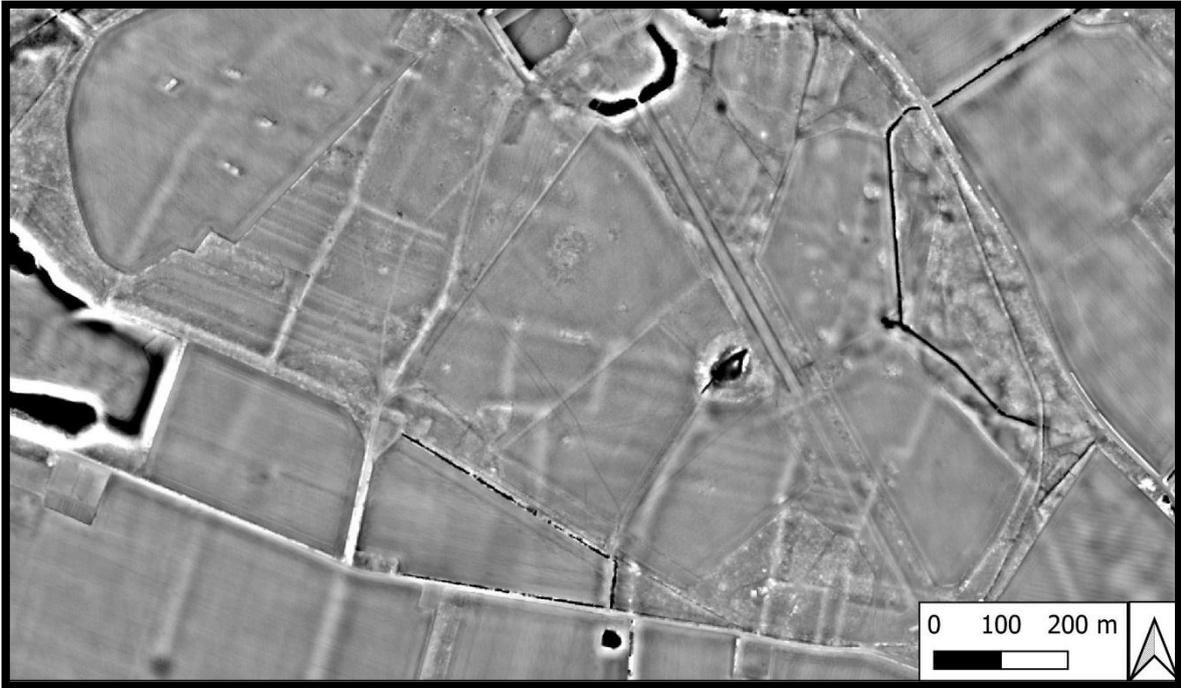
a century earlier.<sup>866</sup> Interestingly, no evidence of ridging or furlong boundaries could be positively identified on lidar imagery of Brandon warren, but this may be because the areas referred to in the historic account have seen significant post-medieval ground disturbance or have been built over through expansion of the town of Brandon, or indeed were relatively low, unintentional ridges that subsequently eroded referred to in the historic account have seen significant post-medieval ground disturbance or have been built over through expansion of the town of Brandon, or indeed were relatively low, unintentional ridges that subsequently eroded away.



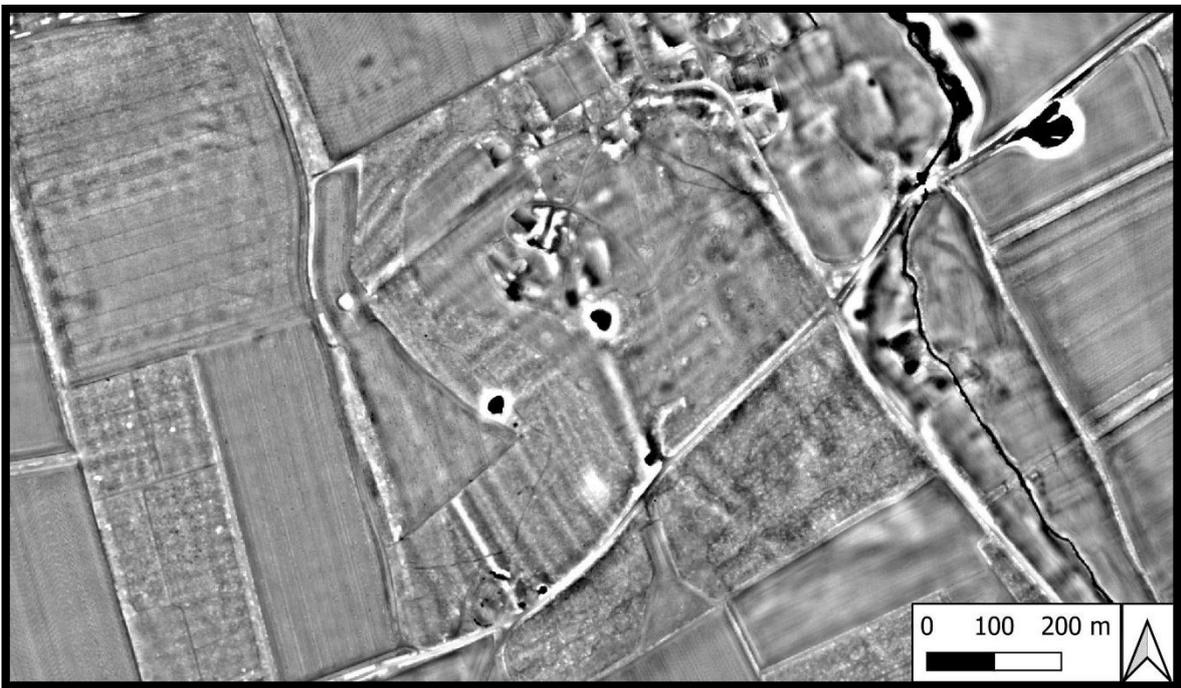
*Figure 50: Possible plough ridging adjacent to West Stow Anglo-Saxon village, Suffolk.*

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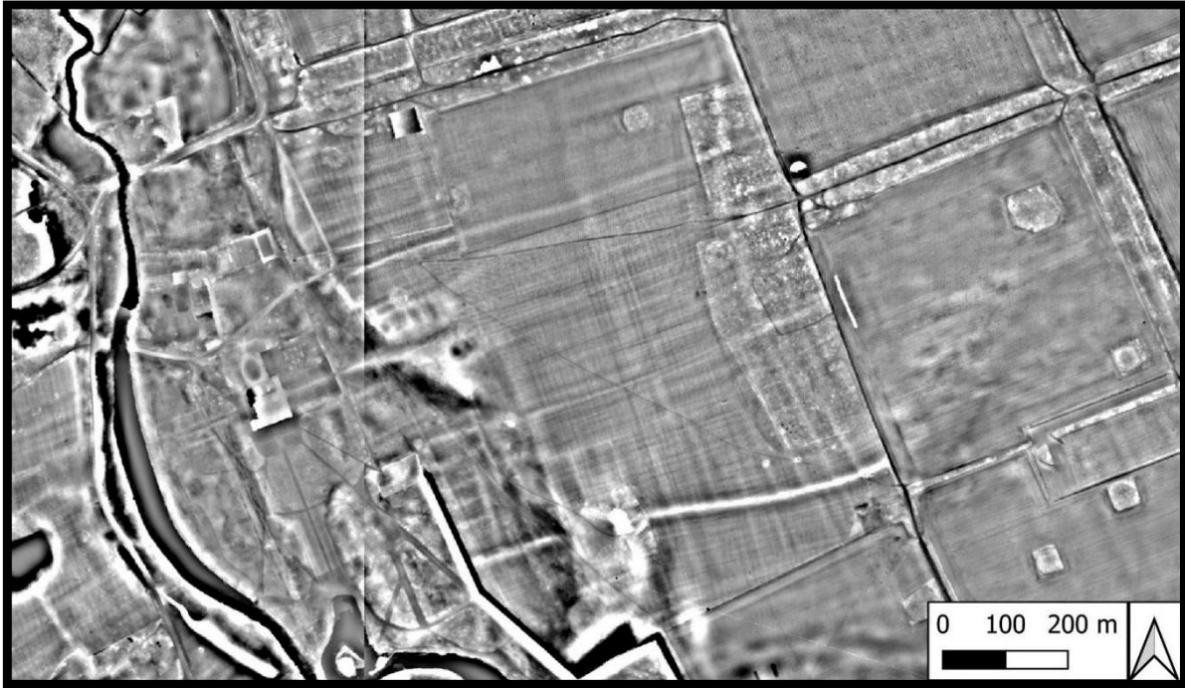
<sup>866</sup> Bailey, “The Rabbit and the Medieval East Anglian Economy”: p. 9.



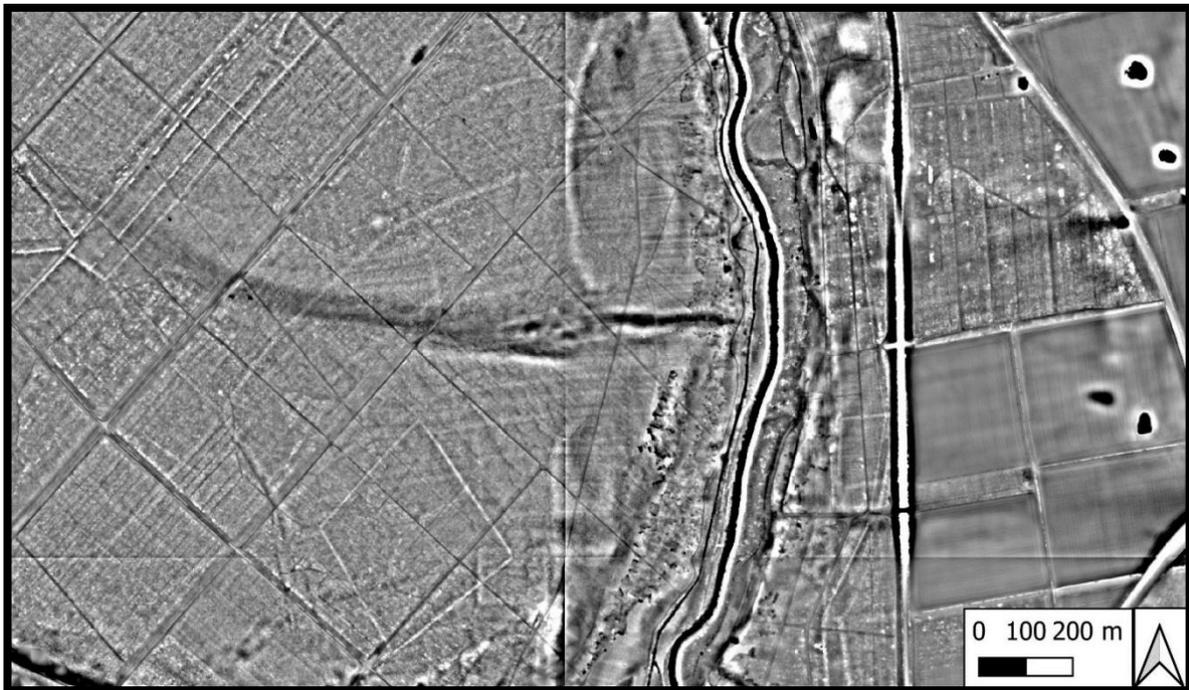
*Figure 51: Preserved earthwork ridging in Hengrave Park, Suffolk.*



*Figure 52: Preserved earthwork ridging in Cavenham Park, Suffolk.*



*Figure 53: Preserved earthwork ridging in Euston Park, Suffolk.*



*Figure 54: Preserved earthwork ridging on the western side of the Little Ouse at Thetford. Note the trapezoidal enclosure that may relate to warren activities overlaying these.*

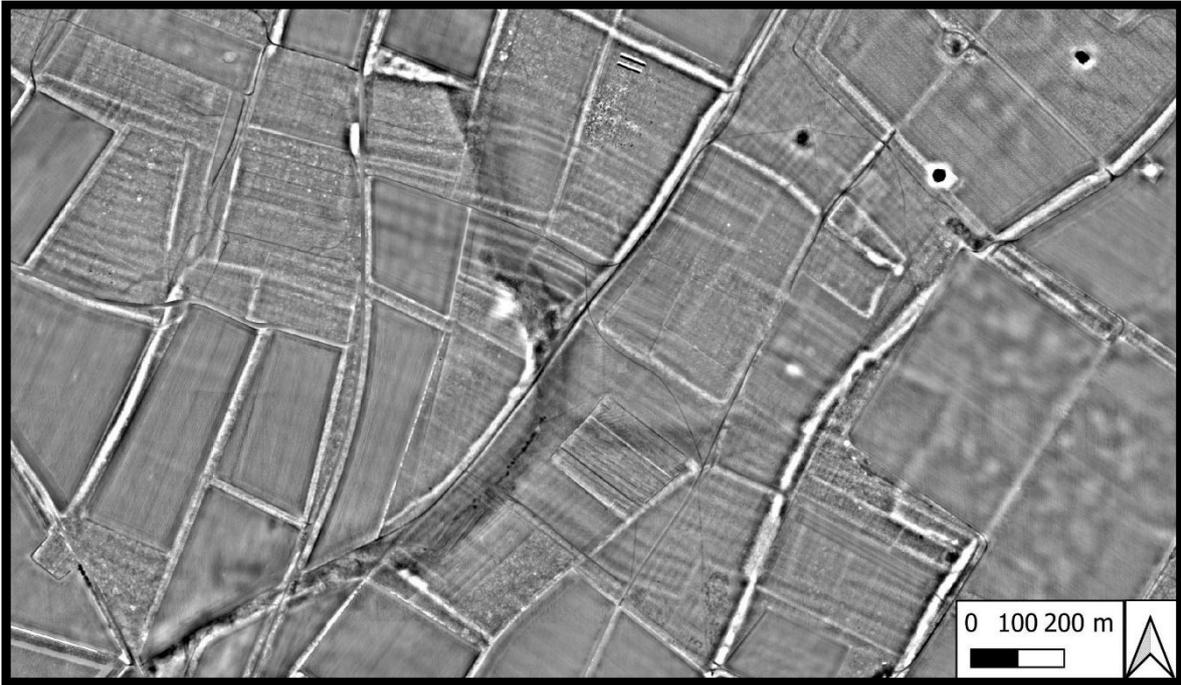


Figure 55: Preserved earthwork ridging on grassland at Icklingham, Suffolk.

