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Understanding the chronologies of England's field systems

Robert Johnston, Rowan May & David McOmish

Introduction

In this chapter, we report on a project that collated and reviewed the scientific dating of field systems in England. Bounded field systems began shaping England's landscapes in the early-mid second millennium BC. Enclosure of land and its reorganisation continued with varying temporal and spatial intensities throughout the subsequent four thousand years. It is estimated that field systems now cover at least 70 per cent of England and are the most extensive form of heritage asset in the country (McOmish, 2011; *cf.* Vinter, this volume). By extension, field systems offer an important source for understanding organisation, identity and change within landscapes at regional and national scales.

A total of 393 scientific dates from 120 sites were recorded, derived from a wide variety of field and boundary types, including large-scale land division, and covering all periods from the early Bronze Age to post-medieval (Johnston et al., 2020). The results show that the English landscape was enclosed during later prehistory and that this was an ongoing, though geographically discontinuous process. Based on the analysis of the scientific dates, large-scale apportionment of land into field systems began in the early centuries of the second millennium BC and became more commonplace after 1700 BC. The active apportionment of land and maintenance of field systems may have been interrupted during the period c. 1100–700 BC. Land enclosure re-emerged and extended into new regions during the middle and late first millennium BC. There are few scientific dates from Roman and historic period field systems.

There are a number of biases in the current dataset of scientific dates. The project identified a lack of a consistent recording method for scientific dates both regionally and nationally, severely limiting the dissemination of this information for research and comparative purposes. The nature of development-led archaeology means that most data arises from areas of modern economic activity, leading to an under-representation of uplands and heathlands, where dating is currently poorly understood. Additionally, there is a low number of scientific dates associated with Roman field systems across most regions, whilst post-Roman and medieval fields remain largely inaccessible through scientific dating.

Our chapter introduces the project and the data, identifies the biases that affected the quality and completeness of the data, reviews the dating strategies, geographical distribution and chronological variation of the dates. The conclusion identifies broad patterns in the spatial and temporal distributions of field systems in England. It presents several recommendations for revising dating strategies, the data management of scientific dates and future research directions in the study of field systems.

Project context and aims

The past and present patterns of England's field systems have been surveyed systematically, if not always analytically, across many regions. This field and desk-based research has delivered convincing arguments for the chronological sequence of land enclosure within these regions, based on a combination of relative dating using the physical relationships of landscape features, morphology and typology, map regression (*cf.* Roughley, this volume), and incorporating dates from excavations and proxy sources (such as palaeoenvironmental sequences; *cf.* Vinter, this volume). For example, the current understanding of the relict field systems on the Salisbury Plain reflects a balanced evaluation of a wide variety of sources combined with targeted analytical survey (McOmish, et al. 2002). By comparison, landscape characterisation offers the coarsest resolution and the most reliance on typologies, although it is also the most accessible and widely-used (measured in geographic terms) method for identifying the historic character of field systems (Turner, 2006).

While accepting that there are many strengths to the current understanding of field systems, there are also significant weaknesses. A key one is a lack of secure absolute dates for the formation, use, transformation, and abandonment of the fields and enclosure systems (*cf.* Arnoldussen, this volume). In part this is because until the advent of large-scale rescue projects (typified by Fengate and Mucking (Evans, et al. 2009: 12–14) in a lowland context, and Shaugh Moor in the uplands (Balaam, et al. 1982)) the investigation of field systems was restricted to the localised trenching of a few or maybe only one boundary. Larger scale archaeological investigations, whether across open areas or in corridors, have vastly increased the opportunities for systematically sampling and dating field systems. Alongside this, scientific dating is more widely employed and with much stricter criteria applied to the selection and reporting of samples.

Scientific dating offers an important method for understanding the chronologies of field systems. Scientific dates can be independent of and may be more precise than artefacts and relative dating, however, it is by no means straightforward. Samples for radiocarbon dating are rarely from 'event contexts', as field boundaries do not usually provide the locations where activities happened 'in situ'. Field surfaces themselves were subjected to re-working, soil formation processes, erosion and truncation. Physical boundaries provided important 'traps' for datable material, whether sealed within or beneath banks or incorporated into ditch sediments. This has benefits but also brings challenges. The datable material in boundaries can derive from secondary formation processes such as manuring using midden deposits that have accumulated elsewhere, followed by erosion from a field surface into a boundary. Complex formation processes make it important that all scientific dates are critically evaluated against their contexts, in a technical and an agricultural sense.

Optical Stimulated Luminescence (OSL) dating overcomes some of the problems with radiocarbon methods, yet thus far its use remains relatively limited. OSL has the advantage that it dates sediments and that it estimates an event (the time when the sediment was last exposed to light), which may in turn correlate with an archaeological context – the construction of a bank, for example. On Big Moor, Derbyshire, OSL was used to date the cultivation of the fields to the later second and early first millennium BC (Heath, 2003). Gwithian in Cornwall, where sand overlies the cultivated horizons, is another (Nowakowski, 2009). Additionally, there are important examples of the OSL in northwest European field systems (Arnoldussen, this volume).

The 'Scientific Dates for Field Systems in England' project was completed during 2015-16 in a partnership between Historic England, the University of Sheffield and ArcHeritage, a commercial archaeological consultancy. The project's aims were to: (a) produce a collated list of relevant scientific dates for field systems in England; (b) provide a constructive critique of fieldscape chronologies based on collated scientific dates; (c) recommend methodological enhancements and future research that arise from the project's results. The project assessed the current understanding of the chronology of field systems of all periods in England. The focus of the work was on reviewing known dates for the activity of enclosure for agricultural purposes and aimed to review existing dates for fields of all periods drawn from published and unpublished sources. The intention was that all scientific dates (radiocarbon and luminescence) should be included within the review, with a focus on dates that have been derived from field boundary features such as lynchets, banks and ditches, or similar.

Methodology

Sources

The 'Scientific Dates for Field Systems in England' project recorded 393 scientific dates from 120 excavated sites ('site' refers to the archaeologically investigated area, however large or small) using information from unpublished and published sources. Our starting point was a search of England's regional monument databases (HERs), the national monument database, and several key online sources, including the Council for British Archaeology's database of radiocarbon dates and the Archaeology Data Service. We supplemented this primary search with a review of key bibliographic databases and reviews, such as the British and Irish Archaeological Bibliography, the Archaeological Investigations Project's (AIP) database of grey literature reports, and the period surveys in regional research frameworks. A series of

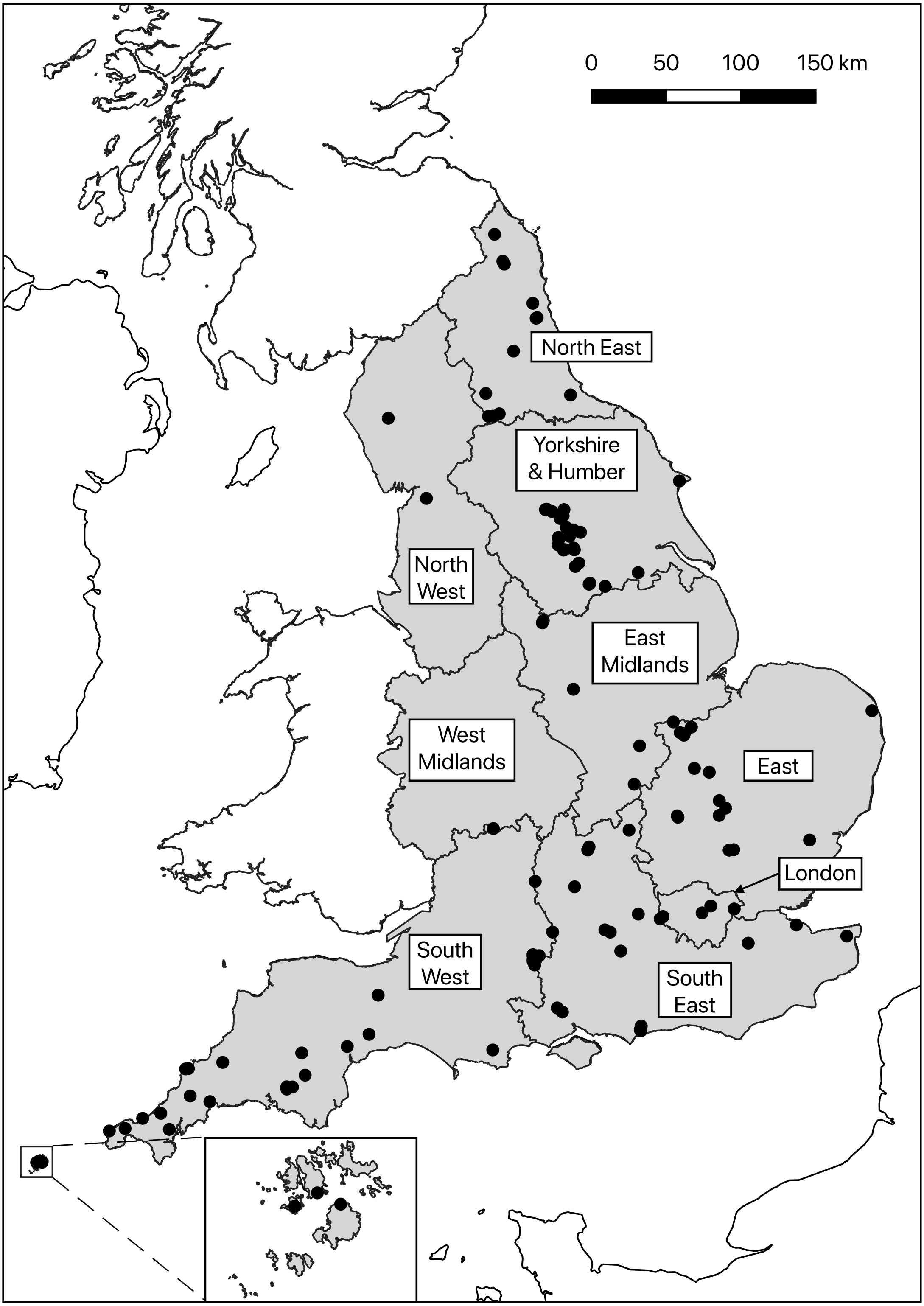

FIGURE 1 – Map showing the locations of the sites and the regions recorded in the database.

research projects relating to fields have been undertaken or were ongoing during the project. These included individual PhD research (e.g. Yates, 2007; Chadwick, 2008; English, 2013; Løvschal, 2014), as well as larger scale research projects undertaken by universities, local government authorities or archaeological consultancies (e.g. Cooper and Green, 2016; Rippon, et al. 2015; Bradley, et al. 2015). Finally, we requested information on unreported sites from over 40 offices of major contracting units that operate in England.

