High Weald AONB Unit Report

www.highweald.org

Case study report and heritage assessment: Earlye Farm

Field systems in the High Weald

High Weald AONB Unit

March 2017

About this report

Background

Earlye Farm is 108ha working livestock farm with a mixture of sheep and cattle in the parish of Frant. Earlye was selected as the main case study site for the Field Systems in the Weald project due in part its well preserved medieval assart fields – something which is especially characteristic of the High Weald landscape – as well as the exceptional level of access granted to the site by its owners, Bill and Celia Gingell.

This report represents the outputs from a detailed historic and natural environment study of Earlye Farm using a range of evidence - existing data, historic maps, LIDAR, field survey and archive research undertaken by a range of technical specialists including landscape archaeologists, ecologists and archivists. The table below provides an overview of all the work that has taken place at the Earlye Farm case study site up to this point.

Summary information: Earlye Farm	
Field survey type (comprehensive or footpath)	Comprehensive
Field surveyor	Dr Nicola Bannister
Number of days surveying	10
Average field size (ha)	3.3
Case study area (ha)	107.5
Drone survey	Yes
Drone surveyor(s)	Matt Pitts, Charles Winchester & Bill Hunter
Ecological survey & historic ecology survey	Yes
Ecological surveyor & historical ecology survey	Kate Ryland & Phil Sansum
Desktop assessment	Yes
Desktop surveyors	Tessa de Ruyter, Fred Warner & William Gibbs
Geophysical survey	Yes
Geophysical surveyor	Hastings Area Archaeological Research Group (HAARG)
Archive research	Yes
Archive researcher	Dr Nicola Bannister & Christopher Whittick

Report structure

The following report begins with a summary of the results and analysis of the key findings which set out the heritage assessment of the site. This is followed by an introduction to the case study programme, its aims and a description of the case study method. Principally, however, this report provides an account of all the work undertaken at Earlye Farm, as well as outlining the initial steps that were taken to create a practical field survey form and build the GIS geodatabase into which the survey data would ultimately be entered. The various historic map sources used in the project are highlighted, as is the process of digitising historic maps to provide additional historic information about the site. Finally, some of the issues that arose during the various stages of work on the Earlye case study are discussed and recommendations to address them are made.

Acknowledgements

The entire project team is particularly grateful to Bill and Celia Gingell for granting extensive access to their beautiful farm and for their exceptional hospitality during the numerous site visits. We hope the project has been as interesting and enlightening to them as it has been to us.

Contents

Introduction to case study site selection

Earlye Farm was one of five case study areas and selected as the main case study for a full heritage and ecological assessment.

The case study method was designed to explore the value and relative costs of varying levels of detailed field survey, archive research and archaeological investigation to an understanding of field systems. This report covers the outputs from the Earlye Farm case study selected to receive a more detailed historic and natural environment survey including a desk based GIS assessment involving historic maps and LIDAR; a comprehensive field survey undertaken by a landscape archaeologist; a rapid ecological survey of fields and historic ecology survey of field boundaries; archive research; a geophysical survey of selected areas and a drone flyover.

The case study areas were selected to reflect typical and atypical field system characters which contribute to fieldscapes in the Weald. The area of each case study is large enough to represent the field system character being examined but not too large for undertaking the field work. The case study selection also considered settlement proximity and the presence of historic farmsteads. Evidence and experience from other studies, together with advice from Historic England, also helped to inform the sample selection. Moreover, each case study area selection was under-pinned by clear statements of criteria together with supporting historic evidence drawn from a desk-based assessment including historic map regression, aerial photographs, LiDAR, biological surveys etc.

The selection criteria for the case study areas are:

- Ease of gaining permission for access and subsequent publication of the results;
- Atypicality/typicality of field system characteristics; good supportive historic archive evidence for landscape continuity, farming systems used (livestock/arable/fruit) and land use, for example a well-documented farmstead in a manor, or a well-documented estate. This is to include a well- illustrated map regression for each case study area;
- Presence of historic farmstead in locality;
- A supportive local community group willing and able to become involved and engaged with the project;
- Links with other landscape survey/monitoring work such as the High Weald Meadows Initiative.

1. Results & analysis

1.1 Historic environment: field survey results

Small regular enclosures at Pococksgate. Hedges on banks. Hazel and Holly dominant. Some boundary loss. Enclosure from Waterdown Forest ?
Source: Fieldwork, Historic maps

Stream = boundary of:-
Parish = Wadhurst - Frant
Manor = South Malling - Rotherfield
Sub Manor = Wadhurst – Frant
Hundred = Loxfield Camden - Rothfield
Yardland = Earlye - ?
Source: Historic maps

Upper and Lower Sands (1840).
Great and Little Sandes in c.1565.
Bounbdary lynchet in field
Source: Archives, Tithe Map Fieldwork

Furnace Field (1840) possibly Knolles in c.1565 contains boundary lynchets and old trackway.
Source: Archives, Historic Maps, Fieldwork

Traces of older field system below ground surface; *Geophysical Survey*

Possibly Knolles Strake c.1565
Source: Archives, Tithe Map

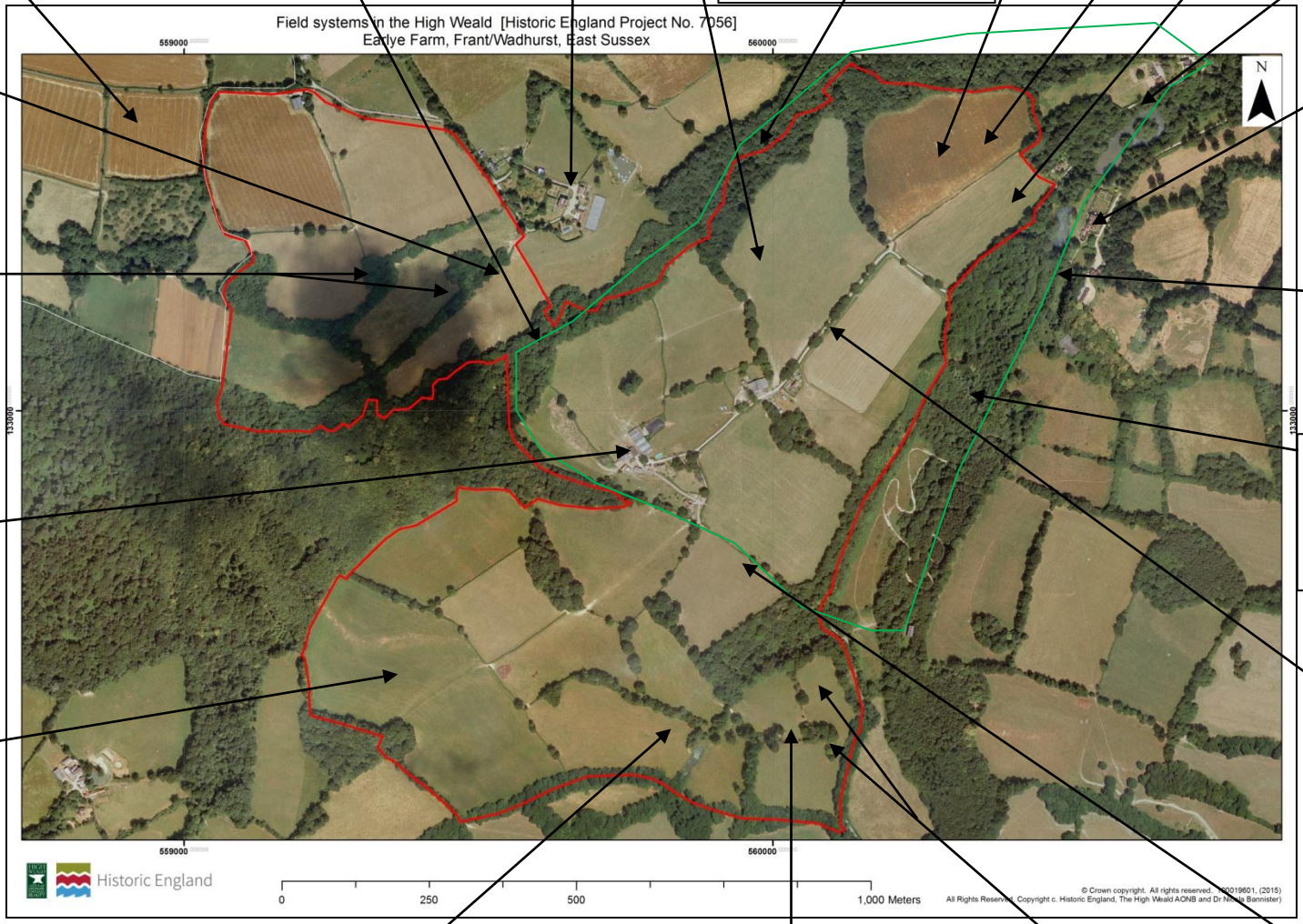
Lightlands = Ironmasters House
Source: HER

Pond bays on stream to pen stocks for Henley Forge
Source: Fieldwork, HER

East Mill of Riverhall with pond
Source. Archives

Ridge & Furrow overlying ditch to former boundary in c.1813. Between 1813 and 1840 boundary removed replaced by laid quicksett on bank to west. Planted to hops in C19. Species rich sward now
Source: Historic maps, fieldwork, LiDAR, Aerial Photos

RIVERHALL =
Medieval tenement C16
Ironmasters house C17
Source. HER, Archives



Iron & stone pits incorporated into boundaries. Ancient woodland indicators present in areas of secondary coppice and wood
Source: Fieldwork

Medieval Yardland of Earlye. Yardlands are early settlements and farmsteads. Possible boundary of
Earlye = eagles clearing
Source: Archives, Placenames

EARLYE FARM = medieval farmstead earliest structure in house dated to 1450 and extended 1600. Building platforms in adjacent fields, Traces of old boundaries below ground surface
Earliest record1245 John de Arleygh
Source: Custumal of Archbishop of Canterbury's' Manors. Building Survey;Field work; Geophysical Survey

Brooklands used in exchange with Riverhall for building mill pond ? c.1565
Fields for hay along stream belonging to yardland of Earlye
Upper and Lower Brook Fields in 1840
Source: Archives

Fields with some boundary loss. Large lynchets remaining suggesting early medieval fields allowing for the build of soil in boundary.
Source: LiDAR, Field work

Ridge top track access to Earlye Farm. Fields are 'hung' from it and bounded by streams. Hedges mixed species on banks but with hazel and holly dominant - fodder
Source; Fieldwork

1.1.1 Results overview
EARLYE FARM - Summary of key heritage features associated with the field systems

Sinuous mixed species hedges on banks irregular fields on sloping ground, lynchets and plough headlands
Source. Fieldwork

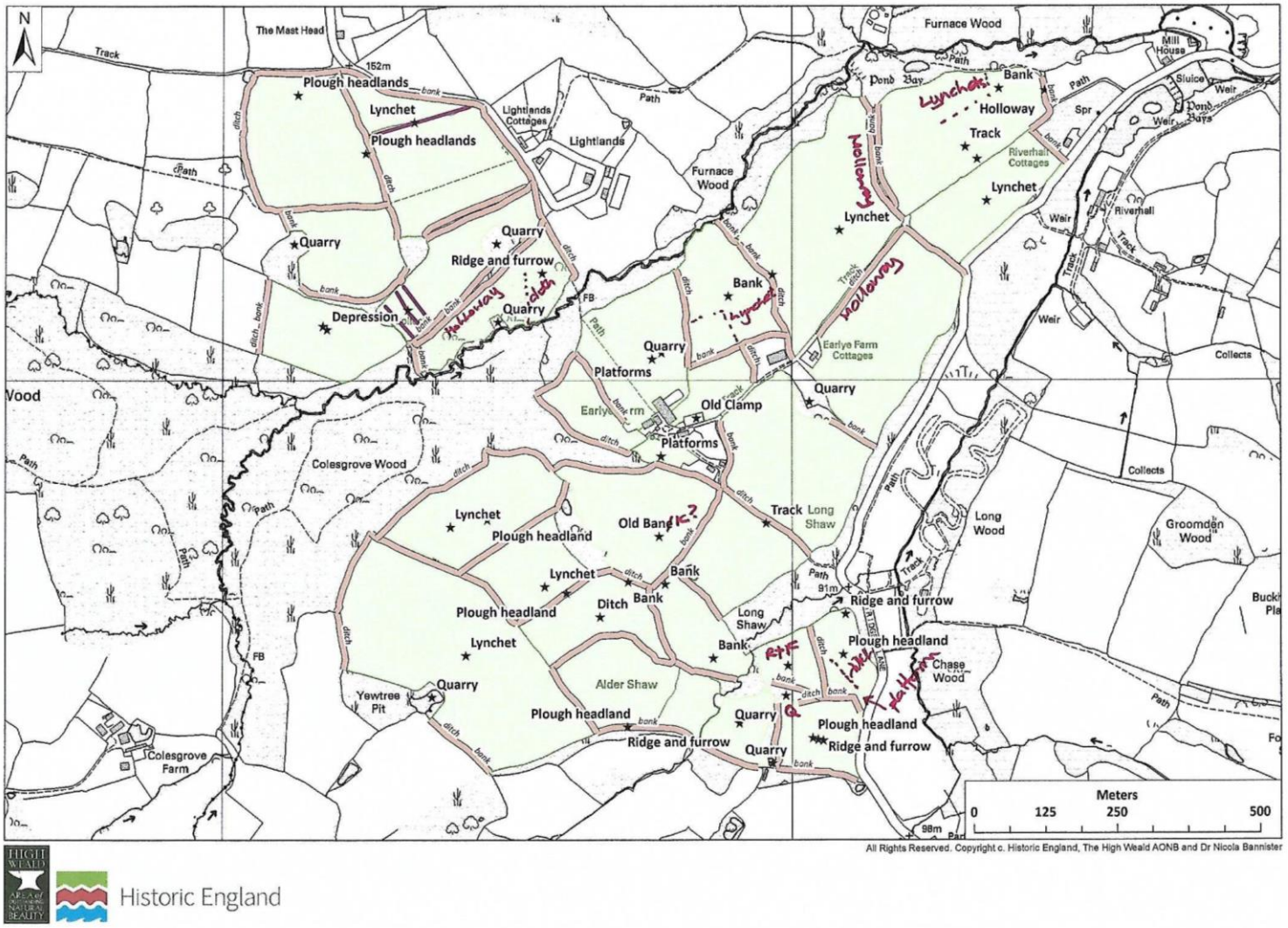
Group of assart fields, bounded by wood banks, contain ridge and furrow, plough headlands and old tracks, with marl pits, site of well.
Source: Fieldwork, LiDAR

Below ground remains of field system, ridge and furrow, building platform :
Source Geophysical Survey

Medieval route to Earlye. Remains as hollow way, earthwork and soil mark in field. Possible boundary to Yardland
Source: Archives, Fieldwork, Historic maps, LiDAR

1.12 Features recorded

Figure 1. Map of features recorded in the field survey



Earlye Farm	
Archaeological features	
Type	***Number recorded***
Bank	5
Depression	1
Ditch	1
Holloway	1
Lynchet	6
Old bane	1
Old clamp	1
Platform	2
Plough headland	9
Quarry	8
Ridge and furrow	6
Track	2
TOTAL	**43**
Boundary types	
Type	***Number recorded***
Balk	2
Fence	3
Hedge	16
Hedge with trees	18
Shaw	10
Watercourse	2
Wooded hedge	14
Woodland edge	30
TOTAL	**95**
Earthwork features	
Type	***Number recorded***
Asymmetrical bank	4
Lynchet bank	17
Symmetrical bank	23
Symmetrical ditch	25
Bank with 'uncertain' symmetry	13
Ditches with 'uncertain' symmetry	10
TOTAL	**92**
Field shapes	
Type	***Number recorded***
Irregular fields	11
Irregular rectangular fields	5
Irregular square fields	2
Rectangular fields	4
Square fields	6
TOTAL	**28**
Boundary furniture	
Type	***Number recorded***
Gate	58
Marker trees	12
Stock watering	8
Other	6
TOTAL	**84**

Table 1. Features recorded in the field survey.

Summary stats:

- The total area of Earlye Farm is 108ha and area of fieldscape (i.e. total area of all its fields) is 91ha
- Therefore, there are 43/91 = 0.47 archaeological features per ha of fieldscape at Earlye Farm
- There are 27 individual fields at Earlye Farm
- Therefore, there are 43/27 = 1.59 archaeological features per field.

1.2 Ecological conclusions

The woody boundary and linear features of the Earlye Farm fieldscape have inherited or acquired a good but not full complement of the locally indigenous woody flora.

In the context of this fieldscape persistence of species has been as important as re-establishment and carefully chosen indicator species can be useful in assessing the historical development of High Weald field patterns.

The evidence of the Ancient Woodland Indicator tree and shrub species points to a conclusion that many of the field boundaries are not derived from original woodland vegetation but some shaws within the fieldscape occupying disused quarries or pits may have a closer affinity with the intact ancient semi-natural woodland of the locale than do most of the extant linear field boundaries.

1.3 Geophysical survey conclusions

The identification of a building platform indicates changes to the farmstead and how it was used. The absence of more building platforms indicates that the farmstead has remained on the same site and not 'moved' within the landscape. Thus potential evidence of earlier settlement is likely to lie below the present buildings and farmyard. Modern farm activities and associated debris prevents a full magnetometer survey from being undertaken.

Furnace field is likely to be one of the older fields at Earlye first cleared along the edge of the ridge. It was selected because of the evidence of slight lynchet earthworks identified during the walk over. These were identified by the magnetometer survey as an earlier field system within the present field. There was no evidence of a track along the southern boundary of the field, but several smaller ditch features close to the manure heap on the top of the hill may possibly be part of a track way.

The geophysical survey of the assart fields to the south of the farm clearly revealed the extant ridge and furrow and plough headland earthworks. The rectangular feature bounded by a bank was unable to be fully surveyed due to the disturbance caused by the well to the south. This had been back filled with metal debris (B. Gingell pers.comm.). Thus the theory of it being a building platform could not be tested.

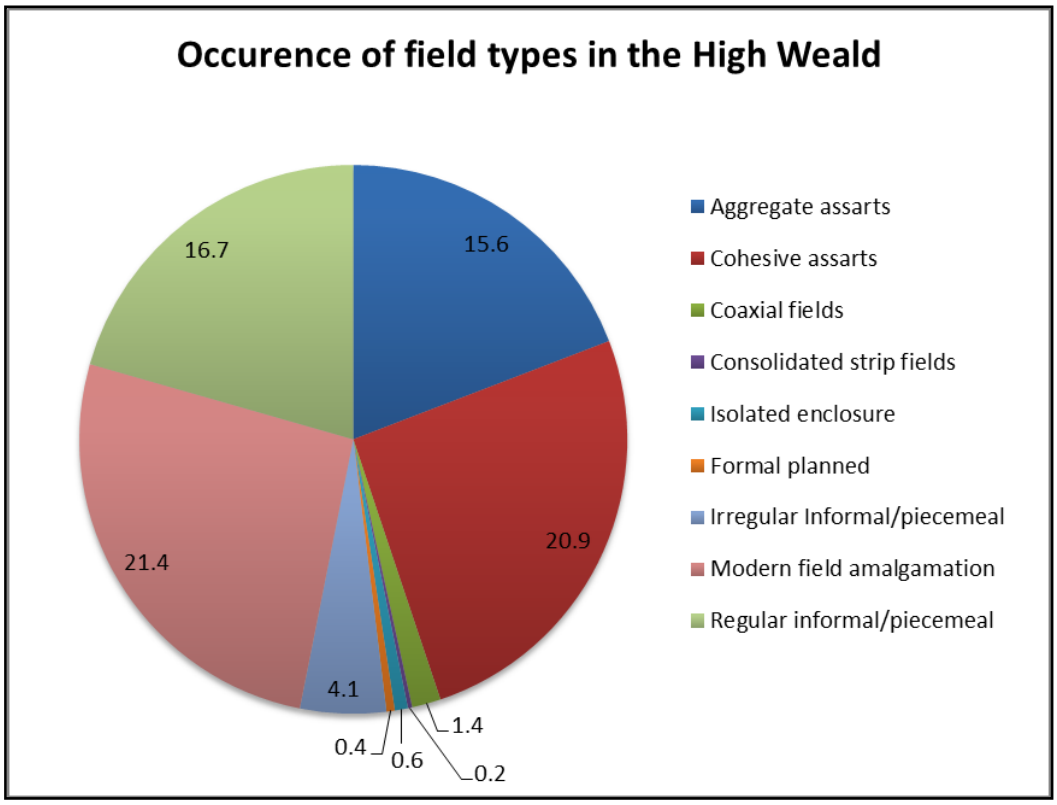
2. The landscape context

2.1 Field type occurrence and rarity

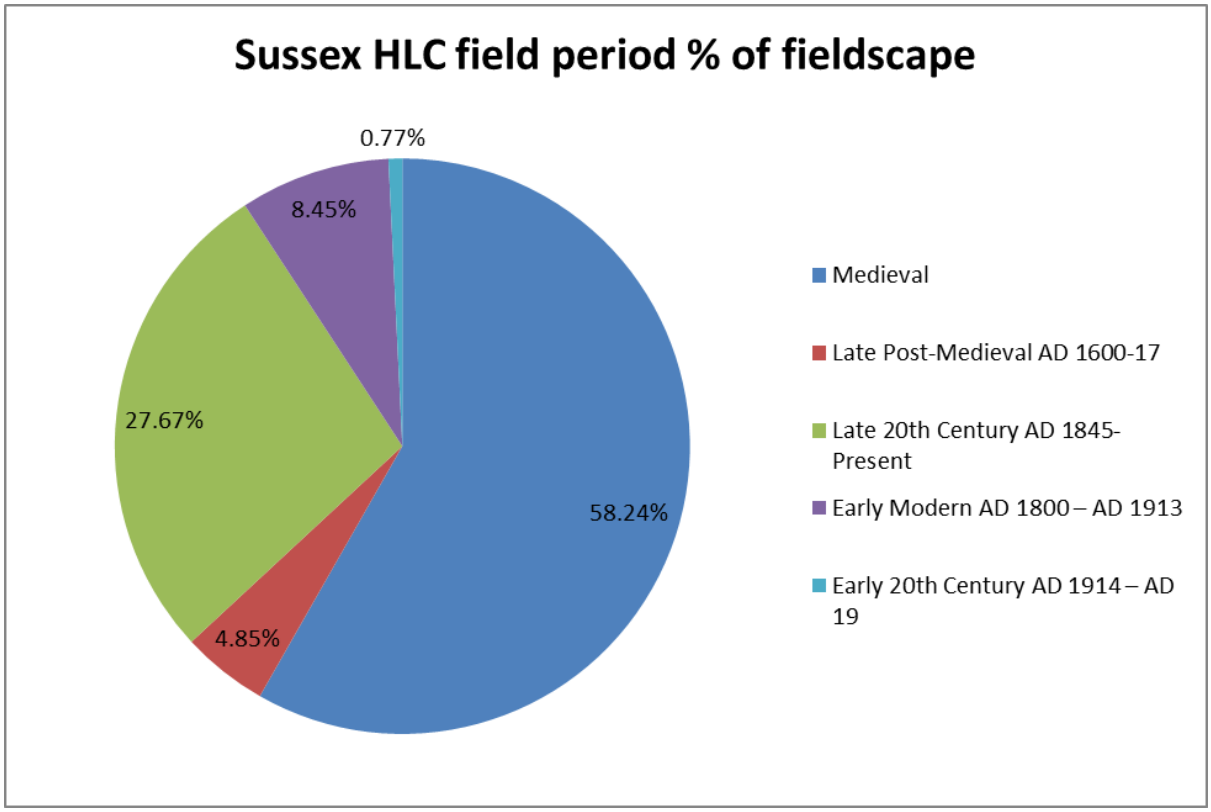
In order to assess the typicality and rarity of fields at Earlye Farm in terms of their field type and period of origin Historic Landscape Characterisation data for the wider High Weald landscape was analysed.

Merging the Kent and Sussex HLC enabled us to see the occurrence of field types within the High Weald (fig 3). This pie chart shows us the area percentage of different field types within the High Weald boundaries. This was based on the merging of Kent and Sussex HLC and thus **does not cover any other county.** It does show us that modern field amalgamations and cohesive assart fields (predominantly 12th-13th century woodland clearances) are the most abundant field types in the Kent and Sussex HLC areas. The rarest field types are formal planned fields (late post-medieval, early modern), consolidated strip fields (early post-medieval), isolated enclosures (late post-medieval, early-modern) and coaxial fields (age debatable, but at least early medieval according to Kent and Sussex HLC).

Figure 3 Occurrence of field types in the High Weald, calculation based on Kent and Sussex HLC. The numbers show the proportion of a certain field type of the total area of field systems in the High Weald (Sussex and Kent HLC area).



The total area of all HLC field types (Sussex & Kent merged, but only for higher res Kent data) = **66583.3ha**



2.2 Field size analysis

1.2.1 GIS data preparation

The two main GIS datasets used for the analysis are:

- Revised version of Kent HLC, which only covers the four parishes of Goudhurst, Cranbrook, Hawkhurst and Benenden
- Sussex HLC
- MasterMap data

Both Kent and Sussex HLC datasets were created by unionising individual MasterMap polygons. This means that the HLC data are made up of polygons that are groups of merged individual (MasterMap) fields. However, to be able to carry out the analysis we have to go one step back again to create the individual MasterMap polygons again. This was done by extracting the individual polygons from MasterMap that were located within a certain HLC field type (e.g. all MasterMap polygons within aggregate assart field type) for both the parish of Frant and the four Kent parishes. As Kent HLC seems to line up with Mastermap correctly and Sussex HLC does not (possibly since a more recent version was used), the same procedure as the Frant parish was

carried out to select and extract all HLC types and MasterMap polygons situated within these HLC polygons. However, some MasterMap polygons covered a larger area than the actual HLC polygon did. So after selecting and extracting the MasterMap polygons, some polygons had to be split and the outlying parts were deleted (Figure 1).

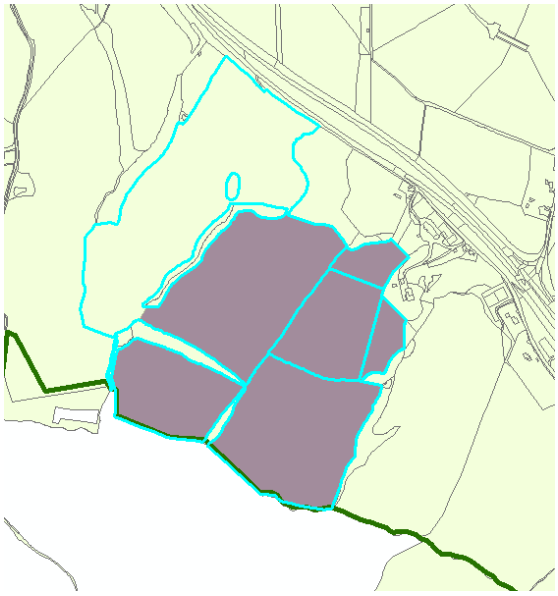


Figure 2. Selected (blue) MasterMap polygon overlaps HLC (purple) polygon, but also covers an area which is not part of this particular HLC type. Such polygons had to be split.

All MasterMap polygons within the parish boundaries of Frant and within the Kent HLC extent were selected and exported as a separate shapefile. This MasterMap data was next filtered and cleaned up, because we don't want to use polygons in our calculations that contain built areas, woodland, etc. This could be achieved by following the process outlines in the Metadata guidelines for the High Weald AONB Unit's historic field boundary data.

This document states that the codes 10111 and 10056 (which represent natural environment and general surface) were selected from the field 'FEATCODE' and the rest of the polygons were removed from the attribute tables. Then a selection based on polygon size was applied and the polygons smaller than 1000 m^2 were removed from the table. Also, polygons larger than 20,000 m^2 were removed. In addition, all features containing the word 'trees' in the field 'DESCTERM' were removed. This was done to ensure that only polygons that are most likely to be fields remained.

Figure 3. Example of 'DESCTERM' attribute that was used to remove non-field polygons.

CALCAREA	CHANGE	DESCGROUP	DESCTERM
26.113	2004-08-04 Position	General Surface	
128.006488	2004-08-04 Position	General Surface	
14144.019064	2004-08-04 Position	Natural Environment	Coniferous Trees; Coppice Or Osiers; Rough Grassland; Scrub

Next, all HLC field types within the parish boundaries were selected by attribute from the Sussex HLC and/or Kent HLC and exported as a separate shapefile Y:\HWAONB GIS Data\Working\Tessa2015\Data\Frant_HLC_MasterMap_extractions.

Then, all individual Mastermap polygons within each field type were selected with the 'Select by location' tool. The selections were checked and corrected manually. These selections were

exported as a shapefile as well. The Mastermap polygons were manually checked to see if every polygon was an actual field and no built up area or wooded area. This wasn't done for Kent HLC however, as this would take too much time.

1.2.2 Present day average field size – Frant

The overall average field size in Frant parish was 1.9 ha with a total number of 343 fields (see the Table 1 below).

Table 2. Summary statistics for different HLC field types in Frant Parish.