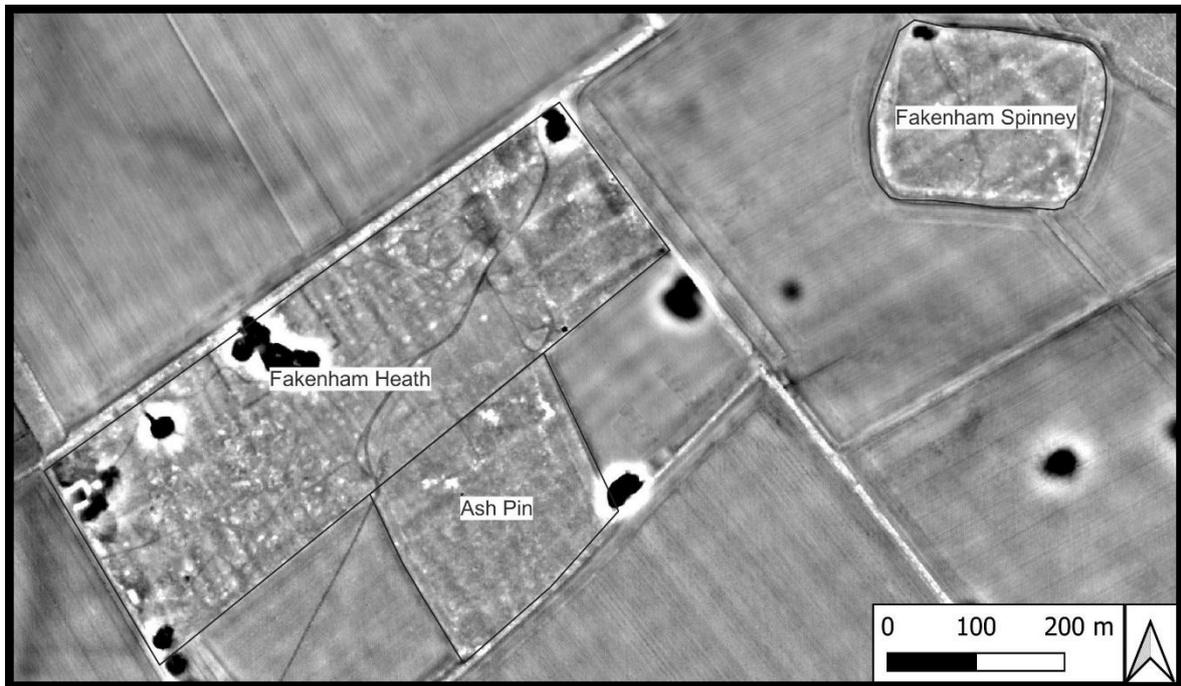


Figure 56: Preserved earthwork ridging at Fakenham, Suffolk.



*Figure 57: Preserved earthwork ridging in woodland to the west of Brandon, Suffolk.*

### **Furlong Boundaries**

Furlong boundaries, by contrast, are much more prominent and harder to remove features in the landscape, generated over time by the formation of a ploughing headland on the open field. That is, when a plough team reached the end of a strip and would manoeuvre into position to plough the next strip, any soil on the animals and equipment would often be cleaned off at this point. Over time, this would raise the soil level at the ends of a field and these low but broad earthworks can even survive intensive modern ploughing methods in some places. Lidar surveys of other landscapes can often reveal extensive networks of former medieval open field systems through the survival of furlong boundaries, and published examples include extensive systems mapped in parts of

Cambridgeshire.<sup>867</sup> In Breckland, examples of furlong boundaries on known areas of open field can be seen around the town of Swaffham (Figure 58) where boundary patterns indicate extensive areas of open field that were subsequently enclosed by piecemeal means. More recent enlargement of fields has removed some of these boundaries, but the low earthwork banks forming the headlands of the furlongs have survived and can be plotted to show the underlying layout of medieval open fields around the town, consisting of long, broadly parallel systems of earthwork banks mixed with some extant boundaries. Similar extensive systems are also visible to the east of Marham as another example of the typical form that these earthworks take (Figure 59). In some cases, historic routeways may also preserve a former furlong boundary, either because the routeway pre-dated the open field and formed a useful marker against which the open fields could be formed, or because a furlong bank presented a useful way through the open fields without trampling across ploughed strips and multiple properties. The modern footpath of Shouldham Lane in Swaffham provides a good example of this, formed by a relatively straight routeway that would have acted as a drove between the town of Swaffham and the heathland to the west. Either side of the path is flanked by a high bank topped with a native species-rich hedge showing evidence of having been historically laid with intermittent pollards, something of an unusual site in Breckland and attesting to its use as a droveway with

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<sup>867</sup> Sally Evans, David Knight, Jonathan Last and Matthew Oakey, *National Archaeological Identification Survey: South West Cambridgeshire*, Historic England Research Report No. 67/2018 (Historic England, 2018): pp. 100-122.

hedging to prevent livestock wandering onto the arable. When placed into a wider context, it slots neatly into the furlong boundary pattern of the open fields of Swaffham.



*Figure 58: Furlong boundary patterns and the route of Shouldham Lane to the west of Swaffham, Norfolk.*

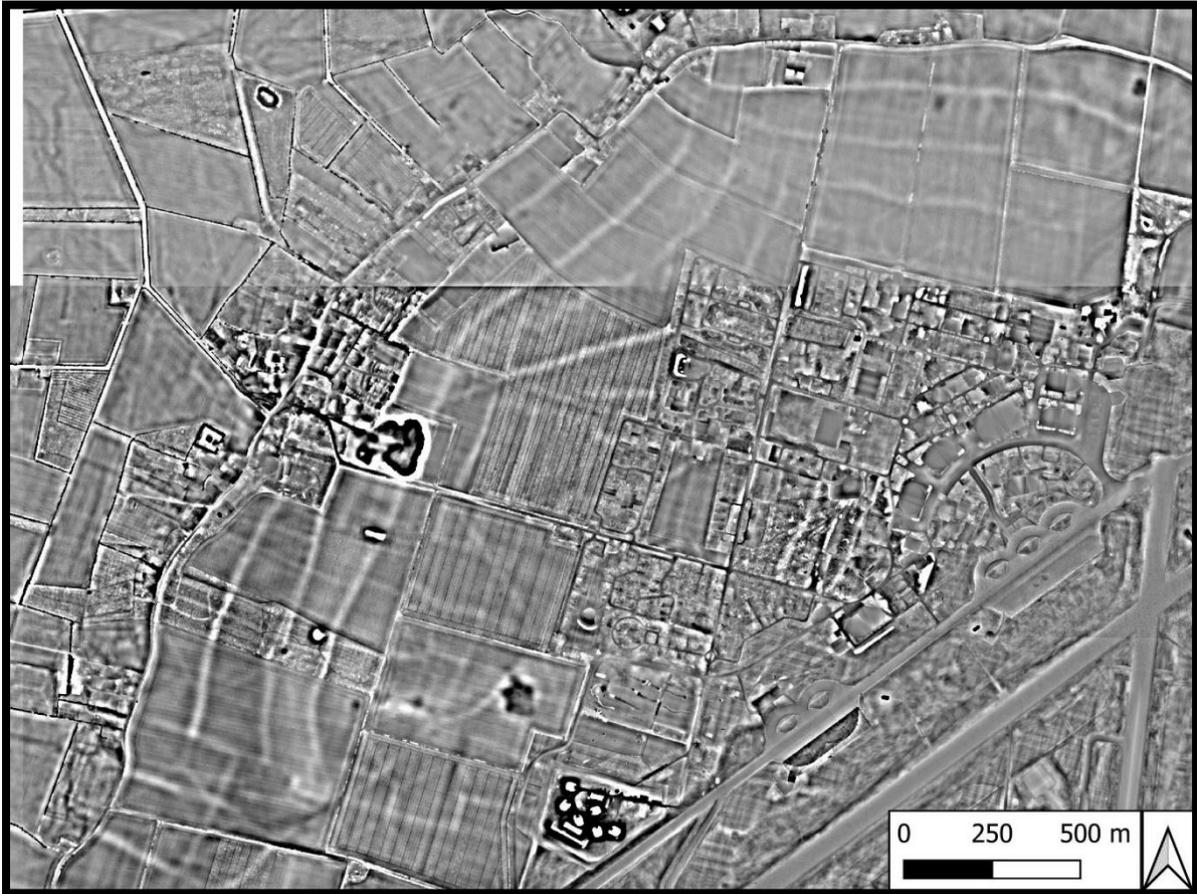


Figure 59: Extensive furlong bank systems survive to the east of Marham village, Norfolk.

Knowing the resilience of this type of earthwork, examination of lidar data in other parts of Breckland, where there may not have been any previous indication of open field, is worthwhile in an effort to potentially define the maximum extent of core medieval arable. The results of this revealed a number of hitherto unrecorded field systems within areas that were formerly rabbit warren and before detailing these it is worth briefly outlining the nature of warrening in Breckland to provide a context for the following discussions.

The rabbit (*Oryctolagus cuniculus*) is not native to Britain, with the ‘wild’ rabbits in the landscape today being descended from a population introduced by the Normans. Warrens were manorial concerns established for the farming of these rabbits from the

Norman period onwards, taking a range of forms and sizes and containing various enclosures and structures geared towards the specialised production of both meat and fur as high-status commodities.<sup>868</sup> In Breckland, at least twenty-six warrens are recorded on the sandy soils of the region, some of which were medieval foundations while others are more definitively post-medieval creations.<sup>869</sup> The expansion of warrening in the later medieval and post-medieval periods in Breckland has been seen primarily as an economic decision by manorial lords to maximise production on the light soils of the area after the Black Death.<sup>870</sup> As will be seen below, however, any suggestion that the areas enclosed as warrens were not physically viable for other agricultural uses is more complex.

A series of parallel linear banks were recorded through NMP/AIM survey in Santon Downham Warren, some of which continued beyond the warren and parish boundary up into Elveden Warren.<sup>871</sup> It is possible that these boundaries represent the development of large-scale open field systems prior to the enclosure of the area for warrens in the later medieval period – the earliest recorded evidence for Santon Downham and Elveden Warrens is 1440 and 1618 respectively.<sup>872</sup> Indeed, the creation of extensive arable in the hinterlands of Thetford could conceivably have been encouraged from the Late Saxon period when the town was reaching its height of population and status,<sup>873</sup> and would have required the importation of surplus cereal grain to feed an urban population. However, it

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<sup>868</sup> Tom Williamson, *Rabbits, Warrens and Archaeology* (Tempus, 2007).

<sup>869</sup> Mason and Parry, *The Warrens of Breckland*.

<sup>870</sup> Bailey, “The Rabbit and the Medieval East Anglian Economy”: pp. 1-20.

<sup>871</sup> Horlock and Tremlett, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 1)*: pp. 68-73.

<sup>872</sup> Mason and Parry, *The Warrens of Breckland*: pp. 19-20.