There were predictable challenges with accessing data from some of the project's core sources. The regional monument databases, although immensely valuable, could not provide a comprehensive picture. Given the constraints on local government funding, the HERs have substantial backlogs of sites yet to be entered on their databases. Regional differences in staffing levels and staff time pressures as well as different database packages and the type of information recorded meant that most could not search specifically for excavated sites with associated scientific dates. The recording of scientific dating in the searchable fields of most of our sources was limited. For example, the AIP database only mentioned radiocarbon dating in the summary field for two of the nearly 50 records of projects with field systems.

Database structure

Information gathered during the project was collected in a relational database (Table 1; full dataset available: Johnston et al., 2020). We included locational information in the site table (national grid references and latitude-longitude) so that the distribution of sites could be presented and queried within a GIS (Figure 1). Up to two chronological periods were recorded for each site as there were instances where field systems spanned multiple periods. The 'primary' period was defined by the earliest dates associated with field or boundary-related features. The database used Historic England's thesaurus of monument types to categorise the field systems (FISH, 2020). During analysis, the 'main' monument type was selected as the category most representative of the dated features.

TABLE 1

THE PROJECT'S DATABASE STRUCTURE, COMPRISING FOUR RELATED TABLES AND THEIR CONSTITUENT FIELDS.

1. Site table:	
Site UID	Site name
County	NGR
Easting & Northing	Latitude & Longitude
Date of intervention	Monument type(s) x 2 (based on Historic England's Monuments Thesaurus)

Archaeological period(s) x 2 (based on Historic England's periodisation)	Short reference
Site summary	SMR/HER monument or event no.
2. Dating method table:	
Site UID	Dating method (e.g. radiocarbon, OSL)
3. Radiocarbon date table:	
Date UID	Site UID
Laboratory code and unique sample number	Project sample reference
Type of material dated [defined list]	Description of material
Description of context	Objective for dating sample
^{14}C age	^{14}C error
δ^{-13}C(per cent)	Measurement type [AMS/radiometric]
Calibrated date [to 2 sigma, 95 per cent confidence]	Comment/interpretation
4. OSL date table:	
Date UID	Site UID
Laboratory code and unique sample number	Project's sample no
Description of context	Objective for dating sample
De measurement and error	Total dose rate
Luminescence age	Age error
Calendar date	Date of measurement
Comment/interpretation	

Field system categorisation

Field systems form distinctive and readily observable spatial patterns that make them well suited to categorisation within morphological schemes. It is reasonably straightforward to distinguish field systems according to their relative sizes, the shape of the boundaries (whether straight or curvilinear, for instance), and the ways that they were constructed and used. While there is no single scheme for categorising prehistoric and historic field systems in England, there are recurring, widely accepted terms: e.g. aggregated, coaxial, Celtic, brickwork, assarts, open fields, or planned enclosure. Based on decades of archaeological survey and excavations, most of these categories are ascribed to broad time periods. For example, curvilinear aggregated fields in upland landscapes are predominately classified as later prehistoric. The regular patterns and straight boundaries of planned field systems that

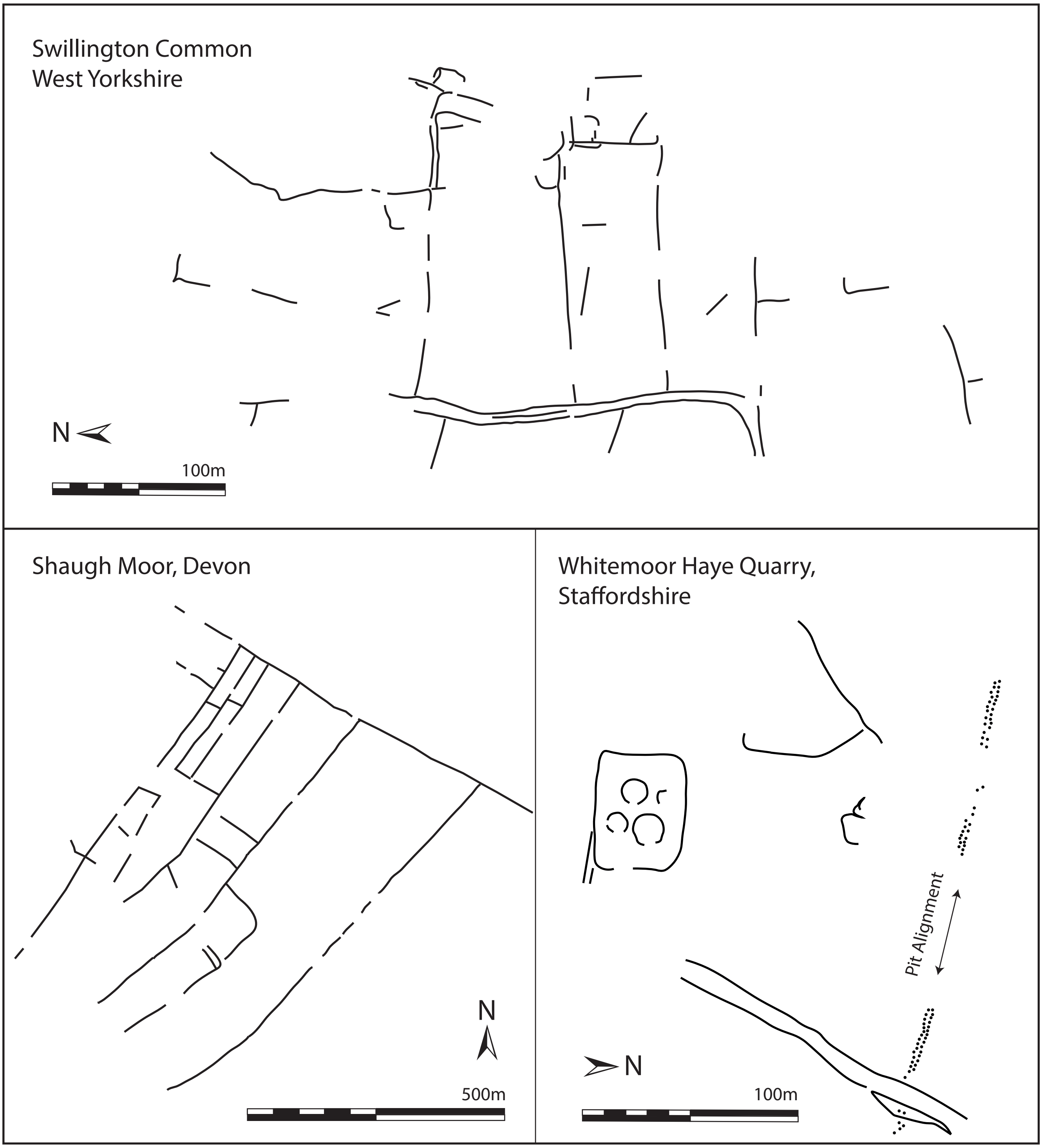

FIGURE 2 – Examples of field system types commonly represented in the database: aggregated (Swillington Common), coaxial (Shaugh Moor/Saddlesborough), linear / pit alignment (Whitemoor Haye Quarry) (plans adapted from Roberts, et al. 2001: 48; Smith, et al. 1981: 210; Coates, 1999: Fig. 15).

continue in use in the present-day were largely created during the 18th and 19th centuries. These categories have been refined further to take account of specific regional and historical processes. An example of this can be found around some villages in Derbyshire and other Midland counties, where the post-medieval enclosure by agreement of open fields created narrow strip fields with distinctive curving boundaries, which preserve the layout and ploughing patterns of the medieval field systems (Hall, 2012). The coaxial field systems on Dartmoor dating to the second millennium BC (termed reaves) are another, much earlier, instance of a field pattern that is a distinctive regional manifestation of a broader, national category (coaxial; Fleming 1978; 2008). The method of Historic Landscape Characterisation that has been applied across England during the last 15-20 years has played a major role in drawing out many of these regional schemes for classifying field systems, particularly medieval and later field systems (Turner, 2006).

While acknowledging the importance of the refined, regionally specific schemes that are available, especially for historic field systems, this project uses a more straightforward and higher-level framework for the data management and analysis. There are two key reasons for adopting this approach: maintaining a sufficient sample size within each category, and ensuring a degree of consistency between regional frameworks. There are too few scientific dates across England as a whole to support a more fine-grained categorical scheme. For example, distinguishing reaves on Dartmoor from other coaxial field systems or between curvilinear and rectilinear aggregated field systems would lead to lots of categories each with few dates. The variability in how different excavation reports, which form the project's primary source of information, apply a variety of terminologies reflected regional and subjective preferences. The term 'Celtic', for example, is widely applied to later prehistoric field systems defined by lynchets on the chalk downland of southern England, which is the region where the label was first coined (Crawford, 1923). Yet 'Celtic fields' also appear in descriptions of fields in County Durham (Bowes Moor field system – site 28; see Appendix for a list of sites) and Cornwall (Gwithian and Stencoose, sites 5 and 59).