Parish	HLC Field type	Average size (ha)	Total area (m2)	Number of polygons	Field type % of total area of fields
Frant	Aggregate assarts	1.85	1721304	93	24
	Cohesive assarts	2.05	654806	32	9
	Coaxial fields	1.51	527713	35	7
	Irregular Piecemeal	0.29	11519	5	0
	Isolated enclosure	1.77	176936	10	2
	Modern field amalgamation	3.94	1103099	28	16
	Planned private enclosure	2.43	1022626	42	14
	Regular piecemeal enclosure	1.41	1384740	98	19
Sum			**6602743**	**343**	
Average			**1.925**		

1.2.3 Calculating average field size for Tithe fields

Tithe average field size – Frant

To compare the present day average field size and number of fields with the historic (Tithe) average size of fields, we used previously digitised Tithe data for analysis. The original apportionments were used, which were digitised by William. This data was filtered and cleaned up by sorting the data by cultivation type in the 'cultivation' field in the attribute table. First, all cultivation types were selected which relate to fields, such as arable, pasture, orchards, hops, etc. There appeared to be a considerable number of fields with no data. This problem could be overcome by searching the 'name and description of land' field for cultivation or land use types. These appeared to be land use types, such as built up areas, parkland, estates, gardens, tenements, water, reservoirs, roads, shaws, ponds, etc. All remaining field descriptions were individually assessed and looked up on the map. Then they were filtered and selected out if they were not likely to be fields.

Next, the table contains three fields which show field size in acres, roods and perches. A conversion formula was used to convert these numbers to hectares in excel. The average was calculated and turned out to be 2.17 ha (total number of fields was 813). This appears to be considerably larger than the average field size of 1.42 ha which was calculated using the polygon size as measured by ArcMap when drawing the polygons.

Table 3. Average field sizes in Frant Parish according to the 1846 tithe schedule.

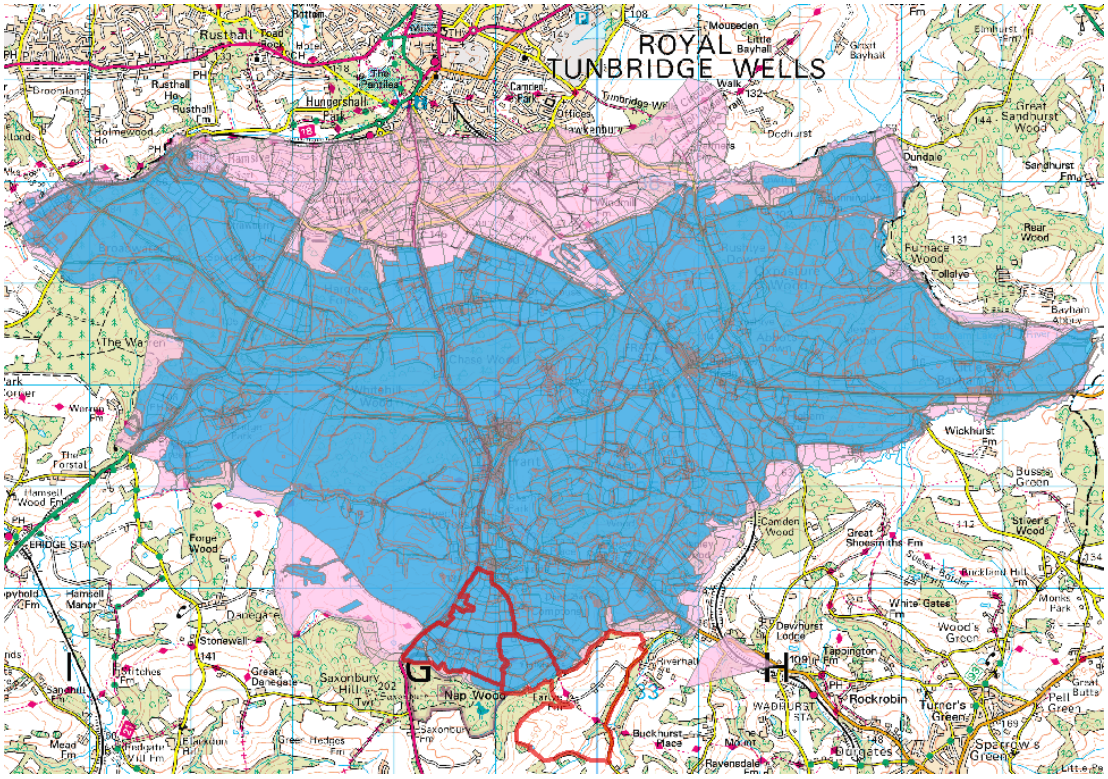
Parish	Calculation	Average field	Total parish	Acres	Roods	Perches	Total

		size (ha)	field size (ha)	(0.4047 ha)	(0.1012 ha)	(0.0025 ha)	number of fields
Frant 1846	From polygon size	1.42	1452.91				1022
	From original measurements	2.17	1760.32	3972	1161	14016	813

1.2.4 Constraints

This calculations show us that the average field size based on the original measurements is bigger than the average field size based on the polygons drawn in ArcGIS. Although it seemed to be more reliable to use the converted field size as an average – because digitised Tithe polygons can be stretched as they are based on digitised Tithe scans - we assume an average of 1.42 ha is more realistic than an average of 2.17 ha which is bigger than the present day average field size (1.9 ha). However, when looking at the extent of the Tithe polygons, the parish size appears to be bigger during Tithe than the current extent: 3604.9 ha against 2758.9 ha (fig 1). That's a difference of 846 ha. The Tithe extent was clipped to the current extent using the ArcMap clip (analysis) function. Calculating the average field size now results in 1.9 ha, which is the same as the present day average field size.

Figure 4. Parish of Frant. The extent of the Tithe parish map (pink) is bigger than the current MasterMap extent (blue). The red lines represent the Earlye case study site and Pococksgate.

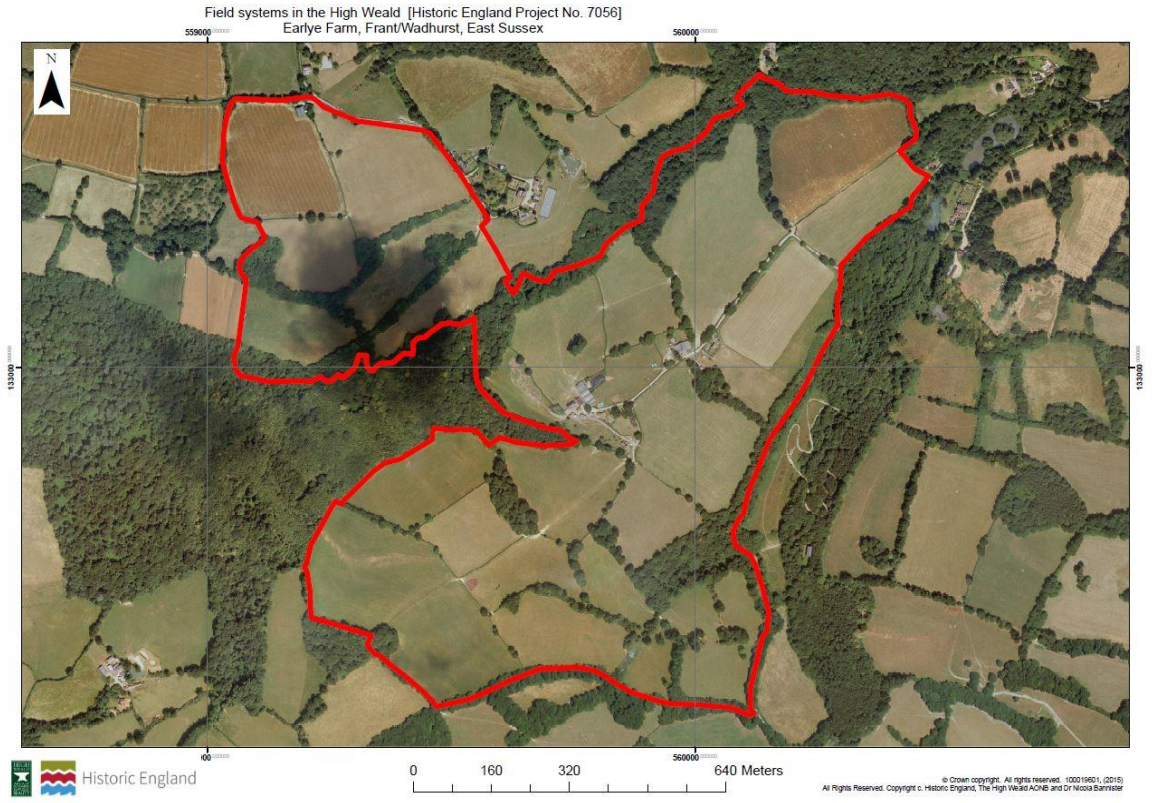


3. Earlye Farm

3.1 Introduction to the site

Earlye Farm is located in East Sussex in between the villages of Frant and Wadhurst. The farm is a working livestock farm with a mixture of sheep and cattle. A map displaying the extent of the farm may be seen below in Figure 5.

Figure 5. Earlye Farm boundary with OS aerial basemap.



The entire farm, illustrated by the red ownership boundary above, was comprehensively surveyed, with field survey forms being filled in for every boundary and field on the farm.

3.2 Map data for Earlye Farm

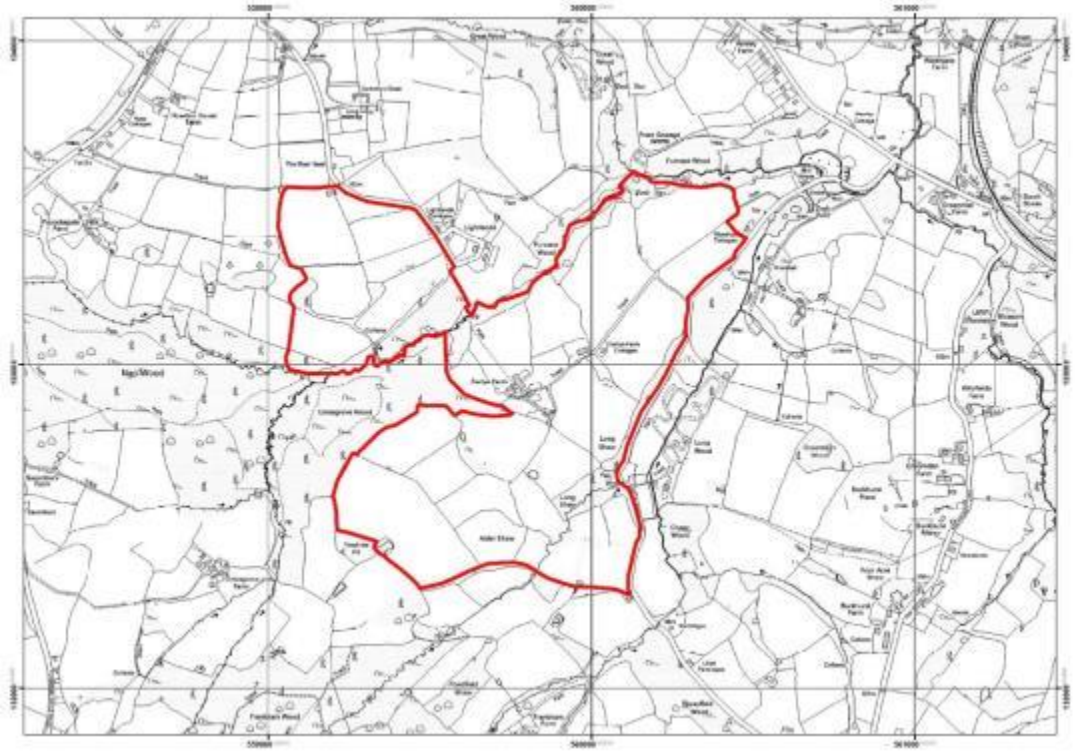
In preparation for the field surveys a series of maps were produced for the Earlye Farm case study site. The modern maps (particularly the Ordnance Survey and aerial maps) were used during the field surveys to help locate features recorded on the ground, and the historic maps provide additional information about the history and how it has changed over time – e.g. where boundary

loss has occurred or ownership patterns have changed. In addition, maps displaying Historic Landscape Characterisation (HLC) information shed light on the origin and character of the fields being surveyed, whilst LiDAR provided invaluable in identifying significant topographic features and in helping to test a desktop approach to the field surveying.

All the maps produced for Earlye are displayed on the following pages under the relevant headings.

3.2.1 Modern maps

Ordnance Survey 10k

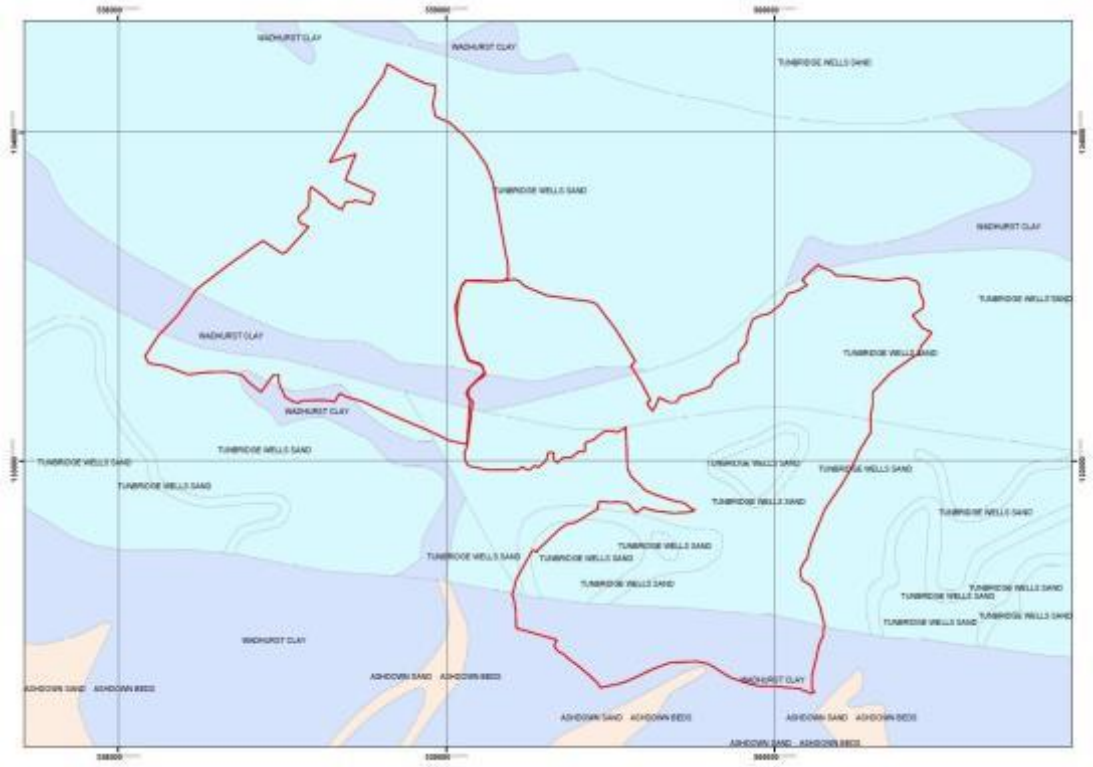


The field pattern reveals three different types:

1. A northern group part of a regular pattern with strong N-S axis
2. A core group centered on the farm and 'hung from the farm access track
3. A small group of irregular fields in SE corner.

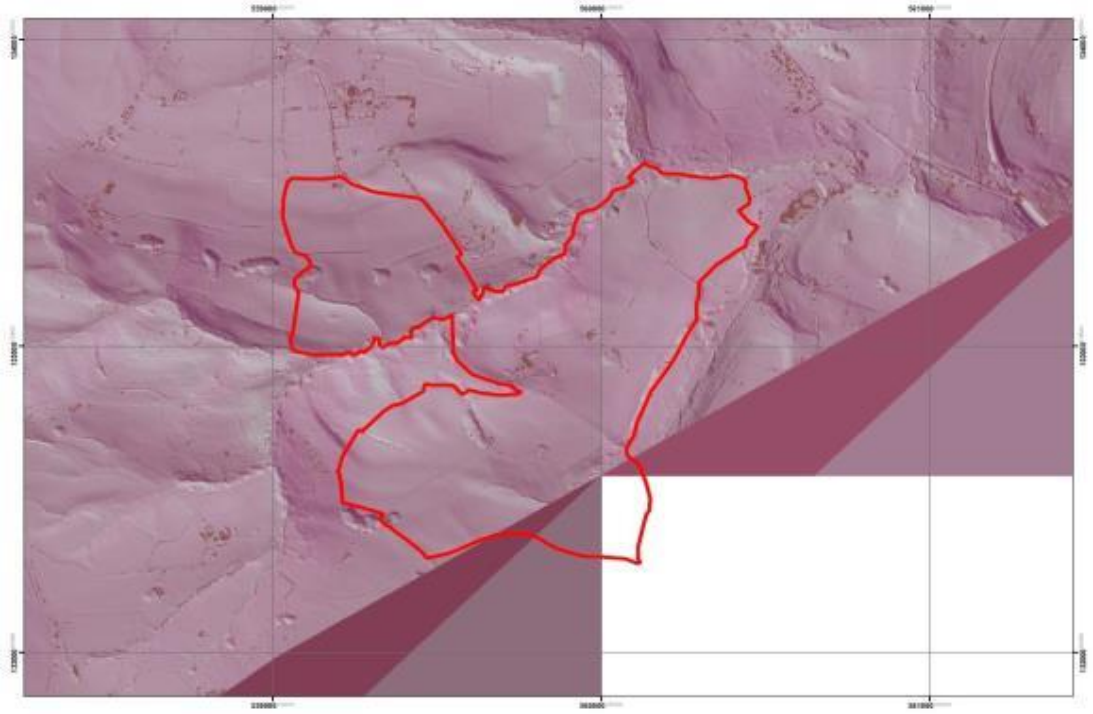
There is a strong topography visible with a ridge bounded by two streams suggesting meadows and ancient gill woods. Small blocks of woods occur to the north inline, suggesting quarrying along relatively uniform geological strata.

Geology



The presence of Wadhurst clay in the norther area supports areas of iron working pits, which form part of the field pattern, whilst the Ashdown Beds suggest quarries for marl and for stone.

LiDAR

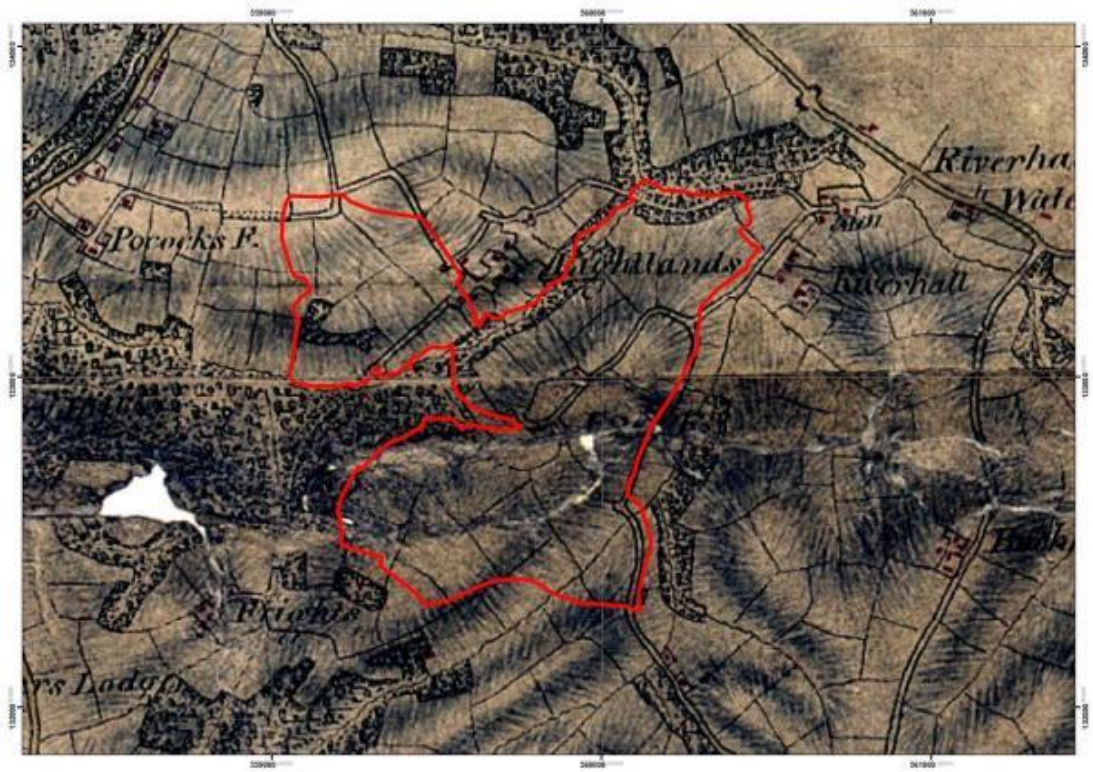


The LiDAR clearly shows the iron extraction pits. It also shows that the boundaries have earthwork banks and ridge and furrow in the irregular fields to the S and in the meadows to the north. This map also highlights the hollow ways of old routes into the farm.

There is no real evidence of building platforms around the farmstead suggesting the site has been in use since medieval times

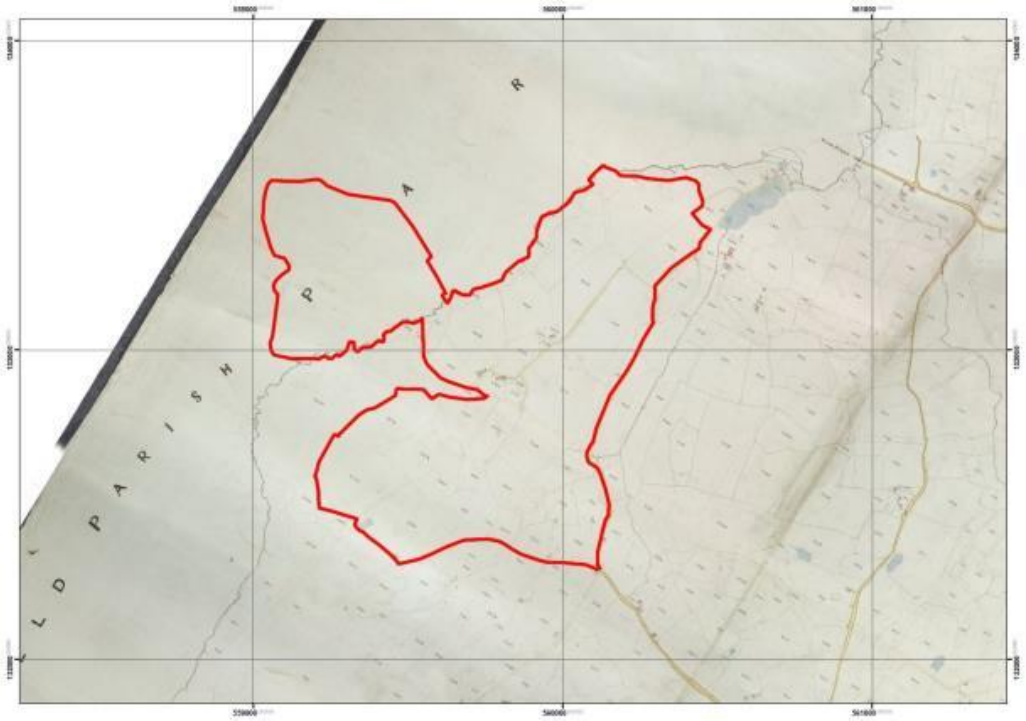
3.2.2 Historic maps

Ordnance Surveyors Draft (OSD)



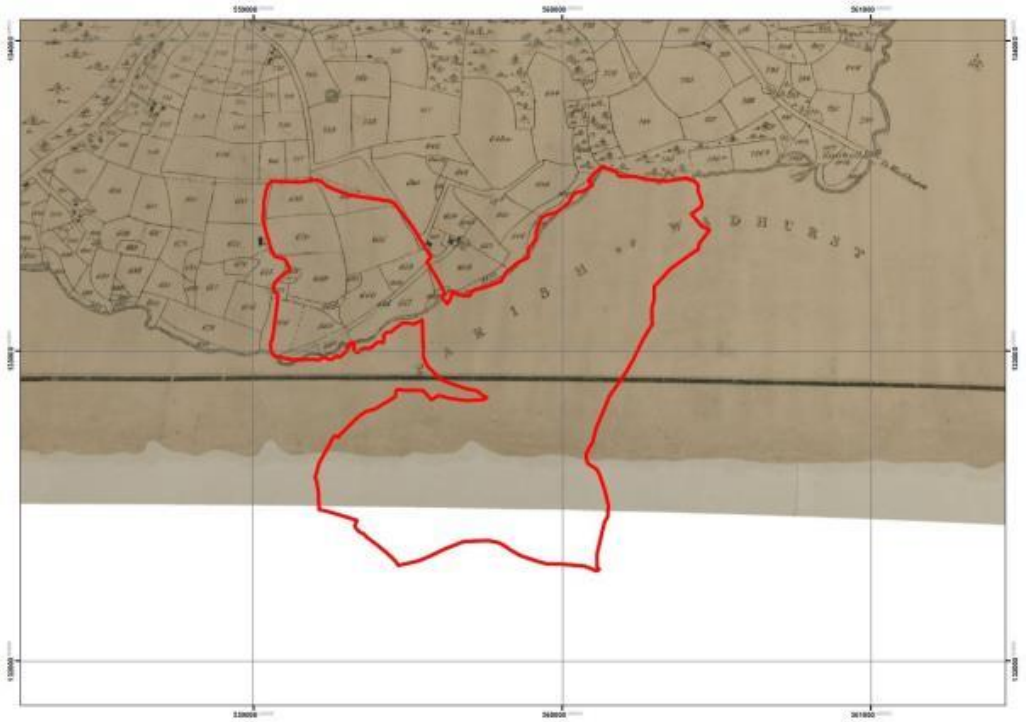
This map of c.1800 shows most of the fields in a schematic fashion together with old roouteways and iron pits. It helps to support the antiquity of the fieldscape at Earlye.

Wadhurst tithe



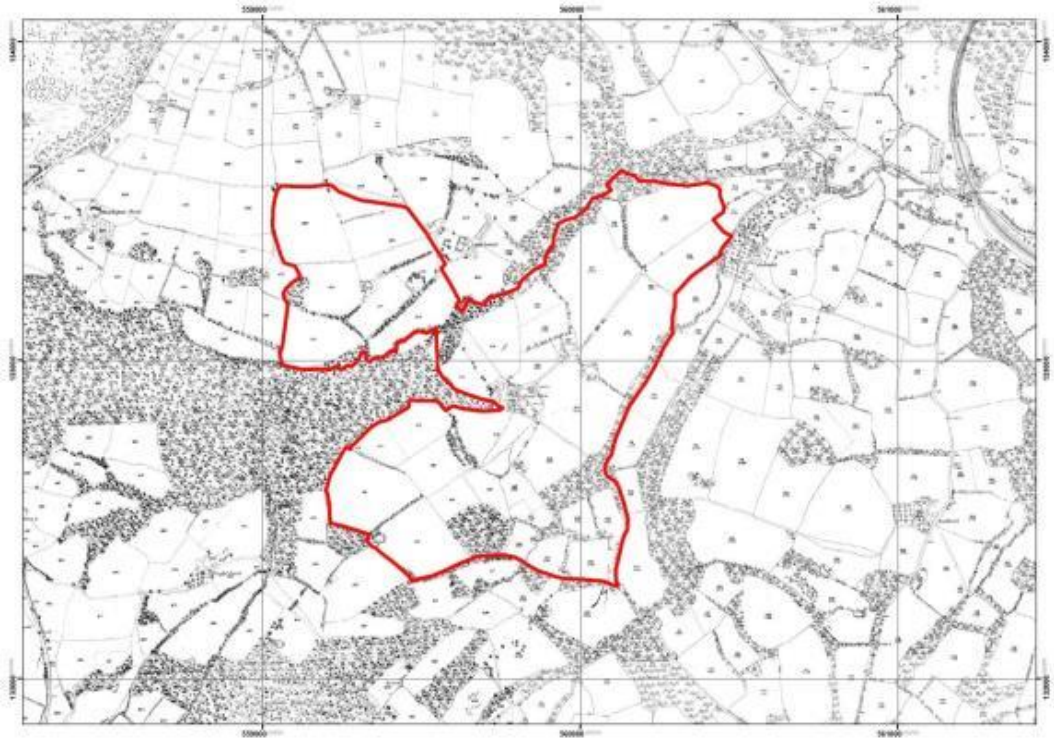
The Tithe map shows that a few field boundaries have been lost since c. 1840 to the present day but not significantly altered the fieldscape and field pattern at Earlye.