<sup>873</sup> Norfolk Heritage Explorer, Parish Summary for Thetford.

must be noted that these banks are relatively slight in comparison to other examples of furlongs in the study area, raising questions about how long or regularly these areas may have seen use. That said, the very fact that they survive as earthworks suggests that they must have seen a period of relatively continual use in order for the banks to develop. A similar set of broadly parallel banks can be seen on the western boundary of Swaffham and skirting into Beachamwell (see Figure 60, and below for further discussion), and also in the northern ends of Icklingham, West Stow and Wordwell parishes in Suffolk (Figure 61). In Thetford Warren, too, evidence of faint furlong boundaries exists in the northern part of the warren and in the vicinity of the late medieval warren lodge (Figure 62).



*Figure 60: Possible furlong banks appear to be cut by the later boundary banks of Beachamwell Warren, Norfolk.*



Figure 61: Possible furlong boundary systems in the northern parts of Icklingham, West Stow and Wordwell parishes, Suffolk.

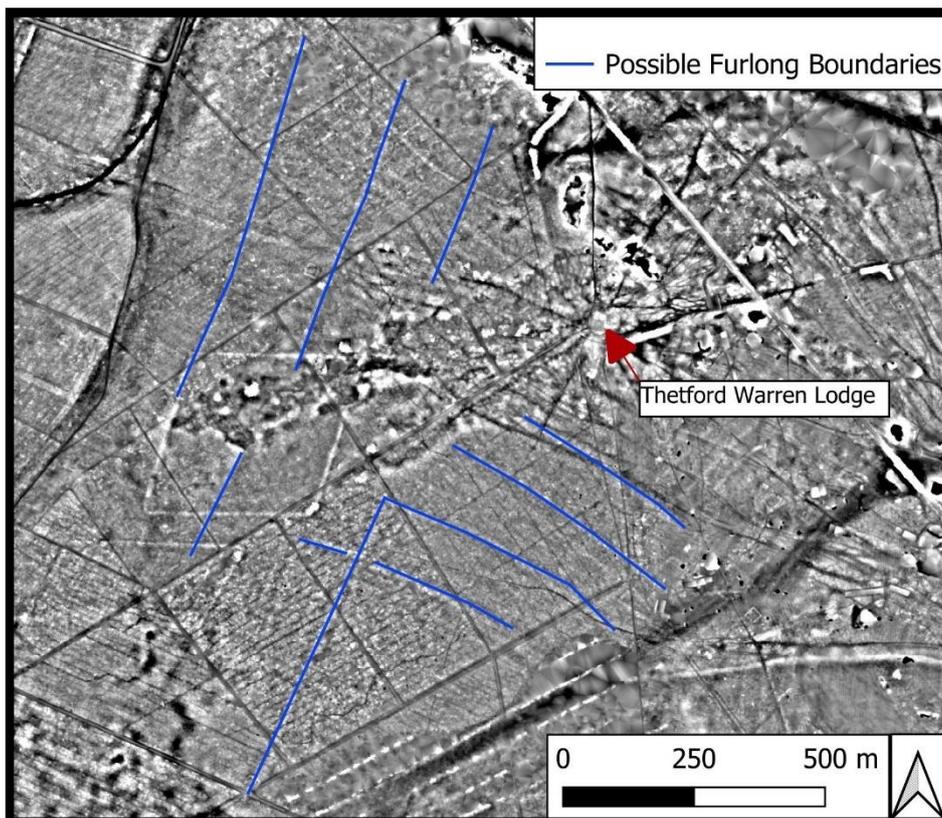


Figure 62: Possible furlong boundaries in the vicinity of Thetford Warren Lodge, Norfolk.

In contrast, a more convincing and substantial set of furlong boundaries is present within the former Wangford Warren (Figure 63). These examples cover a similar area to those present in Downham and Elveden Warrens, but here archaeological survey of part of the area has helped secure a date range for the system as probably developing in the Late Saxon period.<sup>874</sup> The archaeological evidence is less clear on when these banks went out of use, with the earliest evidence for the warren existing being from the mid-eighteenth century.<sup>875</sup> However, documentary evidence for arable practices in Wangford does exist that reveals the survival of this arable into at least the mid-seventeenth century. A terrier of 1542 that surveyed the open fields of Wangford stated the arable of the parish was formed of eighteen furlongs, with additional notes added in the 1640s revealing a three-shift crop rotation with two of the shifts covering around 400 acres each.<sup>876</sup> The area covered by the third shift was not given but may be assumed to have been of similar size, suggesting the fields surveyed covered around 1,200 acres. The open field systems recorded in the field survey and visible on lidar cover an area of approximately 1,300 acres, although the eastern and western edges of this area are more diffuse and uncertain in character. Matching the open fields surveyed in the 1542 terrier with those visible on lidar may be done through examination of the landscape of Wangford. Firstly, no other earthwork banks of similar character are visible on lidar imagery of the parish, whereas in adjacent Lakenheath furlong banks are present to the east of the village in an area that was not part of the warren, providing a useful contrast. Secondly, the area to the west of Wangford village predominantly consists of former

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<sup>874</sup> McIntosh and Hinman, *Land at Wangford Warren, Phases One through Three*: pp. 115-116.

<sup>875</sup> Mason and Parry, *The Warrens of Breckland*: p. 36.

<sup>876</sup> NRO MS 4071, 4E4, *Wangford Terrier* (1542).

fenland, while the landscape between the eastern side of Wangford village across to the western limits of the furlong banks within the warren is formed of the deep sandy Newport 4 soils, which were historically avoided for arable use (see below). There is little room remaining in the parish to fit the arable land recorded in the Wangford terrier and there can be little doubt that the open fields recorded in the 1542 survey are those visible on the lidar extending across a large proportion of the warren, with the furthest reaches of this system being over four kilometres from the medieval village.

The interpretation of this system, then, is that a significant area of Wangford parish was under open field arable historically, probably from the Late Saxon period, and that this was in use up until at least the mid-seventeenth century. It is possible that before 1350 these fields may have been part of the more regular arable, and contraction of this took the form of the development of a 'shiftfield' system (see discussion below) rather than the complete disuse of the arable landscape. It must be noted, however, that some abandonment may also have taken place if the extent of recorded arable in the 1640 is around 1,200 acres while the fields visible on lidar cover 1,300 acres. Similar patterns of contraction may be seen elsewhere in Breckland, such as in the Caldecote in Norfolk, where eighteenth-century mapping shows an area of five 'breacks' extending over the eastern part of the parish.<sup>877</sup> Morphologically, however, they appear to represent a continuation of the open field systems that extend across the area from Oxborough to the south, and lidar imagery shows substantial furlong banks surviving in some parts that align with the mapped divisions of the 'breacks'. Earthwork banks of similar size also align

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<sup>877</sup> NRO DN/TA 979, *Caldecote* (1722).

with mapped furlongs of core arable in neighbouring Cockley Cley<sup>878</sup> and Oxborough.<sup>879</sup> It is clear that these post-medieval ‘breacks’ originally developed and were farmed as part of a wider system of open field furlongs in the landscape, but that by the eighteenth century were only being used as breck. That they were almost certainly contemporary with the development of the medieval open fields is attested to by comparison of brecks in neighbouring Oxborough, which are depicted as rectangular intakes of the common grazing distinctly separate from the furlong systems and probably being post-medieval developments.<sup>880</sup>

Further furlong boundaries are present to the south of Wangford in Lakenheath Warren (earliest date of 1300<sup>881</sup>) (Figure 63). These examples are better preserved due to the warren having had limited post-medieval plantation activity, and crucially they appear to underlie the possible fodder enclosures mentioned above, raising questions about whether the remnant ridging recorded in these enclosures may have been relict from earlier arable use. Some of these banks and other evidence of ploughing were also recorded during survey in the 1970s, but the full extent of these does not appear to have been detected and only given passing comment.<sup>882</sup> Interestingly, documentary evidence records the abandonment of lands to the warren by at least the mid-fifteenth century.<sup>883</sup> At their furthest, they extend over six kilometres from the medieval village core. A more

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<sup>878</sup> NRO FX 386/2, *Map of Cockley Cley* (1722).

<sup>879</sup> NRO BRA 2524/1, *Map of the parish of Oxborough, showing the lands of Sir Henry Bedingfield, by Philip Wissiter, (1722).*

<sup>880</sup> *Ibid.*

<sup>881</sup> Mason and Parry, *The Warrens of Breckland*: p. 36.

<sup>882</sup> Gigi Crompton and John Sheail, “The Historical Ecology of Lakenheath Warren in Suffolk, England: A Case Study” in *Biological Conservation*, Vol. 8 (1975): pp. 299-313.

<sup>883</sup> Bailey, “The Rabbit and the Medieval East Anglian Economy”: p. 9.

extensive set of furlong boundaries are present covering a significant part of Eriswell Warren (earliest date of 1309<sup>884</sup>) (Figure 63), part of which are recorded as a field or trackway system of unknown date.<sup>885</sup> These examples are more heavily eroded due to much of the area being under modern arable use, but their regularity of spacing and broadly parallel layout is morphologically typical of open field furlong systems. In a similar pattern, documentary evidence suggests the expansion of the warren between the early fourteenth and the mid-seventeenth century, which may have seen these open fields absorbed into the warren.<sup>886</sup> A highway diversion order from 1820 refers to the creation of a road running from Eriswell village towards Icklingham, which passes across the western edge of this field system and states that it passes over “How Hill Furlong” and “Heron Field”.<sup>887</sup> This strongly suggests that, even if the open fields were incorporated into the warren by this time, they had been in use recently enough to still be considered a useful and known point of reference in the landscape. As with Wangford and Lakenheath, this system extends more than three kilometres away from the medieval village at its most distant parts. A further set of boundaries are present in Mildenhall Warren (earliest date of 1323<sup>888</sup>) where there is also documentary evidence for presumed arable land being absorbed into the warren after 1381<sup>889</sup> (Figure 63). These are particularly eroded, probably due to intensive modern forestry practices, but traces of ridging do appear to survive in one area of this system. In Norfolk, this trend appears less often, but the series

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<sup>884</sup> Mason and Parry, *The Warrens of Breckland*: p. 21.

<sup>885</sup> SHER ERL 121.

<sup>886</sup> Mason and Parry, *The Warrens of Breckland*: p. 21.

<sup>887</sup> SA BA500/F/6/2/31, *West Suffolk Quarter Sessions Highway Diversion Eriswell (1820)*.

<sup>888</sup> *Ibid.*: p. 27.

<sup>889</sup> Bailey, “The Rabbit and the Medieval East Anglian Economy”: p. 9.

of banks on the area between Beachamwell and Swaffham appear to be truncated by the boundary banks of the eastern side of Beachamwell Warren (earliest date of 1275<sup>890</sup>) (Figure 60) with documentary evidence referencing land at Swaffham being abandoned to the warren by the mid-fifteenth century.<sup>891</sup> These banks are also absent from historic mapping of the warrens and were not detected by previous fieldwork,<sup>892</sup> emphasising that these features are often relatively shallow and easily missed on the ground, but are far more visible when viewed at a wider scale with appropriate lidar processing.

It is of significance that a contrast appears to exist between the regularity and layout of some of the furlong boundaries present within the warrens. In other parts of Breckland, areas of core arable are defined by substantial furlong banks which run broadly parallel and are regularly spaced, often with a distance of between 140-240m between boundaries (see Figures 58 and 59 for examples). However, many of the earthwork banks identified for this project are less regular in alignment, less substantial and tend to either be particularly widely spaced or relatively close together (see Figure 60 for examples). The less substantial size of the furlong boundaries suggests that these areas of arable were either in use for a shorter period of time, or were not ploughed as regularly, as well as (in some cases) being less organised in the landscape. The implication from this is that these may have been areas of breck or represent the last phases of open field expansion onto areas of less favourable soils before subsequent

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<sup>890</sup> Mason and Parry, *The Warrens of Breckland*: p. 13.

<sup>891</sup> Bailey, "The Rabbit and the Medieval East Anglian Economy": p. 9.; John Sheail and Mark Bailey, "The history of the rabbit in Breckland" in Ratcliffe and Claridge (Eds.), *Thetford Forest Park, The Ecology of a Pine Forest*: pp. 16-20.

<sup>892</sup> Anne Mason and Hames Parry, *The Internal Archaeology of the Breckland Warrens* (The Breckland Society, 2017).

contraction from the fourteenth century onwards. Some of these areas of open field may have transitioned into use as brecks, while others may have been abandoned completely. Thus, the field systems within Wangford, Lakenheath, Eriswell and Mildenhall Warrens have a morphology suggesting they probably formed part of the permanent arable from an early date, while the systems within Elveden, Downham High Warren, Thetford Warren, and between Swaffham and Beachamwell are more suggestive of extensive systems of either breck or open field that formed at a slightly later date and therefore saw more limited use before contraction and/or absorption into warren.