There are six types of site in the project's database. They align closely with the types that David McOmish (2011) identifies in his introduction to field systems in England: coaxial/cohesive, regular and irregular accreted (treated as one category in the database – 'aggregated'), formal terraced, open, enclosed and parliamentary fields (Figure 2). Field systems were (and are) not immutable structures in the landscape. They were lived in, cultivated, modified through decades and centuries, and they were shaped as much by natural processes as by social life. Any category applied to a field system will necessarily be reductive and mask variability through time and space. In many coaxial systems, for instance, the primary spinal boundaries or trackways create wide strips that are infilled with aggregated patterns of smaller fields. Given the potential variability within a field system and the large areas they cover, it can frequently be difficult to assign a category to an excavated field system. In some cases, the definition of the fields is limited by a lack of sufficient detail exposed in the excavated areas. In other examples, formation processes have affected the preservation of boundaries, such that only fragments of individual boundaries are visible. These are common limitations with the project's dataset, and the types 'field boundary' and 'uncategorised' are, combined, the most common site type.

Dating methods

Three dating methods were recorded during the project, with the most commonly used being radiocarbon dating, with OSL occasionally used, and one instance of thermoluminescence (TL) dating. We calibrated all the radiocarbon measurements collated during the project using the OxCal (version 4.2) and the IntCal 13 radiocarbon calibration curve (Bronk Ramsey, 2009; Reimer, et al. 2013). The dates are quoted at 2 sigma (95 per cent) confidence, and to avoid a false perception of precision, the dates were rounded outwards to 10 years, or 5 years where the error is less than 25 years (following conventions described in Bayliss & Marshall, in prep.). There are currently no set specifications for the reporting of luminescence ages (Duller, 2008). We only included limited measurement data in the database: the D_e measurement and the luminescence age. Calendar years have been calculated from the luminescence age and error range and rounded out to the nearest 10 years. In many cases the measurement year was not recorded and this has been estimated based on publication date.

Biases

There were biases affecting the completeness and representativeness of the database. A primary factor was the difference in responses from regional monument databases, their levels of recording scientific dating information and the extent to which their data was up-to-date. Our consultation with contracting units was intended to address HER bias, but only a small number of units responded positively to our requests. The poor response rate provided its own skewing factor. For example, the large number of sites recorded from Cornwall (southwest England) and Cambridgeshire (east) partly reflects the considerable assistance provided by the Cornwall and Cambridge Archaeological Units (although many excavations of field systems in these counties were also identified through searches of publications).

We also found biases created by the uneven distribution of infrastructure and housing development and aggregate extraction. The rise in development-led excavations has greatly increased the available information on field systems, but it is driven by modern economic activity rather than research priorities. The corollary of this is that regions where modern development is limited or small-scale are poorly represented in the data. This includes protected areas such as national parks and Areas of Outstanding Natural Beauty, where most field systems have been recorded through survey and dated on morphological or stratigraphic grounds.

The precise dating of land enclosure is not seen as a research priority in some regions, which results in further local and regional biases. We identified several projects where excavated field boundaries were treated as the lowest priority for scientific dating, at least partly due to difficulties in obtaining datable samples. The availability of suitable samples also creates regional biases, with well-preserved, often waterlogged features in the southeast and east of England providing a greater number of secure dates than the more limited survival of remains on well-drained sands and gravels in the Midlands and north. Period bias is marked by an over-representation of later prehistoric dates (second and first millennia BC) and very few dates from Roman to post-medieval periods (AD 43-1900). This is often due to a reliance on artefactual material for dating later periods.

Dating methods and materials

The majority of the scientific dates were derived from radiocarbon analyses (380), with a small number of OSL dates (12) and one instance of a TL measurement. Most of the 380 radiocarbon dates recorded during the project were dated by AMS measurement (77 per cent). This reflects the appropriateness of AMS for dating small, single-entity, samples such as charcoal fragments, individual bones and plant macrofossils. Radiometric dates (21 per cent) are more common for older projects, prior to the development of AMS dating in the 1980s, although radiometric dating was utilised by more recent projects for sediments such as peat or larger pieces of waterlogged wood.

Projects chose a variety of materials for dating, with charcoal being the most common, followed by plant macrofossils (grains, seeds, nutshells and fruit stones), waterlogged wood and carbonised residue on the interior of pottery sherds. Animal and human bones were also dated, with the relatively low numbers perhaps reflecting the difficulties in establishing if the bone was residual or contemporary with the use of the boundary. Articulated bones should be more reliable as they are unlikely to have moved from other, older, deposits. That said, anomalies do occur, as at Lynton Way, Sawston, where bone from a partially complete dog skeleton from a pit cutting (and therefore younger than) an enclosure ditch returned a date older than the ditch (Weston, et al. 2007). Groups of similar bones, possibly from the same animal, were found in three deposits within the ditch.

A minority of the dated material comprised organic sediments (peat) and two humic acid samples – the latter were both from waterholes investigated during the Heathrow Terminal 5 excavations and returned results that were significantly different from waterlogged wood in the same features (site 85; Appendix I). Peat has primarily been used for dating stone or earthwork boundaries, reflecting the predominance of upstanding field boundaries in moorland areas (where peat is a common). The excavators interpreted the dates from peat underlying boundaries as providing *terminus post quem* (TPQs) for the field boundaries. Occasionally, peat was sampled from within ditches, and it is generally assumed to provide a *terminus ante quem* (TAQ) for the boundary. The database includes four dates on sediment used to date soil horizons, including material accumulated within ard cultivation marks cut into a buried soil (Lafone St, Southwark – site 72; Appendix I). In some cases, the soil horizons are difficult to relate to the field boundaries they are dating, as at the Coach and Horses Earthwork on the A66 excavations (site 29).

Dating strategies

The majority (85 per cent) of the 120 sites provided small numbers (five or fewer) scientific dates for field boundaries. Of these, just over half provided 2 to 5 dates (46 per cent of total sites), with 36 per cent of the total sites recorded in the project providing only one date directly associated with a boundary. Some of the low figures represented small sites uncovered during corridor investigations, such as road and pipeline schemes, where only the limited extents of boundary features were excavated (e.g. the Asselby to Pannal pipeline in North and West Yorkshire, sites 9–17; Appendix I for site details). Other factors affecting the low numbers of dates are a lack of suitable samples for dating, and excavators' decisions to prioritise artefactual chronologies and only use scientific dating as an additional test. The proportions of sites with 6 to 10 (8 per cent) and 11 or more (7 per cent) dates represent the minority of scientifically-dated field systems. These are mainly large area excavations undertaken in advance of development or quarrying, such as Perry Oaks (Heathrow Terminal 5; site 85), Bestwall and Huntsman's Quarries (sites 4 and 76) and Sewerby Cottage Farm (site 94). The only small-area project with over 11 dates is Gwithian (site 5), which is a long-term research and rescue excavation from the mid-twentieth century that was reassessed in the early 2000s.

Many of the dates associated with field ditches derive from material from slow infilling or deliberate backfilling deposits, and can only be used to date the end of use of the field systems rather than their constructions or periods of use. In some cases, burials or cremations inserted into ditch fills have been dated, their locations indicating that the ditch was still a visible feature in the landscape, though possibly infilled to the extent that it no longer formed part of a working field system. Ditches may have had associated banks, fences and hedges, which have subsequently been lost through post-depositional erosion and destruction. At the Elliott site, Fengate (site 64), waterlogged hedging material and stakes dumped in a pit pre-dated any of the dates from the Fengate field and enclosure ditches. This was assumed to be material associated with field boundary hedges, and may provide information on the early development of the field system, though the relationship remains unproven and the dates are significantly earlier than those from ditch fills (Evans, et al. 2009). In many cases, ditches were cleaned and recut over a long period of time, which can add further complications to dating the origin of the field system. At Old Rydon Lane, Exeter (site 106), the field ditches did not appear to have been kept clear and were thought to have been dug for material to construct hedge banks running alongside, with a later episode of recutting perhaps associated with strengthening of the banks.

In southern England, dating of waterholes has been increasingly undertaken to date associated field systems where the ditch fills contain low quantities of artefactual and ecofactual material. The waterholes may have direct association with field boundaries that cut, were cut by, respected or were respected by them, and waterlogging of the fills has the potential to preserve material suitable for single-entity sampling (for example, at Heathrow Terminal 5; site 85). Material such as wooden stakes from revetments can give accurate dates for the construction of the waterholes, although these may only provide a date for before or after an associated field ditch was dug. At Huntsman's Quarry, Kemerton, dating of waterholes and settlement remains suggests that the Bronze Age fields may have been laid out c. 100 years before settlement was established within the field system (site 76). This has implications for the interpretation of other sites, since the physical proximity of field boundaries and domestic structures need not mean that they had contemporaneous origins. Scientific dating of earth or stone banks has been undertaken at 21 sites, representing 5 per cent of the sites recorded in the database. Earthwork field boundaries survive in landscape zones, such as upland and heathland, where there has not been historic cultivation and intensive grazing. These are areas largely outside zones of modern development and aggregates extraction and so rarely become the object of development-led excavation. Most earth and stone field boundaries were radiocarbon dated using charcoal or sediment samples, with only one instance of a charred grain and two dates on waterlogged wood from stakes forming part of the boundary feature.

Radiocarbon dates from old land surfaces underlying stone and earth banks provide TPQs for a large proportion of the dates from sites. At Big Moor (site 2) dates from a pit sealed by a bank were unexpectedly early (Mesolithic), and therefore unhelpful in dating the bank. Some dates have been taken on sediment overlying or adjacent to earthworks, providing TAQs for their construction and use. The problem with TAQs is illustrated at Simy Folds (site 96), where samples were taken from a slag heap overlying a boundary wall and hearths within two buildings which were built on top of another boundary. These provided early medieval dates. On the basis of pottery sherds found during the excavations and a radiocarbon date from another building, the excavators thought it possible that the boundaries were significantly earlier, possibly prehistoric, and reused to house a small settlement in the early medieval period.