Frant tithe



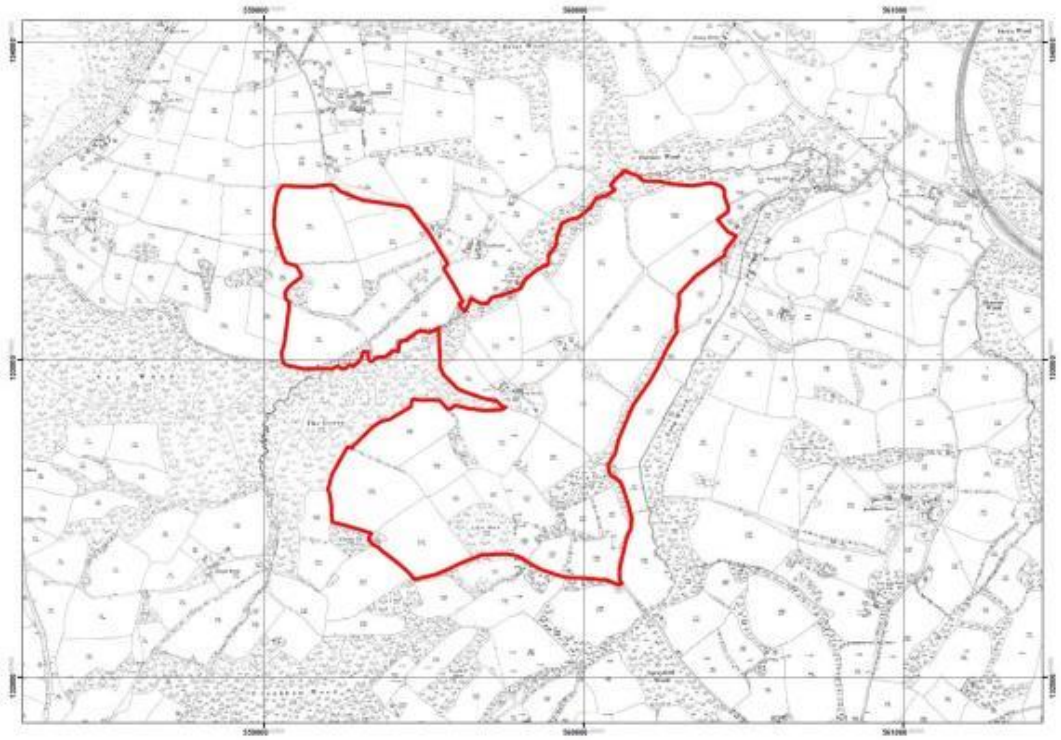
The Tithe map for Frant clearly shows the strong regular n-s field pattern to which some the fields on the present Earlye Farm belong. This would need to research more to understand the link with Waterdown Forest and the adjacent Eridge Park. Fields possibly laid out in a planned way as part of a formal enclosure which also took account of the old iron workings.

Epoch 1



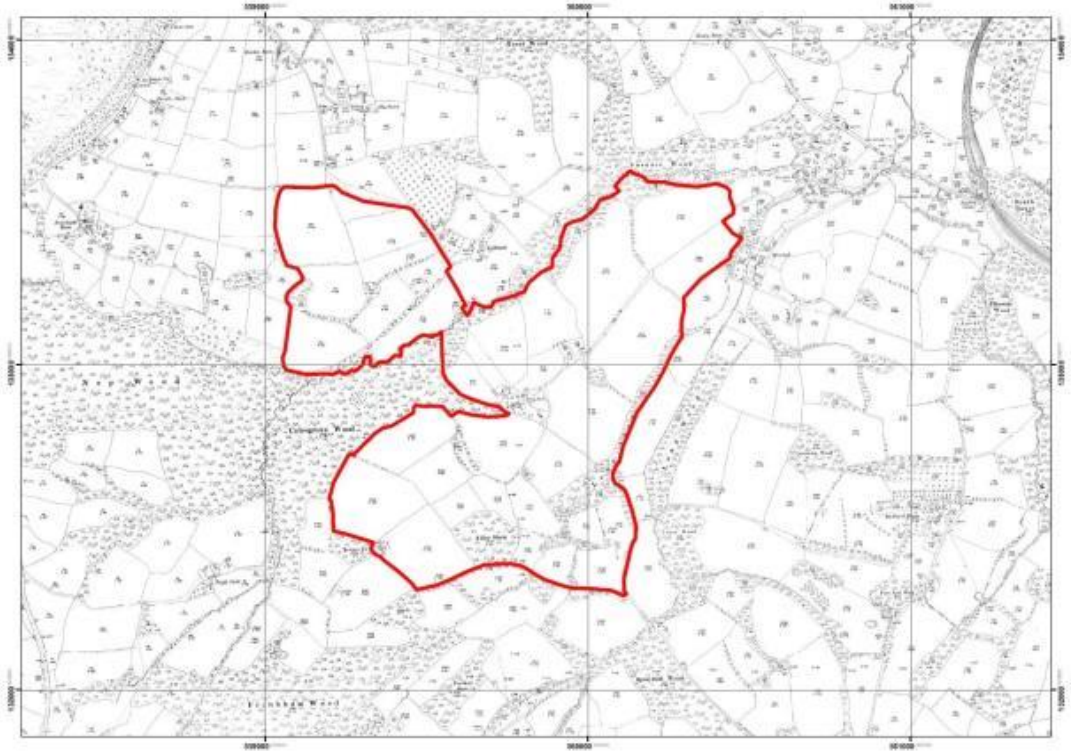
Between Tithe and Epoch 1 start to get changes in field patterns with boundaries being removed and replaced or lost altogether. Epoch 1 reinforces comments made of 10K modern map with the three types of field patterns, together with the strong topographical influence for the ridge fields. It also shows which boundaries are significantly wooded.

Epoch 2



Little change between the two maps – see comment below

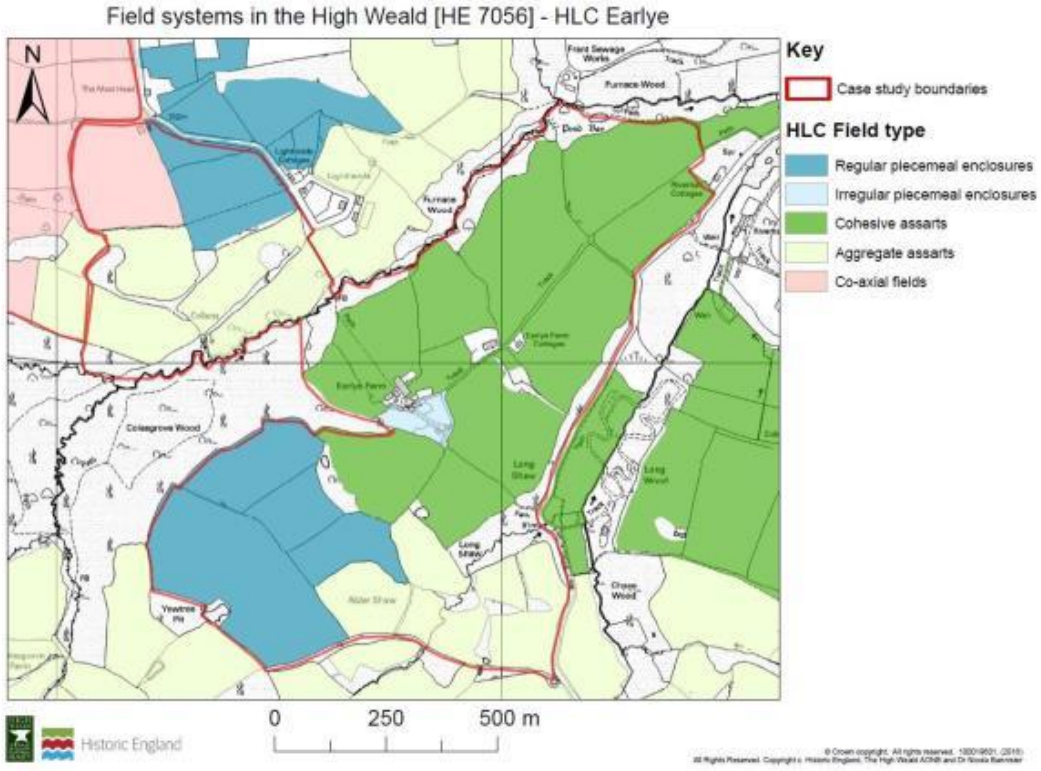
Epoch 3



The sequence of Epoch maps show that this fieldscape has remained virtually unaltered from the mid C19 to the present day and when compared with the Tithes the fieldscape of Earlye Farm exhibits considerable antiquity, having undergone little change.

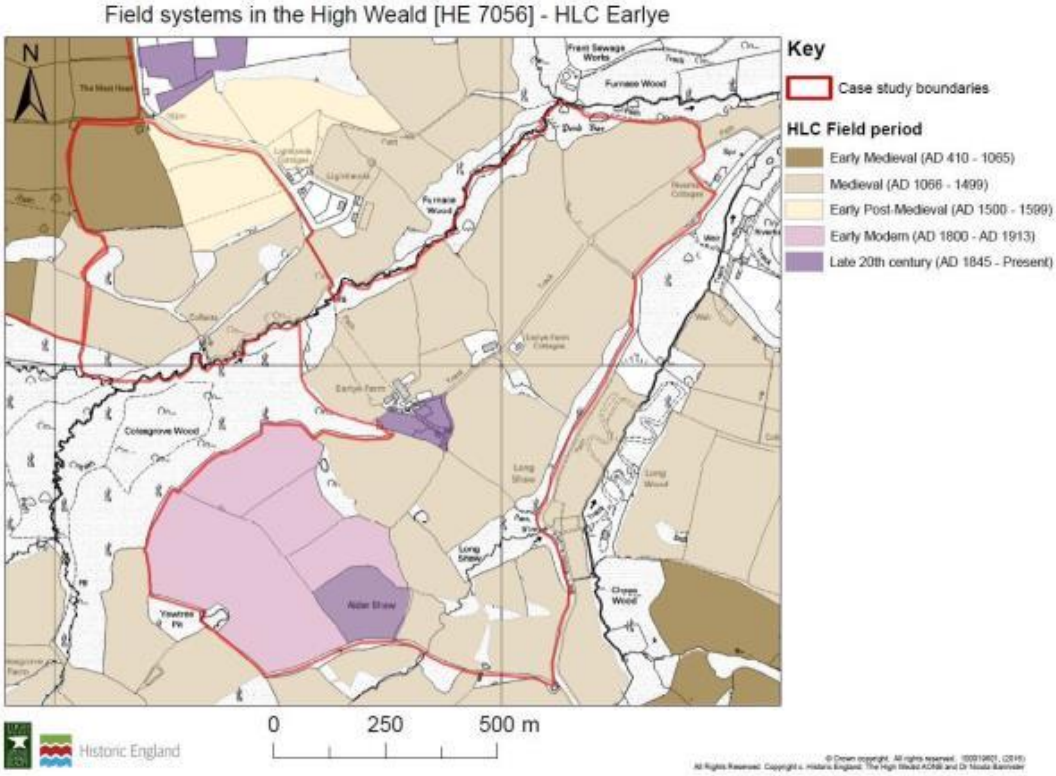
3.2.3 HLC maps

HLC field types



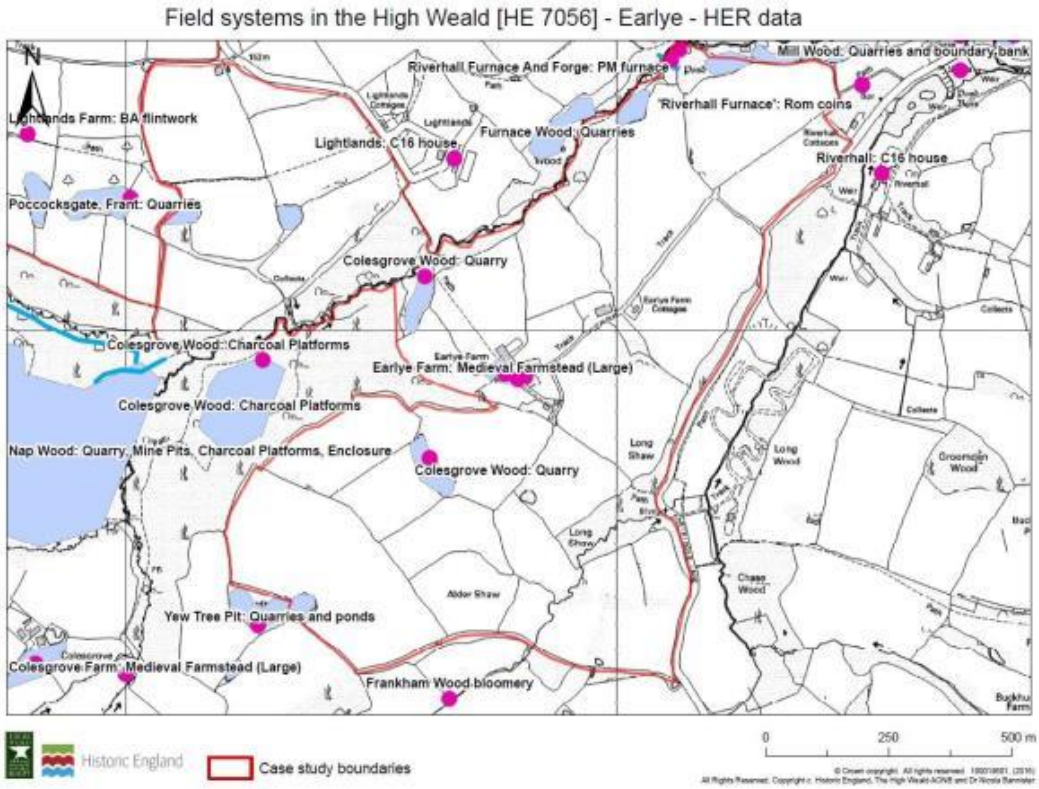
The HLC characterizes the fieldscape at Earlye Farm. Cohesive assarts occur along the ridge and are associated with the historic farmstead. Aggregate assarts reflecting possibly later enclosure of fields from former woodland occur along the valley sides. Regular piecemeal (or informal) fields occur where the field pattern may have been re-organised, and co-axial fields are visible to the north.

HLC field period



Here the antiquity of the landscape is in evidence with the medieval origins of the field pattern. With hindsight and the in-depth knowledge from the archives, I would suggest that the Cohesive assart fields are possibly the early medieval and the co-axial ones might be late medieval or early post-medieval enclosure of Waterdown Forest.

3.2.4 Historic Environment Record (HER) map

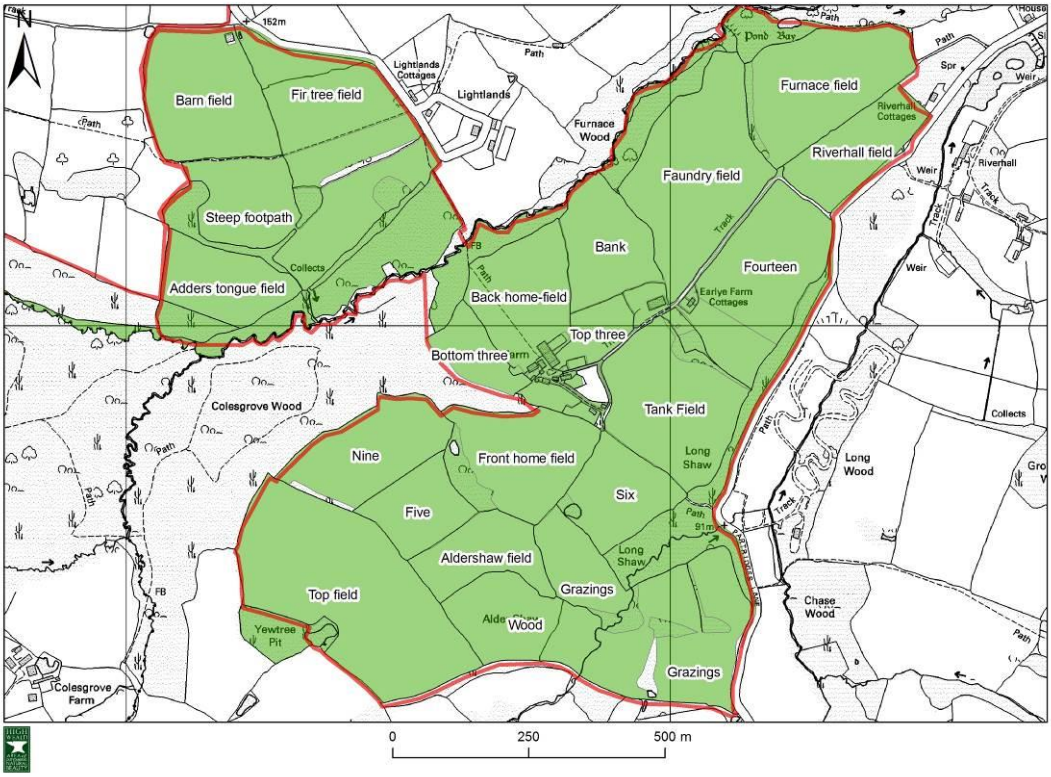


The HER is a record of known heritage features and which have been recorded. It does not mean that there are no further ones to be identified. Roman presence is indicated with a bloomery in Frankham Wood and Roman coin finds at Riverhall. A medieval farmstead set within its field systems where industry has taken place. Post-medieval Iron stone extraction, iron production and manufacture has also taken place, together with the development of estates belonging to the ironmasters at Riverhall and at Lightlands.

There is an absence of agrarian heritage features such as ridge and furrow, old routeways, and former boundaries.

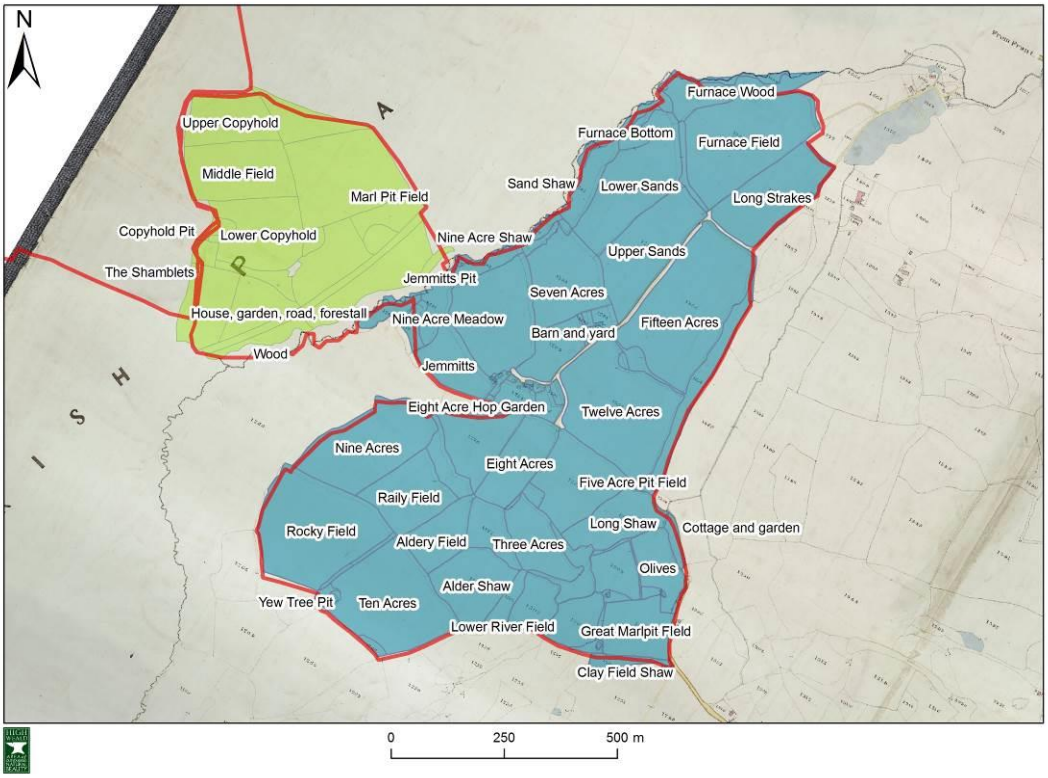
3.3 Modern & historic field names

3.3.1 Modern field names (currently in use by the landowner)



The field names reflect the modern usage of the farm and its fields. Furnace and Foundary Field are held on from the iron workings. All the rest are modern.

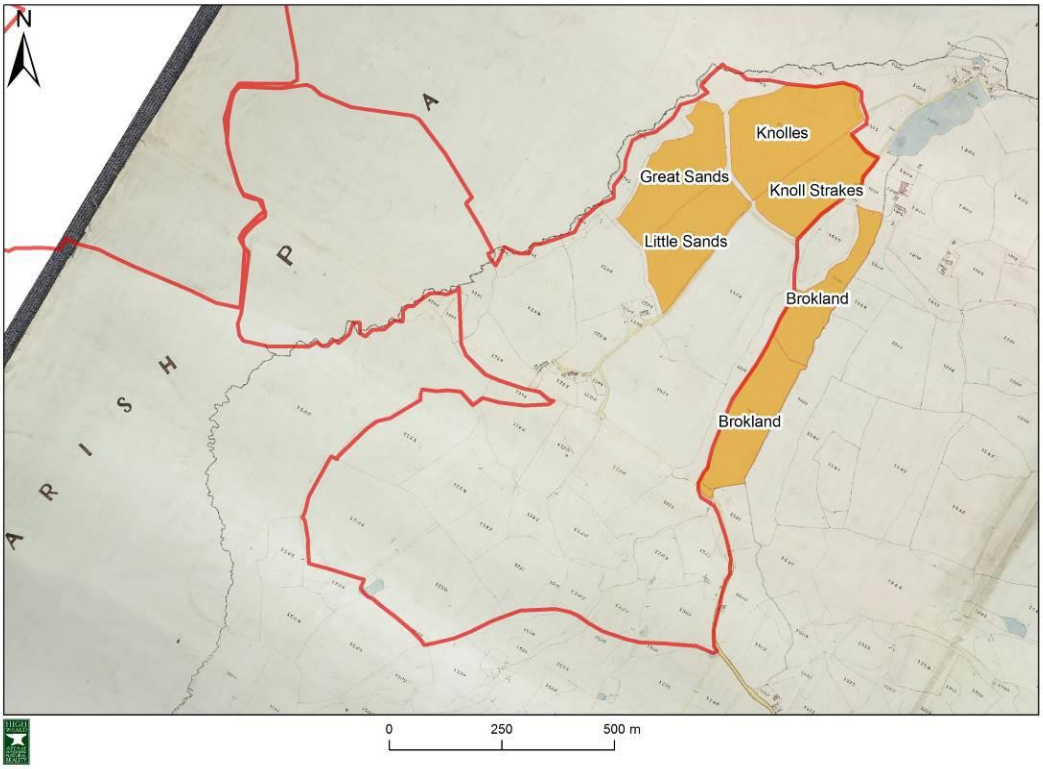
3.3.2 Tithe field names (derived from the Frant and Wadhurst tithe maps)



As with the modern field the names reflect how the fields were being used:

- Marlpit field and Pit field indicate extraction.
- Copyhold is manorial and shows that the tenant/owner held the land as a copyhold from the Manor of Frant (as opposed to freehold). Those fields named by acreage tend to be those which are in regular cultivation for crops or pasture.
- Furnace field indicates its proximity to the iron workings
- Upper and Lower Sands indicate where sandy soil is or where it was dug out (for use in the iron works perhaps)
- 'No data' or no field name (as in the Frant Tithe apportionment for fields close to Lightlands) indicates late enclosure with owner/tenant having only just enclosed the fields or re-organised the fields
- Strakes means 'narrow strip of land'
- The Shambletts (or Stumbletts on a map of 1830 is place where tree stumps occur, perhaps indicating woodland clearance.

3.3.3 Medieval field names (derived from archival research)



Medieval field names rarely survive into the present day but the link between the medieval to the post-medieval (i.e. through the Tithe maps) indicates the antiquity of the field systems. In this case only the name ‘strakes’ and ‘Sands’ has survived from the C15th to the C19th. The name Knolle appears in the landscape further to the north of Earlye as Knowle Farm.

4. Digitising the tithe maps for Earlye Farm

Earlye Farm straddles two parishes, Wadhurst and Frant. One aim of the project was to capture the wealth of information contained in the mid-19th century parish tithe maps, including field size, name, ownership and use. This information could then be used to shed light on the history of the case study sites.

In order to do this for Earlye it was first necessary to digitize each of the fields represented on the Wadhurst and Frant tithe maps. This involved two weeks of solid GIS work creating polygons for each field so that the information in the associated tithe schedules could be appended. Doing this makes it possible to query the data on a field-by-field basis inside the GIS. The details of the process by which this was achieved are described below.

4.1 Creating polygons

4. 1.1 Fields

- A single large polygon covering the total area was created and then divided according to tithe field boundaries using the cut polygon tool.
- This approach was chosen over the use of OS Master Map (OS MM) as the basis for field digitisation. There are two main reasons for this:
-
    1) Using OS MM makes the process of digitising the tithe field boundaries slower and more fiddly due to all the clutter included in the MM layer – we found that it takes significantly longer to clean this clutter and match boundaries to those on the tithe than to just create and then divide one large polygon
    2) We wanted to create an accurate copy of field boundary layout at the time of the tithe map rather than try to transpose historic boundaries onto the present day landscape. We felt this would minimise assumptions regarding boundary changes, instead creating a faithful representation of the tithe which could then be layered up and compared with modern mapping subsequently.
    3) Unlike the Ancient Woodland Inventory revision we are not attempting to identify the existence of present day features at various points in the past; rather we are more concerned with how field patterns may have changed over time.

- Properties (i.e. buildings) have been included within field boundaries classified as land where it is apportioned.

- All land parcels with distinct boundaries were digitised, including those with dotted and/or dashed lines, despite the fact that, as Prince (1956) notes: "*Most tithe maps mark the boundaries of unenclosed parcels of land by dotted lines. Such lines may represent property divisions, separating holdings in an open arable field or common meadow, or they may represent either permanent or temporary divisions between lands of differing utilization in a field belonging to a single farmer. It is generally possible to confirm this*

distinction by referring to the apportionment, but contemporary private estate maps may be of some help in making a decision". Our reasoning was that, although parcels of land demarcated by dotted/dashed may not have had any physical boundaries associated with them, they should be digitised as distinct as they likely have their own unique management histories and may at one time (and may still do to this day) have had some a boundary associated with them.

- Consequently, the rule we followed was to treat ALL lines on tithe as a boundary of some sort – whether dashed, dotted or solid – and digitise accordingly.

4.1.2 Roads, route ways and streams

- Roads and route ways have not been digitised for case study locations as they are not assigned an apportionment number in the tithe schedule.
- However for the "Frant Parish feature class" roads have been digitised and called 'roads' in the attribute table, due to time constraints streams were not. Roads can therefore be highlighted with a change of symbology.

- It would be easy to add roads or rivers to the feature classes for each case study location as below shown below.

- It is possible to easily digitise roads or rivers/streams by using the trace tool in the editor tool bar. One must highlight the polygons that are to be traced using the edit tool (black arrow). First use the sketch tool to start the drawing of a new polygon (make sure that snapping is on). Once the highlighted section is clicked select the trace tool as above and follow the edge of the selected polygons. Trace tool will only draw as far as the selected polygons continue, it is possible to selected more polygons during the sketch by reusing the edit tool and selecting more polygons.

  The following video provides a useful tutorial on tracing polygons in ArcGIS:
  https://www.youtube.com/watch?v=TB7jnD5oyoE

4.2 Assigning apportionment numbers to polygon

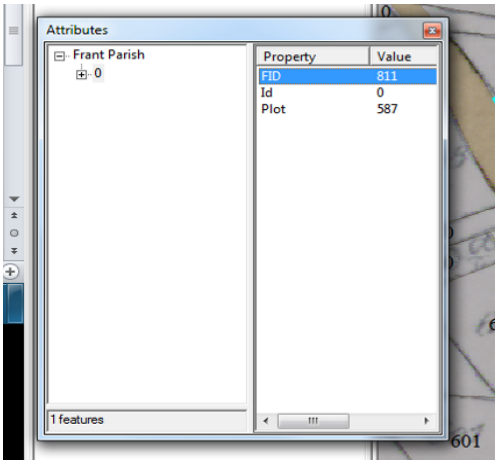
The following processes make the numbering of polygons for digitised tithe maps faster:

- When giving each polygon a number use the "label features" function. Secondly in *symbology select "Plot" as the feature to be given a label. This will highlight those polygons given a number and thus show those* still requiring a plot number.

- To give a number to a polygon, use the "Attributes" icon on the editor tool bar *(Pic 1)* rather than using the attributes table. This icon will open up a window like the one below *(Pic 2).* Assign each number to the "Plot" attribute here.

Pic 1

Pic 2



4.3 Joining polygons to Excel tithe apportionment tables

These steps below have been developed to be able join polygons to the corresponding plot of land within the apportionment. A number of complexities mean that it is not just as simple as assigning a number and joining to the excel sheet. The Steps below aim to minimise these complexities.

- Each polygon is assigned a plot number according to the tithe map – e.g. 650, 710 or 710a (letters often are underlined on tithe map, this can distinguish between letters and objects such as trees).
- This plot number should be used as the basis for a join in GIS to the accompanying Excel apportionment table, in a new column named "Join". This new column should be in the format of "long integer", to store large numbers.
- In the column "Join" input all of the corresponding values for those plots not including a letter i.e. 700, 800 or 900. To deal with letters use the coding system highlighted below.