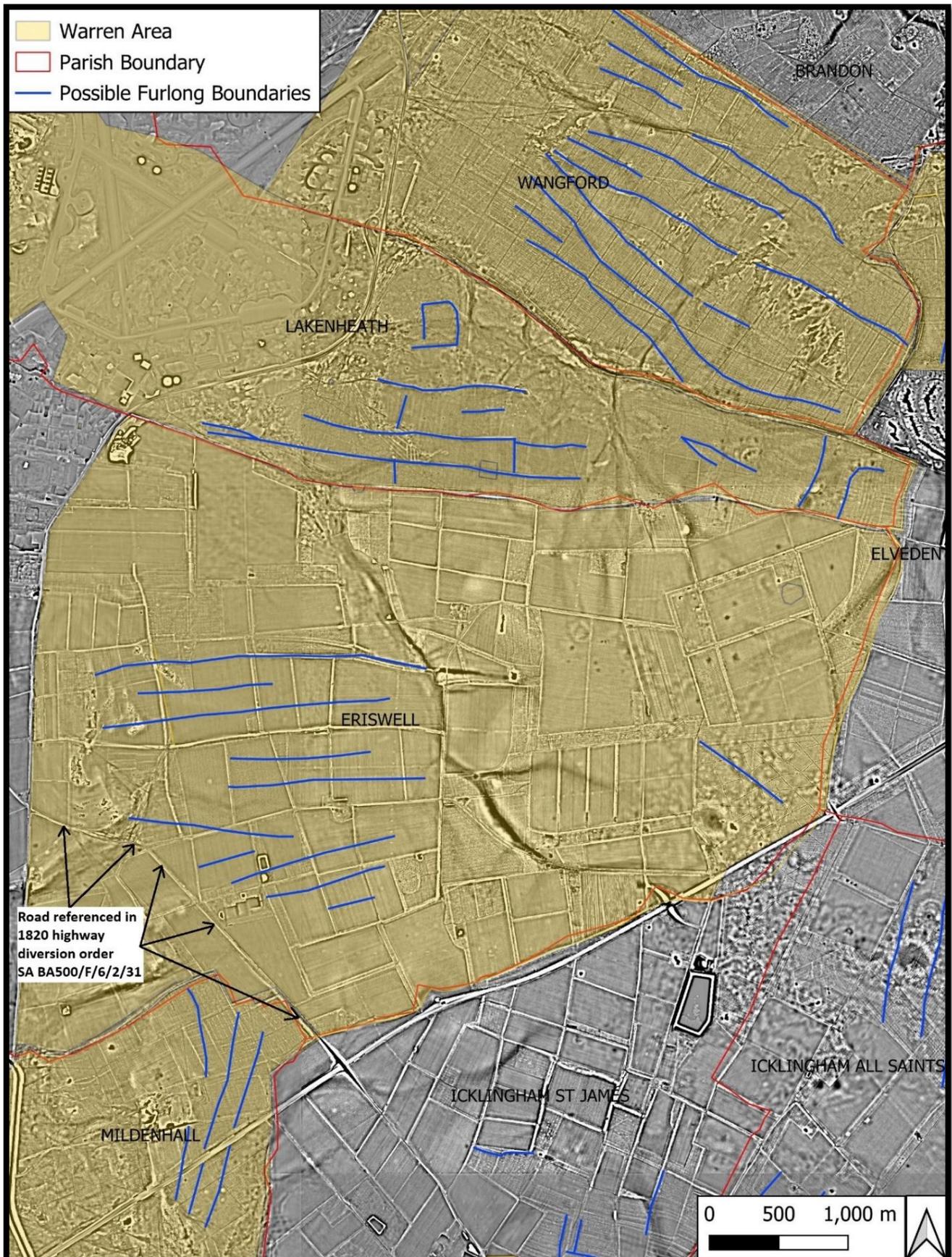


Figure 63: Relict furlong boundaries and other possible field systems in the Suffolk Breckland warrens.

The importance of these boundaries being present in so many of the warrens in Suffolk Breckland, alongside the documentary evidence discussed above relating to Brandon Warren, should not be understated. The evidence indicates that large tracts of rabbit warrens in the study area were formerly under open field arable cultivation before being enclosed or incorporated into warrens. Crucially, large parts of these systems appear to represent established, long-term arable landscapes in order to generate such considerable earthwork features, alongside systems that may have been more breck-like in nature, in areas that have previously been interpreted as forming part of the “high, permanently dry pastureland” during the medieval period.<sup>893</sup> The presence of these field systems suggests that this was not the case in the earlier medieval period, and that the development of heathland on these areas occurred in the later medieval or post-medieval periods after these systems were abandoned or deliberately incorporated into the established warrens. This raises two important points relating to medieval land use in the region. Firstly, that the contraction of arable in Suffolk Breckland began broadly after 1350 and was a long-term process that ultimately represented a large-scale and considerable reduction in the areas under arable in those parishes that may have occurred in several phases. The systems present in Wangford, Lakenheath, Eriswell and Mildenhall represent a minimum reduction of arable across those parishes of at least 2,000 acres, which, from the dating evidence, appears to have occurred from the fourteenth century through into the seventeenth. Secondly, the idea that warrens are constructed by taking in areas of permanent heathland that were not suitable for other uses does not appear to be true if large parts of the warrens had formerly been under

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<sup>893</sup> Mason and Parry, *The Warrens of Breckland*: p. 8.

arable cultivation. That is, unless certain factors meant these areas subsequently became unworkable. Sheail and Bailey argued that warrening in Breckland represented an optimal use of the available land,<sup>894</sup> but from the evidence presented here, optimal use does not simply reflect the suitability of an area for arable versus warren but also whether the required inputs and indeed availability of labour after 1350 made one more economically attractive and/or practically viable than the other. Some areas within the warrens discussed above had clearly been viable for long-term arable use into the post-medieval period, suggesting soil quality was not a major hindrance to this form of land use. However, from the fourteenth century onwards processes of contraction indicate this was increasingly no longer considered to be the 'optimal' use of the land. One speculative possibility for Wangford is that drift-sand activity in the later seventeenth century may have disrupted parts of the arable with evidence of sand blow-out truncating some of the furlong banks and scouring parts of the former fields (see Chapter Seven). This, in turn, may have reduced the economic output of the arable and pushed the manorial lord(s) towards warrening as a more economically attractive prospect. However, it must be stated that evidence for this is not necessarily present in the other Suffolk warrens and episodes of open field abandonment/absorption into warren are likely to be the result of specific factors at particular times in each parish. A further implication from this is that many of the warrens appear to be late medieval or early post-medieval in date, and that the lack of earlier references in many cases is genuinely because the warrens were late creations rather than this earlier evidence not surviving. Many of the warrens recorded in Breckland have their earliest references from the

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<sup>894</sup> Sheail and Bailey, "The history of the rabbit in Breckland".

fourteenth century onwards,<sup>895</sup> with others, such as Eriswell Warren, having documentary evidence suggesting expansion of the warren during its lifetime, which may have incorporated the areas of open field discussed above.<sup>896</sup>

What is of importance to consider is that these earthworks represent the minimum extent of detectable cultivation in the region. That is to say, the substantial boundaries that survive represent likely areas of core, continual arable, while areas that may represent breck or late development of fields may leave far less significant earthworks, potentially none at all in areas that have been subjected to intensive modern forestry or arable, or on the very periphery of the arable zone where lands may have only been ploughed on rare occasions. It can therefore be reasonably suggested that the total extents of medieval arable in the region were greater than can be accurately reconstructed with processes of arable contraction broadly beginning after 1350 and continuing through into the post-medieval period.

As mentioned above in relation to the field systems of Wangford, Lakenheath and Eriswell, some of these medieval field systems extend a reasonable distance away from their cores of presumed associated settlements, often between three and five kilometres. The same appears to be true of the less regular systems, such as those at Thetford Warren and Swaffham (see above). Part of the reason for this may relate to the restricted availability of suitable soils in some areas (discussed more below) necessitating the establishment of fields towards the periphery of a parish during periods of agricultural expansion. Conversely, periods of agricultural contraction would be more

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<sup>895</sup> Mason and Parry, *The Warrens of Breckland*.

<sup>896</sup> *Ibid.*: p. 21.

likely to see these outlying systems abandoned first, in favour of fields that were closer to the cores of settlement. It is notable that parishes containing areas of less regular furlong systems also tend to contain evidence for medieval arable nearer to the core of medieval settlement, while those with outlying furlong systems of more regular and substantial appearance, such as at Wangford and Eriswell, do not.

A further, final point to briefly consider in relation to the establishment of warrens over arable land is that no correlation can be discerned between those parishes where a warren was established and subsequent desertion or shrinkage of the village. While in Wangford, the village may have undergone a degree of contraction after the open field was incorporated into warren (although the evidence for contraction is unclear), this appears to relate more to the loss of core arable land than the creation of a warren *per se*. Instead, it appears likely that processes of settlement contraction in the region were linked to wider trends of population reduction and the ability to maintain arable extents in the region (see below) with places such as Caldecote near Oxborough at one time being large enough to require parish church,<sup>897</sup> but being reduced to a single farmstead by the 1720s,<sup>898</sup> with no evidence of warren being present in this area.

### **Medieval Arable and Soil Variation**

With the mapping of surviving earthwork features, alongside the use of historic mapping from a range of sources, trends appear across the distribution of medieval arable that demonstrate environmental factors influencing where these tracts of open field were located in the landscape. In particular, variations in soil type within what would have been

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<sup>897</sup> NHER 2619.

<sup>898</sup> NRO DN/TA 979, *Caldecote* (1722).

increasingly solidifying boundaries of parish, manor and vill have, to an extent, structured the positioning and extent of medieval arable around the Breckland villages. This is perhaps unsurprising, and the observation that the medieval arable tended to favour soils that were either more easily worked or higher in fertility as the core areas of arable is true of medieval practices in England more widely, but it is worth briefly examining this within the landscape of Breckland. For the sake of clarity, this discussion will use parishes as a reasonable measure of the area forming the lands around a settlement, as parish boundaries are the most widely surviving and easily surveyed of the different forms of administrative boundary in the landscape.

One aspect that distinguishes Breckland as a particular landscape compared to other parts of East Anglia is that the soil types in the region are varied and changeable. As a result, as settlements and their respective boundaries developed in the earlier part of the medieval period it was often the case that a medieval parish may extend over several different soil types. This is in contrast to areas such as south Norfolk and north Suffolk, where the clay soils are far less variable. The generally higher variation in soils within the Breckland parishes meant that each parish would have consisted of areas that were suited to arable agriculture to a greater or lesser degree depending on the soil type. However, this would not necessarily be uniform across every parish and a soil that might be considered of middling quality and not used for arable in one parish might, by contrast, be the best choice of what was available in a neighbouring parish and therefore would be used for arable. When medieval arable extents are plotted in Breckland using selected historic mapping and surviving earthwork furlong boundaries as a useful approximate measure of this (Figure 64), the pattern that emerges is one of a sliding scale of preference between different soil types, where, within each parish, the most suitable (or

least worst) soil saw the development of open field arable. However, the use of a specific soil type for arable is not uniform across Breckland because the availability of the most suitable soil is relative to that parish.

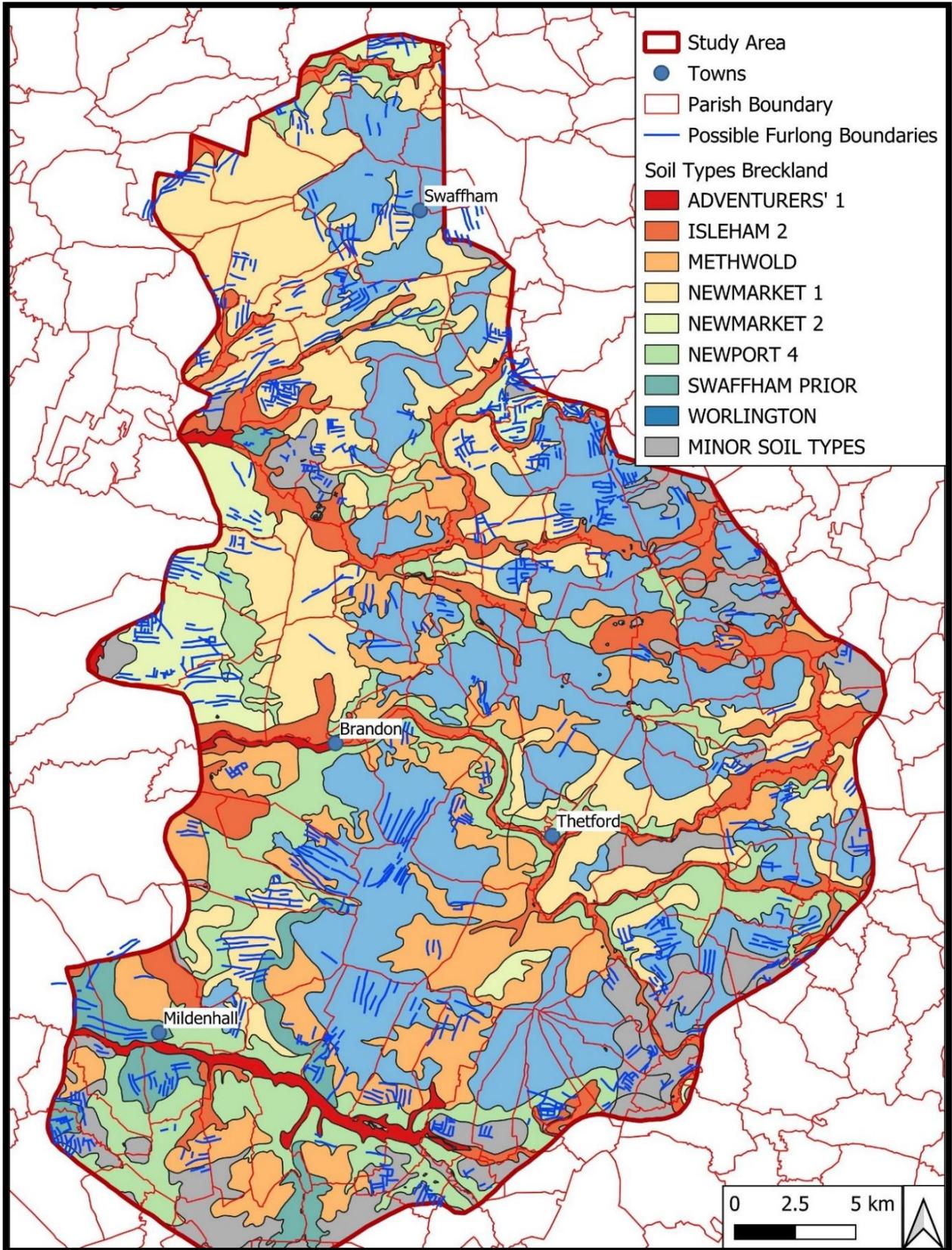


Figure 64: The relationship between surviving earthwork furlong boundaries and soil types in Breckland.