Most luminescence dates were associated with earth or stone boundary features (nine of the 13 dates, from three sites). These dates were on samples taken from buried surfaces underlying banks (at Shovel Down; site 45), deposits accumulated within a stony boundary (at Big Moor; site 2), or wind-blown sand deposited between periods of cultivation (at Gwithian, site 5). At Big Moor (site 2), two of the dates from the core of the bank and overlying accumulated colluvium were stratigraphically consistent, but two others from the later sediment were anomalously early and probably relate to the geomorphological formation of the sediment (Heath, 2003). Both samples were low in the profile of the outer edge of the bank and close to the old land surface, and they may have been insufficiently bleached during deposition through solifluction. At Gwithian (site 5), both radiocarbon and OSL dating were used to refine the chronology of a series of occupation and agricultural deposits, interleaved by wind-blown sand layers. The OSL dates for two sand deposits separated by a ploughsoil deposit were broadly contemporary with radiocarbon dates from carbonised residue on pottery sherds from occupation/cultivation horizons, and were consistent with each other within 1 sigma errors, but the lower deposit (layer 6, Aber-101 GWT-6 3360±160a, 1515-1190 BC) returned a more recent date than the upper deposit (layer 4, UID 1379, Aber-101 GWT-4 3650±160a, 1805-1480 BC). This anomaly, despite the relatively high precision of the dates, was interpreted as being due to rapid deposition of sand, with only a brief period of stabilisation in between, due to cultivation.

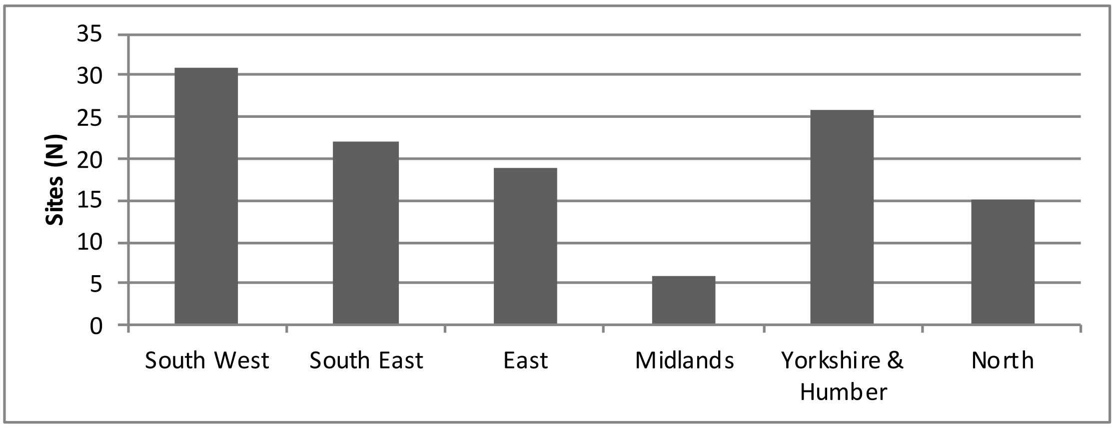

FIGURE 3 – Chart comparing the numbers of scientifically-dated sites by regions.

Geographic variation

While affected by some data collection biases, the distribution of sites recorded during the project reflects patterns of both excavated field systems and scientific dating across England. In order to give an indication of the reliability of the coverage of scientifically dated fields, a comparison was made between the collected scientific dates and the distribution of excavated or evaluated field system sites reported by AIP (1990-2010). For the thirteen counties with no scientific dates in the database, nine also have either no or fewer than five projects with associated field systems on AIP. The remaining counties, which have five or more projects on AIP, are Nottinghamshire, Shropshire, Suffolk and Warwickshire.

The spatial distribution shows a significant lack of scientifically dated field systems in the Midlands region, with only eight sites recorded (Figure 3). Relatively few field-related projects are recorded in AIP for the western and central Midlands (Merseyside, Cheshire, Derbyshire, Staffordshire, Shropshire, Worcestershire). It is surprising that few scientifically dated sites have been recorded from Nottinghamshire and Lincolnshire, where ditched field systems are a common feature recorded during sand and gravel quarrying. Only one site with scientific dates was identified from Lincolnshire and no scientifically dated examples are known from Nottinghamshire. Ongoing quarry projects may be a factor here, with post-excavation analysis and full publication sometimes awaiting the end of staged phases of excavation. A backlog of publication of sites was previously noted in the East Midlands Resource Assessment (Cooper, 2006). The low numbers of dates from Northamptonshire fields is also important, as the HER records at least 27 excavated sites with field-related features, though only two of these have associated scientific dates (sites 100–101). Local contracting units reported that dating of fields in this region is mainly achieved through artefactual material and stratigraphic relationships.

The larger number of projects from Yorkshire and Humberside is partly a result of access to data, with West Yorkshire being one of the few HERs which has searchable scientific dates, and partly a consequence of large-scale linear excavation projects with several scientifically-dated field-systems (e.g. the M1-A1 link road and the Asselby to Pannal pipeline; Appendix I sites 9–17). The region is well-known for its extensive later prehistoric and Roman field systems (Chadwick, 2008). The lack of datable artefacts in many prehistoric to Roman field ditches in this period is also a factor in the number of scientific dates. Scientifically dated sites in the East region are dominated by Cambridgeshire (including Peterborough), where good preservation of field boundaries and waterlogged deposits have combined with large-scale quarrying and development projects and a strong research agenda relating to Bronze Age field systems. This pattern is also reflected in the AIP data, where Cambridgeshire has 50 more relevant project reports than any other county. Further to the east there are few dated sites, with only one dated site recorded in Norfolk. This pattern was noted by Yates (2007, 81), who identified no sites with scientific (or artefactual) dates for Bronze Age fields from Norfolk, although information from Norfolk HER suggests that scientific dating of field system is being undertaken on at least two sites that are yet to be published.

In the South East, 22 sites have been scientifically dated, particularly in the Thames Valley, reflecting the location of large-scale development and quarrying projects as well as good preservation of buried archaeology. This includes a cluster of sites to the west of

London, in Berkshire. Within Greater London, three smaller sites with evidence for field systems or stock enclosures have associated scientific dates. Relatively few sites from Kent have been recorded. Although Kent HER were unable to provide any data, three sites were identified from local journals and publications, mainly concentrated on the east coast, near Sheppey. Along the southern coast, there are two clusters of dated sites around Bognor Regis and Southampton.

Thirty-one sites have been recorded in the South West, particularly in Cornwall. In Devon, the majority are on Dartmoor, principally from the Shaugh Moor rescue project (Appendix I: sites 40, 42–44), with a recent increase in scientifically dated ditched field systems in areas outside the moors. In Cornwall, the scientifically dated sites are spread relatively widely and many derive from recent development-led projects. Several sites have also been recorded on the Isles of Scilly – generally research and rescue excavations associated with field walls exposed by coastal erosion. The only relevant sites identified in Wiltshire were from the Wessex Linear Ditches Project (sites 107–113), mainly dating large-scale land division, although a pit alignment and field boundaries pre-dating the linear ditches were also investigated.

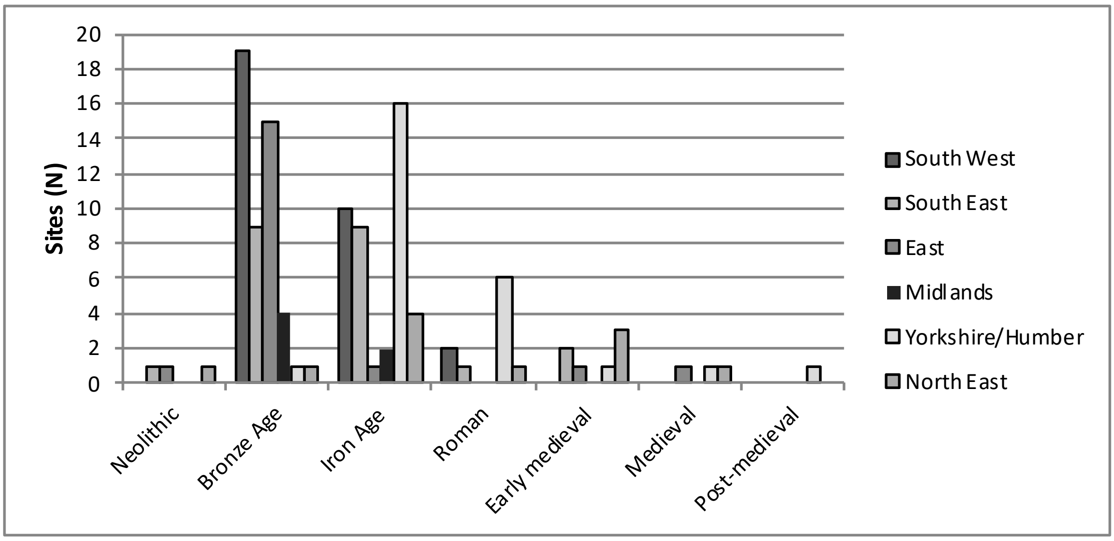

FIGURE 4 – Chart comparing the numbers of scientifically-dated sites by regions and the primary periods recorded in the database.

Chronological variation by region

There were clear regional differences in the main periods to which fields and linear boundaries have been scientifically dated (Figure 4). In the South West, Midlands and East regions, Bronze Age dates (2300–700 BC) dominate the dataset, with sites which have the Bronze Age as the primary dated period representing between 61 per cent and 83 per cent of dated sites. The pattern in the South East is different, with Bronze Age and Iron Age sites each forming 41 per cent of the dataset. In the Yorkshire and Humber and North regions, there are much lower proportions of dated Bronze Age sites, between 4 per cent and 7 per cent.