4.3.1 Coding

- It is not possible to join plot numbers such as 790a to the excel sheet apportionment column called "Plot" as it contains both numerical and alphabetical information. Therefore a code has been developed to confirm the join. These steps overcome the issue of not being able to join alphanumeric columns.

    1. In the column "Join" any number with "a", "b" or "c" associated has been substituted with a code. After the number 000 should be interested and then depending on the letter 1,2,3,4. For example, with a code 790a became 7900001, 790b became 7900002 and 790c became 7900003.

2. A copy of the Excel apportionment for the case study site should be made and called “NameOfCasestudy_Join”. In the excel sheet in the column “Plot” substitute any number with “a”, “b” or “c” with the code convention. 7900001, 7900002.

3. Use the attribute column “Join” and the excel column “Plot” for the join this can subsequently be hidden or deleted.

4. Once the join is complete then one should create a new column called “Plot” in a text format of 5 characters. In this column both numerical and alphabetical information can be stored. It is possible to populate this field using field calculator, editing the coded values so they appear as on map I.e. 790a. This Colum should remain visible.

4.3.2 “Shared” and “Unique tithe”

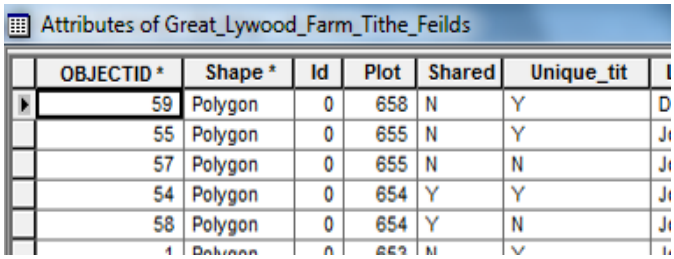
- A column was created for those parcels of land attached to another parcel with an “S” style symbol. This is called “Joint_plot” and refers to a parcel of land with no apportionment number within it’s a boundary, but that shares a number with another polygon containing a number. The user should give all polygons a “Y”/ “N” in the attribute table as to whether they are joined in this fashion or not. “Y” should been given to all polygons attached to another, inclusive of the polygon which has the number within it. “N” should be used for standalone polygons not attached to another parcel of land.

- A column titled “Unique tithe” was added to the tithe attribute table and a “Y” was assigned all polygons with a unique tithe number, and to one – and only one – of the polygons making a group of polygons sharing the same tithe number. All the other polygons in a group sharing a tithe number were assigned an “N”. Querying this column to select out all the “Y” values will enable the total area to be calculated according to the areas measured in the tithe schedule (as opposed to the actual area of all the digitised polygons). This is because the “Y” assigned to one of the polygons from a group of polygons sharing the same plot number displays the value of the total area of all the parcels to which it is connected (see the “Acres”, “Roods” and “Perches”).

4.4 Working examples

Plot number 654 occurs two times as this number refers to two parcels of land joined together. Therefore, this plot receives “Y” two times in “Shared” column; however, only one of the poygon’s with plot number 654 receives a “Y” in “Unique” column ensuring a means by which the total area according to the tithe apportionment can be calculated.

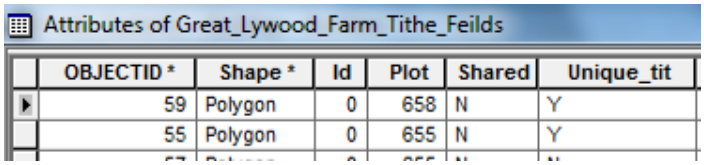
Pic 3. Example of joint land and unique tithe steps



Attributes of Great_Lywood_Farm_Tithe_Feilds

OBJECTID *	Shape *	Id	Plot	Shared	Unique_tit	
59	Polygon	0	658	N	Y	D
55	Polygon	0	655	N	Y	J
57	Polygon	0	655	N	N	J
54	Polygon	0	654	Y	Y	J
58	Polygon	0	654	Y	N	J

Pic 4. Idealised attributes table before join



Attributes of Great_Lywood_Farm_Tithe_Feilds

OBJECTID *	Shape *	Id	Plot	Shared	Unique_tit
59	Polygon	0	658	N	Y
55	Polygon	0	655	N	Y

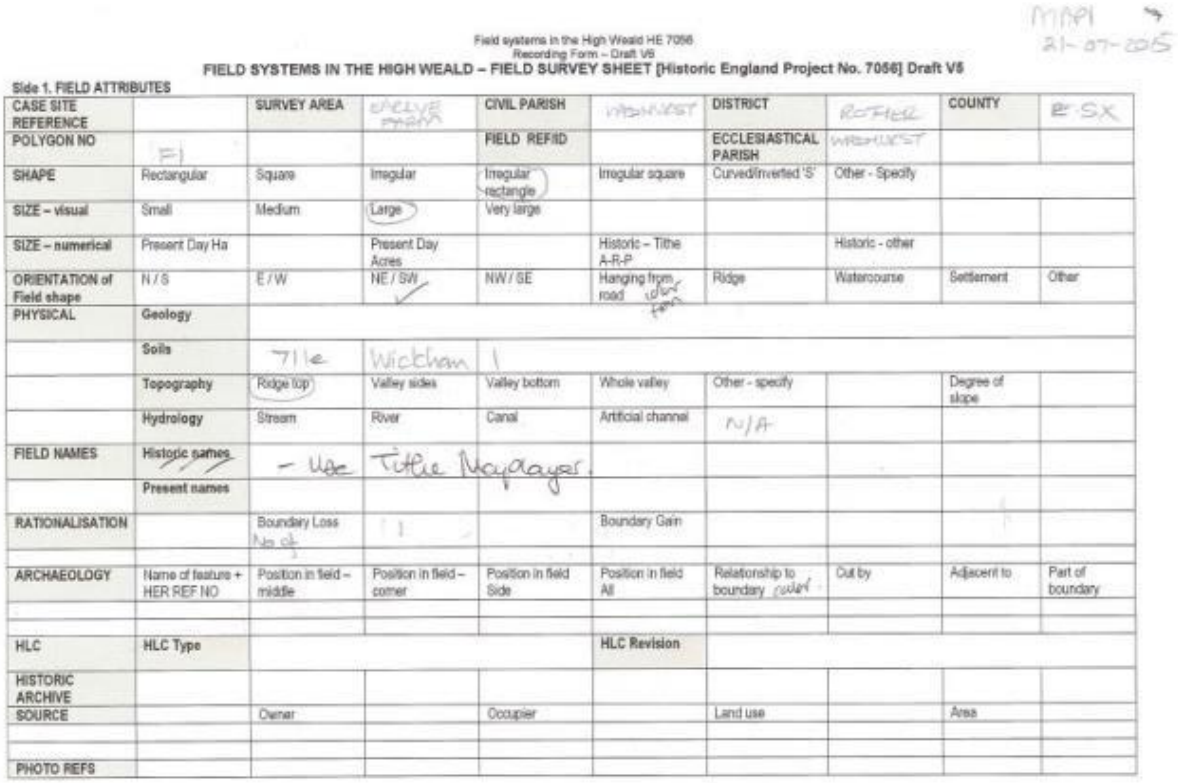
NB: on the Kent tithes figures appearing under the column headings “Vicarial” and “Appropriator” refer to money to be paid by each landowner in pounds, shillings and pence. (This information was not appended to the attribute table as it refers to total holdings and not to single parcels (i.e. polygons).

NB: where case study properties include land from two or more parishes the field boundaries from each tithe map were digitised faithfully as they appear on the map. This often means the polygon along the parish boundaries will overlap – or at least not align properly. Consequently, considerable caution should be exercised when examining tithe field boundaries abutting parish boundaries.

5. Field survey method

5.1 Survey form design: undertaken by a historic environment specialist & GIS technician

The following series of screenshots show a completed field survey form used at the Earlye Farm case study site. Each form is accompanied by a map (see the final screenshot of the series) of the site which allows the recorder to indicate the location of each feature so that they can be drawn in the correct location inside the GIS.



Field systems in the High Weald HE 7056
Recording Form – Draft V5

FIELD SYSTEMS IN THE HIGH WEALD – FIELD SURVEY SHEET [Historic England Project No. 7056] Draft V5

Side 1. FIELD ATTRIBUTES

CASE SITE REFERENCE		SURVEY AREA	EARLYE FARM	CIVIL PARISH	WARBLETON	DISTRICT	ROTHER	COUNTY	E SX
POLYGON NO	F1			FIELD REFID		ECCLESIASTICAL PARISH	WARBLETON		
SHAPE	Rectangular	Square	Irregular	Irregular rectangle	Irregular square	Curved/inverted 'S'	Other - Specify		
SIZE – visual	Small	Medium	Large	Very large					
SIZE – numerical	Present Day Ha		Present Day Acres		Historic – Tithe A-R-P		Historic - other		
ORIENTATION of Field shape	N / S	E / W	NE / SW ✓	NW / SE	Hanging from road	Ridge	Watercourse	Settlement	Other
PHYSICAL	Geology								
	Soils	Tile	Wickham 1						
	Topography	Ridge top	Valley sides	Valley bottom	Whole valley	Other - specify		Degree of slope	
	Hydrology	Stream	River	Canal	Artificial channel	N/A			
FIELD NAMES	Historic names	– Use	Tithe Mapping						
	Present names								
RATIONALISATION		Boundary Loss No ch			Boundary Gain				
ARCHAEOLOGY	Name of feature + HER REF NO	Position in field – middle	Position in field – corner	Position in field Side	Position in field All	Relationship to boundary	Cut by	Adjacent to	Part of boundary
HLC	HLC Type				HLC Revision				
HISTORIC ARCHIVE									
SOURCE		Owner		Occupier		Land use		Area	
PHOTO REFS									

MAP 21-07-2015

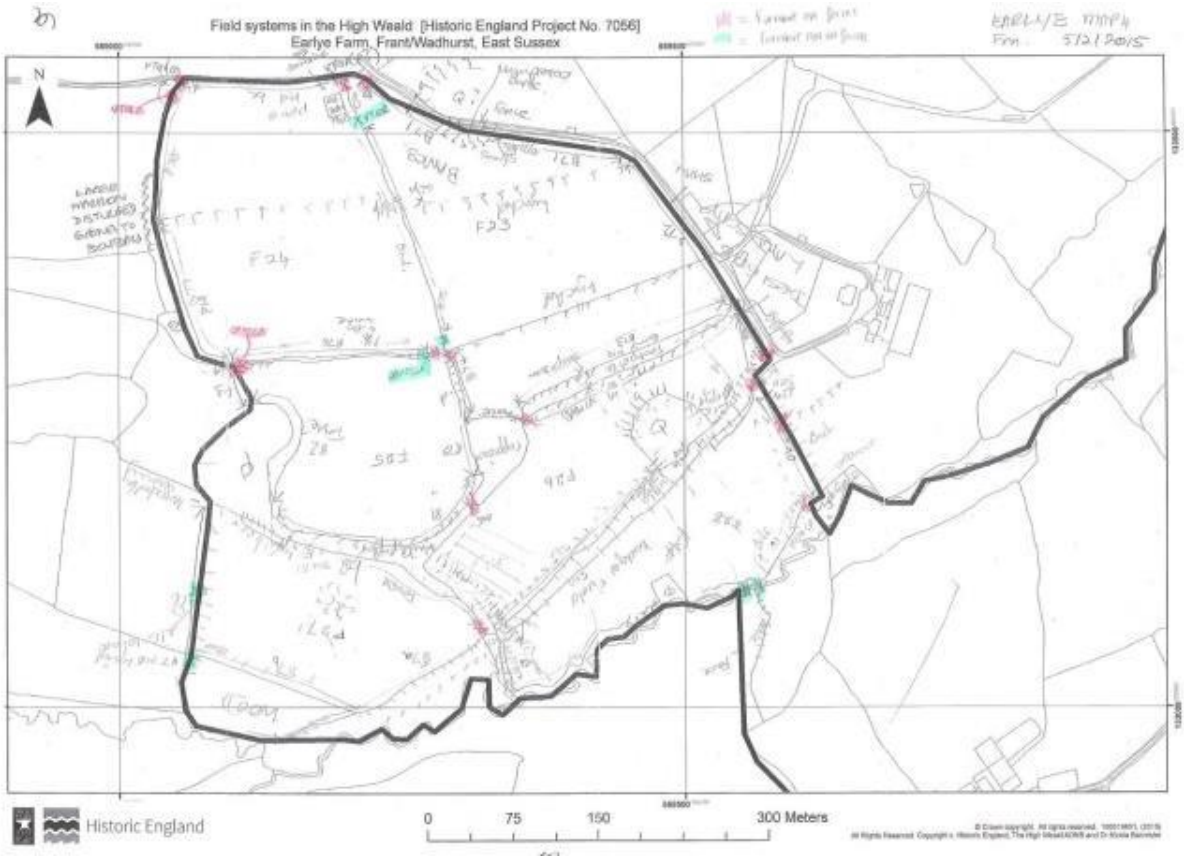
EARLY E MAP 1

Field systems in the High Weald HE 7056
Recording Form – Draft V6

		Boundary number											
Polygon no.	E1	B1		2		3		# 50		S 51		S 52	
Type	Hedge												
	Hedge with trees	✓		✓		✓						✓	
	Wooded Hedge												
	Woodland edge							✓		✓			
	Shaw												
	Stone Wall												
	Stone faced bank												
	Fence												
	Ditch												
	Balk												
	Watercourse												
Function	Agrarian	✓		✓		✓		✓					
	Farm							✓		✓		✓	
	Parish												
	Recreation												
	Local Admin												
	Regional Admin												
	Road												
	Other												
Morphology	Straight											✓	
	Curved												
	Sinuous	✓		✓		✓		✓		✓			
	Dog-legged							✓					
	Inverted S												
	Discontinuous												
	Other - specify												
Earthwork	**Bank**							NA					
	Size-W 0 - 1.0m	✓		✓									
	1.0 – 3.0m	✓				✓				✓			
	+ 3.0m											✓	
	Size H 0 – 0.5	✓		✓		✓						✓	
	0.5 – 1.0m									✓			
	+ 1.0m												
	Profile A/s									A		L	
	Ditch							NA					
	Size W 0 – 0.5m			✓									
	0.5m – 1.0m	✓				✓						✓	
	+ 1.0m									✓			
	Size D 0.0-5m	✓		✓		✓							
	0.5m – 1.0m									✓		✓	
	+ 1.0m												
	Profile A/S	S		S						S		S	
	Silted	✓		✓						✓			
Relationship	Boundary No	B2		B1	B3	B2		B3		46b	47	51	
to adjacent	Abutting									✓		✓	
boundary	Overlying												
	Overlaid												
	Cut by ditch			✓	✓	✓							
	Gate	✓						✓			✓		

Field systems in the High Weald HE 7056
Recording Form – Draft V6

		Boundary number											
Polygon no.	F1	B1		2		3		~~4~~ 50		~~5~~ 51		~~6~~ 52	
	Other												
Relationship to slope	Across slope											✓	
	With slope									✓			
	Other												
Orientation	N/S												
Of boundary	E/W												
	NE/SW												
	NW/SE												
Furniture	Gate	✓		✓		✓						✓	
	Stile												
	Markers											[illegible]	
	Stock watering												
	Creeps/smoots												
	Other - specify												
Historic	Pollard											✓	
Management	Stubbed												
	Coppiced									✓			
	Laid												
	Flailed												
	Hand trimmed												
	None												
Modern	Flailed	✓		✓		✓							
Management	Coppiced												
	None									✓			
Species	0 - 3			✓									
	4 - 6	✓		✓		✓				✓		✓	
	+ 6												
	Thorn sps dom											✓	
	Woodland sps	✓	✓	✓		✓				✓			
	Key Species	CM				Rub				CA			
	–	1A				cm				QR			
		Rosa											
		CA											
Biodiversity value	High												
	Medium												
	Low											✓	
Cross ref with meadow survey													
Notes		Maturing QR		Mature QR OAKS		Mature QR OAKS							
Photo refs													



5.2 Geodatabase design & setup: undertaken by a historic environment specialist & GIS technician

Once the suite of features that would be collected in the field survey form had been decided, a geodatabase was created using GIS so that all the survey data could be captured, stored, mapped and overlaid with other data. The process by which this was achieved is outlined below.

Geodatabase and Feature Classes

A geodatabase was created using ArcCatalogue in order to act as a central location within which the subsequent feature classes would be held. Five initial feature classes were then created:

- "field_attributes" (polygon)
- "archaeology_attributes" (point)
- "boundary_attributes" (line)
- "boundary_furniture" (point)
- "earthwork_attributes" (line)

5.2.1 Attributes

The five feature classes were then loaded into what would become the GIS. Once loaded, the attribute table for each of the feature classes was opened in turn as attributes were created in response to questions asked during the data collection process. For instance, one of the questions asked related to the boundary type. Therefore an attribute titled: “Boundary_type” was added to the boundary attributes feature class.

Domains and Coded Values

Domains and their coded values were created in response to the answers of the questions. For instance a domain titled “boundary_type” was created within which coded values were then specified. The coded values related to the possible options on the data collection forms, so within the “boundary_type” domain the following is a sample of the coded values: ditch, fence, hedge etc. Having created the domains and their coded values, they were then linked to the correct attribute using ArcCatalogue.

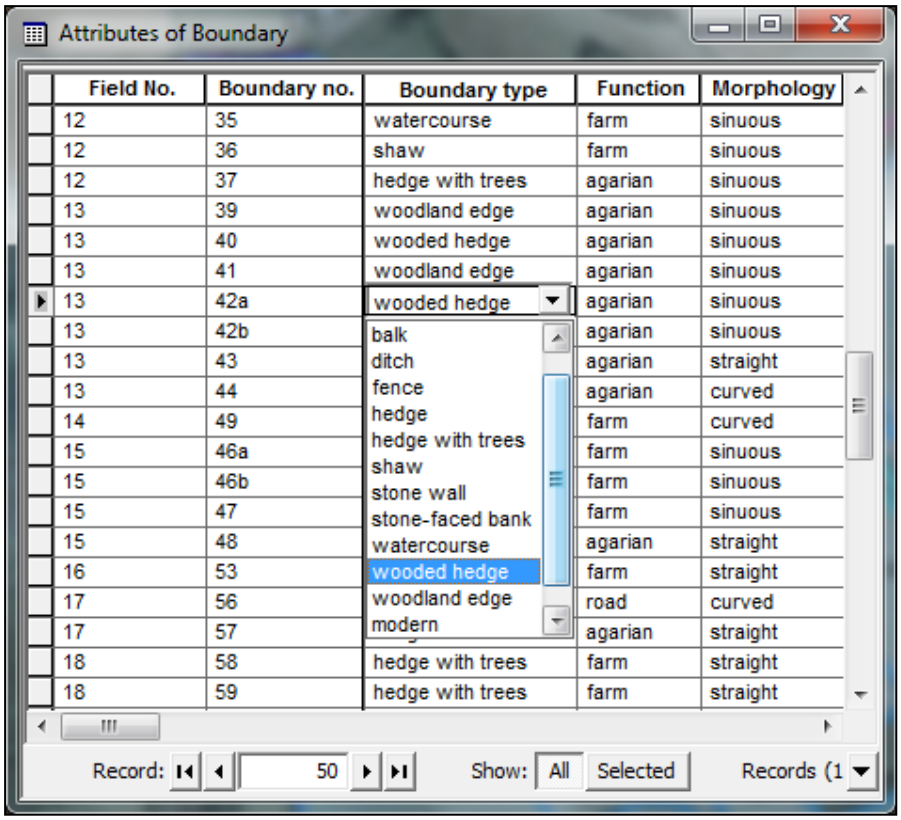
When specifying the coded values for domains consideration must be taken as to the order they are entered in. This is because (to my knowledge) they cannot be re-ordered without completely removing the necessary coded values and then re-entering them at the bottom of the list. This is problematic because in removing a coded value it will remove any data stored under that value in the attribute table meaning that re-ordering the coded values once data has been entered can cause considerable data loss. Therefore it is suggested to have decided upon a consistent format as to how the coded values are to appear prior to any data entry. I suggest an alphabetical/numerical format with a catch all negative coded value at the bottom.

This problem can also be encountered when new coded values are deemed necessary to be added into the domain as more data is made available. When this occurred it was decided that the added coded value would remain at the bottom of the drop down menu as this was deemed more acceptable than removing several other coded values which would have caused significant data loss.

Domains and coded values were used for two principle reasons. The first of which is that they will ultimately save a significant amount of time in the long run. This is because once the domains have been linked to the attributes the data entry process is a case of selecting the right option from a drop down menu – see Figure 6 p.35.

In addition to saving time, the use of domains also reduces the chance of incorrectly entered data because a choice has to be made from an already predetermined list of potential options. This not only makes the data entry process notably more robust since the potential for typos is removed but also saves time. This is because the chance for error is significantly reduced meaning that considerably less time is needed to identify any instances in which data was incorrectly added.

Figure 6: Attribute table for the feature class: “boundary_attributes”.



5.2.2 Text Fields

Not all attributes used domains and coded values. This is because there are instances in which the potential range for data to be entered into an attribute is beyond the scope of coded values. An obvious example of this is the attribute relating to the name of the field since creating coded values to hold this information would be a pointlessly time consuming task.

An additional reason for text fields is when they are used in conjunction with the coded value “other (specify)”. For instance, the attributes “boundary type” and “boundary type (other)” were both created, with the formed being linked to a domain, including the coded value “other (specify)”, and the latter being a free text attribute. The purpose of this is that it acts as a catch all for instances when a boundary type that isn’t represented by the coded values is identified. This information can then be typed into the free text attribute whilst mitigating the need to add additional coded values that are rarely used.

5.3 Field survey method: undertaken by a historic environment specialist

The whole farm was covered in order to capture as much data as possible from several individual field system patterns. Over 250 acres covered in four days in June/July by two people (8 person days) using a Land Rover for access. A pasture farm on which sheep and cattle farmed – and where the hay and silage had already been taken off – made both access and the visual across the fields relatively easy.

Photographs were taken of views of each boundary, together with any details on structure etc. Also views were taken of the fields in order to provide an idea of character and landscape setting. Where possible archaeological features were also recorded by photographs (see the photos below).

Field view with lynchet running through the middle

Boundary bank

Covering the whole farm meant that every boundary was viewed on both sides, except for the farm ownership boundaries. Individual forms were filled for each field and a map of the site was annotated using a key.

The main issue was the amount of bracken undergrowth covering the earthwork component of the boundaries making it difficult to quickly assess the boundary structure and changes along its length. It is therefore recommended that field surveying be carried out either early or late in the year when there is less vegetation cover.

5.4 Desk-based survey method: undertaken by a GIS technician

5.4.1 Survey forms

The form was trialled by a non-expert (i.e. a GIS technician rather than a historic environment specialist) using only desk-based mapping. The first page of the form could be filled in relatively easy by means of the modern Ordnance Survey map (OS 10K), aerial photography, geology and soil map, the HLC map and the Ordnance Survey Epochs (OSEs). Due to a lack of data, no information on area, archaeology and field names was available. The problem of how to record fields and boundaries became apparent. Fields need to be treated in a consistent way. During this work questions arose such as: how would you record boundary relics, which are not currently functioning anymore?

The boundary characteristics could predominantly be identified by using the OS 10K map, Lidar images and aerial imagery. However, from map observation it was not clear how certain

boundaries overlap or how they are cut by ditches. From desk-based study it appears impossible to define historic and modern management, as well as species and biodiversity value (see table 2).

Another problem encountered as a non-expert was how to identify archaeological features like banks, ditches, lynchets, quarries, sunken tracks etc. from Lidar images and aerial photographs. One solution would be to have clearly illustrated examples on how to recognize these features from different map types. Determining ditch depth or bank height and width from a Lidar images is also difficult.

On some occasions information derived from the OS 10K map was contradictory to aerial photographs. For instance, boundaries indicated on aerial images do not always coincide with boundaries indicated on the OS map or in-field (which was the case at Scotney Farm). Only field survey can rule out any uncertainties.

6. Data entry

6.1 Data entry for desk-based surveys

The desk-based survey data could only be entered in the field attribute table, earthwork attribute table and boundary attribute table. No archaeological features were recorded, because they couldn't be observed from a desk-based study. From the desk study it became clear that boundary furniture (stiles, stock watering) is difficult to locate due to their relatively small size, insignificant representation in aerial photography or due to being obscured by thick tree coverage along the boundaries. There is no reliable way to record this information without a field survey. It was not possible to collect data on ecological features from aerial photography.

Table 4. Data recording possibilities for desk or field survey.

Desk / field survey	Attributes	Required and recommended maps
Features which can be recorded from desk study	Field shape	Aerials OS 10K Mastermap
	Size	
	Orientation	
	Physical characteristics	Soil map Geology Lidar + contour map
	Historic field names	Tithe, other available sources
	Archaeology	County heritage data
	HLC type	County HLC data
	Rationalisation	Aerials modern + historic OS 10K, OSE, OSD Tithe Estate maps (if available)
	Boundary type	Aerials OS 10K Lidar
	Boundary function	Aerials
	Morphology	Aerials OS 10K Lidar + contour Map
	Boundary orientation	OS 10K, aerials, any modern map
	Relationship adjacent boundaries	OS 10K, aerials, Lidar
	Slope	Lidar + contour map
	Boundary furniture (where visible)	Aerials
Features which require field survey	Historic management	NA
	Modern management	NA
	Species	NA
	Biodiversity	NA
	Earthwork dimensions	NA
	Boundary furniture	NA

6.2 Data entry for field surveys

6.2.1 Field Attributes

Prior to any field attribute data being entered into the GIS the field polygons have to be created. This was done using OS Master Map tiles by selecting the necessary field (identified using the field surveyor's notes) and then copying and pasting it into the field attributes layer – Figure 7. It is recommended to do this in ascending field number order; the reason for this is that the created polygons can then be sorted by objectID in the attribute table, meaning they will be in a logical order when it comes to adding the data. The alternative to this approach would have been to hand digitise the field boundaries which would have been hugely time consuming even on a relatively small test site like this.

Figure 7. (A) OS Master Map layer with Earlye Farm Boundary indicated. (B) Necessary field boundaries taken from OS Master Map layer and copied into the field attributes layer.

Use of drop down options associated with domains and coded values, makes the process of data entry simple and relatively quick. In order to maximise efficiency it is recommended that the attributes be put in the same order as they are referred to on the data collection form. The reason for this is that it allows for the user to simply look down the form and add in the data as they go rather than moving back and forth over the page. Once the data has been entered into the GIS the order of the columns in the attribute table can be altered to make the order logical.

As well as the data being added to the field attributes layer, scanned copies of the data collection form were added via hyperlinks to the actual polygons. This means that when the hyperlink tool is enabled (in the tools toolbar) by clicking on a field polygon the data collection forms for the field and the associated boundaries will be opened. However, the forms in this case were saved on a local server and not within the GIS meaning if the GIS is opened without access to the server the hyperlinks will not work.

6.2.2 Boundary Attributes

Similar to how to the polygons that would represent the fields had to be created prior to data entry, the poly-lines that would represent that boundaries also had to be created before any data could be entered. However, unlike creating the field polygons a hand digitised method was employed the separate sections of the field polygons that represented each boundary arc could not be individually selected.

In order to maximise the efficiency and accuracy when hand digitising the boundaries it is recommended to have "snapping" enabled between the boundary attributes and field attributes feature classes. It is also recommended to create the boundaries in the order they are referred to on the data collection forms rather than in ascending order. For instance, field one at Earlye Farm has boundaries 1,2,3,50,57 and 52. This allows for all the boundaries on the same data collection form to be added at the same time and to be added in the order they appear on the form.

Figure 8. (A) Field 1 boundaries in the order they appear on the data collection form. (B) Field 1 boundaries entered into the attribute table in the same order as on the data collection forms.

A

Polygon no.	Boundary number					
	B1	2	3	4 50	5 57	6 52

B

Attributes of Boundary

Field No.	Boundary no.	Boundary type	Function	Morphology
01	1	hedge with trees	agarian	sinuous
01	2	hedge with trees	agarian	sinuous
01	3	hedge with trees	agarian	sinuous
01	50	woodland edge	agarian	sinuous
01	57	woodland edge	farm	sinuous
01	52	hedge with trees	farm	straight
02	4	woodland edge	agarian	sinuous
02	64	<Null>	<Null>	<Null>
02	5	watercourse	agarian	sinuous
02	6	hedge with trees	agarian	sinuous

Record: 1 Show: All Selected Records (0 out of 100 Selected) Options

During data entry for boundaries the most efficient methodology was to add the data from all of the boundaries on the form attribute by attribute rather than working through each individual boundary one at a time. For instance, all of the information relating to boundary type would be added in, then function and then morphology etc.

Another way to improve efficiency is to turn off any unnecessary fields and make the columns of the attribute table relatively narrow meaning that more of the attribute table can be seen at any one time. This reduces the need to be scrolling left and right within the attribute table which ultimately improves efficiency.