The overall trend that emerges across Breckland more widely is one of a preference towards the more calcareous, loamier soils and away from the acidic sands, but again, this is not necessarily possible within each parish. It should be noted that other soil types are present within the study area than those discussed below, but these form either relatively small areas for which no clear pattern of preference could be identified or were flood plain or fen edge soils that historically would have been too wet for arable use. At the southern end of the region, soils of the Melford, Moulton and Swaffham Prior associations show a clear correlation with the medieval arable. Similarly, where Newmarket 1 and 2 soils are available, these appear to be preferred for arable use above the sandier soils, although it should be noted the Newmarket 2 soils appear to take preference over Newmarket 1 soils where available. Where these soils are unavailable, Methwold and Worlington association soils will be put under arable use. Finally, soils of the Newport 4 association show limited correlation with medieval arable extents and it is clear that arable on these areas has almost always been the result of expansion from an adjacent area of preferred soils, rather than deliberate selection of Newport 4 soils for the core arable. It is notable that the area of medieval arable discovered at West Stow<sup>899</sup> was sited on Newport 4 soils and fell out of use in the fourteenth century, perhaps suggesting it was towards the edge of the arable zone compared to other areas of field present on Methwold and Worlington soils in the parish. The plotting of post-medieval common extents in the Lark valley, taken from eighteenth-century military maps, also shows a tendency towards Newport 4 soils being under heathland while the arable

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<sup>899</sup> West, *West Stow: The Prehistoric and Romano-British Occupations*: p. 40.

tended to be on the less acidic sands and loamier soils.<sup>900</sup> Likewise, an eighteenth-century map showing much of the western side of Mildenhall up to the fen edge reveals the area to have been under large-scale open field cultivation on an area of Swaffham Prior soils,<sup>901</sup> while historic Ordnance Survey mapping shows heathland on the eastern side of the town overlying Newport 4 soils.<sup>902</sup> Similar investigations of historic settlement in the Sandlings region of East Suffolk revealed a similar correlation between heathland and Newport 4 soils, with a clear preference for the medieval occupants of the landscape around Sutton to cultivate the more fertile Newport 2 soils occupying the slopes between the upland heaths and the river plain.<sup>903</sup>

At the other end of this scale, eighteenth-century mapping of Caldecote,<sup>904</sup> Cockley Cley,<sup>905</sup> and Oxborough<sup>906</sup> show extensive areas of open field (some of which has been piecemeal enclosed by this date) across large tracts of Newmarket 1 loams and some Worlington soils, giving the north side of the Gadder valley a distinctly ‘champion’ appearance. Areas of common grazing, meadow and pasture tend towards the Newport 4 and wetter Isleham 2 soils. Perhaps the most striking correlation is shown on an incomplete late eighteenth-century map of Foulden (Figure 65).<sup>907</sup> The village has a far

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<sup>900</sup> RCIN 734032.ab, *Map of encampment at Hengrave, Fornham All Saints and Bury St Edmunds* (1778); RCIN 734032.ah, *Map of encampment at Cavenham Heath* (1779).

<sup>901</sup> CUL Maps.Ms.Plans.7, *Plan of a titheing and estate at Westrow within the manor of Mildenhall in the county of Suffolk belonging to Biscoe Esq.* (1776).

<sup>902</sup> OSD 238, *Ordnance Surveyor Drawing of Feltwell St Nicholas* (1813).

<sup>903</sup> Williamson, *Sutton Hoo and its Landscape*: pp. 32-37.

<sup>904</sup> NRO DN/TA 979, *Caldecote* (1722).

<sup>905</sup> NRO FX 386/2, *Map of Cockley Cley* (1722).

<sup>906</sup> NRO BRA 2524/1, *Map of the parish of Oxborough, showing the lands of Sir Henry Bedingfield, by Philip Wissiter* (1722).

<sup>907</sup> NRO MC 86, *Map of the manor of Foulden belonging to Francis John Tyssen surveyed by Thomas Warren of Bury St Edmunds* (1770).

more dispersed morphology around a large green on an extensive tract of heavier Wickham 2 soils, and sits in a mosaic landscape of old enclosures, irregular patches of open field and tracts of common land. To the north-west and south-west, modest tracts of open field, some of which is piecemeal enclosed by 1770, sit detached and form islands within larger tracts of common, which are sited partly on Wickham 2 soils, and partly on the loamier Swaffham Prior soils. The mixed and diverse landscape of the western half of the parish would not look out of place on the Norfolk clays. However, the eastern half of the parish overlies the same tract of loamy Newmarket 1 soils as nearby Oxborough and Cockley Cley, and the transition of this part of the parish into large, extensive tracts of open field with little variation follows the boundary of the Newmarket 1 soils with remarkable consistency. It appears to be the case the soils available in any given parish not only present a sliding scale of preference for where the arable is sited but also influenced the overall extent and character of the medieval agrarian landscape, whether it developed into large, extensive tracts of open field with little variation, or into a more mosaic landscape of smaller tracts of arable interspersed with areas of common land.

When this distribution and apparent preference for certain soils is applied to the relict furlong boundaries surviving within the Suffolk rabbit warrens, it becomes clear that the areas of arable that appear to have been abandoned or incorporated into the warrens were not necessarily on the most marginal of soils, but rather fit the model suggesting that the best (or least worst) soils for arable land use would form the arable core. This is particularly true for the warrens of Wangford, Lakenheath, Eriswell and Mildenhall where, in all four cases, the furlong systems are sited on soils that, relative to each parish, would have been amongst the best for arable use. In the case of Mildenhall Warren, the

reduction of arable appears to have been relatively limited, with suitable soils to the west of the town that were evidently farmed under open fields.<sup>908</sup> By contrast, the field system in Wangford Warren appears to represent a considerable proportion, if not most, of the former arable land for the parish, with the rest of the parish being formed of Newport 4 soils in the vicinity of the village, or the wetter Isleham association soils to the west of this. In Lakenheath and Eriswell, too, the relict field systems may represent reasonable proportions of the available arable land, although not to the same degree as Wangford. A further emergent pattern in the areas of historic arable is the presence of a ‘leapfrogging’ effect, where areas of less suitable soils are left as gaps in the arable distribution. Thus, the villages of Wangford and Eriswell are sited on areas of Newport 4 soils, and while there may have been some limited arable in their immediate vicinity, the majority of their open fields were sited slightly detached from the medieval cores of occupation. A similar pattern is present in the parishes of Icklingham, West Stow and Wordwell, where evidence of medieval open fields exists in the lower slopes of the Lark valley, with an apparent gap in arable across the middle part of the valley, before further evidence of open fields is present on the higher slopes of the valley within these parishes. There is no clear correlation with changing soil types in these areas, and it may perhaps be more influenced by the depth of the underlying chalk moderating soil acidity, even if the overlying association does not change.

Arising from this apparent hierarchy of preference for different soil types in the study area is the possible relationship with the development of brecking as a pragmatic response to the expansion of arable in a landscape of mixed and variable soil types. It

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<sup>908</sup> CUL Maps.Ms.Plans.7, *Plan of a tithing and estate at Westrow (1776)*.

could be seen that in a landscape where many of the surface soils are sandy and it may not be readily apparent how (in)fertile an area may be without attempting to farm it, different decisions would be made by a community as they encountered soils of different quality and viability as arable. During periods of arable expansion, the area under plough would have pushed outwards away from the cores of settlement and onto land that may not have been used for arable within memory. If this ground was found to be workable then it would have been reasonable to try and incorporate it into the more permanent fields. If it was of lesser quality but still somewhat productive then periodic rotation (brecking) to allow fertility to recover would have been the most efficient way to exploit the land. If the ground was found to be unworkable for arable, principally because of issues with fertility or soil acidity, then this would be disregarded for arable use. However, the desire to expand the arable may have seen further ground beyond this brought into cultivation if it was workable, and this would have generated the 'leapfrogging' effect in the arable distribution described above. This may seem like a rather obvious solution to expanding the area under arable cultivation, but it must be emphasized that brecking is a specific practice to areas of mixed and often sandy soils and developed to such an extent in this landscape as to give the region its name. Brecking is therefore the result of this system refining itself and finding an appropriate balance between the input and output of labour and crop yields relative to soil fertility, alongside the amount of labour available at a given time. Once established as a viable farming practice it naturally evolved and refined itself over the course of the medieval and post-medieval periods. Brecking did not happen so readily in other parts of East Anglia because in places such as the Norfolk claylands fertility is not as much of an influencing factor in a landscape of generally more uniform soils. Instead, farmers on the clays were more concerned with

how challenging the soils were to plough against factors such as labour costs, ploughing windows and drainage. In Breckland, most soils plough easily, but there was no point in ploughing if the yield was not worth the effort. Postgate defined the field systems of Breckland as an “infield-outfield-breck” model, where the infields were the core arable land under regular cultivation, the outfielders were ploughed semi-regularly, and the brecks were the most peripheral, often with many years between ploughings, all of which was generally termed as a ‘shiftfield’ system in the region.<sup>909</sup> The discussions above support this with the added geological and environmental aspects helping to better nuance Postgate’s model into the physical context of the Breckland landscape.

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<sup>909</sup> Postgate, “The Field Systems of Breckland”: pp. 89-96.