The Iron Age (700 BC–AD 43) is the most common primary period of field systems in the Yorkshire and Humber region (61 per cent), and forms a significant portion of the dates from all regions apart from the East, ranging from 27 per cent in the North to 41 per cent in the South East. The high proportion of Iron Age dates from Yorkshire in part reflects a general lack of artefacts from Iron Age field ditches in this area, with scientific dating providing the only means of establishing a chronology for the features. Yorkshire is also the region with the greatest proportion of sites with Roman dates (23 per cent), with no other regions having greater than 7 per cent of dates, and the Midlands and East regions having no scientifically dated sites from the Roman period (AD 43–450).

Early medieval dates (AD 450-1066) are more common than medieval dates (AD 1066-1485) in all areas apart from the North, and generally range between 4 to 9 per cent, with no dates from any medieval period in the Midlands and South West. In the North, the medieval and early medieval periods combined make up just over half of the sites. The North and Yorkshire and Humber regions also have the widest spread of dates from different periods, each having examples of all but one of the period categories. The only site where the primary dated period is post-medieval is from the Asselby to Pannal Pipeline, North Yorkshire, where two presumed Iron Age ditches gave consistent post-medieval dates and are thought to be associated with an 18th-century enclosure (site 9).

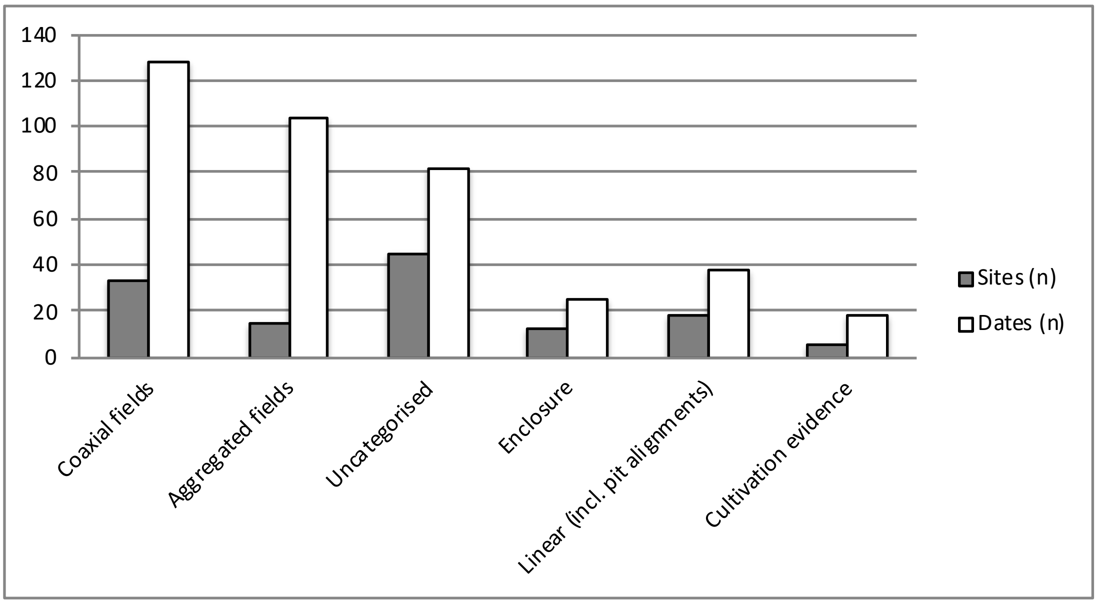

FIGURE 5 – Chart comparing the numbers of sites and scientific dates within each category of field system.

Chronological variation by type (Figure 5)

Aggregated fields

Aggregated field systems developed piecemeal, without adherence to an axial alignment or through the application of a predefined plan over a large area. They can be comprised of irregular, curving and sometimes discontinuous boundaries, or more regular, rectilinear arrangements of fields. The enclosed fields are often less than 0.5 hectare, and a field system may only cover a relatively small area (a few hectares). Some of the most impressive examples of later prehistoric aggregated field systems can be found on the granite moorland of Devon and Cornwall: Bodmin Moor, Dartmoor and West Penwith (Johnson & Rose, 1994; Newman, 2011; Herring, et al. 2016). Processes of piecemeal, aggregated enclosure appear to have continued throughout much of the last 4000 years, with regular and irregular aggregated fields found alongside settlements of later prehistoric through to medieval date in many areas.

The project database includes 104 scientific dates from 15 sites that are categorised as aggregated. The earliest dates calibrated to the first half of the second millennium BC and are from both upland and lowland landscapes in southern England and the Midlands. At Eaglestone Flat (site 35), a group of cremation burials were excavated alongside the stone boundaries of a fragmentary field system. The TPQ for the boundaries (based on charcoal underlying the banks) is c. 1900-1600 BC, with a TAQ of 1700–1300 BC. The two radiocarbon dates from peat below a field wall on Stannon Down (site 39) provided a TPQ for the boundary of c. 1700–1500 BC. A stronger group of dates are available for the first phase field system at Bestwall Quarry (site 4). These are from carbonised residues on pottery, short-lived, identifiable charcoal and charred seeds. The dates provide a period of use for the ditches in 2000–1500 BC, with a more likely range of 1750–1500 – an early date from residue on a sherd of Beaker pottery has a very wide error range and may be residual in the ditch. The dates from the first phase field systems at Bestwall Quarry are similar to those from Gwithian (Cornwall), where the earliest phase of settlement with a terraced field system (layer 8) is dated to 1890–1620 BC. However, this based on one date and the other two dates from this phase were interpreted as too late, and the result of intrusive material.

There were subsequent phases of aggregated fields at both Bestwall Quarry and Gwithian. At Bestwall Quarry, the majority of dates (12) fall within 1750–1300, with the second phase of field systems dated to 1500–1300 BC (three further dates are interpreted as later material deposited in the upper fills of still visible ditches). A similar range is covered by the dates from Big Moor (site 2) and the farmsteads at Terminal 5 Heathrow (site 85). At Gwithian, the latest phase of fields (layer 3) spans 1400–900 BC, making it one of the few field systems to provide scientific dates that span the second and first millennia BC.

A second cluster of aggregated field systems are dated to the second half of the first millennium BC: North Rigton (site 14), Lockington Quarry (site 99) and Great Doddington (site 100). In all three cases, the TAQs for the field systems are pre-Roman. Only Lockington Quarry has material evidence of occupation continuing into the Roman period, although this is not visible in the radiocarbon chronology. Following this, there are isolated dates in the Roman period for aggregated field systems at Stencoose (site 59) and Ashville Trading Estate (site 48). At Bowes Moor (site 28), a sequence of four dates associated with an aggregated field system span AD 30–1160. However, the dates are from organic-rich horizons within the field soil: a thin buried A-horizon and an overlying peat. These dates provide a TAQ for the construction of the boundaries.

Coaxial fields

Coaxial field systems have dominant alignments that structure the development of the fields. These axes may continue for hundreds of metres and in many cases can be traced across several kilometres of landscape. Andrew Fleming (1978) mapped a continuous coaxial field system covering 3000 ha and 6 km in length around Dartmeet, Dartmoor (Devon). Coaxial field systems are not attributable to a specific period in time. Coaxial field systems in southern England originate in the middle and late second millennium BC (Yates, 2007). Iron Age and Roman coaxial landscapes are recognised in the East Midlands and northern England (Chadwick, 2008), whilst coaxial boundaries have been shown to structure landscape development from later prehistory into the Middle Ages, for example in west Cambridgeshire (Oosthuizen, 2003).

There are 128 scientific dates from 33 sites categorised as 'coaxial' in the database. These include field systems that were categorised as cohesive, brickwork and rectilinear. In broad terms, the scientific dates support the wide chronology for coaxial field systems that is proposed in Fleming's (2008, 159–86) review, as they span the second millennium BC to the first millennium AD. There were notable intensities and lacuna within this time span.

The earliest dates for coaxial field systems are from Shaugh Moor and Holne Moor (sites 40–44), Elliott Site, Fengate (site 64), and Thanet (site 67); these pre-date 1700 BC and some have a calibrated range pre-dating 2000 BC. In most cases, there are reasons to question whether the dates provide a credible estimate of the period when the field boundaries were built and in use. With one exception, the dates from boundaries on Shaugh Moor and Holne Moor are all TPQs from bulk peat samples and charcoal. The exception to this is a wooden stake recovered from the boundary ditch on Shaugh Moor, which is interpreted as the remains of timber fence that formed the first phase of the boundary. The calibrated radiocarbon date is 1890–1430 BC (site 40). Of similar character, the earliest dates from Elliot Site, Fengate, came from worked wood in a pit with hedge material and stakes (site 64). They calibrate to the final centuries of the third millennium BC. The three dates from the field system at

Monkton Road, Thanet (Kent, site 67), are tightly grouped within c. 1900–1700 BC, and appear to provide a reliable estimate for activity contemporary with the early infilling of the ditches.

The majority of second millennium BC coaxial field systems fall after 1600 BC and before 1000 BC. These include Clay Farm (site 78), Colne Fen (site 57), Castle Hill (site 89), Heathrow (site 85) and Kemerton (site 76). At Edgerley Drain Road, Fengate, the dates were on samples in pits in stratigraphic association with the field boundaries. The most reliable of these (1640–1440 BC – site 68) is on bone from a cow burial that post-dates the infilling of the boundary. The duration of the chronologies for the second millennium BC coaxial field systems is closely correlated with the numbers of scientific dates from each site. Clay Farm, Colne Fen, Tower's Fen, and Castle Hill have relatively short chronologies based on the scientific dating – a couple of centuries after 1500 BC – and these are based on only two dates from the same or associated features in most cases. By comparison, the chronologies for Newark Road (site 80), Cranford Lane (site 95) and Kemerton (site 76) are longer (up to 1700–1000 BC), and based on 11 to 14 scientific dates from each site.