6.2.3 Boundary Furniture

Boundary furniture was the first of the point data to be added into the GIS. The most efficient way to enter this data was, again, to work on a field by field basis.

However, during the entry of this data a common issue became apparent; it was unclear from the field surveyor's notes where the boundary furniture was located along the boundary. Gates which make up 69% [2 S.F.] of boundary furniture could, usually, be located using aerial photography due to the obvious signs of increased and concentrated use of these areas - Figure 9. However, other types of boundary furniture, such as stiles and stock watering locations, were more difficult to locate due to their relatively small size, insignificant representation in aerial photography or being obscured by thick tree coverage.

Figure 9: Two clearly identifiable gate locations at which gate locations.

6.2.4 Earthwork Attributes

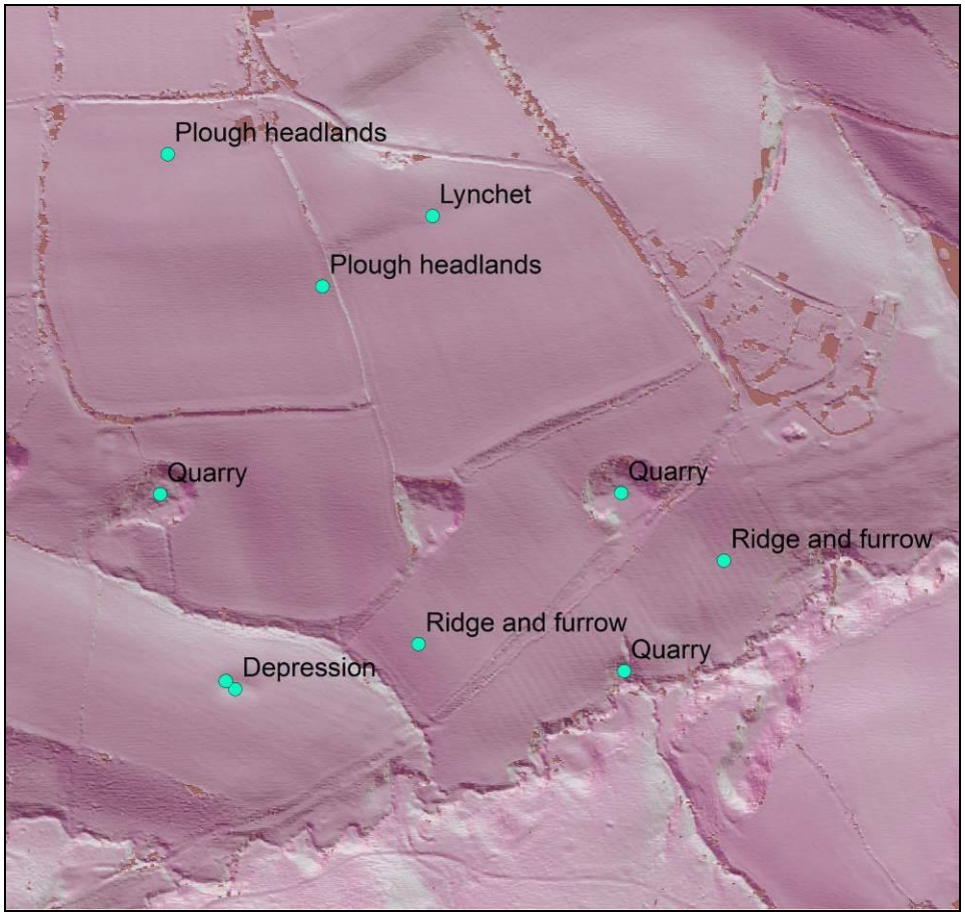
Entering the data for earthwork profiles after the creation of the poly-lines that will represent the boundaries is recommended. This is because the necessary boundaries (i.e. those with earthworks) can be selected, copied and then pasted into the earthwork attributes layer.

Data entry efficiency for earthwork attributes can be improved in similar ways to boundary attributes. Efficiency is improved by working on an attribute by attribute basis rather than working through each earthwork element individually.

6.2.5 Archaeology Attributes

Entering the data into the archaeology attributes feature class was similar to data entry into the boundary furniture feature class as both are point data and both are located in GIS using the field surveyor's notes. Similarly to how aerial photography was used to help identify boundary furniture, LiDAR (Light Detection and Ranging) data was used to help locate archaeological features – see Figure 10 below.

Figure 10. LiDAR data used to help identify and locate archaeological features.



6.2.6 Additional Layers

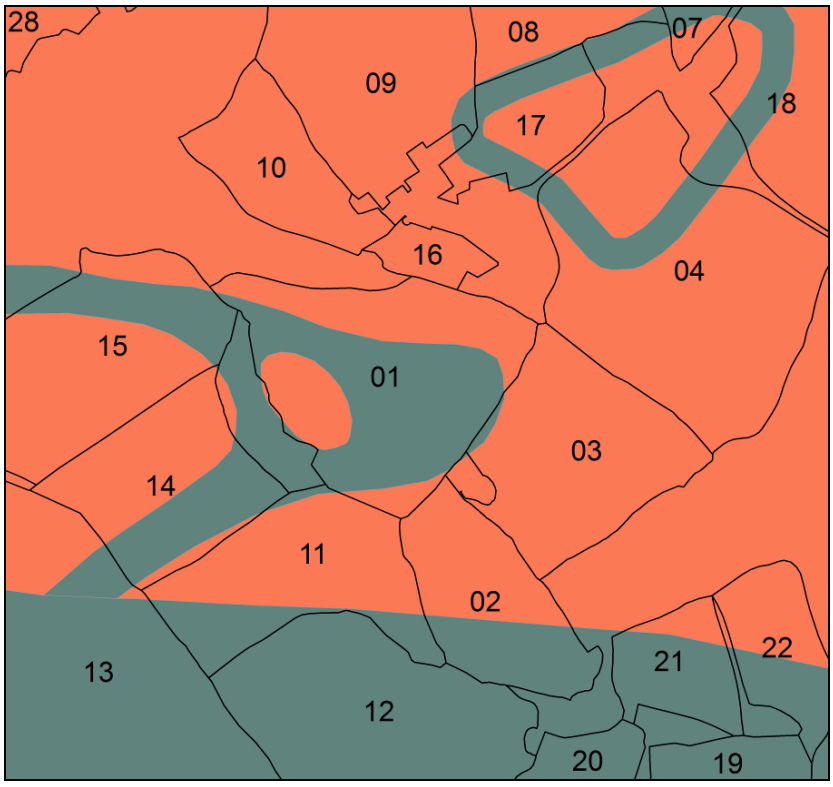
As previously mentioned in the data entry sections for both boundary furniture and archaeological attributes the use of external data layers proved very useful. The additional layers can broadly be put into three categories:

1. Layers used to help locate attributes such as boundary furniture and archaeological attributes. These layers were aerial photography and LiDAR data
2. Layers that reduce the need for data to be entered into the attribute tables. This includes layers containing information such as geology and soil type. This is beneficial because there are instances, see field 1 in Figure 11, below, in which a single entry into an attribute such as geology is not representative

3. Supplementary data against which the field data can be compared to or studied within a wider context. Within this category are maps containing historical information (e.g. tithe map and the historical land classification map) which can be overlaid with the field data. Using the tithe map it is possible to identify if fields have lost boundaries and how field names have changed over time. The historical land classification is arguably the most useful layer in this category due to the sheer volume of data contained within this layer.

It is, however, important to note that the above categories are not mutually exclusive since the aerial photography can be used to provide supplementary data regarding boundary types. Whilst the historical land classification map can be used to display land use rather than entering this into the field attributes layer.

Figure 11. Geology information for the Earlye Farm in which grey represents Wadhurst Clay and the orange represents Tunbridge Wells Sand.



7. Drone survey testing

7.1 Introduction

The rapid development of Unmanned Aerial Vehicles (UAVs) has made the possibility of remotely surveying fields and field boundaries for this project a realistic possibility. Consequently, the opportunity was taken to test the viability of using a UAV – more commonly referred to as a drone – with an on-board camera to gather data at the Earlye Farm case study site. By doing so the Field Systems in the High Weald project fulfilled an objective to investigate novel and cost-effective survey techniques:

- *O2 To develop a cost-effective method of survey and characterisation of field systems utilising existing information – HLC, HER, Lidar, historic maps – that is replicable elsewhere in England, including specific techniques that will help deepen understanding of the heritage value of boundaries and the fields themselves.*

Moreover, products P9 and P10 of the Field system in the High Weald Project include field testing drone survey techniques to assist in data capture:

- *A method will be developed to test the use of drones in rapid data capture comparing the results with that from the expert-led survey work on the ground. The results to develop potential methods for monitoring field system change. This will be explored in the light of other research projects using drones.*[1]

This work also helped fulfil the community engagement objective, utilising the help of an enthusiastic local volunteer with the requisite piloting skills and a state-of-the-art drone to undertake some the aerial survey work. Additional work was also undertaken by the project team at the High Weald AONB Unit using a drone they constructed themselves.

7.2 Objectives

The objectives for testing the use a drone to undertake field surveys were:

- To test the breadth and scope of the use of the drone for survey and monitoring ecological and archaeological aspects of the landscape.

[1] http://archaeologydataservice.ac.uk/blog/2014/11/archaeological-drones/

- To test the use of the drone with the detailed field walking survey of one or more of the Case Study sites.

7.3 The field tests

Earlye Farm is one the case study sites which has been field-walked in detail and all of its boundaries recorded. In order to be able to make meaningful comparisons between this comprehensive field data and data gathered with the drone the following tasks were undertaken:

1. High resolution vertical photographs were taken across the farm to compare with aerial photos already taken and also with LiDAR.

2. Oblique Photographs of fields were taken in several fields on the farm to see if cultural heritage features recorded in the field survey can be identified from the air. The flights took place under different light conditions and at different times of day.

3. Flights were made along several key boundaries and the images were used to complete a field survey sheet for each boundary. The flights followed both sides of each boundary.

4. Composite images of larger areas were created by stitching together aerial photos using Agisoft PhotoScan. The purpose was to see if a high resolution aerial survey of a larger site could be created using a drone.

Elements taken into account were:

- The earthwork structure of the boundary
- Botanical/woody shrub identification
- Boundary 'furniture' including marker trees
- Relationship to other Cultural heritage features in the field.

Images collected from these drone surveys, each of which relate to one of the three tasks above, may be seen below in Figures 12 to 15.

Figure 12. High resolution vertical photograph displaying ridge and furrow.

Figure 13. Oblique aerial photograph showing various topographic features.

Figure 14. Boundary photograph illustrating the difficulty of recording historic features from the air when the vegetation is in full leaf.

Figure 15. Composite aerial photograph taken by automatically stitching together a series of vertical images.

7.4 Conclusion

The use of drones in undertaking archaeological field surveys has significant potential. By taking high resolution aerial imagery it is possible to pick up topographic features in the landscape that are not necessarily immediately visible from conventional aerial photography or from ground level. This is particularly true of images captured either early in the morning or later in the evening when the more oblique light helps to pick out more subtle variations in topography.

Nevertheless, surveys undertaken with a drone can encounter a number of issues. Drones are complex and relatively expensive pieces of equipment with finite battery lives and the potential to malfunction. Indeed, during some of the High Weald Unit's early tests the drone went off its pre-programmed course and crashed in a nearby woodland sustaining fairly significant damage (see Figures 16 and 17 below). Fortunately all the survey photographs were recoverable and the Unit's drone could be repaired, but it does highlight an issue around reliability.

Figure 16. Image automatically taken by the drone as it crashed through the woodland canopy.

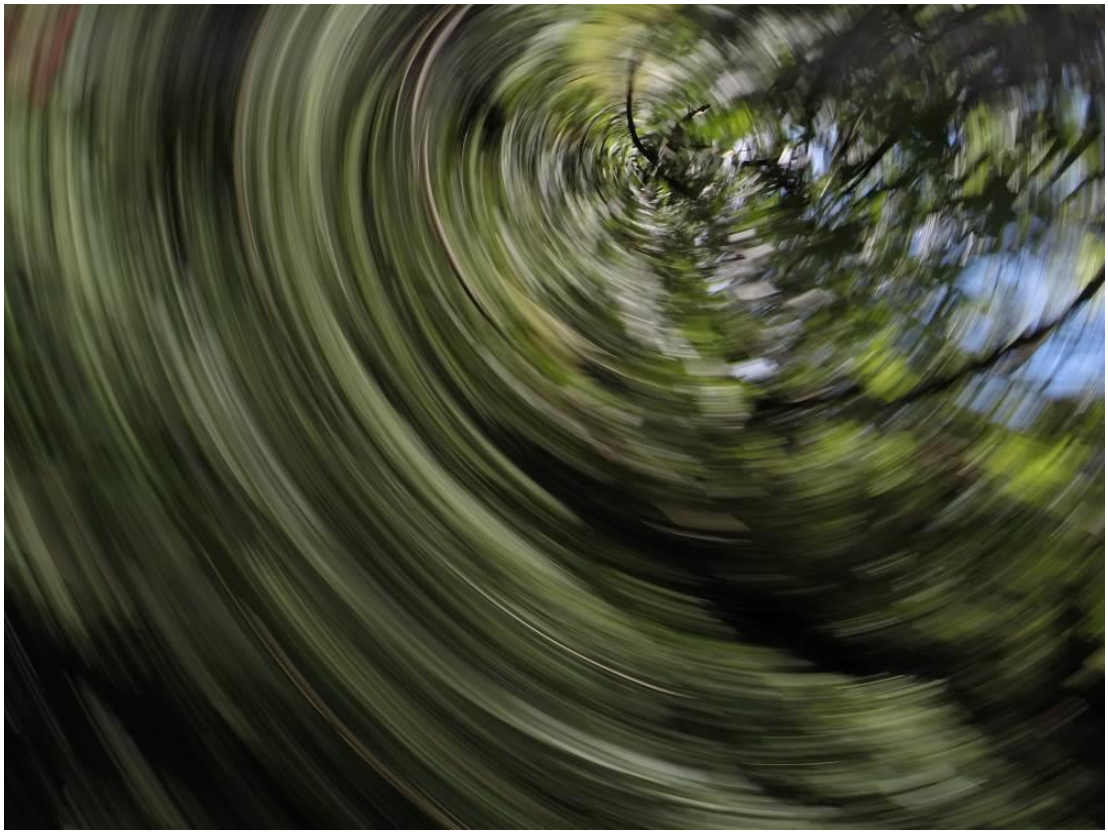


Figure 17. Image of the drone in pieces after its crash.

In addition, it quickly became apparent that the ability of a drone to survey boundaries is likely to be limited to certain times of year. In summer there is often too much vegetation to be able to identify the features that someone would be able to pick out on the ground. Moreover, drones can only fly in certain weather conditions – preferably low winds and no rain. This makes completing more comprehensive surveys tricky given that the ideal vegetative conditions (i.e. little leaf cover) and the ideal weather conditions tend to occur in opposite seasons.

Even once aerial images have been captured, it is still necessary to invest a significant amount of time processing and interpreting them – something which often requires expert judgement to do effectively. This time and technical expertise is of course in addition to the training required to competent enough to operate the drone in the first place.

Ultimately, the utility of drones in conducting archaeological surveys depends on the time and money available to invest in this rapidly developing technology. Their viability for these kinds of surveys will, however, require review. Prices will inevitably drop in the coming years at the same time as the technical capabilities increase.

8. Ecological surveys

8.1 Survey aims

The purpose of the ecological surveys was:

1. To assess the historical and ecological continuity of woody field boundaries;
2. To explore the relationship between age and continuity of field features, and biodiversity value;
3. To assess the biodiversity value of the grassland

8.2 Survey of woody boundary features

The survey was carried out by Philip Sansum, a Woodland Ecologist and Environmental Historian.

8.2.2 Method

The Earlye Farm study area was as pre-defined in the project GIS dataset (and is being described elsewhere). 33 woody boundary features were observed over three days and information on their species composition recorded, with particular attention to trees and shrubs and associated woody undershrubs, climbers and twiners. The 33 features included a selection of hedges, shaws, routeway sections and wooded-over pits or quarries. Species composition data on the areas of gill woodland (Colesgrove, Nap and Furnace Woods) contiguous with the Earlye Farm 'fieldscape' were also collected from direct observation where possible and from other existing information. Features to be observed were selected using aerial photography to identify which boundaries within the study area contained significant tree and/or shrub cover. The information was collected relatively quickly and is not intended to give a census of the arboreal diversity of the whole site but should be sufficient to provide for a basic comparison between the main types of woody feature present. For this purpose, no effort was made to standardise the length of each feature sampled, the emphasis of the comparison being on a boundary as an historical-ecological entity rather than a controlled vegetation sample.

Locations of observed features are indicated in Table 1 using the existing identifier code from the project GIS dataset where available, otherwise an alternative name is assigned and a grid reference quoted.

8.2.3 Results: General summary of composition in relation to field boundaries and woodland features

The site overall was moderately rich in woody species, the majority being native woodland species in East Sussex (*Acer pseudoplatanus* and *Pinus sylvestris* the only exceptions encountered). Formerly laid stocks of *Carpinus betulus* (Hornbeam) (B83, B86, B93), *Ilex aquifolium* (Holly) (B83, B90), *Crataegus monogyna* (Hawthorn) (B90) and *Corylus avellana* (Hazel) (B83) were visible on some linear features. Most hedges were currently managed by flailing. Most shaws and pits were

either grazed or unmanaged. Two shaws at the north of the farm have recently been coppiced and fenced.

Twenty seven tree and shrub species and a further 8 species of associated woody undershrubs, climbers or twiners have recently been observed in the gill woodland on or adjacent to the study site and contiguous with its field systems (various sources including observations in Nap Wood 2008-2014 and observations in Furnace and Colesgrove Woods 2014-2015). 30 of these 35 species were also encountered outside the gill woodland in the infrastructure of the field system (either in shaws, hedgerows or other linear features) with varying degrees of frequency (Table 5 p.54). *Frangula alnus* (Alder Buckthorn), *Ribes nigrum* (Black Currant), *Viburnum opulus* (Guelder Rose) (excepting a planted individual in a hedge), *Salix fragilis* (Crack Willow) and *Tilia x europaea* (Lime), were apparently largely confined to the gill woodland (the first three are listed as ancient woodland vascular plants [AWVPs] in SE England). *Sambucus nigra* (Elder) and the hybrid between the two native species of hawthorn, *Crataegus* x *media*, were encountered within the field systems but not in the gill woodland (although they may be well be present there).

As a generalisation the shaws (including wooded pits or quarries) supported greater diversity of trees and shrubs than linear field boundaries (Table 1). Some of the latter were notably rich however, in particular the sinuous hedges associated with extant or former ancient semi-natural woodland (e.g. B6 & B21) or those hedges which themselves are demonstrably the boundaries of recently lost woods (e.g. B33).

Interestingly, though it is not clear if this is significant, straight hedge boundaries along the ridge axis also appear to be somewhat richer than average. B48 for instance and the hedges along the lane between F7 & F18 are rich and contain species like *Taxus baccata* and *Sorbus aucuparia* which appear to be infrequent on the field boundaries generally (Table 1). KR (her Target Note 6) also noted the richness of B13. This may just be an artefact of recent management (more detailed survey would be necessary to investigate and corroborate it) or indicate that these ridge line axes are primary subdivisions of the land and perhaps possess greater antiquity.

The most frequent species, present in more than half of all the features observed, were:

Crataegus monogyna	Hawthorn
Corylus avellana	Hazel
Ilex aquifolium	Holly
Quercus robur	Pedunculate Oak
Fraxinus excelsior	Ash
Rosa canina agg.	Dog Rose
Rubus fruticosus agg.	Bramble

The distribution of some of the less frequent species, with particular reference to woody AWVPs (Rose 1999) may be meaningful in terms of the historical development of the field systems on site.

		adjacent gill woodland (various sources: Nap. Colesgrove & Furnace Woods)	?Five Acre Pit TQ598326	Long Shaw	'Quarry' in Field 26, part of B86	Copyhold Pit & Shaw	47, 49, 50 & area within	Boundary 43	Old Road Shaw (boundary betw. F26 & F28)	Boundary 33	Boundary 48	nameless wooded pit TQ600324	Yew Tree Pit TQ593324	Boundary 80 (pit betw. F23, F25 & F26)	Boundary 6	Boundary 21	Boundary 58 & 20 (lane betw. F7 & F18)	nameless wooded pit TQ599323	Boundary 73 & 83 (routeway/shaw betw. F23 & F26)	Boundary 5	Boundary 7	17, 23 & area within	Boundary 90	Boundary 11a	nameless shaw TQ599324	Boundary 16	nameless wooded pit TQ600329	Boundary 66	Boundary 38	Boundary 45	Boundary 74	Boundary 61	Boundary 1	Boundary 2	Boundary 35	Observed frequency of species outside gill woodland
Boundary_n (from GIS)			-	-	86	81,82,89	-	43	85,86,93	33	48	-	-	80	6	21	-	-	73,83	5	7	-	90	11a	-	16	-	66	38	45	74	61	1	2	35	
*Acer campestre**	Field Maple	1	1				1	1				1									P							1				1		1		7
Acer pseudoplatanus	Sycamore	1								1																									1
Alnus glutinosa	Alder	1		1						1			1*							1					1									1	5
Betula pendula	Silver Birch	1		1	1	1		1			1			1						1				1	1			1							10
Betula pubescens	Downy Birch	1	1	1		1						1																							4
*Carpinus betulus**	Hornbeam	1		1	1	1			1	1	1			1	1	1			1	1																11
Castanea sativa	Sweet Chestnut	1		1									1																						2
Corylus avellana	Hazel	1	1	1		1	1	1	1	1	1	1			1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1			1	1	27
*Crataegus laevigata**	Midland Hawthorn	1			1		1		1		1	1	1					1																		7
Crataegus monogyna	Hawthorn	1	1		1	1		1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1		28
Crataegus x media			1																																	1
Cytisus scoparius	Broom			1												1					1						1									4
Euonymus europaeus	Spindle																											P								0
Fagus sylvatica	Beech	1	1	1	1		1					1	1					1				1					1				1					10
*Frangula alnus**	Alder Buckthorn	1																																		0
Fraxinus excelsior	Ash	1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1			1	1				1		1	1		1				21
*Ilex aquifolium**	Holly	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1		1	1		27
*Malus sylvestris**	Crab Apple	1	1				1					1												1												4
Pinus sylvestris	Scots Pine	1			1																															1
Populus alba	White Poplar	1				1																														1
*Prunus avium**	Wild Cherry	1		1												1			1			1														4
Prunus spinosa	Blackthorn	1		1	1		1	1	1		1				1	1	1				1		1						1	1	1		1			15
Quercus robur	Pedunculate Oak	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1		1	1	1	1	1				1	1			25
Salix caprea	Goat Willow	1			1	1		1	1	1				1																						6
Salix cinerea	Grey Willow	1				1															1		1													3
Salix fragilis	Crack-willow	1																																		0
Salix sp.			1			1								1																						3
Sambucus nigra	Elder		1				1			1					1		1									1				1						7
Sorbus aucuparia	Rowan	1															1																			1
Taxus baccata	Yew	1											1				1						1			1										4
Tilia x europaea	Lime	1																																		0
*Viburnum opulus**	Guelder-rose	1																			P															0
Tree & Shrub spp.		**27**	**12**	**12**	**11**	**11**	**10**	**9**	**9**	**9**	**9**	**8**	**8**	**8**	**8**	**8**	**8**	**7**	**7**	**7**	**7**	**7**	**7**	**6**	**6**	**6**	**5**	**5**	**5**	**5**	**5**	**4**	**4**	**4**	**2**	
Hedera helix	Common Ivy	1		1	1		1			1			1		1	1		1	1	1	1					1								1		13
Lonicera periclymenum	Honeysuckle	1								1	1		1			1	1			1			1			1			1		1		1	1		11
*Ribes nigrum**	Black Currant	1																																		0
*Ribes rubrum**	Red Currant	1		1																																1
*Rosa arvensis**	Field-rose	1						1		1	1				1		1	1		1	1				1	1	1		1	1						13
Rosa canina agg.	Dog Rose	1				1	1		1		1				1	1	1	1	1		1		1			1	1		1	1	1		1			17
Rubus fruticosus agg.	Bramble	1	1	1	1	1	1			1	1		1		1	1		1	1		1		1					1				1	1		17
Solanum dulcamara	Bittersweet										1	1																								2
*Tamus communis**	Black Bryony	1									1				1						1		1							1			1			6
Additional woody spp.		**8**	**1**	**3**	**2**	**2**	**3**	**1**	**1**	**4**	**6**	**1**	**3**	**0**	**5**	**4**	**3**	**4**	**3**	**2**	**5**	**0**	**4**	**0**	**1**	**4**	**2**	**0**	**4**	**3**	**2**	**0**	**3**	**4**	**0**	
Total		**35**	**13**	**15**	**13**	**13**	**13**	**10**	**10**	**13**	**15**	**9**	**11**	**8**	**13**	**12**	**11**	**11**	**10**	**9**	**12**	**7**	**11**	**6**	**7**	**10**	**7**	**5**	**9**	**8**	**7**	**4**	**7**	**8**	**2**	

Table 5. Observed presence of woody species in 33 boundary features or shaws at Earlye Farm. The first column gives an overview of the main species present in the gill woodland in which the field pattern is embedded. P = planted (excluded from frequency column). * = ancient woodland indicator (or AWVP) in SE England *sensu* Rose 1999. The results are indicative and not based on an exhaustive botanical survey.

8.2.4 Comments on individual species

Carpinus betulus (Hornbeam)

There were 11 observed instances of Hornbeam outside of the gill woodland (where it is a frequent component in many of the stands). It was rare in straight hedges even when these were in close proximity to strong populations of the species. 6 instances were in shaws or wooded-over pits, 4 were in sinuous field boundaries closely associated with current or former woodland (either Furnace Wood or the former 'Alder Shaw' at the south of the study area). The other instance was a single tree in B48, a hedge which, although very straight, is notably species-rich (see Table 5).

On the study site Hornbeam does appear to be almost confined to features which are likely to have ecological continuity with former woodland. It is, for instance, absent from the short stretch of B28 which connects an area of Hornbeam-rich gill woodland to Old Road Shaw (in which Hornbeam is the dominant species).

Trees encountered outside the gill woodland were typically aged individuals and these existed in the form of coppice stools, stubs and plants that had been laid (and sometimes layered) along boundaries (see photographs). Stools in the interior of 'Old Road Shaw', i.e. on the presumed surface of the former road were sometimes sizeable, up to 1.5m diameter but are presumably not ancient. A large oak, also growing on the surface of this former road is probably early 19th century in origin.

Ilex aquifolium (Holly)

The distribution of Holly places it in contrast to Hornbeam. Both species have been considered AWVPs in south-east England (Rose 1999) (i.e. having some affinity with ancient woodland and at least weakly indicative of it) but Holly is widespread throughout the field system, absent from very few of the boundary features observed and abundant in many of them (equal in frequency with *Corylus avellana* and *Crataegus monogyna*). Unless encountered as veteran or ancient individuals then it is not a species that can be used to discern a boundary's antiquity. It was strongly favoured as a hedge plant in the past and old laid stocks are occasionally evident on the farm. Nonetheless no direct field evidence was seen that the hedgerow population here was definitely planted. The neat rows of bushes alongside B23 (the holloway leading to a pond bay in Furnace Wood gill) seen on Epoch 1 (which is now Holly dominated) *may* suggest planting there but either a bird-sown or planted origin is generally plausible for the abundant hedge plants elsewhere; the species is a frequent and important component of semi-natural woodland locally and tolerant of the full range of soil conditions present.

Crataegus laevigata (Woodland or Midland Hawthorn)

Close attention was paid to the specific identity of hawthorns encountered in the study area by reference to leaf and fruit characters (most plants were fruiting well at the time of the fieldwork). Hawthorn (*C. monogyna*) or its hybrid (*C.* x *media*) with *C. laevigata* was frequent across the site in both shaws and hedges. *Crataegus laevigata*, the hawthorn typically associated with ancient gill woodland interiors (Rose & Patmore 1992), was less frequent but still well represented on the farm (not just in the gill woodland). It was found in 5 wooded-over pits as well as 'Old Road Shaw' (though adjacent to the corner of Colesgrove Wood gill). It was absent from straight hedges with the exception of the species-rich hedge at B48, where a single plant was seen.
The presence of apparently pure populations of *C. laevigata* is noteworthy. Previous work on the distribution of the species in southeast England (Byatt 1975) suggests that in situations where the two have come into close contact through dissection of the habitat of *Crataegus laevigata* (as presumably would have occurred historically in the High Weald when field systems were developed on forested ridges between gill valleys) hybridisation results in the progressive loss of pure *C. laevigata*. *C. x. media* has been widely reported to be more common than *C. laevigata* in the cultural landscapes of Britain (Stace *et al*. 2015).