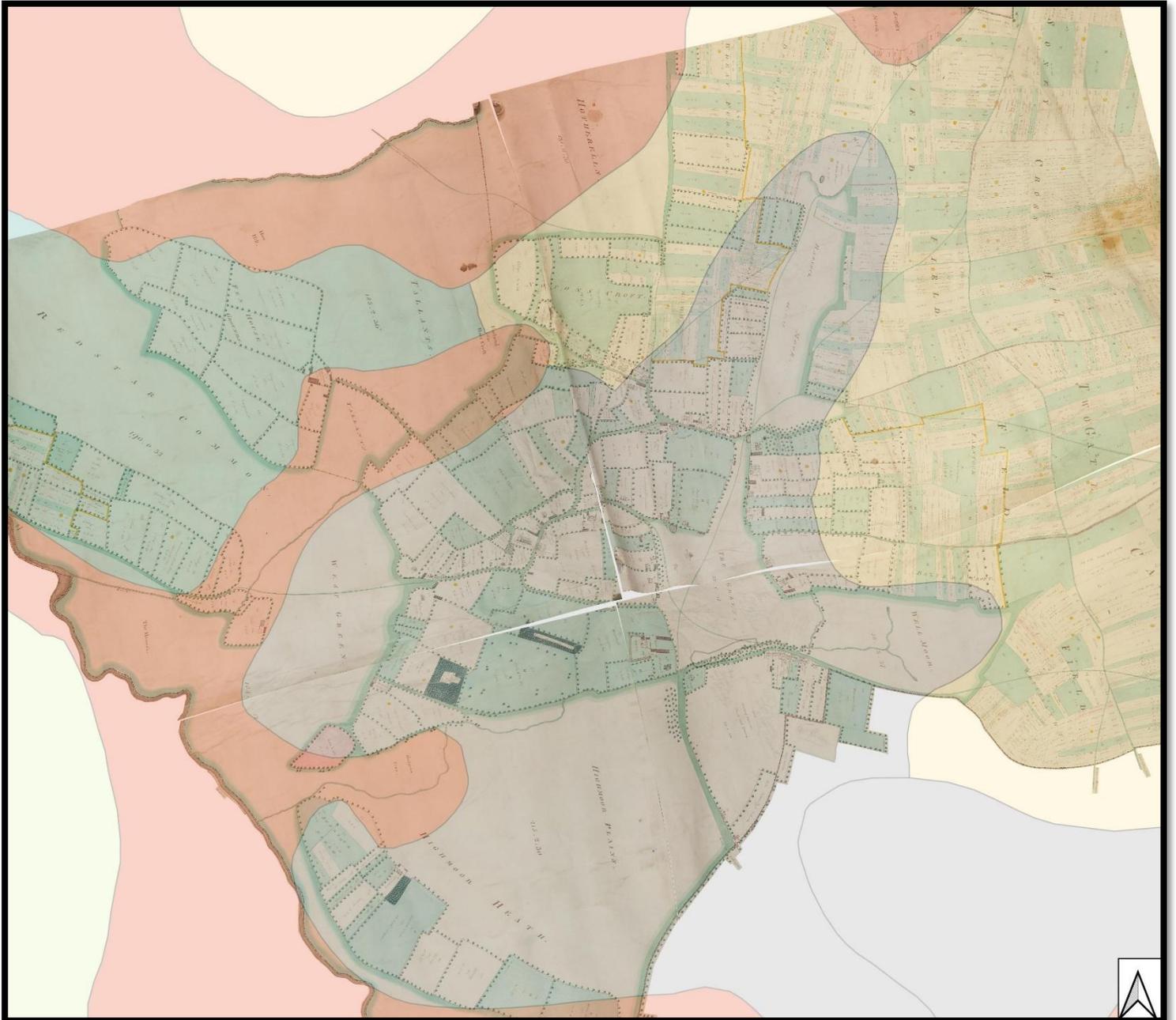


Figure 65: Historic mapping of Foulton shows clear correlation between dispersed settlement, irregular field systems and tracts of common land with the Wickham 2 (grey), Swaffham Prior (green) and Isleham 2 (red) soils and extensive tracts of open field with the Newmarket 2 soils (yellow). NRO MC 86/1 (1770).

## **Discussion and Conclusions**

The widespread availability of lidar in Breckland has allowed large-scale survey for earthwork evidence of medieval arable practices in a way that was not easily previously possible. While some parts of Breckland had been surveyed through NMP/AIM mapping projects,<sup>910</sup> investigations for this thesis have covered the rest of Breckland and incorporated all of the results into GIS for analysis. The results of this are the identification of medieval field systems in areas previously thought to be of historic heathland character, revealing that the medieval arable landscape was more extensive than previously thought. Some areas of heathland may only have generated from the later medieval period and as late as the mid-seventeenth century in some cases, after areas of open field were abandoned and incorporated into warrens. In some of these places, as well as in some parkland and other places that have seen no modern ploughing, low East Anglian type plough 'ridging' survives more extensively than has hitherto been recognised, emphasising how widespread this practice was and also how easily it is lost through post-medieval and modern ploughing techniques. By incorporating this with historic mapping to examining the distribution of medieval arable in more detail, a hierarchy of preferred soil types becomes apparent, with communities selecting the best (or least worst) soils available to them for their core arable. The development of brecking would appear to be a pragmatic response that developed alongside this. In a landscape where soil types can be highly varied, the system of brecking, once established, refined itself to make the most efficient use of the landscape for arable farming depending on the

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<sup>910</sup> Horlock and Tremlett, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region (Stage 1)*; Powell, Tremlett and Horlock, *Breckland Aerial Investigation and Mapping of part of the Norfolk and Suffolk Breckland Region: Stage 2 and Overall Results*.

soils available to a community and. In some cases, areas used as breck or 'shift' appear to be derived from medieval open field systems, while in others they appear more post-medieval in form. It is possible, as a tentative suggestion, that the refining of brecking, 'shiftfield', and, by extension, the foldcourse in the later medieval and post-medieval periods may have been in an effort to maintain the tracts of established arable in an extensive, low yield farming regime after a period of population decline and stagnation. Arable contraction in the region did not necessarily result in reduction of land under the plough, but as shown in places like Caldecote, tracts of established open field could instead be used as breck, being put under a periodic ploughing regime when previously they may have been part of the regular arable.

## **Chapter Eleven: Breckland: Settlement, Land Use and Climatic Fluctuation**

It should be clear from the preceding chapters that, in relative terms, the situation in Breckland was never stable for very long, in terms of settlement patterns, population, the character and use of the landscape, and the wider climate. Breckland did not exist in isolation, and the same developments of technology, culture, population and social organisation that occurred elsewhere in England across the study period may also be seen in Breckland. The one key aspect of stability in the region is the geological framework, which formed the basis for the distinguishing characteristics of the region when compared with other regions in East Anglia, and naturally had knock-on effects for the environment (the flora and fauna) as well as the way in which humans were able to settle and use this landscape. The continual theme that has become apparent throughout this thesis is that human use of the Breckland landscape from prehistory to the post-medieval period has, in general, attempted to settle, farm and structure the landscape in a similar manner to elsewhere in England but that these activities have seen adaptation to the local environmental conditions in order to make the most efficient use of the landscape and resources available. The changes that occurred for a range of factors across the study period have been tabulated in Table 2 and attempts to show broad trends and developments in the Breckland landscape in relation to fluctuations in climate. The trends shown are somewhat simplified in their descriptions, but more in-depth discussions of these factors may be found in the relevant earlier chapters. This chapter will bring together the insights gained into the historic character of the Breckland landscape from the preceding chapters and summarise these overall trends against the backdrop of longer-term climatic fluctuations. What will become apparent from this is that while certain correlations with changes in climate do occur, these are of a similar

pattern to landscapes elsewhere in England and, despite the reasonable assumption that climate will have some form of impact on human use of the landscape, no clear causal links can be seen in a Breckland context with the relatively low resolution of much of the historic data meaning that descriptions and discussion may only be broad at best.

Year	Settlement Forms	Settlement Stability	Settlement Visibility	Population	Arable Extents	Pastoral Regime	Heathland Extents	Woodland Extents	Other Land Uses	Water Tables	River Management	Drift Sand	Temperature	Rainfall	Climatic Stability/Instability	Sea Levels	Forcing Events
>1600	^	^	^	Slow Recovery	Beginning of 'improvements'	^	^	^	Fen Drainage	Lowering?	^		^	^			
1600				^				^					Into LIA				
1500							Broadly known today					Drift Sand	Milder			Lower	
1400					Brecking well established								^				
1300		Some contraction post-1350		Stagnation, then big drop c.1350	Contraction	Refining of foldcourse	Expansion post-1350		Expansion of warrens				Cold				
1200		^		Peak	Arable peak		^						Cooler	Wetter	Unstable	High	
1100				^	Brecking in use				Warrens				^				
1000AD	'Villages', Some nucleated, some more dispersed.	Stabilisation	Very Visible		Expansion, focus on barley	Foldcourse, sheep dominant	Brecking impact, contract for arable	Very little recorded		River management impacts?	Gradual increase	Drift Sand	MWP	Mild	Stable		
900	^	^		Gradual Recovery	Brecking origins?	Foldcourse?	^	^			^		^	^			
800			Increasingly visible	^	Open field origins?	^							Milder	Dry			
700	Settlement Shift	Settlement Shift	^										^	^		Low	
600		^			Confined to lower valley slopes								Colder	Wet Peak	^		
500	Dispersal	Transient		Decline	Contraction	Shift towards sheep?					Unlikely?	Drift Sand	^	^			
400	^	Major contraction	Less visible	Population Peak	Peak, spelt wheat surplus	^	Expansion	Minimal regeneration?			^		Milder				
300		^	^	^	^		^	^					^				
200													Cooler	Wetter	Less Stable		
100AD	Some small towns												^	^			
0	Dispersed but dense	Somewhat stable	Very Visible		Expansion					Relatively High?	Possible		Warm			High	Limited
100BC	^	Stabilising?	Increasingly Visible	Recovery		Cattle and corn husbandry	Contraction for arable	Any large areas likely cleared for arable					^		Very Stable		
200		^	^	^		^	^	^							^		
300																	
400																	
500														Dryer	Stabilising		
600										Rising				^	^		
700																	
800				Reduction													
900				^													
1000BC																	
<1000BC	Dispersed, transient	Transient	Less Visible			Cattle, then sheep	Already extensive, some natural?	Some areas, but not as much as on the clays	Monuments, funerary landscapes		Natural		Cooler	Wetter	Unstable	Lower	

Table 2: Changes to a range of factors across the study period.

## **From Prehistory to Post-medieval**

### **Before 1000 BC**

Before the relevant aspects of the study period are addressed, it is worthwhile to highlight that the Breckland landscape had already seen a significant degree of human activity in prior to this. This has been summarised in Chapter Six and demonstrated that the Breckland landscape had seen a considerable degree of activity and change before 1000 BC, and that the changes and activities of those living in the region from the earliest date have always been connected and influenced by wider patterns of human activity and development.

### **Late Bronze Age and Iron Age (1000 BC-50 AD)**

As discussed in Chapter Two, the beginning of the study period was characterised at a wider level by a period of climatic deterioration and apparent population reduction, alongside the shift towards the use of iron for many tools and objects at this time. In Breckland, the archaeological evidence suggests a similar trend of population and settlement reduction with Early and Middle Iron Age sites being noticeably less detectable in the archaeological record than either Late Bronze Age or Late Iron Age sites. Indeed, areas of landscape that had clearly seen at least background activity in the Late Bronze Age, such as at Wangford Warren,<sup>911</sup> appear to have seen a reduction in overall human activity until the Late Iron Age. Similarly, at Mildenhall, activity beside the River Lark in the Late Bronze Age saw a reduction into the Early Iron Age before the construction of a fort in the Middle Iron Age,<sup>912</sup> perhaps at the point at which the population of the

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<sup>911</sup> McIntosh and Hinman, *Wangford Warren Phases One Through Three*: pp. 105-109.

<sup>912</sup> Harvard, Alexander and Holt, *Iron Age Fortification Beside the River Lark*.

region began to recover and expand. The construction of a significant monument indicates the area acted as a central place at this time, but one that did not have any clear antecedence and was only sparsely populated in the centuries before. It should also be noted that ‘hillforts’ are rare types of monuments in Breckland and also East Anglia more generally, being of particular significance in the Iron Age Landscape rather than the everyday farmsteads that would have been present (or not present) in the wider landscape. By contrast, Middle Iron Age activity at Ingham Quarry appears to be relatively intense compared to elsewhere in Breckland and serves as a useful example of an exception to the often sparse Early and Middle Iron Age activity detected on other sites.<sup>913</sup> That said, the evidence from the A11 road scheme does suggest that at least some permanent settlement that persisted into the Late Iron Age and Roman periods had its origins in the Middle Iron Age.<sup>914</sup> Describing this period of Breckland history has been particularly challenging precisely because the evidence is limited compared to other periods and can therefore only be tentatively inferred. However, this trend is similar to that seen in wider lowland Britain at this time, suggesting that the situation in Breckland is not drastically different to elsewhere.

Another difficulty in discussing Iron Age archaeology is the often broad and overlapping date ranges given to the Early and Middle periods, as well as a different interpretations of when precisely the Late Iron Age begins. However, taking the period as a whole in Breckland, the evidence suggests a contraction of population and settlement across the study area in the earlier period, correlating with a period of climatic deterioration. Where Early and Middle Iron Age activity is present, it appears to be

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<sup>913</sup> SHER FSG 017.

<sup>914</sup> Woolhouse and Hinman, *The Heathland Road*.

relatively concentrated in contrast to the more widely dispersed activity in the surrounding periods. The Iron Age forts of the region, for example, represent sites of special significance and centrality that have either survived as extant earthworks to the present day, or have been very obvious during archaeological investigations. This is in contrast to more general occupation sites, which have not been found nearly as readily as they have for other periods.

Farming regimes are not obviously drastically different in character to elsewhere and were probably mostly near-subsistence levels with any surplus being distributed on relatively local lines for much of this period, although in part this may be due to limitations in the archaeological data. However, the Hockham Mere pollen data does suggest that the Late Iron Age saw an upturn in clearing areas of woodland in the catchment as the area under agriculture expanded, correlating with a period of climatic stability. Indeed, it appears to be during the Late Iron Age that the population of Breckland sees a noticeable increase, with a marked upturn in the amount of activity detected in the study area. In part, this may be due to a change in Late Iron Age material culture (more durable object types are used and therefore survive to the present day to be found) but the development of sites such as Fison Way and the recovery of high-status objects such as coin moulds from this site indicate that it was a significant central place in the kingdom of the Iceni.<sup>915</sup> Breckland was not peripheral in Iron Age East Anglia but was well-integrated into the wider networks of trade and social organisation. This is something which is unlikely to have been spontaneous to the Late Iron Age and instead more likely

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<sup>915</sup> Gregory, *Excavations in Thetford, 1980-1982, Fison Way*: p. 139.

developed and evolved out of the Middle Iron Age, again of similar character to the development of Iron Age communities at a wider level.