Of the 27 coaxial field systems, only two have chronological boundaries that lie predominantly within c.1000 and 500 BC: Cranford Lane (site 95) and Trenowah (site 50). At Cranford Lane, there are two dates from a well within the field system that are interpreted as the latest use of the field systems during 800–600 BC. At Trenowah, there are two Early Iron Age dates from an infilled boundary ditch, c.800–400 BC.

The chronology of the field systems at Trenowah spans the first millennium BC, and may continue into the Roman period. It is one of nine coaxial field systems that are dated within 500 BC–AD 900. With the exception of Trenowah and Tremough (site 49) and Wrotham Quarry (site 90) these are all in the Midlands and North, from Lincolnshire to County Durham, and with the majority in South and West Yorkshire, in an area recognised as rich in later Iron Age and Roman field systems (Chadwick, 2008). The concentration of coaxial field systems of this date in the North and Midlands primarily relates to the lack of material culture, specifically ceramics, from excavations. This makes scientific dating the only tool for establishing chronological frameworks.

One coaxial field system has provided post-Roman dates: Ravock (site 30). At this site, the medieval and post-medieval dates from a lens of soil in a boundary and from peat overlying another boundary do not correspond with the excavators' interpretation of the boundaries as much older and possibly prehistoric.

Linear land division (including pit alignments)

The category of linear land division includes linear banks and ditches covering long distances, as well as pit alignments that do not appear to be associated with a ceremonial function

(Wigley 2007). In the South West region, it has been noted that pit alignments and linear ditches combined to form larger landscape divisions, possibly representing different ways of marking the same boundary perhaps in areas of different ground conditions and topography (Fitzpatrick, 2007).

There are 35 dates from 16 linear boundaries (including six pit alignments) within the database, spanning 1400 BC to AD 600. The linear banks and ditches dated by the Wessex Linear Ditch Project (sites 108 to 113) fall largely between 600-100 BC. One date from animal bone at Weather Hill (1220-800 BC) is interpreted by the excavators as residual, whilst a late date from a deliberate deposition in one of the Sidbury Double Linear Ditch terminals appeared to indicate that the feature remained prominent over a long period. At Ardleigh, Essex, a series of dates on a pair of ditches span 1490-830 BC; these ditches were interpreted by the excavators as more characteristic of large-scale linear land division rather than field boundaries, although only a limited portion of each was recorded. The only post-Iron Age date comes from the Wether Hill site at Ingram Valley (site 117) but this was considered to be a TAQ, derived from peat formation in the base of the ditch, and cannot be considered reliable. A date from turf sealed by the associated bank dated to 400-40 BC.

Of the six pit alignments included in the dataset, only two have multiple, stratigraphically related dates. At Holmfield, West Yorkshire, the pits were dug around c. 40 BC–AD 50, with subsequent human burials inserted during the 1st century AD (site 24). The dates from three pits at Redscar Wood (site 73) span the 1st to 6th centuries AD. The dates from within each pit were consistent with each other, and those between two pits were also similar (Roman), though the dates the third pit were 5th to 6th century AD. This was interpreted as representing either maintenance of the boundary over a long period of time, or two phases of boundary construction.

Single dates from individual pits were taken from site WWBP on the A1[M] Darrington to Dishforth road scheme (site 22), South Elmsall (site 7), and Haxton Down (site 112). All of these fall into the range 400-150 BC, though the differences in dates from the sites with multiple determinations indicate that single dates cannot be taken as definitive dating of pit alignments.

Uncategorised boundaries and field systems

There are 45 scientific dates from uncategorised boundaries and field systems that were collected during the project. Considering the broad chronological distribution of these dates, 13 sites fall within the Middle Bronze Age, four in the Late Bronze Age, 14 in the Iron Age, six in the Roman period, two post-Roman, and six medieval or later.

This distribution of dates is broadly consistent with the pattern from the categorised field systems, most notably with a gap in the Late Bronze Age/Early Iron Age (c. 1000–600

BC). The four sites in the Late Bronze Age/Early Iron Age period mainly have single dates. These include a short stretch of L-shaped ditch at Priors Hall (site 101) and Shrubsoles Hill (site 55), where the date is from an enclosure cutting an earlier field ditch system. The date from Dairy Lane (site 91) comes from unspecified mixed fragments of charcoal from various levels within the ditch fill of a system thought to be Middle Bronze Age on the basis of associated pottery, and must be considered dubious, and at Shotton Village (site 74) the only date is from alder charcoal from the fill of a ditch forming part of a T-junction.

A small number of uncategorised sites produced early medieval (post-Roman) and medieval to post-medieval dates. The segmented, curvilinear ditches at Newton Bewley (site 66) returned early medieval dates, as did a ditch at Vicarage Lane, Romford (site 71), which appeared to have performed both field boundary and drainage functions. A ditch at Whitelands Farm (site 102) was on the same alignment as Iron Age and Roman field ditches but contained Anglo-Saxon pottery consistent with the radiocarbon determination. Four dates from three presumed Iron Age ditches at Rigton Bank (site 15) returned consistent early medieval dates, but were considered to be from intrusive samples. Early medieval dates for activity within stone-built field and enclosure boundaries at Simy Folds (site 96) related to structures overlying the field boundaries and provide a TAQ, though the excavators thought the original boundaries may have been prehistoric, possibly Bronze Age in date.

Medieval dates were obtained from a fenced boundary and coppiced brushwood exposed by peat erosion in the Seathwaite Valley (site 46), and from a probable field boundary ditch at the GlaxoSmithCline U–Building site (site 118). Ditches creating a funnelled droveway, probably for bringing sheep or cattle from common ground to ditched enclosures at Lancaster University (site 84) also returned medieval dates, supported by pottery. Stock enclosures and field boundaries of early medieval to medieval date suggested two phases of occupation at Boundary Lane, Whittonstall (site 79), from the 8th to 9th century and 11th to early 12th centuries AD. This was rare evidence for agricultural activity from this period in the North Pennines. Only one ditch was scientifically dated to this period, with a post-medieval date recovered for another boundary phase.

Two post-medieval dates were obtained from parallel rock-cut ditches excavated on the Asselby to Pannal pipeline (site 9), and these were interpreted as 18th-century enclosure boundaries. Post-medieval dates derived from human bones from two separate ditches at Normanton (site 8) appeared to be intrusive in the contexts, although the similarity of dates suggested that they may have derived from a post-medieval boundary seen crossing the site on historic mapping, which was not visible archaeologically perhaps due to geological conditions.

Discussion and conclusions

Historical narratives

The project recorded 393 scientific dates from 120 sites, with dates covering a variety of different field and boundary types, as well as large scale linear land division, and from all periods ranging from the Early Bronze Age to the post-medieval. The results confirm that bounded field systems appeared in the English landscape during the first quarter of the second millennium BC and subsequent enclosure was an ongoing, geographically discontinuous process.

Large-scale apportionment of land into field systems began in the early centuries of the second millennium BC and became more commonplace after 1700 BC. This revises the long-held chronology of Bronze Age field systems, which placed their inception at around 1600/1500 BC – the Middle Bronze Age (English Heritage, 2012; Yates, 2007). While individual excavation narratives have noted potential Early Bronze Age origins for field systems, the scientific dating indicates that large-scale land enclosure should be recognised as a phenomenon of the early and middle second millennium BC.

A further important insight from the project is that the active apportionment of land and maintenance of field systems was possibly interrupted during c. 1000–600 BC (the Late Bronze Age and earliest Iron Age). This hiatus was observed uniformly across all categories of field systems and throughout the country in the project's data. The scientific dates from linear boundaries do not fill this gap in the chronology. It is recommended that future research seeks to test this observation that there was a hiatus in land enclosure during c. 1000–600 BC.

There is a general low number of scientific dates for Roman field systems across most regions, while post-Roman and medieval fields remain largely inaccessible through scientific dating. Even at sites where there have been strong scientific dating programmes, these have tended to focus on early periods, with later features dated through artefactual material or stratigraphic relationships. Roman, medieval and later landscapes are poorly served by scientific dating, and this is rarely addressed in regional research frameworks. Recent research has suggested that there is a strong case for continuity of field systems from the Roman periods onwards in some areas (Rippon et al., 2015; Oosthuizen, 2013), and further scientific dating from these periods could assist in refining these chronologies and understanding these processes.

Methodologies and data standards

There are a number of biases in the current dataset of scientific dates, many arising from the difficulties in locating information on projects with scientific dating programmes through HERs and online data repositories. Although more information is now available online, including grey literature reports, it is rare for scientific dating to be recorded in searchable fields. The project has illustrated the requirement for standardised reporting of scientific dates in grey literature reports and publications. This is important, as missing information was frequently found, and this affects the usability of the measurements for appraisal or reassessment of the reliability of the dating. The current lack of regional or national records of scientific dates hinders the potential to undertake wide-scale research or to find comparative dates for excavated sites. A clear strategy for recording and flagging this information, ideally on a national basis, would be an invaluable research and dissemination tool.

Geographical biases within the data occur due to the nature of development-led archaeology. Most data arise from regions commonly subject to urban expansion, quarrying and infrastructure projects. There is an attendant under-representation of more marginal and upland areas where the majority of fields are recorded through aerial or topographic survey, with dating poorly understood. Features such as the Dartmoor reaves remain poorly dated despite their significance and long history of research. Consequently, we recommend that research funding should be targeted on investigations into field systems in such areas, with provision made for adequate scientific dating programmes.