Contrary to this the hybrid (*C. x media*) *appears* to be less common than either of the two species in all the woody habitats - gill, shaw and hedgerow - of the study site (the limits of the species are debatable and while some of the material recorded as *C. monogyna* could be of hybrid origin, the plants recorded as *C. laevigata* are unlikely to be). This is interesting and likely to be of some historical-ecological significance. A long period of close coexistence would be expected to have led to higher rates of hybridity than evident. Relatively recent increase in *C. monogyna*, either through deliberate introduction as hedging stock or as bird sown plants following its general increase in the landscape elsewhere after widespread use in formal enclosure might account for the pattern observed. To some extent this would be supported by the observation that although *C. monogyna* is an abundant hedge component in many of the site's field boundaries it is *Ilex* and *Corylus* and not *C. monogyna* which often form the base hedge material.

Malus sylvestris (Crab Apple)

Though it was only occasionally encountered this species (also an AWVP) appears to conform to a similar pattern. Absent from most hedges, it is present as a veteran tree on a bank leading out of one of the wooded pits (B11a) as well as in gill woodland and in a number of the wooded-over pits.

Taxus baccata (Yew)

Yew was present sparingly in all the types of feature observed. This is an interesting species – whose historical ecology in the High Weald has not really been studied. As a native woodland component it is classically associated with semi-natural vegetation on chalk substrates, not on acid clays and sands. Nonetheless, it is a characteristic constituent of

some High Weald woods forming a distinct localised community with Holly on sandstone outcrops and ledges around gills. In these situations it is very probably indigenous and there are a number of mature trees in the gills surrounding Earlye Farm. The presence of old Yews of similar size in Beech woodland occupying a large pit on the margin of the study area ('Yew Tree Pit') was notable. The same pit supported a good range of herbaceous AWVPs as well as old Alder stools on its wet floor and seems to be very old, if not ancient, secondary woodland. Yew appears to be an ancient woodland species in the High Weald which occasionally establishes in secondary woodland and hedges (cf. the South Downs where it is more frequent in recent than ancient woods – Tittensor 1980).

Acer campestre (Field Maple) and Prunus avium (Wild Cherry)

Two other 'ancient woodland indicator species' of tree present were Field Maple and Wild Cherry. The former appeared to be generally uncommon outside woodland but veterans or aged trees were seen on some of the apparently woodland relict boundaries in the south-east corner of the study area. Wild Cherry was present in the sinuous boundaries running between Furnace Wood gill and the ridge to the north of the farm.

8.2.5 Conclusions

Conclusions:

- The woody boundary and linear features of the Earlye Farm 'fieldscape' have inherited or acquired a good but not full complement of the locally indigenous woody flora. Species diversity, and also presence of species indicative of antiquity, was most concentrated in: secondary woodland on old pits or quarries; along routeways linking these resources with each other and with other sites; in boundaries which are probably derived from historic woodland.

- Although not measured in this survey the proximity effect was less obvious (hedges closest to intact gill woodland not necessarily being the most interesting – the history of the individual features seemed to be key). This suggests that in the context of this fieldscape persistence of species has been as important as re-establishment and that the concept of (carefully chosen) indicator species can be useful in assessing the historical development of High Weald field patterns. *Crataegus laevigata* for instance seldom grows in hedges, scrub, wood-pasture or secondary woodland (Rackham 2003) yet at Earlye it grows in small woods seemingly by definition *secondary* – Old Road Shaw and several wooded-over pits.

- Further work locally on the extent and distribution of pure populations of *Crataegus laevigata* and the relationship with hedgerow hawthorn plants of *monogyna* or hybrid type could provide valuable evidence on the historical development of field systems. Hornbeam, although it has the mobility to slowly establish in secondary woodland over a few generations, has colonised few hedges here.

- On the whole, the evidence of the Ancient Woodland Indicator tree and shrub species points to a conclusion that many of the field boundaries are not derived from original woodland vegetation (contrary to a popular supposition that in the Weald they originate as linear clearance remnants of the pre-existing forest cover), but, a caveat is that the ecological character of many of the boundaries may also have been significantly altered during the 20th century (possibly obscuring evidence of ecological continuity between features). The observations do show however that some shaws within the 'fieldscape' occupying disused quarries or pits (which, conversely, are often disregarded as 'recent secondary woodland') may have a closer affinity with the intact ancient semi-natural woodland of the locale than do most of the extant linear field boundaries. These now are an integral part of the field system's infrastructure. There is a suggestion that the pits on Wadhurst Clay (those more distant from the farmstead) were excavated and subsequently re-wooded in a less open environment and may pre-date the field pattern. (Whether the quarries close to the farmstead belong to a different phase of extraction – they differ geologically – should also be considered).

8.2.6 References

BYATT, J. I. (1975). Hybridization between Crataegus monogyna Jacq. and C. laevigata (Poiret) DC. in south-eastern England. Watsonia 10, 253-264.
RACKHAM, O. (2003). Ancient Woodland: its history, vegetation and uses in England. New Edition. Castlepoint Press.
ROSE, F. (1999). Indicators of ancient woodland: the use of vascular plants in evaluating ancient woods for nature conservation. British Wildlife 10, 241-251.
ROSE, F. AND PATMORE, J. M. (1997). Weald Gill Woodlands. English Nature, Nature Conservancy Council.
STACE, C.A., PRESTON, C.D. & PEARMAN, D.A. (2015). Hybrid flora of the British Isles. Bristol, Botanical Society of Britain & Ireland
TITTENSOR, R.M. (1980). Ecological history of yew *Taxus baccata* L. in southern England. Biological Conservation, 17, 243–265.

8.2.7 Photographs

following 4 pages →

Two oaks on a defunct boundary bank (part of B70). To the right the tiny shaw occupies a pit at the edge of the Wadhurst Clay substrates. Among various tree and shrub species it contains the AWVPs *Crataegus laevigata*, *Malus sylvestris* and *Acer campestre*. The gappy remnant of a linear shaw extending to the north of this pit (B66), which may itself be a former woodland boundary, mostly overlies sandy substrates and is contrastingly species-poor, dominated by *Betula pendula*, with a single aged *Acer campestre* appearing at the clayey end.

Old *Carpinus betulus* stub apparently marking the route of the old road as it emerges from Colesgrove Wood heading northeast towards Lightlands (TQ593330)

'Old Road Shaw' (a linear *Carpinus* coppice with old laid hedges on banks either side) – seen from west end of B86.

‘Old Road Shaw’ showing browse line on Hornbeam coppice, the ridge of Nap Wood rising to the right in background. Seen from north of F26 looking S & W.

Outgrown laid *Carpinus* hedge on northern bank (B86) of ‘Old Road Shaw’ (above)

Alnus glutinosa stool 1.5m basal diameter on B33. This is the most species rich hedge that was observed in terms of woody species; the ghost boundary of ‘Alder Shaw’, an area of woodland removed in the 20th century.

Alnus glutinosa stub and *Corylus avellana* stools on the bank of B33

Two low Hornbeam stubs maintained on the sinuous hedgebank (B5) along a watercourse linking the former Alder Shaw with Long Shaw – a boundary almost certainly directly derived from ancient woodland. The opposite, unseen, wetter side of the bank supports a complementary Alder stub.

Large Ash stool in Long Shaw. This linear shaw is essentially the upper edge of the gill valley wood lying to the east of Earlye Farm (known as 'Long Wood'), but presumably anciently split from it. It contains appreciable numbers of very sizeable stubs and stools of Ash, the larger of which may be ancient. Its species diversity is likely to be higher than indicated by Table 1 as it was surveyed only briefly.

Large Ash stub or high-cut stool near the upper boundary of Long Shaw.

Old Hawthorn stock in B90 showing evidence of former laying.

Flint nodule, 25cm, on pit floor at TQ596327.

8.3 Grassland Survey

In addition to historical data, the Field Systems in the High Weald Project took the opportunity to collect a range ecological data at a number of case study sites, including Earlye Farm. The main focus of this ecological survey work was recording species-rich grassland habitats which are ecologically important but are becoming increasingly scarce. The grassland survey was carried out by Kate Ryland of Dolphin Ecological Surveys.

8.3.1 Method

The grassland assessment element of the High Weald Fieldscapes Project at Earlye Farm, Wadhurst was carried out by Kate Ryland on 3rd July 2015 in warm, sunny, still weather conditions. The survey recorded the species present and their abundance according the DAFOR scale (**A** = Abundant, **F** = Frequent, **O** = Occasional, **R** = Rare). The survey form also included sections for recording other features, such as: in-field trees, NVC community type, sward characteristics, physical features (e.g. anthills), management activities, and historic boundary features (e.g. banks and ditches). For further information on the recording forms, please refer to Appendix F (pp.126-137).

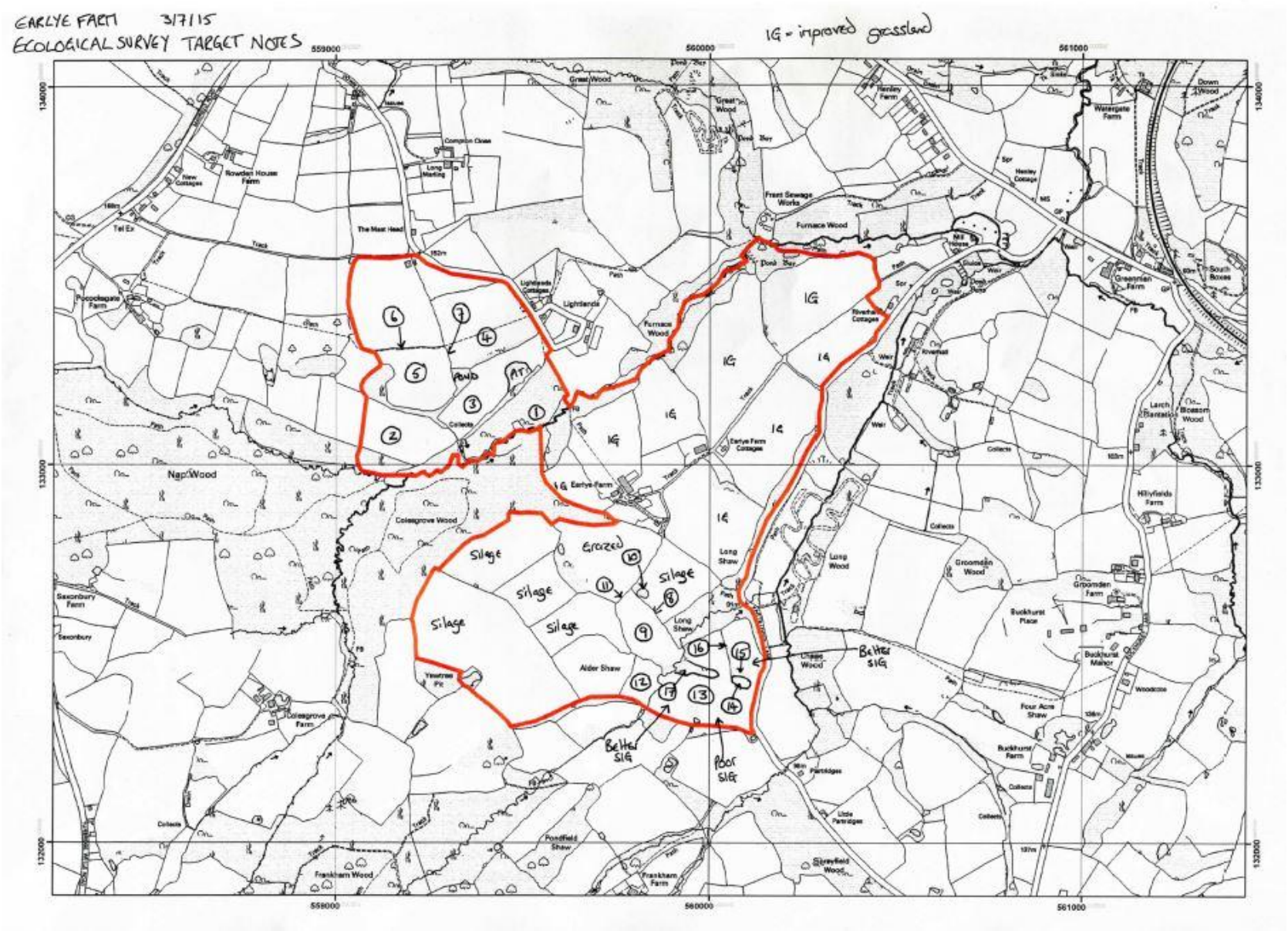
Before undertaking the field survey the landowner, Bill Gingel, was consulted and he reported that:

- The northeastern block of fields are almost entirely improved grassland and are used as the main forage areas for dairy cattle.
- He also mentioned that adder's-tongue fern (*Ophioglossum vulgare*) usually occurs in small quantities in one of his least improved fields (target note 2).
- Most of the fields in the northwestern block, some of which are quite herb-rich, have been ploughed in the past by the current owner.
- The southern block of fields, to the south of the farmstead, was mainly cut for silage at the time of the survey but there is an interesting area in the extreme southeast of the farm where a number of very small fields have been combined into one grazing unit.

This initial consultation provided useful background information surveying floristic diversity the field boundaries and fields at Earlye – the results of which are presented below.

8.3.2 Results

The following page displays a map showing the fields and field edges surveyed for grassland species at Earlye Farm. The numbers on the map relate to their respective target notes and species survey. These forms may be seen in their entirety in Appendix F (pp.126-137).


EARLYE FARM 3/7/15
ECOLOGICAL SURVEY TARGET NOTES
IG = improved grassland
559000
560000
561000
134000
133000
132000
Napp Wood
Colesgrove Wood
Furnace Wood
Great Wood
Long Shaw
Alder Shaw
Long Wood
Groomsden Wood
Buckhurst Place
Four Acre Shaw
Frankham Wood
Pondfield Shaw
Strayfield Wood
Earlye Farm
Earlye Farm Cottages
Furnace Wood
Riverhall Cottages
Lightlands
Lightlands Cottages
Front Sewage Works
Watergate Farm
Hanley Farm
Down Wood
Greenman Farm
South Boxes
Larch Plantation
Blossom Wood
Hillyfields Farm
Groomsden Farm
Buckhurst Manor
Buckhurst Farm
Woodcote
Saxonbury Farm
Saxonbury
Colesgrove Farm
Frankham Farm
Rowden House Farm
Tupplesgate Farm
The Mast Head
Compton Close
Long Meadow
New Cottages
Tel Ex
Track
Path
Collects
Pond
AT
Silage
Eroded
Better SIG
Poor SIG
IG

The results of these surveys may be summarised as follows:

- An area of permanent pasture on a steep south-facing slope, identified by the landowner as being one of his more botanically diverse fields. It comprises species-rich semi-improved grassland. Along its northern edge is an excellent mixed shaw with a complicated set of earthworks within it. **Separate survey sheet completed.**
- Permanent pasture on a domed field with gentle north- and east-facing slopes. This field was also picked out by the landowner as of potential ecological interest and in most years apparently supports a small patch of adder's-tongue. Found to be species-rich semi-improved grassland, though perhaps slightly less diverse than field 1. **Separate survey sheet completed.**
- This field adjoins the previous two and was not singled out by the landowner as being of particular interest. It was surveyed in the same way to help calibrate the survey results and to ensure that the choice of fields subject to assessment was not being unduly led by Bill's recommendation. Semi-improved grassland of only moderate botanical interest its edge habitats include two excellent shaws. **Separate survey sheet completed.**
- A large, open field at the northern extent of the farm with a tall, very ordinary semi-improved sward (future hay crop?), crossed by a public right of way. The sward is rather grassy (Yorkshire fog, common bent, sweet vernal-grass and perennial rye-grass prominent components) and a high proportion of white clover. Common cat's-ear, red clover and greater birds-foot-trefoil occur but white clover is particularly frequent. This is potentially a useful field for pollinators and other invertebrates but not considered sufficiently good for a separate survey sheet.
- This pasture field on a south-facing bank also appears to be semi-improved grassland of average quality with much white clover and perennial rye-grass in the sward. Its most notable feature is the hedgebank along its northern edge (see 6 below).
- The hedgebank along the northern edge of field 5 comprises a tall, dense, mixed hedge – potentially of some antiquity – with a quite diverse strip of grassland at its base. Patches of bare, sandy ground occur on the south-facing foot of the bank. The relict grassland at the hedge base included fine-leaved grasses and herbs such as barren strawberry, germander speedwell and betony, which probably reflect the original sward in this area. **Separate survey sheet completed.**
- The hedgerow on the eastern edge of field 5 was examined to see if any further unimproved grassland relicts were present but none were found.
- This bank and ditch feature has a relict, patchy hedgerow of blackthorn, holly and hawthorn with oak trees. Whilst largely grazed and trampled to the east it is better vegetated on the western side. Little of botanic note was observed but it is still an interesting feature.
- This long, narrow pasture lies on a southeast-facing slope. The upper part has a rather poor, grass-dominated sward but further downslope the sward is much more diverse with patches of birds-foot-trefoil, red clover, common sorrel, yarrow, knapweed and meadow buttercup. Selective topping in the field suggests thistle control is underway. A good field for invertebrates. **Separate survey sheet completed.**
- Coppiced oak stools and oak maidens on a distinct bank adjoining the pond.
- A short length of hedgerow on a very wide (3-4m) bank that drops down to the top of field 9. At the foot of the hedge herbs including bugle, violet and barren strawberry were noted

along with several anthills. The bank itself has a largely improved sward.

- This small, irregularly shaped field had also been topped in places, presumably to control thistle. Despite its potential interest due to its small size, shape and south-facing slope it had a rather disappointingly poor sward and may have been re-seeded at some stage.
- A single, large grazing unit derived from several smaller fields. The old, relict hedgerows are now reduced to rows of trees with some small banks. The field itself has a complex topography with different aspects and varied slopes. Wet flushes occur along the stream edge and there is also dry, parched ground at the top of the slopes. The sward is also variable with some poor semi-improved areas in the south but much more herb-rich grassland in the east and west (see 17 below). This field has many features likely to be valuable to invertebrates and in particular to pollinators. **Separate survey sheet completed.**
- Two oak trees on the edge of a bank/slope with a patch of quite species-rich sward below.
- A large wooded hollow (perhaps an old quarry?)
- A bank with occasional birch, oak and field maple trees.
- This sloping area supports one of the most diverse and least improved fragments of grassland sward observed on the site. Some of the plants noted include frequent common knapweed, birds-foot-trefoil and selfheal along with smaller amounts of less widespread species such as quaking grass, devil's-bit scabious and mouse-ear hawkweed.

9. Issues & uncertainties

9.1 Field surveys

9.1.1 General issues

The greatest problem faced during the creation of the GIS was missing data on the collection forms. In the circumstances a GIS technician who has not seen the field cannot make judge what to enter into the GIS, and simply leaving the attribute blank is undesirable.

The solution to this, following deliberation with the field surveyor, comes in three parts.

1. To include a catch all negative coded value that can be used by the GIS analyst when the data on the form is unclear or missing in order to indicate that they are uncertain.
2. The surveyor to fill in as much of the form as possible and to make the data as clear as possible. However it must be acknowledged that this isn't always possible due to time constraints and the sheer volume of data to be collected.
3. Post data entry deliberation is often needed between the GIS analyst and the field surveyor in order to reduce any instances in which the uncertain field had to be used. This methodology proved to work well and with time and the gradual improvements of the form the need for post data entry deliberation will likely decrease.

The following is a list of issues to be addressed or followed up on with the field surveyor:

- Field 18 is missing an external boundary profile.
- Field 20 is missing an external boundary profile.
- Boundaries 64 and 29 are both missing profiles.
- Follow up on the positioning of boundary furniture (this was being addressed by the surveyor)
- Boundary 83 has been used in fields 25 and 26 to represent different boundaries.
- Boundaries 76 (field 24), 82 (field 25) and 85 (field 26) are missing historical management information.
- Boundary 86 (field 26) has been ticked twice for historic management.
- Boundary 82 (field 25) is missing current management information.
- Boundaries 85 and 86 (both field 25) and 89 (field 27) are missing boundary biodiversity information.
- Earthwork profile on boundary 79 (field 24) is missing width information for the bank.

In all of above instances where there is missing information the catch all negative coded value has been used and can changed to the necessary value should the information be made available.

9.1.2 Recommendations

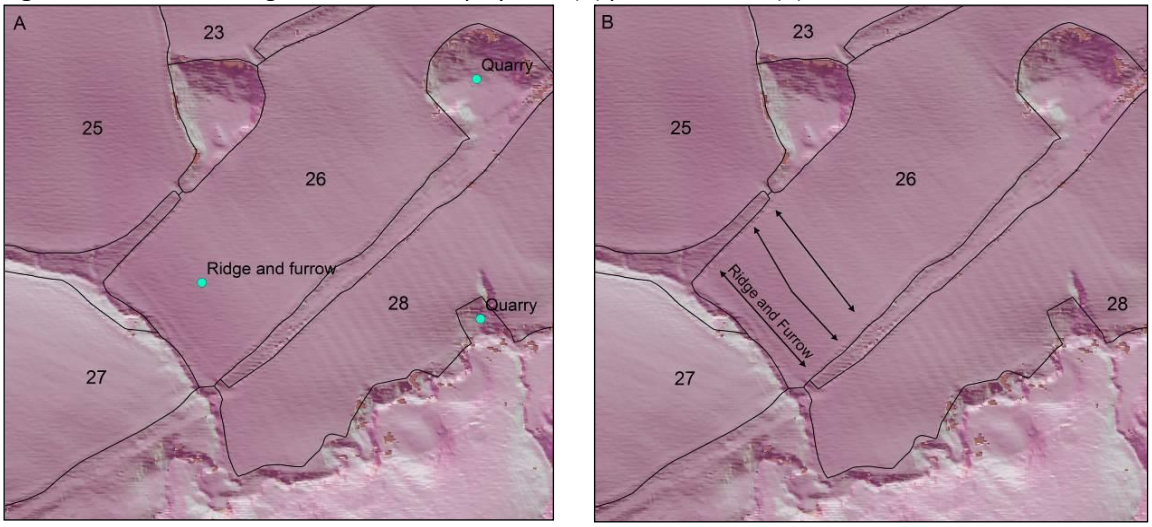
One of the ways the GIS could be improved is through the differentiation between archaeological point features and linear archaeological features. Currently linear features such as lynchets and ridge and furrow assemblages are represented by a single point meaning that the scale, orientation and the number of features is lost. However if represented using line poly-lines the archaeological features could be displayed in a more representative manner – Figures 18 and 19. If the differentiation was adopted accurate field surveyors notes and LiDAR data will be essential for accurately displaying the features.

An additional recommendation is to include hyperlinks to the maps that were drawn on by Nikki and these contain a large amount of data that isn't included within the forms, and therefore the GIS, such as comments and detailed indications of where archaeological features are located.

A final recommendation is in relation to the data collections forms. Currently, all of the columns are all the same colour. I feel it would be beneficial to shade alternating columns in a pale colour to make reading the data notably easier during the data entry process.

Figure 18. A lynchet displayed as (A) point data and (B) as line data.

Figure 19. A series of ridge and furrows displayed as (A) point data and (B) as line data.



9.2 Desk surveys

9.2.1 General issues

As the Project Design document explains, 5 case study sites were selected in order to undertake a combination of full field surveys, rapid walkover surveys, or desk-based GIS data surveys. These two groups are then examined and compared to assess the outcomes of the identification of significant field systems characteristics.

9.2.2 Data recording issues

Not all field systems characteristics can be recorded from a desk-based study, which can lead to incomplete data collection. For instance, from a desk-based study there is no possible way to record data on ecological features. As a consequence, these features cannot be taken into account in the assessment of the field key characteristics and the importance of them.

Some problems were also faced regarding the use of different map types. OS MasterMap was used by one of our GIS technicians to draw the field polygons; however this map does not always appear to correspond with boundaries indicated on aerial images or the Ordnance Survey base mapping. Consequently, cross compatibility should be taken into account when drawing the field polygons from either MasterMap or by hand.

9.3 Issues with the field survey form

9.3.1 Field attributes

One of first problems encountered during the field surveys is how best to treat and record different fields and their corresponding boundaries – as well as their attributes.

Size – visual and numerical

It is unclear whether 'visual size' is worth assessing using visual perception in the field gathered more accurately in GIS by using OS MasterMap. However, it should be questioned how accurate and up to date this dataset is, as field size in MasterMap does not always coincide with the field size indicated on aerial photographs or the Ordnance Survey base mapping. Consequently, it may be worth testing the difference in field size between fields measured using MasterMap and field polygons drawn using OS base mapping or aerial photos.

Field shape

Given the sinuous nature of field boundaries in the High Weald, field shape is not always easy to characterise – particularly for the non-expert. Consequently, it would be useful to include clear examples and/or illustrations of different field shapes with the recording form.

Orientation, rationalisation, hydrology

The non-expert user of the field recording form would also benefit from greater clarification of the options 'hanging from', 'rationalisation' and 'hydrology'. It would also be useful to make clearer what historic maps should be used to assess boundary loss/gain. Again, it is recommended that some clear examples and/or illustrations of the relevant options for each section on the recording form are included.

9.3.2 Boundary attributes

The biggest issues with boundary-related data revolved around how to clearly define boundaries. For example, should a boundary between two fields be recorded separately for both fields, or recorded as one?

Boundary type

Another problem was how to deal with boundaries that consist of multiple attributes, such as a hedge and a fence. For example, questions arose such as whether a fence behind a hedge should be recorded separately or as a single feature. Moreover, attempting to distinguish boundary types from maps often required making subtle distinctions – between shaws and hedges, for example. A guide illustrating the differences between a hedge, hedge with trees, wooded hedge, woodland edge, and shaws, etc. would certainly prove useful in making such desk-based distinctions.

Boundary function and relation to other boundaries

From the desk it was often unclear if 'boundary function' concerns present or historic use. Therefore it is also unclear how boundary relics, which don't function as boundaries anymore, should be recorded. Boundaries often serve multiple functions – e.g. a river could both have a parish boundary function and an agrarian function – and therefore more options for this attribute should be available. It is therefore recommended to add 'and' options like agrarian AND parish.

Vegetation

The main objective here is to provide information on whether a hedge is species rich or poor. It may therefore be worthwhile including more species options, like 'coppice with standards', 'riverine' or 'wetland' species, to ensure all boundary vegetation types can be accounted for. In addition, clarification on what constitutes 'historic' vs. 'modern' management of boundary vegetation would be beneficial.

Boundary furniture

Boundary furniture should be indicated either by point or line features in the Field Systems GIS geodatabase. However, the field recording form does not mention specifying furniture location. Therefore it should be clearly mentioned on the form that the exact location of boundary furniture

be indicated on a survey map. Furthermore, more furniture type options explaining should be added to the form, including, for example, bridge, culvert, and fence.

Finally, the GIS boundary furniture attribute table contains a field called 'location from map/form'. It is unclear what is meant by this.

Earthwork attributes and archaeology attributes

It is important that Earthwork attributes are recorded carefully as they can represent former field boundaries. The form only mentions bank (bank could be asymmetrical, symmetrical or lynchet) or ditch, but features like clay pits or former/fossil river channels could also be included where necessary. It should also be noted that earthwork and archaeological features can also be situated within fields rather than along the field boundaries, and that it is not always clear how to record lynchets or other in-field archaeological features on the form. Clarification of the term 'silted' would also be useful.

9.4 Issues with the GIS geodatabase

A number of attribute tables within the 'fieldscapes' geodatabase contain fields that are not completely filled in or don't contain data at all, and thus seem to be redundant. This raises questions about the design of the geodatabase and the consistency of recording and data entry. All of the shortcomings of the geodatabase are displayed in Table 6 p.73.

Table 6. Imperfections or shortcomings that concern the fieldscapes geodatabase feature classes.

Attribute table	Imperfections/shortcomings	Adjustments
Field attributes	Structure is disorganised, which makes data entry more complicated and inefficient.	Reorder structure in same way as recording forms
Boundary attributes	Structure is disorganised, which makes data entry more complicated and inefficient.	Reorder structure in same way as recording forms. Cut out: function other, morphology other, notes, photo refs, adjacent secondary boundary, relation to adjacent secondary boundary
Boundary furniture	What's the purpose of the fields 'location' and 'map or form'?	Delete fields: notes, photo refs, type other.
Earthwork attributes	What does silted mean? Why is a lynchet recorded separately in the archaeology attribute table and why is it part of a bank in the earthwork attribute table?	Delete fields: FID earthwork attributes, polygon number, earthwork number, number of earthworks, size, lynchet, photo refs, and notes.
Archaeological linear features	Entire table is irrelevant; data are recorded in archaeological attributes. Table is contradictory to the other archaeological attribute table.	Delete entire table?
Archaeological attributes	Table also contains data on lynchets and ridge and furrow. Point features are used to record linear features, but point data do not cover the entire scope of some linear features like lynchets. Is this table supposed to contain the heritage data only or also field based survey data? Why are the position in field and the heritage number relevant?	Maybe separate archaeological linear and point features? It's easier however, to have all archaeological features in one attribute table.

9.5 Expert vs. non-expert survey

This issues discussed above illustrate the range of difficulties that may be experienced by non-experts undertaking a field survey or desk-based survey. Experts, like archaeologists, ecologists, landscape historians etc., would be able to recognise features in-field as well as from a desk far more easily due to their training and experience. Non-experts, however – such as planners – will probably

encounter problems in observing and recording field characteristics because they lack this specialist knowledge.