### *Roman (c.50 AD-410 AD)*

The transition into the Roman period in Breckland took place during a period of very stable climate (see Chapter Two) and it appears that population and settlement in the region continued the trends of expansion that originated in the Late Iron Age. While the Romanisation of Breckland and integration into Imperial structures perhaps reduced the wider regional 'centrality' of the area compared to the Iron Age, it is clear that it remained well-populated and increasingly developed towards a surplus-producing agrarian regime centred principally on the production of spelt wheat and the keeping of cattle (see Chapter Nine). Evidence from fieldwalking and other surveys demonstrates that the Roman arable was probably at least as extensive as the medieval, with a likely correlation between the areas used and viewed as suitable for arable agriculture across both historic periods. Evidence from the Hockham Mere catchment suggests a continued expansion of arable over this period (see Chapter Two). From the middle of the Second Century AD, the climate appears to have become somewhat wetter and less stable than before but, as discussed in Chapter Nine, this does not appear to have had any detectable impact on agrarian regimes in Breckland, and instead an intensification of this agriculture is seen during the third and fourth centuries. The focus of agrarian practice in Breckland appears to have centred on the maintenance of arable fertility to allow for the surplus production of spelt wheat, discussed in detail in Chapter Nine. Again, it would be reasonable to suggest that the underlying geological framework of the region was the prime factor influencing any necessary adaptations to the system, although an increase in rainfall may

also have required extra efforts to keep the freely-draining soils of Breckland fertile, encouraging the growing of a higher than might be expected proportion of barley to maintain larger herd numbers to produce greater quantities of manure. This system does not appear to have been markedly different to elsewhere in lowland Britain but may have had some minor local adaptations to achieve the desired surplus output. By the middle and later parts of the fourth century, this system appeared to be at its most extensively developed and continued into the early fifth century until at least the end of the Roman administration in Britain in 410 AD. However, it is not clear whether the main driving force behind the breaking down of this system in fifth-century Breckland was as a result of climatic deterioration, population decrease, or the withdrawal of Imperial Roman contact effectively removing the market and incentive to maintain such levels of surplus production, particularly on some soils that would have required significant levels of manure and labour to keep them in good heart.

#### Anglo-Saxon (410 AD-1066 AD)

As described in Chapter Two, the Anglo-Saxon climate was characterised as seeing a shift away from the relatively mild conditions of the fourth century and towards a colder, drier climate that lasted until the eighth century when conditions ameliorated into milder conditions that peaked in the tenth century. The climate then remained relatively mild into the medieval period (see below).

In Breckland, the organised surplus producing economy of the Late Roman period saw a break down in the fifth century, with settlement seemingly retreating into more core areas of occupation, usually the principal river valleys and Fen edge. Some of the Late Roman farmsteads discovered in Breckland may have continued into the fifth century,

but the reduction in new coinage entering Britain (as a useful dating indicator of a site) as well as the loss of other Roman material culture and technology makes it difficult to suggest when these sites finally fell out of use in many cases. What is clear, however, is that on sites such as Wangford Warren and the A11 road scheme activity did not persist to the degree that the inhabitants saw a material shift to using Early Anglo-Saxon object types in any form. The decline of these sites and the apparent abandonment of the agricultural land attached to these farmsteads may, in part, have been a response to the climatic deterioration seen at this time, alongside the loss of access to Roman Imperial markets reducing the demand for the production of a grain surplus. Both of these factors may have pushed the inhabitants of farmsteads on the less fertile grounds towards the abandonment of relatively outlying places and towards regimes centred on subsistence-based practices on the more productive soils, a pattern that also occurs at a wider level in Britain at this time. As a result, the landscape of Early Anglo-Saxon Breckland appeared to undergo the same broad processes that were happening elsewhere, suggesting that the landscape of Breckland offered little incentive for the inhabitants to act differently to surrounding regions.

Middle Saxon activity in Breckland appears to show a continuation of preference for the principal river valleys with no marked expansion of settlement despite an improvement of climate from this time. However, the emergence of territories and estate centres, such as that discussed in Chapter Four at Methwold and Grimshoe Hundred provide the first evidence of an administrative structuring of the Breckland landscape that endured into the medieval period and beyond. A further focus of Middle Saxon wealth and power appeared to be concentrated in the Little Ouse and Thet valleys, with the notable settlement site at Staunch Meadow, Brandon, the emergence of the settlement at

Thetford and archaeological evidence suggesting the area around the Harling villages was also a central place in the landscape at this time.<sup>916</sup>

It is during the Late Saxon period that many of the villages and settlements in Breckland stabilise in the landscape in forms that are recognisable in the medieval period and beyond, and where some of the processes of arable and animal husbandry that gave Breckland its historic character appear to emerge. The climate at this time was one of relatively warm, favourable conditions, which facilitated an expansion of the area under arable alongside an increase in population.

Across the Anglo-Saxon period as a whole, an agricultural transition occurred away from the spelt wheat and cattle economy of the Roman period and towards the more widespread use of bread wheat and sheep husbandry (see Chapter Nine). This formed the foundations of the foldcourse system in Breckland, with bread wheats less tolerant of the poorer soils, potentially limiting where they could be reliably grown without the intensive direct manuring available through the close-folding of sheep. As a result, the tracts of heathland in the region, some of which may have existed for particularly long periods of time and others which may have only generated as a result of arable contraction in the post-Roman period, increasingly became linked into the rural economy as the extensive resource that provided the nutrients that would then be concentrated by sheep-folding, while at the same time the farmers of the region shifted towards the hardier barley as the principal cereal crop.

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<sup>916</sup> NHER 6033.

Medieval and early post-medieval (1066-1600 AD)

The medieval and post-medieval landscape of Breckland has seen far more study and characterisation than previous periods. This has been aided in part by the survival of documentary evidence from this time, providing crucial data in some cases for the type and character of agricultural practices in the region, how these were structured and specialised for the region, and the yields this produced.<sup>917</sup> An increasingly centralised system of control exercised by landholders at this time, predominantly manorial lords and monastic houses (particularly the abbey at Bury St Edmunds) also allowed for a greater scale of organisation and specialisation across areas wider than parish or district level, in order to make the most effective use of the landscape, something that was only perhaps previously seen during the Roman period a millennium before. As a result, much of the Breckland landscape solidified itself during this period into settlement and land use patterns that endured into the post-medieval period and, in many cases, through to the present day, making investigation of the medieval landscape less challenging than that of earlier periods. That said, this thesis has demonstrated that some parts of the medieval Breckland landscape were used in a significantly different way than was previously assumed. In particular, large areas of rabbit warren that were previously considered to have been taken out of areas of long-established heathland show clear evidence for having been part of the open field arable landscape in the earlier part of the medieval period. In some cases, these identified areas of open field appear to have formed the core area of arable in a parish, which could be both detached from the village itself and/or continue in use into the post-medieval.

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<sup>917</sup> The two clearest examples of this being Bailey, *A Marginal Economy?* and Belcher, *The Foldcourse and East Anglian Agriculture*.

The overall trends for medieval Breckland appear to be broadly in keeping with those seen at a wider level. Population appears to have risen steadily from the Late Saxon period with settlement expanding alongside this. At the same time, specialisation into barley production and the continued development of foldcourse sheep husbandry helped to maximise output in a landscape of relatively infertile soils under a wider extensive farming regime during a period of relatively mild climate. A deterioration in these conditions at the start of the fourteenth century correlated with a stagnation in population and apparent halt in the expansion of arable land. Indeed, some areas of Breckland that were previously under arable regimes may have been abandoned at this time and turned over to rabbit warren in a number of cases. More widespread contraction of arable appears to have taken place after the population crash in the 1350s, with Breckland appearing to conform to the wider patterns of population and arable reduction seen in England at this time. However, in some parts of Breckland the nature of arable contraction may have involved further development and refining of brecking and shiftfield regimes with areas being ploughed on longer rotations, meaning less land was under crop at any given time, rather than a reduction in the overall area of land being ploughed. That said, while some areas in Breckland saw this increasing specialisation of farming systems, other areas of open field arable further fell out of use and were incorporated into warrens, either through abandonment of the arable or as an economic decision taken by the landowner(s). This was a longer-term process that continued at various points into the post-medieval period with some open field, such as at Wangford, only being incorporated into warren at some point after the 1640s, while other areas of open field in Breckland survived until general enclosure in the later eighteenth and early nineteenth centuries. In part, this may have been due to the population in the region not

recovering to pre-1350 levels before the end of the study period, and also because climatic conditions remained relatively cool and unstable for the remainder of the study period, and elsewhere this has been suggested as a reason for the continued abandonment of some upland and ‘marginal’ landscapes.<sup>918</sup>

### ***Discussion and Summary***

While Breckland has always been viewed as a distinctive landscape, both in an East Anglian and wider British context, the broader trends of settlement and land use examined in this thesis show that the changes seen in the landscape across the study period are broadly similar to that seen at a wider level across lowland Britain. Particularly detailed study of ancient climate and human interaction in Breckland is made difficult by a lack of fine resolution to both the climatic and archaeological data, and as a result things may only be interpreted in relatively broad terms. Nor does climatic fluctuation appear to induce a shift in land use and settlement patterns in any detectably different way to wider Britain across the study period. Indeed, it appears that any changes the climate may have had in the region were responded and reacted to in the same manner as elsewhere *despite* the distinctive character of Breckland and the subtle differences in approach the inhabitants took to living and farming there. The overarching theme that emerges from this thesis is that, over the long-term, historic settlement and land use in the region was principally impacted by the underlying geological framework, which in turn shaped the wider hydrology and natural ecology of the region. The constraints and opportunities given by these conditions saw a number of adaptations and specialisation where required to make the region habitable. This may have taken the form of, for

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<sup>918</sup> Dyer, “The Retreat from Marginal Land”; Dyer and Jones (Eds.), *Deserted Villages Revisited*.

example, settlement zones being limited to certain areas where water supply was more reliable at certain times, or the creation of medieval arable on the 'least worst' soils available to a settlement, which may have further driven the need to adapt farming practices to maximise output. These adaptations, however, regardless of the time period in Breckland, all appear to be in an effort to farm, organise and administratively structure the landscape in as similar a way as possible to elsewhere, rather than the inhabitants actively trying to act in a drastically different way. Where certain conditions in Breckland prevented this from happening, it was as a result of the local environment at a structural, underlying level that prevented this, rather than through any difference in climatic impact. What also becomes clear from the preceding chapters, then, is that any fluctuations in climate appear to have had a similar impact on the Breckland landscape as elsewhere, and that while climate almost certainly played its role in shaping the longer-term landscape patterns of the region, the local environment was a far more important factor in creating a landscape distinct from those around it, and requiring a certain degree of adaptation at certain times.

## **Chapter Twelve: Conclusions**

The image that emerges of Breckland across the study period is one of a dynamic and changing landscape, underpinned by a geological framework that gave the region its distinctive ecology and character. Despite these contrasts with surrounding areas and wider East Anglia, the inhabitants of Breckland all appear to have attempted to occupy, order and exploit the landscape in much the same way as elsewhere, but this required a degree of adaptation and specialisation in some cases to meet these needs at different times. The landscape of Breckland before 1000 BC was one that had already seen a considerable degree of human activity and impact, and it is possible that some of the earliest focus of human activity in Breckland was in areas that had developed naturally into relatively open landscapes after the last Ice Age. That is not to say that tracts of woodland were not present, as the pollen data from Hockham Mere demonstrates, but that the prehistoric landscape of Breckland was perhaps more of a shifting mosaic of more open and more wooded spaces from the earliest post-glacial periods. The presence of specialist *flora*, some species of which now find themselves restricted to Breckland and the few similar landscapes in Britain, attests to a continuum of at least some open ground from prehistory onwards. Furthermore, the construction of Bronze Age barrows in the study area also acts as a useful proxy indicator of open spaces in prehistory. The beginning of the study period sits against this backdrop of a diverse and already well-trodden landscape.

The trends that appear in Breckland from the Late Bronze Age through to the post-medieval consist of various phases of population and settlement expansion, with a corresponding expansion of land under arable use and reduction of heathland and

woodland. A broad correlation exists between periods of expansion and relatively warm, stable climate, such as during the Late Iron Age and Early Roman periods, and the Late Saxon to high medieval periods (See Chapter Two, pages 39-52). However, this is not in any contrast to areas beyond Breckland, and instead the population of Breckland seems to have matched these wider trends suggesting that climate had little discernible impact on distinguishing Breckland from elsewhere. Likewise, periods of population and agricultural contraction also appear to be in step with broader trends, which share a broad correlation with periods of relative climatic instability. Climate almost certainly had an effect on the settlement and land use patterns of the study area, but the overall impression given through this study is one where this appears to be little different to wider patterns seen in Britain.