Regional priorities and research agendas influence the scientific dating of field-related features. This is partly period-based, with most regional resource assessments mentioning the desirability of scientific dates for prehistoric fields, but few considering this a priority for post-Roman or later field systems, even where it is recognised that artefactual dating is limited or problematic. The decision to employ scientific dating is influenced by a variety of factors, including funding, the availability of other sources of chronological control, particularly material culture and stratigraphic information. This means that scientific dating is most prevalent where pottery, particularly, is scarce or ceramic chronologies poorly refined.

The impact of different sampling and dating strategies can be significant. For coaxial field systems, there is a correlation between the numbers of dates taken for sites and the length of the chronology for the field system. Higher numbers of dates taken tend to correlate with longer chronologies. This implies that on sites where few scientific dates are taken, chronologies are artificially low. There are relatively few sites with multiple (more than 5) dates and more work on this aspect would be needed to understand whether this is the result of a small dataset or a wider phenomenon.

The majority of development-led projects understand the appropriate sampling strategies for scientific dating. For smaller projects, or those with limited funds for post-excavation work, it appears that few samples are submitted for scientific dating, and these may be insufficient to provide reliable chronologies. In many areas there is a dearth of scientific dating undertaken for samples relating to Roman and later periods, even where there is limited artefactual material to date features and deposits.

There is an opportunity to communicate the importance of dating field systems to the planning archaeologists who can specify the requirements for robust scientific dating strategies and chronological modelling in fieldwork briefs. This will enable the provision for scientific dating to be built into development-led projects at an early stage. The ability to undertake such dating programmes will depend on the presence of suitable contexts and dating material, but greater expectations that this work will be required could lead to more projects incorporating field systems into their scientific dating programmes. Particular attention should be paid to encouraging this dating in regions where field systems are commonly excavated but rarely dated scientifically.

Whilst radiocarbon dating has attendant problems of residuality that can make interpretation of results difficult, OSL offers the potential for directly dating sediments within banks and ditches (Arnoldussen, this volume). The utilisation of OSL for dating field systems and linear land division features is currently rare in development-led archaeology. Although results can be variable and age ranges in prehistoric periods are relatively wide, it offers a potential for dating features for which no other dating material is available, and can be used as a comparison with radiocarbon dates from features. It also has the potential to offer more precise dates for medieval and post-medieval features. This technique should be more widely promoted as a tool for dating field systems and linear land division.

In conclusion, the deep chronology and longevity of field systems is an important characteristic of the English landscape. Prehistories and histories of land enclosure are accessible through the material remains of field systems surviving throughout the countryside. There is high potential to research long term and large-scale transformations in landscape organisation through the study and dating of field systems. Designation, research frameworks and fieldwork strategies should prioritise these long chronologies and rebalance our current excessive focus towards periodised perspectives. Scientific dates and chronological modelling offer the data and the tools to understand some of the complexities in formation of England's field systems.

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Figures

FIGURE 1 – Map showing the locations of the sites and the regions recorded in the database.
FIGURE 2 – Examples of field system types commonly represented in the database: aggregated (Swillington Common), coaxial (Shaugh Moor/Saddlesborough), linear / pit alignment (Whitemoor Haye Quarry) (plans adapted from Roberts, et al. 2001: 48; Smith, et al. 1981: 210; Coates, 1999: Fig. 15).
FIGURE 3 – Chart comparing the numbers of scientifically-dated sites by regions.
FIGURE 4 – Chart comparing the numbers of scientifically-dated sites by regions and the primary periods recorded in the database.
FIGURE 5 – Chart comparing the numbers of sites and scientific dates within each category of field system.

Appendix – Catalogue of sites included in the database

ID	Site name	County	Types (primary listed first)	Periods (primary listed first)	References
1	Chysauster	Cornwall	aggregated	Bronze Age, Roman	Walker et al., 1990; Smith et al., 1996
2	Big Moor	Derbyshire	aggregated	Bronze Age	Barnatt, 2001; Heath, 2003; Bayliss et al., 2013
3	Timberland, Scunthorpe	North Lincolnshire	coaxial	Iron Age, Roman	Richardson, 2009
4	Bestwall Quarry	Dorset	aggregated	Bronze Age, Iron Age	Bayliss et al., 2009
5	Gwithian	Cornwall	aggregated	Bronze Age	Nowakowski et al., 2008; Nowakowski, 2007; Bayliss et al., 2008; Roberts, 2007
6	Moss Carr, Methley	West Yorkshire	field system	Iron Age, Roman	Roberts & Richardson, 2002
7	Doncaster Road, South Elmsall	West Yorkshire	field boundary, pit alignment	Iron Age, medieval	Grassam, 2008
8	Normanton Industrial Estate	West Yorkshire	field system	Roman, Early medieval	Martin & Harrison, 2012
9	AP30 (Asselby to Pannal Pipeline)	North Yorkshire	field boundary	post-medieval	Gregory et al., 2013
10	Becca Banks, Aberford (Asselby to Pannal pipeline Area 8)	West Yorkshire	field boundary, linear earthwork	Bronze Age, Iron Age	Gregory et al., 2013
11	Grove Farm, Little Fenton (Asselby to Pannal pipeline site 2)	North Yorkshire	coaxial	Roman	Gregory et al., 2013
12	Oldgate Farm, Barkston Ash (Asselby to Pannal pipeline site 18-10)	North Yorkshire	enclosure	Iron Age	Gregory et al., 2013
13	Coldhill Lane, Saxton (Asselby to Pannal pipeline site 18-11B)	North Yorkshire	stock enclosure	Early medieval	Gregory et al., 2013
14	Rigton Bank, Bardsey (Asselby to Pannal pipeline site 26-2)	West Yorkshire	aggregated	Roman, Iron Age	Gregory et al., 2013
15	Rigton Bank, Bardsey (Asselby to Pannal pipeline site 26-3)	West Yorkshire	field boundary	Iron Age, Early medieval	Gregory et al., 2013
16	Stainburn Hill, Kirkby Overblow (Asselby to Pannal pipeline Area 14)	North Yorkshire	field boundary	Iron Age, Roman	Gregory et al., 2013

17	North Rigton (Asselby to Pannal pipeline Area 15)	North Yorkshire	aggregated	Iron Age	Gregory et al., 2013
18	Bullerthorpe Lane, Swillington (A1-M1 link road)	West Yorkshire	field boundary	Roman	Roberts et al., 2001
19	Swillington Common (A1-M1 link road)	West Yorkshire	aggregated	Iron Age, Roman	Roberts et al., 2001
20	Knottingley Road retention pond (A1[M] Darrington to Dishforth)	West Yorkshire	field boundary	Roman	Brown et al., 2007
21	Site M, Castle Hills, Ledsham (A1[M] Darrington to Dishforth)	West Yorkshire	field boundary	Iron Age	Brown et al., 2007
22	Site WWBP, north of Wetherby (A1[M] Darrington to Dishforth)	North Yorkshire	pit alignment	Iron Age, Roman	Brown et al., 2007
23	Wattle Syke, Wetherby	West Yorkshire	aggregated	Roman, Iron Age	Martin et al., 2013
24	Holmfield Interchange, Ferrybridge	West Yorkshire	pit alignment, coaxial	Iron Age, Roman	Roberts, 2005
25	Glasshoughton Coalfields Link Rd	West Yorkshire	field system	Iron Age, Roman	Moretti, 2008
26	Carr Lodge Farm, Loversall	South Yorkshire	stock enclosure	Iron Age	JSAC, 2007
27	Catesby Business Park, Balby Carr	South Yorkshire	coaxial	Iron Age, Roman	Jones et al., 2005; ASWYAS, 2006; ASWYAS, 2008
28	Bowes Moor field system (A66 Stainmore Pass)	Durham	aggregated	Early medieval, Iron Age	Bayliss et al., 2013; Gear & Turner, 1992
29	Coach & Horses Earthwork (A66 Stainmore Pass)	Durham	cord rig	Iron Age	Bayliss et al., 2013
30	Ravock field system, Sites B & D (A66 Stainmore Pass)	Durham	coaxial	medieval, Bronze Age	Bayliss et al., 2013; Robinson, 1993
31	Hill Lane, Old Warden (Broom Quarry)	Bedfordshire	linear ditch, enclosure	Bronze Age, Iron Age	Cooper & Edmonds, 2007
32	Ash Covert, Old Warden (Broom Quarry)	Bedfordshire	field system	Bronze Age, Iron Age	Cooper & Edmonds, 2007
33	Area 1A South Gate (SG), Stansted Airport	Essex	enclosure	Early medieval	Cooke et al., 2008
34	M11 Slip Road, Stansted Airport	Essex	field boundary	Bronze Age, Iron Age	Cooke et al., 2008
35	Eaglestone Flat	Derbyshire	aggregated	Bronze Age	Bayliss et al., 2013; Barnatt, 1994