With this in mind, the current field survey method and forms may be hard for a non-expert to understand and use. This is due to several reasons.

Firstly, in-field archaeological features are not always easily recognisable. As a consequence there unreliable or incomplete data collection may occur.

Secondly, certain definitions on the form are unlikely to be understood by a non-expert.

Thirdly, there are differences between field and desk-based survey. A desk based study may be even more problematic, because even simple boundary types and features become hard to identify. Even if certain characteristics are visible from Lidar or aerial images, a non-expert might not recognize these characteristics as such, whereas an expert would recognise these characteristics and would be able to record them. To avoid these problems the desk-based recording form would need to clearly define specialist terms and clearly illustrate the features they are seeking to identify.

The above problems may be avoided at the outset by:

1. Identifying field and boundary characteristics that can be observed from maps and images and are recognisable by both experts and non-experts.
2. Identifying field and boundary characteristics that can be observed from maps and images, which are recognizable by experts, but which are not recognizable by non-experts.
3. Identifying field and boundary characteristics that cannot be observed from maps and images and which require field survey to identify them.

9.6 Recommendations

Based on the issues identified above, the following recommendations are essential for a clear understanding of the forms and survey in general.

7.6.1 Survey guide: 'Tool book'

First, the survey forms should come with a clear instruction guide on how to fill in the forms. This guide should contain some consistent principles of the survey methodology and key definitions, including:

- How to record and number different fields and boundaries and how to recognize them
- What to do when boundaries overlap or if one boundary functions between two fields
- How to indicate boundaries, earthwork and archaeological features on a map.
- A set of symbols and abbreviations (like a key) which represent these different features.
- Guidance on how to use different map types and what maps are suitable for what purposes.

Furthermore, this guide should contain additional information, definitions and examples about how to recognize different boundary types, function, earthwork (banks, ditches), etc. Features like lynchets, banks and ditches should be well-defined. The flowcharts in the South East AONBs Woodland Programme report (Bannister 2007, appendix 2 & 3, pp.81-86) could be useful in this regard. It also might be worth developing similar flowcharts to the 'identification of archaeological features in fields/woodland' flowchart, which would help to identify the following features:

- Linear archaeological features, like banks, ditches, lynchets, ways, tracks, etc.
- Linear boundary features: hedges, shaws, woodland edges, walls, ditched, balks, etc.
- Mounds, depressions, quarries, ponds
- Water courses.

However, the guide should be compact, clear and manageable. Illustrations are desirable rather than text. In addition to the flowcharts, the guide should include illustrations which contain:

- Aerial examples of boundary types: each possible boundary type should be illustrated and explained.
- Lidar examples of boundary types and earthworks and how not to confuse them with e.g. banks, ditches, lynchets, ridge and furrow, etc.
- How to recognize historic and modern management of boundaries: pollards, stubs, coppice, laid hedges, etc.
- How to use the contour map in combination with Lidar for recording slope orientation
- Examples of boundaries indicated on OS maps: OS 10K, OSE, OSD
- Examples of boundaries indicated on Tithe maps and other historic maps
- Any other relevant illustrations which are relevant.

9.6.2 Survey form

The simplicity of the field recording form could be improved by rearranging it in a more logical way. In addition, some features could be eliminated to ensure only features that are essential are recorded. It may also be worth considering creating a digital recording form where every feature has its drop down box or comments box which contains information or links to information and illustrations.

Table 7 (p.76) lists some recommended adjustments to the field survey form.

Table 7. Proposed adjustments to be made on the survey form

Attributes and features to be excluded	Attributes and features to be kept
General case study descriptions like civil parish, ecclesiastical parish, district, county, case site reference, survey area should be recorded once for the entire case study (if case study site is not spread over multiple parishes!)	Shape
Field orientation: N-W-S-E	Field orientation: hanging from, but specify relevance
Degree of slope	Physical characteristics
Visual shape	Field names
Size numerical: choose either hectares or acres. Cut out historic size.	Rationalisation
Historic archive?	Archaeology
Source?	HLC
Photo refs?	Boundary type
Relationship to other/secondary boundaries	Boundary function
Boundary relationship to slope	Boundary morphology
Orientation of boundary	Historic + current management
Dominant/key species the field systems project is about 'noting the variety of the woody shrub component together with its ecological diversity'. The main objective would be to do an observation on whether a hedge is species rich or poor. (section 3: vegetation)	Biodiversity value
Cross ref with meadow survey: No idea what is meant by this.	Earthwork, but specify, add also 'boundary relics', both in-field and at boundary
	Boundary furniture

9.6.3 Field Systems geodatabase

The adjustments to the attribute tables of the Field Systems geodatabase (as indicated in Table 1 on p.46) are also recommended in order to make data entry more efficient.

9.6.4 Data availability

Additional data, such as landownership, land use, field area, HLC, and field names, must be available and easily accessible. An up-to-date version of aerials is also required for reliable data collection. Archaeological features require an up-to-date archaeological database or map which shows both in-field position and the name – and some explanation of – the feature.

10. Archival research

10.1 Introduction

Earlye Farm near Frant is a medieval farmstead located on the edge of a ridge of high ground dividing two streams. The historic character of the farmstead is one of small semi-regular fields divided by wooded boundaries and intermixed with small woods and shaws. On closer inspection it is possible to see that Earlye Farm comprises three different field patterns or systems:

- To the north of the main stream are regular planned fields which form part of a larger field system extending northwards to The Platt.
- The main part of the farm occupying the ridge comprises modified regular or semi-regular fields which appear to be 'hung' or aligned along ridge and access track
- In the southeast corner are irregular fields with woody boundaries which show characteristics of assarts.

The present farm straddles a stream flowing west to east from Nap Wood and which joins with one from Colesgrove Wood flowing east. This was the boundary between the Hundred of Loxfield Baker and the Hundred of Rotherfield. It is also the parish boundary between Wadhurst and Rotherfield and Wadhurst and Frant. See Budgens map of Sussex [REF]. It is also the manorial boundary between the Manor of Frant, and the Manor of Wadhurst and Mayfield. They were carved from the very large medieval paramount manor of South Malling which belonged to the Archbishop of Canterbury. This stretched from the Kent border to the edge of Lewes. The main part of Earlye lies in the Manor of Wadhurst in Loxfield Baker Hundred (formerly Hundred of Loxfield belonging to Archbishop of Canterbury formerly in the Domesday Book of the Hundred of Malling).

The initial archive research undertaken for this farm has shown that it its present extent is a relatively modern one and that historically it comprised land held by different farms and estates – namely Lightlands, Shernfold Estate, Riverhall Estate and Earlye itself.

10.2 The history of place names

10.2.1 Earlye Farm

The name comes from the Anglo-Saxon meaning 'eagle's clearing', nearby Eridge means 'eagle's ridge'.[2] The name suggests that the landscape in this area in the early medieval period must have been relatively open with a mix of woodland, wood pasture and open grazing areas – a place where eagles lived. From at least the C13 there has been a farmstead settlement on ridge top overlooking the valleys of the stream. The name of Earlye or Arlegh is first recorded in the C13.[3] It lay within the Vill of the Mayfield and Wadhurst in the paramount manor of South Malling which belonged to the

[2] Mawer, A. & Stenton, F.W. 2001. Place-names of Sussex. CUP p386
[3] Ibid p386

Archbishop of Canterbury. This was a huge land holding stretching from the border with Kent southwest to Lewes. The Custumal of the Archbishops Manors in Sussex records three people called *Arlegh*.[4] *Arlegh* also was named as a virgate in the borough of Wadhurst which paid a fine of 8s 2d yearly plus an extra 5d at Christmas. In return for which the holder of the virgate had to undertake various services for the Archbishop.[5]

A virgate (or sometimes termed a wista (Sussex) or a yardland) was a variable measure of land depending on the soil quality and represented a quarter of a hide. Normally about 30 acres but could be from 15 to 60 acres. A virgate was also a measure of land capacity. In this case a ploughland of one yoke of oxen. A hide was a ploughland of eight oxen.[6] In the Custumal a virgate was also a unit for rent assessment and in the Weald according to Gardiner comprised a large block of land of fields and some woodland.[7] They equated to the *jugera* in Kent (See Alan Bakers work in Kent HE 7056 P1). The evidence from the Custumal suggests that virgates (or customary land) together with Freeland formed early enclosures certainly pre-C13. Gardiner's study of the virgates at Withyham suggests that these were formally or planned virgates which used an earlier field layout possibly prehistoric. This paper sets out the approach to identifying the virgates and could be used to identify the extent of the Earlye virgate using the Custumal and the surveys and rentals for the Manor of Mayfield and Wadhurst.[8]

In 1285 he virgate of Arlegh was divided between five tenants:

- William at Broke holding *¼ virgate* about 26 acres
- *Stephen de Arlegh holding ¼ of virgate 26 acres of which 3 acres were coppice*
- *Richard de Arlyeghe holding ¼ & ½ a virgate i.e. 3/8 of a virgate approximately 40 acres of which 11 acres were coppice*
- *The widow of Aylward Turgys holding ¼ of a ¼ of a virgate 10 acres*
- *Richard de Sloo holding ¼ of a ¼ of a virgate 10 acres.*
- Stephen was described as a 'freeman' Richard a 'neif' (neif = an unfree tenant owing works to the manor) and Sabina a 'cottar' (tenants both free and neif who owed a hen at Christmas to the lord of the manor).
- The acreage at *Arlegh* appears to be far more than the average virgate. This would need further research. [The Custumal needs further study as there are other references to Earlye. Is there evidence of Earlye in Canterbury Cathedral or Lambeth Palace Library ?].

The name is recorded in 1327 as a personal name of Agnes de Arlegh in the Sussex Subsidy Rolls paying a subsidy tax of 2s in the manor of Mayfield and Wadhurst.[9] In 1332 Alex de Arlegh was paying 1s and 2d in the Manor of Mayfield and Wadhurst.[10]

[4] Redwood and Wilson 1958. The Custumals of the Sussex manors of the Archbishop of Canterbury's manors in Sussex 1285-1330.
[5] See above p25-36
[6] Adams, I. 1976. Agrarian Landscape Terms. A glossary for historical geography. p 1
[7] Gardiner, M. 1985. Planned medieval land division in Withyham. Sussex Archaeological Collections 123. 109-114.
[8] Ibid
[9] Hudson Rev W.M. 1910 The three earliest subsidies for the county of Sussex in the years 1296, 1327 and 1332. Sussex Record Society Vol X p 199.

A transcription was undertaken by Christopher Whittick (Senior Archivist at the East Sussex Record Office) of the entries for Earlye in two surveys of the Manor of Mayfield. [11] The full transcription is given in Appendix 2. *The extract from surveys of the Mayfield beadlewick of the manor of South Malling in 1498 and c1565 relate to the Yard of Arligh.*

In 1565 there were 32 yards (or virgates) in the beadlewick, and the owners held their land by bondhold[12] tenure. Mayfield had 16 yards, and Wadhurst 15 yards and two half-yards.

Assuming that the system was the same or akin to that in neighbouring Rotherfield, and relying on Walter Budgen in SNQ 1 94, we can safely say that each ferling amounted to roughly 60 acres, and was the equivalent of a fourthing or quarter of a hide. Each yard seems to have consisted of two ferlings, although this is nowhere stated.

In the 67 years separating the two rentals the main event had been the division of the 1½ ferlings of the Yard of Arligh between the two sons of William Huggett, the holder in 1498. One moiety descended to Christopher Huggett, presumably the heir of John Huggett; the other was bought from John's brother Robert Huggett by Nicholas Fowle of Riverhall whose furnace and forge, established by 1562, was perhaps the stimulus for the purchase (Henry Cleere and David Crossley, The iron industry of the Weald (1995), 352).

There are extensive post-medieval records for the Manors of Wadhurst and Mayfield so the virgate or yardland of Earlye can be traced backwards and forwards using the names of the occupiers and the rents they woed to the manor

Earlye owners/occupiers from Land Tax Records
1750-1754 James Rogers
1757-1759 John and George Lockyer
1760 Jo Saunders
1760-1780 Joseph King or Kine
1781-1786 Mrs Comber occupied by Jospeh Kine
1787-1801 John Baker occupied by Edward Kine
1802-1832 Joseph Newington occupied by Edward Kine
Discrepancy as in 1829 Nicholas Fowle is described as owning Arlegh see below.

10.2.2 Lightlands

Lightlands as a name is first recorded in 1635 (SRS 14, 91). It is an ironmasters house built in and by ? and possibly from stone reclaimed from a hunting lodge used by King John (Listing/HER description no source. This is a myth and nothing to do with King John CW pers. comm).

---

[10] Ibid p319.
[11] ESRO AMS 5512 f42 1498; ESRO CAM2/2/1 ff49v-50 c.1565
[12] Bondhold equates to copyhold or customary tenure ? Richardson 1981 The Local Historian's Encyclopedia. Historical Publications

Name may mean light arable soils easy to work ?

Lightlands part of which held as copyhold of the manor of Frant [ESRO ABE/16S/1]. This bundle of manuscripts gives some of the history of Lightlands from the abstracts of title. In 1829 it was purchased from William Wingfield and his trustees by Daniel Rowland. The lease and release for this purchase records the names of the fields at this time. Namely *Kitchen Mead, Great and Little Meads, Upper and Lower Furnace Fields, Great and Little Rutley, The Warren House Field, Brick Hurst (Oast) Field, Heave Gate Field, Fant (Frant) Field, Barn Field, Knap Gate* totalling 100 acres in the parish of Frant. [This list needs to be checked against the Tithe names of c.1840). The document also describes the lands abutting;

To the lands of Nicholas Fowle gent called Arlegh, Shruggetts and Court Grove towards the south and south west and to the lands belonging to the Parsonage of Rotherfield called Henley on east to part of the demesne lands of the Manor of Frant called Knowle Mill Hill Wood and to the lands formerly of Charles Carpenter on north and to lands called Bisketts and Larkins Barn towards the west. See the map of Lightlands of 1813 which accompanies this group of documents [ABE 797B formerly ABE 16 S][13].

At this date the owners abutting Lightlands to the south (from west to east) were James Bellemy, John Newington (Earlye ?) and James Randel (Riverhall ?). There appears a discrepancy between 1813 John Newington and 1829 Nicholas Fowle.

10.2.3 Pococksgate

First recorded in 1556 Manorial name John Pococke (Transcription of Court Rolls Manor of Rotherfield). 'gate' element – is this gate to Waterdown Forest or a gate into Eridge Park or both ?. There are several references to it in the ESRO.

10.2.4 Ironworks

Henly Furnaces Frant (Upper & Lower) on the boundary stream (Number 101 in Cleere and Crossley 1995).
Lower Henley recorded in 1574 as John Carpenter's forge. Upper site is penstock.
Riverhall furnace and forge Wadhurst (129 ditto)
Nicholas Fowle 1562 by 1664 both forge and furnace gone.
Check that Fowle built Lightlands ? did the family also build/own Riverhall ?

10.2.5 Riverhall

Another ironmasters house. This property has been researched in detail by David and Barbara Martin but not the lands David Martin pers.comm.). The Fowle Family were ironmasters in this area. Some of their papers are with the Courthope Family of Whiligh Ticehurst Mss (ESRO CO/).

[13] ESRO ABE 797B extracted from ABE 16 S Lightlands.

1606 – Elizabeth 1st ? wife of William Fowle of Riverall died (Horsfield 1835)[14]
1619 – William Fowle of Riverhall[15]
1631 – Sybil 3rd wife of William Fowle of Riverhall died (Horsfield 1835)
1736 – Nicholas Fowle of Riverall and Elizabeth his wife[16]
1760 – John Saunders of Riverhall.[17]

It appears that the fields to the north east of Earlye belonged to Riverhall at the time of Tithe c.1840.

10.2.6 Shernfold in Frant

First recorded in 1327 (Subsidy Rolls) home of Roger de Sharnefold (Name means Dirty *scearn* fold *falod*).[18]

10.2.7 Waterdown Forest

Medieval hunting forest with manor of Rotherfield paramount over it. Eridge Park enclosed within it. Saxtons map of Sussex shows the extent of the Forest and so do subsequent maps. History of enclosure of Waterdown ? evidence in Manor of Rotherfield Mss ?

Theory

The fields in Frant parish appear to form part of the Lightlands Estate and Pococksgate Farm. Fields are small, square and aligned in a regular pattern contained by the park pale of Eridge on the west and the track/road to Lightlands on the east and extending north to The Platt.

Suggestion that these were enclosed in a planned layout from Waterdown Forest in the C16 possibly by the builder of Lightlands together with the building of Pocksgate Farm. Ironmasters had spare capital which could be used to extend farming enterprises and improve lands. The Forest may have been like Ashdown. Open and heathy

The iron ore pits lie along an east-west axis, to which the fields appear to be orientated, with the pits in the field corners. Pits first - fields after ? perhaps. Or the field boundary followed the change in soils/geology and the pits then dug afterwards ?

Theory

The fields around Earlye Farm are the oldest pre C11 probably part of the virgate or yardland of Arlegh. The virgate was divided into several tenements, one could be where the farm is and perhaps the other being the Riverhall fields to which have been added the fields from Lightlands, and the

[14] Horsfield, T.W. 1835. The History, Antiquities and Topography of the County Sussex. Baxter. Sussex Press Lewes.
[15] ESRO AMS 6917/1/ 1619 Attested copy of Lease and Release
[16] ESRO SAS/CO/2/298 Lease and Release
[17] ESRO SAS/CO/2/481 Will of John Saunders of Riverhall
[18] Mawer, A. and Stenton F.M. 2001. The Place-names of Sussex. English Place-name Society, p375

small assarts to the south-east. Need to establish what the manorial/customary rights were for holding the virgate of the manor. Look for evidence of pannage in Waterdown Forest, which once enclosed – fodder for stock would have needed to come from woods and hedges. (Could explain the high proportion of holly and hazel in the hedges).

10.2.8 Assart fields

These based on shape and earthworks, location to farm etc. C12th field creation. These fields need to be chased back in the archives to see if they can be identified as assarts in the manorial records for Mayfield and Wadhurst. See Mark Gardiner's paper in 1985 on Withyham.

Hazel and Holly in hedges used for stock as common pasturage lost when forest enclosed perhaps?

11. Recommendations for further work

The Fields systems in the High Weald was a pilot project to develop a character statement for the different field systems to be found in the High Weald and a method statement to assess the value and importance for any field or groups of fields where landscape is proposed. The aim is to roll the method assessment out across the South east.

In order to understand the land use history of enclosure a range of evidence bases were explored to assess their contribution to the understanding of field systems.

The following sets out those areas where further archive research and field investigation would contribute and deepen significantly to our knowledge on field systems in the High Weald and the High and Low Weald boundary.

11.1 Archive Research

1. Medieval manorial documents to understand ownership/tenant holdings and changes over time with land exchanges
2. Medieval manorial documents such as those of the Archbishop of Canterbury's South Malling manor to understand the development of virgates, yardlands etc. and to explore how to trace these on the ground as groups of fields
3. To identify within the last period of assarting in the C13 and C14 those fields cleared from woodland and to try and relate them to the 'old' and 'new' assarts recorded in manorial documents. Who was doing the assarting, were they new farm holdings or expansion of existing ones?
4. Post-medieval land use surveys to explore land use change and the potential heritage features to be found in the landscape, such as plough headlands, ridge and furrow etc.
5. Research into field names to see how and what type of names survive from the C13 & C14 to the present day
6. Continue the archive research for the existing case study areas.

11.2 Field Investigation

1. Look at several further case studies identified through archive research to explore boundary changes, historical ecology, and ecological relationships with heritage features (such as species rich pasture sward with ridge and furrow)
2. To undertake further geophysical survey of field systems associated with field names which indicate earlier settlement, or where earthworks survive of earlier boundaries
3. To undertake some trial trenching and field walking in areas where relict field systems appear to survive beneath the present day system
4. Current research suggests there was a hiatus between the end of Roman administration and the settlement of Saxons across the Weald. Develop some research projects which explore this period in more depth.

Appendix A:

Selected extracts from the ESRO Archives – Dr Nicola Bannister

Survey of the manor of Mayfield [See Appendix B]
Date: 1546-1560
Repository: East Sussex Record Office
ESRO reference: CAM 2/2/1CAM/2/2/1
Level: File
Description: folio i heading for a survey taken at a court of Edward North, kt, and his wife Alice, 12 Feb 1546, by [blank] Hubberston, gent, and other officers of EN, by reference to documents of the reign of Richard II; list of shop-places in Mayfield, demised in the time of 'bishop Wutton'; a 'view book' compiled 1498 [AMS 5512/1]; with critical observations on the alterations of the custumal by Mr Hubberston
1-45 survey of tenements in Mayfield
46-83 survey of tenements in Wadhurst
84-87 list of contents of each folio
88-94 names of tenants of yardlands in Mayfield and Wadhurst, 25 May 1560
97-98 lists of tenements held by William Aynscombe and Bernett
99-101 - See more at:
http://www.thekeep.info/collections/getrecord/GB179_CAM_2_2_1#sthash.LTd2zqti.dpuf

Probate (PCC) of the will (23 Jun 1760) of John Saunders of Riverhall in Wadhurst, gent
Date: 10 Jul 1760
Repository: East Sussex Record Office
ESRO reference: SAS/CO/2/481SAS-CO/2/27/481
Level: File
Access status: Open - See more at: http://www.thekeep.info/collections/getrecord/GB179_SAS-CO_2_27_481#sthash.xNCu897K.dpuf

Attested copy conveyance (lease and release) for £383
Date: 13-14 Oct 1736
Repository: East Sussex Record Office
ESRO reference: SAS/CO/2/298
Level: File
Description: Nicholas Fowle of Riverhall in Wadhurst, gent, and his wife Elizabeth, to Thomas North of St Olave in Southwark, Surrey, brewer third share in the property as SAS/CO 2/296
Access status: Open - See more at: http://www.thekeep.info/collections/getrecord/GB179_SAS-CO_2_13_298#sthash.nzyExUpM.dpuf

A report of 1724, Ford (170) noted that East chancel was adequate although the North chancel belonging to Lord Abergavenny was in a poor state; church was rebuilt with donations from local worthies (the vicar, the son of the Earl of Abergavenny, the Marquis of Camden who had a family pew built into his South aisle) from 1819 and reopened 14 Jul 1822 - Horsfield (Sussex I 408-9); Nairn & Pevsner (507) follow Horsfield in citing the antiquarian expertise of the designer John Montie;

monuments from the old church were reinstalled; for the earliest slabs in the church (not found) for the Fowles, local ironmasters, one to Sybil, d. 1631, the third wife of William Fowle, of Riverhall, and one to 'EF', perhaps Elizabeth Fowle, d. 1606, the first wife of William Fowle, see Eeles (253-4). See too Horsfield (Sussex 1 409); Willatts (SAC 125 102-4) reports 3 iron slabs here, one with the Fowle arms, which recur at Wadhurst.

Settlement (counterpart grant by trustees, including Isaac Burgess)
Date: 19 Jan 1619
Repository: East Sussex Record Office
ESRO reference: AMS 6917/1/1/
Level: File
Description: William Fowle of Riverhall in Wadhurst, esq, Anthony Fowle of Rotherfield, esq, and Isaac Burges of Rotherfield, yeoman, to Alexander Fermor of Rotherfield, gent, and his heirs in tail male, remainder to Herbert Fermor son of Nicholas Fermor, gent, in tail male, remainder to the right heirs of Henry Fermor of Chelsea, esq, deceased1 messuage and 30 acres called Pilland in Heathfield (N: John Fuller; W: George Drury; S: Anthony Staply, esq; E: Backington Lane)2 messuage and 20 acres called Sudgers in Heathfield3 tenement with a barn and 18 acres called Bedles otherwise Digges Heath in Heathfield4 three acres, late waste land, called Browne Downe, adjoining Digges Heath5 38 acres of waste land, part of the waste called Highdown, in Heathfield (E, S: Thomas Pelham, bt; N: Richard Harmer; W: other parts of the Highdown)6 a seventh part of the waste lands not yet 'limited out' to the tenants of the manor of Heathfield7 tenement and 12 acres called Paynters in Heathfield8 two acres, once part of the waste called Highdown (W: Painters Wood) in Heathfield recites: will of Henry Fermor of Chelsea, esq, bequeathing £2000 to WF, AF and IB to purchase land to be settled as above, 1615; purchase of the above land by WF, AF and IB from John Fuller for £310 in part-performance of their trust, 18 January 1619W: John Maynard, Thomas Larkins, Richard Fowle
Custodial History: SAS/LB 20
Access status: Open - See more at:
http://www.thekeep.info/collections/getrecord/GB179_AMS6917_1_1_1#sthash.DSxvOr0K.dpuf

Appendix B:

Transcriptions of the entries for Earlye in the Survey of the Manor of Mayfield Court – Christopher Whittick

Table 1. Survey of the Manor of Mayfield summary

ESRO AMS 5512 f42v	**Survey of the Manor of Mayfield, 1498**	
	William Hogatt holds	
	A messuage with a garden and certain free lands containing 33 acres late his father Richard Hogatt's and John Steld's, and pays	2s 9d
	15 acres of free land opposite the messuage formerly Praties <by the name of Burchettes>	1s 3d
	A croft of free land lying to the lane leading from Faircrouch to Dorantes on the east called Hogglettes Croft	1d
	Various parcels of bondhold land of the Yard of Crowherst containing 21 acres of called Grene Woddes late Robert a Waters of Crawley <this appears by the copy as but 16 acres and so in the old rental>	2s 8½d
	For the mill at Riverhall and other lands now before written upon the heading of Henry Darell But he has lands at Riverhall formerly Henry Darell and before Roger Ashburnham	
	The same [William] Hogatt <now Nicholas Fowle and Christopher Hogatt 1565> holds	
	a ferling and a half of bondhold land of the Yard of Arlegh afterwards equally divided between his sons John <3s 6¾d> and Robert <3s 6¾d> Hogatt <now Nicholas Fowle ~~except John Berham 3 acres of it~~>	7s 1½d
	Sum 13s 11d	
	Richard Austen <now William Fowle> holds	
	The half-yard of Arelegh for which he pays with suit of court	9s 6d
	Two pieces of free land containing 6 acres of which the first is called The Coloppe the second Northfeld lying to the park of Frankham on the west side and the land aforesaid on the east <note 12 acres or more has there>	6d
	<There is another piece of land called Wodgates containing 8 acres – look elsewhere and query; I suppose that this is part of the half-yard aforesaid; however he has another piece of free land which with those above contains 12 acres>	
ESRO CAM 2/2/1 ff 49v-50	**Survey of the Manor of Mayfield, c1565**	
	Christopher Hoggatt at Arligh holds	
	A messuage with a garden and 5 pieces of land containing the moiety of a ferling and a half of bondhold land of the Yard of Arligh, of which the first piece is called Great Sandes <of which Nicholas Fowle has half an acre>, the 2nd second Lytell Sandes, the 3rd Mydlefeld, the 4th Knolles and the 5th Knolles Strake (half an acre in the hands of Nicholas Fowle)	3s 6¾d

	containing 50 acres with a reasonable way in a certain piece of land called Merlinges towards the hedge of Brokland leading to Lytell Sandes, formerly William Hoggatt (among many) and afterwards devised to John Hoggat	
	He has in exchange with Nicholas Fowle in 4 Elizabeth [1561-62] for 1 acre and 2 half-acres <now in the tenure of the said Nicholas> separately of the lands aforesaid, 5 acres of bondhold land <now in the tenure of the said Christopher> of the aforesaid Yard of the aforesaid piece called Merlinges; which 5 acres lies by the land of the said Christopher called East Mede towards the north and to the land of the said Nicholas towards the west	
	Nicholas Fowle holds	
	the other moiety of a ferling and a half of bondhold land of the Yard of Arligh, <u>of which about 3 acres [were] late in the hands of John Berham where the [*blank*] of the pond is made</u>, which was late purchased from Robert Hoggatt, formerly William Hoggatt with the other lands above; and in all it contains about [45 *deleted*] <50> acres total; he pays, with suit of court	3s 6¾d of which the aforesaid Hoggatt has in exchange as above
	a half-ferling of bondhold land of the Yard of Arligh called Brokland by estimation [10 *deleted*] <7 I think> acres late John Luck of Durgates	2s 4½d
	A parcel of bondhold land of the Yard of Crowherst containing 14 acres called Bondbroome late Richard Luck son of John Luck the elder formerly of Faircrouch; and he pays with suit of court as is enrolled by Edward North knight lying by the land of Baker the younger called Balkyng Place as appears later in this book	1s 8d
Entry deleted	The heirs of John Hoggatt hold	
	A mill formerly called East Mill at Riverhall formerly Henry Darell esquire as appears in the old rental and in the Red Book; and if was formerly Roger Ashburnham's and afterwards Hoggatt's	2d <this Nicholas Fowle they never had .. place formerly dower>
	The heirs of John Hoggatt of Riverhall <John Bromham in the right of his wife> hold	
	A messuage with an adjoining garden and free lands containing 33 acres formerly his great-grandfather William Hoggatt	2s 9d
	15 acres of free land opposite the aforesaid messuage on the other side of the road there, formerly Praties and afterwards the aforesaid William Hoggatt; which in the old rental is called 5 pieces by the name of Byrchettes 14 acres	1s 3d
	A croft of free land to the lane leading from Faircrouch to Dorantes called Hogglettes	1d
	Various parcels of bondhold land of the Yard of Crowherst containing 21 acres of called Grene Woodes; he pays with suit	2s 8½d

	<by the copy of admission dated 5 April 1559 it appears as 3 pieces and a croft containing but 16 acres>	
	A piece or meadow of free land containing about [*blank*] acres at Hurlegoy formerly Henry Darell esquire	
	Which all and singular formerly belonged to Thomas Hoggatt	
	The same heirs hold or have the place formerly called The East Mill at Riverhall formerly Henry Darell esquire and afterwards Hoggatt's, and which formerly belonged to Roger Ashburnham	2d
	<these 2 by the name of the mill of Riverhall with a plot of land at the horle gay and a forestall by Riverhall as appears in the old rental pay 7d; of which it appears to be then one acre of new assart in the corner of the meadow by the stream and street there; Riverhall on the north side of the street>	
	I suppose that it is called Melpend by estimation 2 acres by Riverhall Bridge he says it pays to Nicholas Durrant but by the old rental it appears to pay; see above for the mill	
	Thomas Luck one of the sons of John Luck late of Faircrouch <now Robert Wenborne 1560; now Andrew Skynner 1562> holds	
	Two pieces of free land containing 6 acres lying at Arligh of which the first formerly called Aggotes otherwise Arligh Mede the second Hyghfelde late the aforesaid John the father pays	6d
	And the aforesaid piece called Hyghfeld lies to the land of Richard Olyffe towards the south and west, and to the land of Nicholas Fowle towards the north and east; and the aforesaid piece called Arlighe Mede lies to the land of the aforesaid Richard Olyffe towards the south and east, and to the land of the aforesaid Nicholas Fowle towards the north and east, and to the highway there leading from Buckherst Wood towards Frant towards the west	

Place names for Earlye

Figure 1. Extract from the Tithe Map for Frant

Table 1. Extract from the Tithe Apportionment.