Of more significance are the results from studying a range of different aspects of the Breckland landscape, revealing the far more pervasive influence of the environment, particularly the underlying geological framework, in shaping how people lived in and used the landscape. This is not a particularly new revelation as the environmental character of Breckland has long been used as the foundation for nearly all interpretations that distinguish it from elsewhere. What is of note, however, is the extent to which this has impacted settlement and land use in the region and the adaptations in settlement morphology, agrarian systems, and exploitation of non-arable land types despite an initial desire by the inhabitants to impose systems that were intended to be much the same as elsewhere. The hydrology of the region appears to have had a considerable impact in the settlement morphology of Breckland, with areas of relatively limited water supply seeing correlation of limited long-term occupation, in contrast with surrounding regions where settlement was far more dispersed across the landscape (see Chapter Seven).

Similarly, agrarian regimes saw a degree of adaptation and/or specialisation to maintain output with the principal focus in Breckland being the maintenance of fertility levels on the freely-draining soils, in contrast to other areas where fertility was less important but soil drainage of greater concern (See Chapter Nine). The archaeological and environmental evidence suggests that the Roman approach was one of additional efforts to maintain fertility to allow the production of a surplus of spelt wheat, in keeping with systems seen elsewhere in Roman Britain (See Chapter Nine, pages 271-279) alongside the keeping of cattle as the principal livestock animal (See Chapter Nine, pages 295-298). The medieval period saw a different approach by specialising into barley production to better cope with the trickier Breckland soils, contrasting with regimes seen elsewhere, as well as the keeping of large flocks of sheep to provide the necessary manure.<sup>919</sup>

Beyond the limits of the arable landscape, it would be reasonable to interpret that once an area of woodland was cleared in the region, the character of the soil and subsequent land uses made it more likely to develop into a heathland ecology rather than regenerate into woodland during periods of agricultural and population contraction. That is not to say that some areas of woodland would not have appeared, but that the evidence, particularly from the Anglo-Saxon period, suggests these were limited in extent at best (See Chapter Eight, pages 244-250). The resulting tracts of heathland covered considerable parts of the landscape at certain times, and in some places the particularly sandy nature of the soil led to the generation of dune fields and drift sand activity, which may have been triggered by underlying water tables influencing surface soil moisture and

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<sup>919</sup> Bailey, *A Marginal Economy?*; Belcher, *The Foldcourse and East Anglian Agriculture and Landscape 1100-1900*; Peter Goulding and James Parry, *Sheep in The Brecks* (The Breckland Society, 2017).

stability (See Chapter Seven). The extents of this heathland, as mentioned above were more dynamic than previously thought , with archaeological and earthwork evidence indicating some areas of post-medieval heathland and/or rabbit warren (which would have been of heathland character) had been under arable use in at least the Roman, medieval and post-medieval periods (See Chapters Nine and Ten). This again suggests that during periods of arable contraction, the character of the soils was more conducive to heathland generation than woodland.

Much of the research and source material used in this thesis has been freely available for some time, while others have only been published in the last few years, but the advancements in GIS software to allow the fast marshalling of complex and diverse datasets, as well as the ability to interrogate this data in a range of ways, has allowed questions to be asked at a large scale with relative ease. In addition to this, the more recent completion and availability of high-resolution lidar imagery covering the entirety of Breckland has allowed for the survey of areas that had not previously been investigated by this method. This, alongside the ever-increasing body of aerial photography, revealed a range of features that allowed for new interpretations and insights of the historic landscape to be revealed. In particular, the most significant aspect relating to the medieval landscape to emerge from this study is the recognition of the extent and location of the open fields, which, in a number of cases, were located in areas previously thought to be longer-term heathland and/or rabbit warren. The evidence presented here indicates that this was not the case and that parts of the landscape had a much more dynamic and shifting history than was previously recognised, both for medieval and earlier periods. The apparent hierarchy of preference for arable land in a mosaic landscape of varying soils is also something that has not previously been demonstrated

in the region, and provides a context for why one settlement may choose a particular soil type for their arable, which may be ignored by the neighbouring settlement. The abandonment of parts of this arable land in the later medieval and early post-medieval periods thus means that the tracts of heathland recorded in the region were based upon post-medieval extents in a number of places.

The comparison of archaeological data against the hydrological and geological framework of the region has also allowed for greater insight to be gained into the nature of settlement patterns in Breckland (see Chapter Seven, pages 174-189) and the selection of soil types for historic arable use (See Chapter Ten, pages 342-352). Furthermore, the ability to investigate and compare physical and administrative boundary patterns in the study area has served to demonstrate that the organisation of the landscape right across the study period was attempted to be structured in much the same way as the rest of East Anglia (See Chapter Four). In that sense, Breckland was not viewed from a territorial or administrative perspective as markedly different, and this distinctiveness was only a consideration when it came to the most effective ways to live in and use that landscape, attesting that it was the physical environment that ultimately shaped human interaction with this landscape.

The results of this thesis do not represent a complete picture of the historic Breckland landscape. The scale of this project means that some aspects have been necessarily broad, and this leaves further avenues of investigation open for more focused study. In particular, historic agricultural practices may become more clearly defined and worthy of future review as more and more archaeological investigations and environmental samples become available. Likewise, opportunities to acquire

environmental samples that may provide insight into the wider historic landscape should not be passed up. The Hockham Mere pollen data has been widely referred to in this thesis and serves to emphasise the restricted nature of historic palynological and vegetative data available in this landscape. Any opportunities to acquire this in areas away from the Fen edge should be taken. Further survey of the lidar and aerial photography of the study area would also be worthwhile. Many new earthwork and cropmark features have been noted during this project, some of which have been included in the relevant discussions. However, a number of features have been only noted and, while the details of these will be given for recording on the Norfolk and Suffolk HERs, the interpretation of these features has been limited. Examples of hitherto unrecorded earthworks are shown in Figure 66 and further investigations of these types of features, including their integration into the context of the wider landscape would be worthwhile. In particular, a review of the hitherto unrecorded earthwork features present within the Breckland warrens would potentially help to refine the dating and types of activities taking place within these spaces. Likewise, the quantity of features identified in Breckland suggests that survey of similar landscapes under long-term grassland or woodland in East Anglia and Britain more widely may also be productive, both in identifying features and interpreting these in a landscape history context, particularly where lidar imagery has only recently become available.

A further theme that emerges from the recent archaeological investigations referred to in this thesis is the potential for conflict between the desire to 'restore' areas of Breckland into habitats away from modern pine plantation and the preservation of archaeological and historic landscape features. Williamson has highlighted the destruction that poorly-executed 'rewilding' schemes can have to elements of the

historic landscape, such as hedgerows, which themselves provide their own ecological niche, with the risk that some forms of habitat ‘restoration’ and ‘rewilding’ may amount to little more than land abandonment or the imposition of a particular set of ideas about how the character of a particular landscape should be.<sup>920</sup> The methods by which these areas of heathland habitat are ‘restored’ in Breckland should also be given due consideration in future, with a clear contrast between the methodology employed at Wangford Warren, which only saw the removal of topsoil under a scheme of detailed investigation and recording, and the soil inversion processes used at Hockwold Heath, which effectively destroyed the archaeological horizon without record. It will be of interest to observe the longer-term outcomes of these projects in Breckland and whether the resultant habitats match those which were desired at the outset of works.

Overall, the conclusion must be that climate appears to have played no greater or lesser part in shaping the settlement and land use patterns of Breckland when compared to wider East Anglia and indeed Britain more generally. Providing an answer to this was the core aim of this thesis and the investigations given in this thesis demonstrate the physical environment was the principal factor in shaping the Breckland landscape as a distinct area. The additional, perhaps more significant, benefit of exploring such a range of aspects in order to characterise the region is that this thesis provides an up-to-date landscape history of Breckland, having taken a wide-ranging approach to the source material, interpretations and models of landscape available and presenting them in ways that had not been attempted for the region before, or were previously possible at such a scale. The results of this thesis will help to inform future discussions and work on the

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<sup>920</sup> Tom Williamson, “Rewilding: a landscape history perspective” in *British Wildlife*, vol. 33, no. 6 (2022): pp. 423-429.

region, that, as with previous works on Breckland, may in time be subject to review and revision themselves.

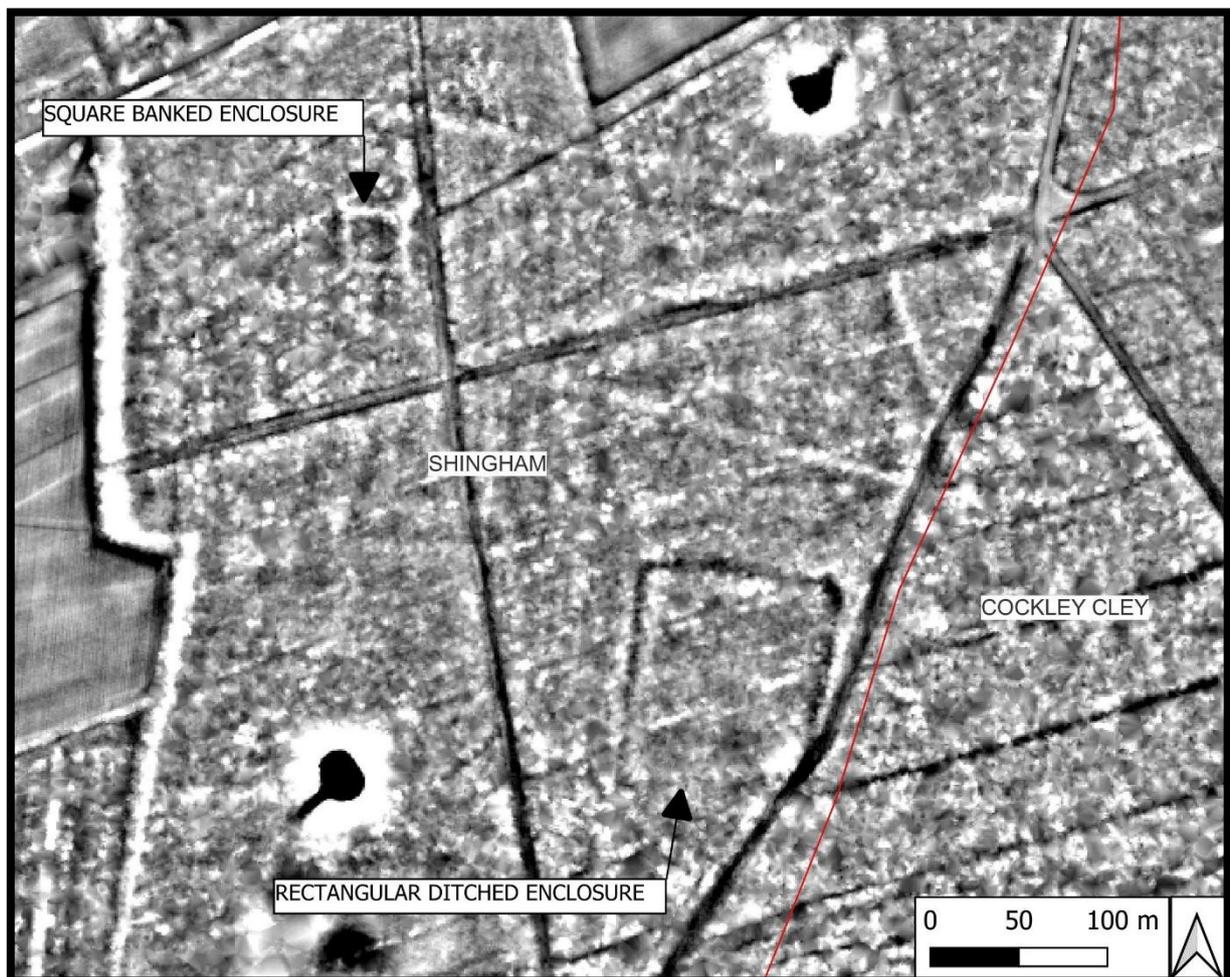


Figure 66: Unrecorded earthwork features revealed on lidar imagery in forestry plantations in Shingham, Norfolk.

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## **Appendix 1: Unpublished Fieldwork reports containing Environmental and Animal Bone reports**

This appendix lists the grey literature reports used to inform discussions in Chapter Nine in relation to historic agrarian and livestock practices in Breckland. Where a report has been directly referenced in the main text, it has been included in the full bibliography. This appendix lists those reports that have not been directly referred to but that contained environmental and/or animal bone reports shown on the distribution map given in Figure 46.

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