36	Crab's Ledge, Tresco	Isles of Scilly	field boundary	Iron Age, Early medieval	Bayliss et al., 2013; Ratcliffe & Straker, 1996
37	North Furzton	Buckinghamshire	stock enclosure	Iron Age	Bayliss et al., 2013; Williams, 1988
38	Samson, East Porth	Isles of Scilly	field boundary	Bronze Age	Bayliss et al., 2013; Ratcliffe & Straker, 1996
39	Stannon, Bodmin Moor	Cornwall	aggregated	Bronze Age	Bayliss et al., 2013; Rose 1992a; Rose, 1992b
40	Saddlesborough Main Reave site 208, Dartmoor	Devon	coaxial	Bronze Age	Jordan et al., 1994; Smith et al., 1981
41	Holne Moor, Dartmoor	Devon	coaxial	Bronze Age	Jordan et al., 1994; Smith et al., 1981
42	Shaugh Moor, Cholwich Town, site 203	Devon	coaxial	Bronze Age	Jordan et al., 1994
43	Shaugh Moor, Wotter Playground site 201	Devon	coaxial, lynchet	Bronze Age	Jordan et al., 1994
44	Shaugh Moor, Wotter Common, site 69	Devon	coaxial	Bronze Age	Jordan et al., 1994; Smith et al., 1981
45	Shovel Down, Dartmoor	Devon	coaxial	Bronze Age	Fyfe et al., 2008
46	Seathwaite Valley	Cumbria	field boundary	medieval	Wild et al., 2001
47	360-364 Shirley Road, Southampton	Hampshire	field boundary	Roman, Iron Age	Russel & Fedorowicz, 2013
48	Ashville Trading Estate, Abingdon	Oxfordshire	aggregated	Iron Age, Roman	Parrington, 1978
49	Tremough, Penryn	Cornwall	coaxial	Iron Age, Roman	Gossip & Jones, 2007; Gossip & Jones, 2010
50	Trenowah, St Austell	Cornwall	coaxial, field boundary	Iron Age, Roman	Johns, 2008
51	Croft Road, Spencers Wood, Reading	Berkshire	field boundary	Iron Age	Taylor & Dawson, 2015
52	Charnham Lane, Hungerford, West Berkshire	Berkshire	linear ditch	Neolithic	Ford, 2014
53	Hitches Lane, Fleet	Hampshire	field system	Bronze Age, Roman	Pine, 2016
54	North Bersted, Bognor Regis	West Sussex	field system	Iron Age, Roman	Taylor et al., 2014
55	Shrubsoles Hill, Sheppey	Kent	field system	Bronze Age	Coles et al., 2003
56	Lidsey Landfill, Woodgate	West Sussex	enclosure, field system	Iron Age, Roman	Wallis & Ford, 2014
57	Colne Fen, Earith	Cambridgeshire	coaxial, aggregated	Bronze Age, Iron Age	Evans et al., 2013

58	Addenbrooke's Access Road, Site 3, Clay Farm, Trumpington	Cambridgeshire	field system	Bronze Age, Iron Age	Timberlake, 2007
59	Stencoose	Cornwall	aggregated	Iron Age, Roman	Jones, 2001
60	Trewellard, North L&'s End Pipeline	Cornwall	field boundary	Roman	Lawson-Jones, 2013
61	Penhale Round	Cornwall	field system	Roman	Nowakowski & Johns, 2015
62	Harlyn Bay A	Cornwall	field boundary	Bronze Age	Jones & Quinnell, 2014
63	Harlyn Bay B	Cornwall	field boundary	Bronze Age	Jones & Quinnell, 2014
64	Elliott Site, Fengate	Cambridgeshire	coaxial, stock enclosure	Bronze Age, Iron Age	Evans et al., 2009
65	Pegswood Moor Farm	Northumberland	field system, stock enclosure	Iron Age, Roman	Proctor, 2002; Proctor, 2009
66	Newton Bewley, Hartlepool	Durham	field system	Early medieval, Roman	Platell & Johns, 2001
67	Monkton Road, Minster in Thanet	Kent	coaxial	Bronze Age	Martin et al., 2012
68	Edgerley Drain Road, Fengate	Cambridgeshire	coaxial	Bronze Age	Evans et al., 2009
69	Barnsdale Bar Quarry, Norton	South Yorkshire	coaxial	Iron Age, Roman	ASWYAS, 2001
70	Finningley Quarry Northern Extension	South Yorkshire	aggregated	Iron Age, Roman	MAP, 2009
71	Vicarage Lane & Romford Road, London Borough of Newham	Greater London	field boundary	Early medieval	Keith-Lucas et al., 2007; Branch, 2003
72	Lafone Street, Southwark	Greater London	cultivation marks, field boundary	Bronze Age	Bates & Minkin, 1999
73	Redscar Wood pit alignment	Northumberland	pit alignment	Roman, Early medieval	Passmore & Waddington, 2009
74	Shotton Village	Northumberland	field boundary	Bronze Age	Hodgson et al., 2012
75	Shotton North-East	Northumberland	stock enclosure	Iron Age	Hodgson et al., 2012
76	Huntsman's Quarry, Kemerton	Worcestershire	coaxial	Bronze Age, Iron Age	Jackson, 2015
77	Ormesby St Michael	Norfolk	field system, enclosure	Bronze Age, Iron Age	Gilmour & Mortimer, 2012; Gilmour et al., 2014
78	Clay Farm, Trumpington	Cambridgeshire	coaxial	Bronze Age, Iron Age	Phillips & Mortimer, 2012
79	Boundary Lane Windfarm, Whittonstall	Northumberland	field boundary	medieval, post-medieval	ASDU, 2014

80	Newark Road sub-site, Fengate	Cambridgeshire	coaxial	Bronze Age, Iron Age	Pryor, 1980; Pryor, 2001
81	Bridge Road, Rainham	Greater London	stock enclosure	Bronze Age	Meddens, 1996; Meddens & Beasley, 1990
82	Roughground Farm, Lechlade	Gloucestershire	coaxial	Iron Age, Roman	Allen et al., 1993
83	Padholme Road sub-site, Fengate	Cambridgeshire	coaxial	Bronze Age	Pryor, 1980; Pryor, 2001
84	Lancaster University Wind Turbine	Lancashire	field system	medieval	Bradley, 2013
85	Heathrow Terminal 5	Greater London	coaxial, aggregated	Bronze Age	Healy et al., 2010
86	Weir Bank Stud Farm, Bray	Berkshire	field system	Bronze Age	Barnes et al., 1995
87	Vince's Farm, Ardleigh	Essex	linear ditch, field system	Bronze Age, Iron Age	Brown, 1999
88	A15 North Borough Bypass, Etton	Cambridgeshire	field system	Neolithic, Bronze Age	French & Pryor, 2005
89	Castle Hill, Feniton	Devon	coaxial	Bronze Age	Fitzpatrick et al., 1999
90	Wrotham Quarry, Trottiscliffe	Kent	coaxial	Iron Age	Malim et al., 2013
91	Dairy Lane, Nursling, Southampton	Hampshire	field system	Bronze Age, Iron Age	Adam et al., 1997
92	Slade Farm, Bicester	Oxfordshire	linear ditch	Iron Age	Ellis et al., 2000
93	Bar Point, St Mary's	Isles of Scilly	field system	Iron Age	Evans, 1983; Jordan et al., 1994;
94	Sewerby Cottage Farm, Bridlington	Humberside	ridge & furrow	medieval, post-medieval	Bayliss et al., 2009
95	Cranford Lane	Greater London	coaxial	Bronze Age, Iron Age	Cotton & Elsden, in prep.; Historic England in prep.
96	Simy Folds	Durham	field system	Early medieval, Bronze Age	Coggins et al., 1983
97	Phoenix Project, Awe	Berkshire	stock enclosure	Iron Age, Roman	Booth, 2013
98	Lynton Way, Sawston	Cambridgeshire	enclosure	Bronze Age	Weston et al., 2007
99	Warren Farm, Lockington Quarry	Leicestershire	aggregated	Iron Age, Roman	Thomas, 2013
100	Wilby Way, Great Doddington	Northamptonshire	aggregated	Iron Age	Thomas & Enwright, 2003
101	Priors Hall, Kirby Lane, Corby	Northamptonshire	field system	Bronze Age	Chapman & Jones, 2012
102	Whitelands Farm, Bicester	Oxfordshire	field system	Early medieval, Iron Age	Martin, 2011
103	Alma Road, Peterborough	Cambridgeshire	field system	Iron Age, Roman	Mudd & Upson-Smith, 2006
104	Hillfarrance	Somerset	field system	Bronze Age	Gent & Reed, 2007
105	Tower's Fen, Thorney	Cambridgeshire	coaxial	Bronze Age	Mudd & Pears, 2008

106	Old Rydon Lane, Exeter	Devon	field system	Bronze Age	Pearce et al., 2011
107	Dunch Hill Midden, Wessex LDP site 081A	Wiltshire	field boundary	Bronze Age, Iron Age	Bradley et al., 1994
108	Weather Hill Linear Ditch, Wessex LDP site 083	Wiltshire	linear earthwork	Bronze Age	Bradley et al., 1994
109	The Devil's Ditch, Wessex LDP site 090	Wiltshire	linear earthwork	Iron Age, Bronze Age	Bradley et al., 1994
110	Windmill Hill Linear Ditch, Wessex LDP site 091	Wiltshire	linear earthwork	Iron Age	Bradley et al., 1994
111	Brigmerston Down Linear Ditch, Wessex LDP site 092	Wiltshire	linear earthwork	Bronze Age	Bradley et al., 1994
112	Haxton Down Linear Ditch/Pit Alignment, Wessex LDP site 099	Wiltshire	linear earthwork, pit alignment	Iron Age, Bronze Age	Bradley et al., 1994
113	Sidbury Double Linear Ditch, Wessex LDP sites 100 & 101	Wiltshire	linear earthwork	Iron Age	Bradley et al., 1994
114	Hazel Road, Bognor Regis	West Sussex	field system	Iron Age	Bedwin & Pitts 1978; Jordan et al., 1994
115	Needingworth Quarry, Over	Cambridgeshire	field system	Bronze Age	Evans, et al.. 2016
116	Plantation Camp, Ingram	Northumberland	cultivation terrace	Iron Age	ASUD, 1997
117	Wether Hill cross-ridge dyke, Ingram	Northumberland	linear earthwork	Iron Age, Roman	ASUD, 1997
118	GlaxoSmithKline U Building, Ware	Hertfordshire	field boundary	medieval	Kaye, 2009
119	Whitemoor Haye Quarry, Alrewas	Staffordshire	pit alignment	Iron Age	Coates, 1999; Knight & Howard, 2004
120	Stanwick, Raunds	Northamptonshire	field boundary	Bronze Age	Harding & Healy, 2007