Number	Name	Owner	Occupier	LAnduse	Acreage
639	No Data	Lord Abergavenny	William Pariss	Pasture	8-1-13
638	Upper Copyhold	Ditto	Ditto	Arable	5-1-15
670	Middle Field	Ditto	Ditto	Arable	7-0-16
655	Nod data	Ditto	Ditto	Arable	10-3-35
669	Lower Copyhold	Ditto	Ditto	Arable	7-0-18
668	Copyhold Pit	Ditto	Ditto	Wood	0-2-26
667	Copyhold Orchard	Ditto	Ditto	Pasture	0-2-12
666	The Shambletts	Ditto	Ditto	Arable	4-1-36
665	The Shambletts	Ditto	Ditto	Arable	4-1-0
662	Shaw	Ditto	Ditto	Wood	0-1-35
664	Wood	Ditto	Ditto	Wood	2-1-29
663	Old Road Shaw	Ditto	Ditto	Wood	0-3-0
661	Shaw	Ditto	Ditto	Wood	0-2-5
660	No Data	Ditto	Ditto	Arable	5-2-24
659	Marl Pit Field	Ditto	Ditto	Pasture	1-2-0
658	Marl Pit Shaw	Ditto	Ditto	Wood	3-3-0
657	No Data	Ditto	Ditto	Hops	6-2-5
1472	No Data	John Newington	Joseph Kine	Pasture	0-0-30

Meanings of some of the Field Names for Lightland in Frant

The Shambletts

This field was called the Stumbletts in 1813[19] thus showing some corruption of the name between 1813 and 1840. This according to Mawer and Stenton is a significant word arising in several Wealden parishes. Derives from OE stumbel meaning a stump of tree (Ibid p208, 375). Thus land with stumps of trees. It suggests that this land was clared from woodland relatively late and tree stumps were still present. It also came to mean a measure of woodland according to an Ashburnham deed of 1584 for Catsfield. Another alternative could be from OE *sceamol* meaning Shambles a shelf of land (Field 1989, 198) – this is more tenuous perhaps.

Upper, Lower (and Middle ?) Copyhold Fields

Land held at the will of the lord of the Manor, authenticated by copy of the court roll. These fields so called in 1840 and 1813.

No Data

This suggests that no names were given to the fields in 1840 but in 1813 from north to south they were called Knap field (arable) with no road going through, Ten acres (arable) and Marl Pit Field (not sub-divided as in 1840).

From the field names the suggestion is that Shambletts Field was cleared from woodland and then sub-divided. The copyhold fields were enclosed by permission from the Lord of the Manor from formerly open land, and held by customary rights recorded on a copy of the court roll. The fields with no data were sub-divided after 1813 and before 1840 suggesting that no other names had been ascribed to them by ether the owner Lord Abergavenny or the tenant William Pariss.

[19] ESRO ABE 797B 1813 Lightlands. Formerly ABE 165 Title Deed

Figure 2. Extract from the Wadhurst Tithe Map.

Table 2. Extract from Wadhurst Tithe Apportionment.

Number	Name	Owner	Occupier	Land use	Acreage
1267	Rocky Field	John Newington	? Wells	Arable & Wood	12-3-3
1269	Ten Acre Shaw	Ditto	Ditto	Wood	0-1-0
1270	Ten Acres	Ditto	Ditto	Pasture	20-2-17
1271	Alder Shaw	Ditto	Ditto	Wood	5-0-32
1272	Alder Hop Garden	Ditto	Ditto	Hops	2-2-13
1273	Aldery Field	Ditto	Ditto	Pasture	3-1-33
1274					
1275	Nine Acres	John Newington	? Wells	Arable	9-1-3
1276	Eight Acre Hop Garden	Ditto	Ditto	Hops	5-0-1
1277	Wash Shaw	Ditto	ditto	Wood	1-2-2
1278	Jemmits	Ditto	Ditto	Pasture	3-2-20
1279	Lower Jemmitts	Ditto	Ditto	Pasture	0-3-38
1280	Calves Brook	Ditto	Ditto	Pasture	1-2-0
1281	Jemmitts Pit	Ditto	Ditto	Wood	1-3-29
1282	Malthouse Meadow Shaw	Lord Abergavenny	James Brown	Wood	0-0-25
1283	Nine Acre Shaw	John Newington	? Wells	Wood	1-1-4
1284	Nine Acre Meadow	Ditto	Ditto	Pasture	9-0-5
1285	Seven Acres	Ditto	Ditto	Pasture & Wood	6-2-2-
1286					
1287	Sand Shaw	Ditto	Ditto	Wood	2-0-38
1288	Furnace Bottom	Ditto	Ditto	Pasture	1-1-5
1289	Lower Sands	Ditto	ditto	Arable & Wood	9-1-6
1290	Upper Sands	Ditto	Ditto	Arable	7-3-6

1291	Barn & yard	Ditto	Ditto	n/d	0-1-38
1292	Plat	Ditto	Ditto	Arable	0-0-28
1293	House Barn & yard	Ditto	Ditto	n/d	0-1-38
1294	Coneybury Field	Ditto	Ditto	Arable & Wood	3-0-24
1295	Garden	Ditto	Ditto	n/d	0-1-20
1296	Oast Plat	Ditto	Ditto	Pasture	0-3-10
1297	Oasthouse Meadow	Ditto	Ditto	Pasture	1-0-37
1298	Eight Acres	Ditto	Ditto	Pasture	4-1-38
1299	Five Acre Pit Field	John Newington	? Wells	Arable & Wood	7-2-2-
1300	Three Acres	John Newington	? Wells	Arable & Wood	5-2-35
1301	Upper River Field Shaw	Joseph Kine	Joseph Kine	Wood	1-0-21
1302	Upper River Field	Ditto	Ditto	Arable	2-0-21
1303	Lower River Field	Ditto	Ditto	Arable & Wood	2-3-27
1304	Little Marlpit Field	Ditto	Ditto	Arable & wood	2-3-30
1305	Great Marlpit Field	Ditto	Ditto	Arable & Wood	4-3-16
1352	Olives	Wm Randall Ex	John Springett	Arable & Wood	3-2-10
1353	Long Shaw	Ditto	Ditto	Wood	5-0-1
1357	Long Shaw	Ditto	Ditto	Wood	3-2-14
1358	Twelve Acres	Ditto	Ditto	Arable & wood	13-0-8
1359	Fifteen acres	Ditto	Ditto	Arable & Wood	15-1-11
1360	Long Strakes	Ditto	Ditto	Arable	7-1-14
1361	Furnace Field	Ditto	Ditto	Arable & wood	12-3-39
1363	Furnace Wood	Ditto	Ditto	Wood	4-1-21

1364	Furnace Shaw	Ditto	Ditto	Wood	0-2-1
1377	Mill meadow	ditto	ditto	Pasture	2-0-25
1379	Plat	Ditto	Ditto	Arable	0-0-7
1380	Plat	Ditto	Ditto	Arable	0-0-10

William Randall owned Riverhall and tenanted it to John Springett
Joseph Kine owned and lived at Skinners Farm south of the Wadhurst – Eridge Road also owned Partridges (as marked on OS Explorer map)
John Newington owned Earlye and tenant it to ? Wells (which according to Land Tax was?)
Meanings of the place-names
Most names are descriptive of the size of the field (in the case of arable and pasture fields) or of the land use.
In the c. 1565 transcription of the yardland of Arligh are several field names;
Great Sandes; Lytell Sandes; Mydle Field; Knolles; Knolles Strake; Merlinges; Brokland
Great Sandes and Lytell Sandes can be identified as 1290 Upper Sands and 1289 Lower Sands
Knolles Strake can be identified with 1360 Long Strake
By association Knolles is probably 1361 Furnace Field or part of it (as there are lynchets suggesting it was once sub-divided) and also Furnace Field contains the highest point on the farm. To the north east is a place called Knolles.
Brokland lies to the south east of the lane to Ealrye identified as 1356 long Brook Hops on Tithe and 1383 Lower Brook Fruit and wood both belonging to River Hall.
Mydel Field and Merlinges have yet to be identified by lie in the same area. In 1565 there was an exchange of land which may relate to the construction of the mill pond for the corn mill (Christopher Whittick pers. comm.)

Appendix C:
Intern report – William Gibbs

High Weald AONB Unit Report

www.highweald.org

Field Systems GIS methodology:
tithe map digitisation

William Gibbs

July 2015

Contents

1. Creating polygons

1.1 Fields

- A single large polygon covering the total area was created and then divided according to tithe field boundaries using the cut polygon tool
- This approach was chosen over the use of OS Master Map (OS MM) as the basis for field digitisation. There are two main reasons for this:

    1) Using OS MM makes the process of digitising the tithe field boundaries slower and more fiddly due to all the clutter included in the MM layer – we found that it takes significantly longer to clean this clutter and match boundaries to those on the tithe than to just create and then divide one large polygon

    2) We wanted to create an accurate copy of field boundary layout at the time of the tithe map rather than try to transpose historic boundaries onto the present day landscape. We felt this would minimise assumptions regarding boundary changes, instead creating a faithful representation of the tithe which could then be layered up and compared with modern mapping subsequently.

    3) Unlike the Ancient Woodland Inventory revision we are not attempting to identify the existence of present day features at various points in the past; rather we are more concerned with how field patterns may have changed over time.

- Property has been included with in field boundaries classify as land where it is apportioned
- All land parcels with distinct boundaries were digitised, including those with dotted and/or dashed lines, despite the fact that, as Prince (1956) notes: "*Most tithe maps mark the boundaries of unenclosed parcels of land by dotted lines. Such lines may represent property divisions, separating holdings in an open arable field or common meadow, or they may represent either permanent or temporary divisions between lands of differing utilization in a field belonging to a single farmer. It is generally possible to confirm this distinction by referring to the apportionment, but contemporary private estate maps may be of some help in making a decision*". Our reasoning was that, although parcels of land demarcated by dotted/dashed may not have had any physical boundaries associated with them, they should be digitised as distinct as they likely have their own unique management histories and may at one time (and may still do to this day) have had some sort of boundary associate with them.
- Consequently, the rule we followed was to treat ALL lines on tithe as a boundary of some sort – whether dashed, dotted or solid – and digitise accordingly

1.2 Roads, route ways and streams

- Roads and route ways have not been digitised for case study locations as they are not assigned an apportionment number in the tithe schedule.

- However for the “Frant Parish feature class” roads have been digitised and called ‘roads’ in the attribute table, due to time constraints streams were not. Roads can therefore be highlighted with a change of symbology.

- It would be easy to add roads or rivers to the feature classes for each case study location as below shown below.

- It is possible to easily digitise roads or rivers/streams by using the trace tool in the editor tool bar. One must highlight the polygons that are to be traced using the edit tool (black arrow). First use the sketch tool to start the drawing of a new polygon (make sure that snapping is on). Once the highlighted section is clicked select the trace tool as above and follow the edge of the selected polygons. Trace tool will only draw as far as the selected polygons continue, it is possible to selected more polygons during the sketch by reusing the edit tool and selecting more polygons.

  Useful video about tracing for 9.2 version but still works for 9.3
  https://www.youtube.com/watch?v=TB7jnD5oyoE

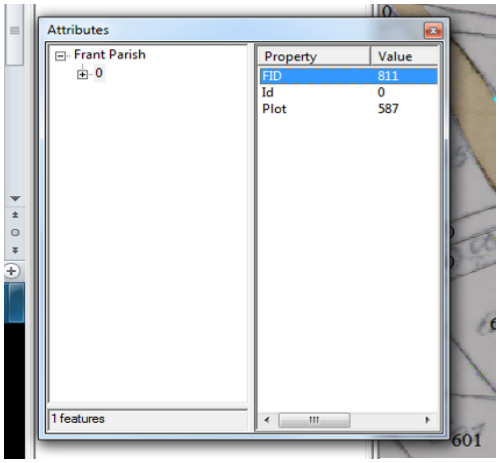
2. Assigning apportionment numbers to polygon

The following have been proven make the numbering of polygons for digitised tithe maps faster:

- When giving each polygon a number use the “label features” function. Secondly in **symbology select “Plot” as the feature to be given a label. This will highlight those polygons given a number and thus show those** still requiring a plot number.

- To give a number to a polygon, use the “Attributes” icon on the editor tool bar *(Pic 1)* rather than using the attributes table. This icon will open up a window like the one below *(Pic 2).* Assign each number to the “Plot” attribute here.

Pic 1



Pic 2

3. Code and joining polygons attributes to apportionment excel tables

These steps below have been developed to be able join polygons to the corresponding plot of land within the apportionment. A number of complexities mean that it is not just as simple as assigning a number and joining to the excel sheet. The Steps below aim to minimise these complexities.

- Each polygon is assigned a plot number according to the tithe map – e.g. 650, 710 or 710a (letters often are underlined on tithe map, this can distinguish between letters and objects such as trees)
- This plot number should be used as the basis for a join in GIS to the accompanying Excel apportionment table, in a new column named "Join". This new column should be in the format of "long integer", to store large numbers.
- In the column "Join" input all of the corresponding values for those plots not including a letter i.e. 700, 800 or 900. To deal with letters use the coding system highlighted below.

3.1 Coding

- It is not possible to join plot numbers such as 790a to the excel sheet apportionment column called "Plot" as it contains both numerical and alphabetical information. Therefore a code has been developed to confirm the join. These steps overcome the issue of not being able to join alphanumeric columns.

5. In the column "Join" any number with "a", "b" or "c" associated has been substituted with a code. After the number 000 should be interested and then depending on the letter 1,2,3,4. For example, with a code 790a became 7900001, 790b became 7900002 and 790c became 7900003.
6. A copy of the Excel apportionment for the case study site should be made and called "NameOfCasestudy_Join". In the excel sheet in the column "Plot" substitute any number with "a", "b" or "c" with the code convention. 7900001, 7900002
7. Use the attribute column "Join" and the excel column "Plot" for the join this can subsequently be hidden or deleted
8. Once the join is complete then one should create a new column called "Plot" in a text format of 5 characters. In this column both numerical and alphabetical information can be stored. It is possible to populate this field using field calculator, editing the coded values so they appear as on map I.e. 790a. This Colum should remain visible

3.2 "Shared" and "Unique tithe"

- A column was created for those parcels of land attached to another parcel with an "S" style symbol. This is called "Joint_plot" and refers to a parcel of land with no apportionment number within it's a boundary, but that shares a number with another polygon containing a number. The user should give all polygons a "Y"/ "N" in the attribute table as to whether they are joined in this fashion or not. "Y" should been given to all polygons attached to

another, inclusive of the polygon which has the number within it. “N” should be used for standalone polygons not attached to another parcel of land.

- A column titled “Unique tithe” was added to the tithe attribute table and a “Y” was assigned all polygons with a unique tithe number, and to one – and only one – of the polygons making a group of polygons sharing the same tithe number. All the other polygons in a group sharing a tithe number were assigned an “N”. Querying this column to select out all the “Y” values will enable the total area to be calculated according to the areas measured in the tithe schedule (as opposed to the actual area of all the digitised polygons). This is because the “Y” assigned to one of the polygons from a group of polygons sharing the same plot number displays the value of the total area of all the parcels to which it is connected (see the “Acres”, “Roods” and “Perches”).

4. Working examples

4.1 Example of joint land and unique tithe steps. (Pic 2)

Plot number 654 occurs two times as this number refers to two parcels of land joined together. Therefore, this plot receives “Y” two times in “Shared” column; however, only one of the poygon’s with plot number 654 receives a “Y” in “Unique” column ensuring a means by which the total area according to the tithe apportionment can be calculated.

Attributes of Great_Lywood_Farm_Tithe_Feilds

OBJECTID *	Shape *	Id	Plot	Shared	Unique_tit	I
59	Polygon	0	658	N	Y	D
55	Polygon	0	655	N	Y	J
57	Polygon	0	655	N	N	J
54	Polygon	0	654	Y	Y	J
58	Polygon	0	654	Y	N	J
1	Polygon	0	653	N	Y	J

Pic 2

4.2 Idealised attributes table before join (Pic 3)

Attributes of Great_Lywood_Farm_Tithe_Feilds

OBJECTID *	Shape *	Id	Plot	Shared	Unique_tit
59	Polygon	0	658	N	Y
55	Polygon	0	655	N	Y
57	Polygon	0	655	N	N

Pic 3

5. Notes

NB: on the Kent tithes figures appearing under the column headings “Vicarial” and “Appropriator” refer to money to be paid by each landowner in pounds, shillings and pence. (This information was not appended to the attribute table as it refers to total holdings and not to single parcels (i.e. polygons).

NB: where case study properties include land from two or more parishes the field boundaries from each tithe map were digitised faithfully as they appear on the map. This often means the polygon along the parish boundaries will overlap – or at least not align properly. Consequently, considerable caution should be exercised when examining tithe field boundaries abutting parish boundaries.

Appendix D:

Intern report – Fred Warner

High Weald AONB Unit Report

www.highweald.org

Field Systems GIS methodology:

geodatabase setup & data entry

Fred Warner

July 2015

Contents

1. Introduction

The geodatabase was set up in consultation with the county Historic Environment Record Centres to maximise simplicity and flexibility of data entry and to ensure compatibility.

2. Set-up

2.1 Geodatabase and Feature Classes

A geodatabase was created using ArcCatalogue in order to act as a central location within which the subsequent feature classes would be held. Five initial feature classes were then created:

- "field_attributes" (polygon)
- "archaeology_attributes" (point)
- "boundary_attributes" (line)
- "boundary_furniture" (point)
- "earthwork_attributes" (line)

2.2 Attributes

The five feature classes were then loaded into what would become the GIS. Once loaded, the attribute table for each of the feature classes was opened in turn as attributes were created in response to questions asked during the data collection process. For instance, one of the questions asked related to the boundary type. Therefore an attribute titled: "Boundary_type" was added to the boundary attributes feature class.

2.3 Domains and Coded Values

Domains and their coded values were created in response to the answers of the questions. For instance a domain titled "boundary_type" was created within which coded values were then specified. The coded values related to the possible options on the data collection forms, so within the "boundary_type" domain the following is a sample of the coded values: ditch, fence, hedge etc. Having created the domains and their coded values, they were then linked to the correct attribute using ArcCatalogue.

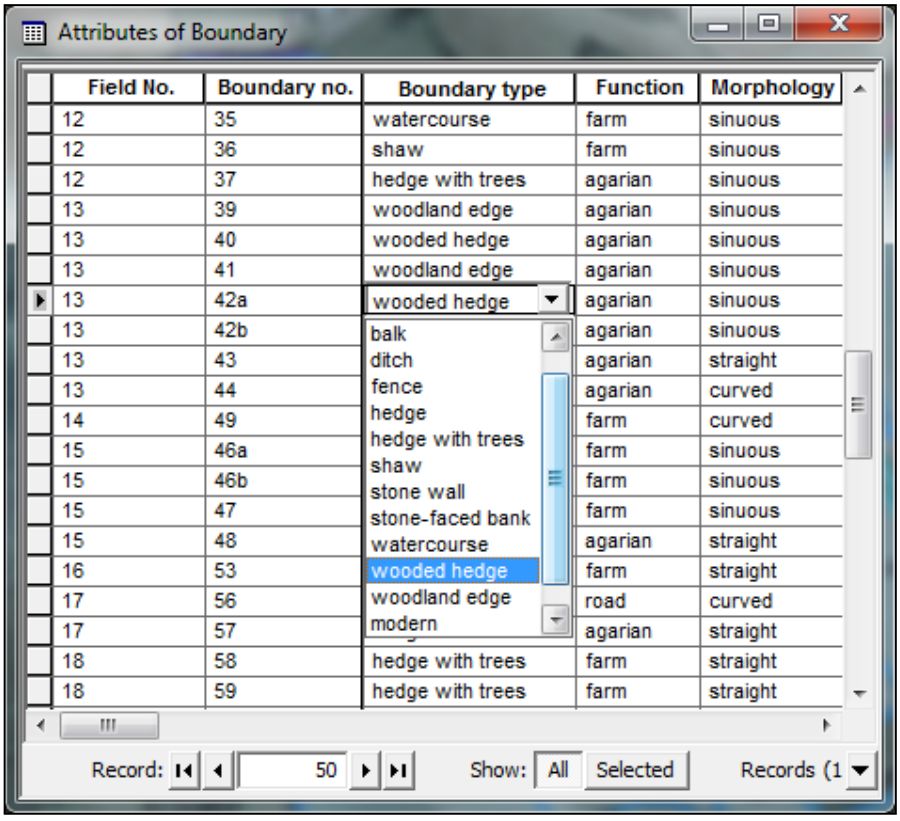
When specifying the coded values for domains consideration must be taken as to the order they are entered in. This is because (to my knowledge) they cannot be re-ordered without completely removing the necessary coded values and then re-entering them at the bottom of the list. This is problematic because in removing a coded value it will remove any data stored under that value in the attribute table meaning that re-ordering the coded values once data has been entered can cause considerable data loss. Therefore it is suggested to have decided upon a consistent format as to how the coded values are to appear prior to any data entry. I suggest an alphabetical/numerical format with a catch all negative coded value at the bottom.

This problem can also be encountered when new coded values are deemed necessary to be added into the domain as more data is made available. When this occurred it was decided that the added coded value would remain at the bottom of the drop down menu as this was deemed more acceptable than removing several other coded values which would have caused significant data loss.

Domains and coded values were used for two principle reasons. The first of which is that they will ultimately save a significant amount of time in the long run. This is because once the domains have been linked to the attributes the data entry process is a case of selecting the right option from a drop down menu – Figure 1.

In addition to saving time, the use of domains also reduces the chance of incorrectly entered data because a choice has to be made from an already predetermined list of potential options. This not only makes the data entry process notably more robust since the potential for typos is removed but also saves time. This is because the chance for error is significantly reduced meaning that considerably less time is needed to identify any instances in which data was incorrectly added.

Figure 1: Attribute table for the feature class: "boundary_attributes".



2.4 Text Fields

Not all attributes used domains and coded values. This is because there are instances in which the potential range for data to be entered into an attribute is beyond the scope of coded values. An obvious example of this is the attribute relating to the name of the field since creating coded values to hold this information would be a pointlessly time consuming task.

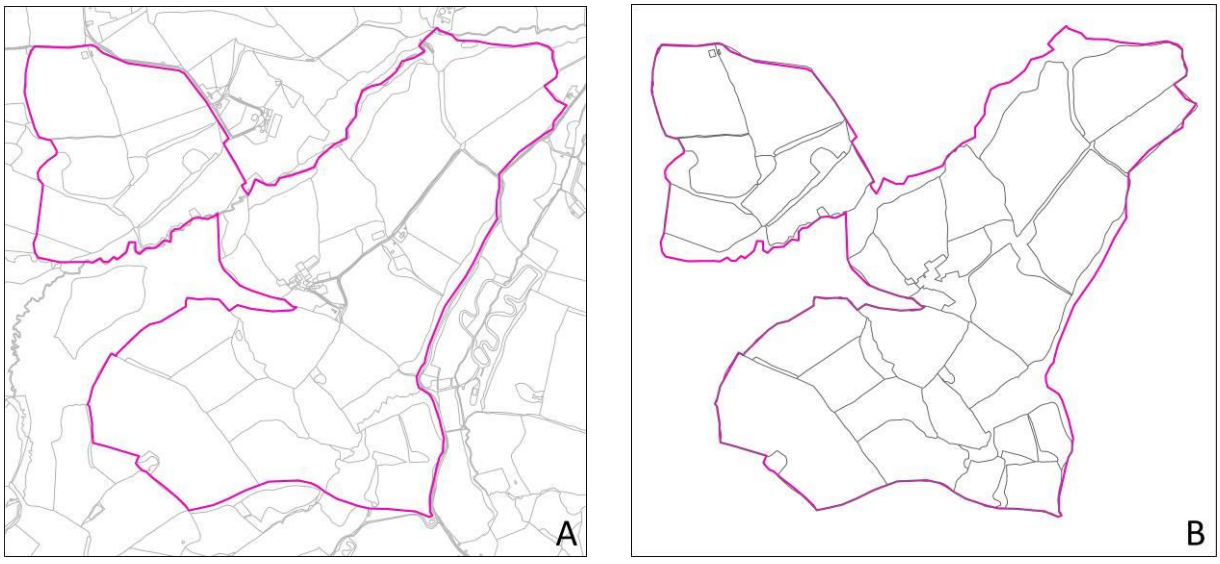
An additional reason for text fields is when they are used in conjunction with the coded value "other (specify)". For instance, the attributes "boundary type" and "boundary type (other)" were both created, with the formed being linked to a domain, including the coded value "other (specify)", and the latter being a free text attribute. The purpose of this is that it acts as a catch all for instances when a boundary type that isn't represented by the coded values is identified. This information can then be typed into the free text attribute whilst mitigating the need to add additional coded values that are rarely used.

3. Data Entry

3.1 Field Attributes

Prior to any field attribute data being entered into the GIS the field polygons had to be created. This was done using OS Master Map tiles by selecting the necessary field (identified using the field surveyor's notes) and then copying and pasting in into the field attributes layer - figure 2. While doing this, it is recommended to do this in ascending field number order; the reason for this is that the created polygons can then be sorted by objectID in the attribute table. Meaning they will be in a logical order when it comes to adding in the data. The alternative to this approach would have been to hand digitise the field boundaries which would have been hugely time consuming even on a relatively small test site like this.

Figure 2: (A) OS Master Map layer with Earlye Farm Boundary indicated. (B) Necessary field boundaries taken from OS Master Map layer and copied into the field attributes layer.



Due to the use of drop down options associated with domains and coded values, the process of data entry is simple and relatively quick. In order to maximise efficiency during this it is recommended that the attributes be put into the same order as they are addressed on the data collection form. The reason for this is that it allows for the user to simply look down the form and add in the data as they go rather than moving back and forth over the page. Once the data has been entered into the GIS the order of the columns in the attribute table can be altered to make the order for logical.

As well as the data being added to the field attributes layer, scanned copies of the data collection form were also added into the GIS via hyperlinks added to the actual polygons. This means that when the hyperlink tool is enabled (in the tools toolbar) by clicking on a field polygon the data collection forms for the field and the associated boundaries will be opened. However, the forms are saved on a local server and not within the GIS meaning if the GIS is opened without access to the server the hyperlinks will not work.

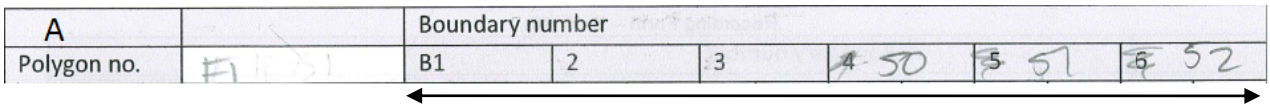
3.2 Boundary Attributes

Similar to how to the polygons that would represent the fields had to be created prior to data entry, the poly-lines that would represent that boundaries also had to be created before any data could be entered. However, unlike when creating the field polygons a hand digitised method was employed as the separate sections of the field polygons that represented each boundary arc could not be individually selected.

In order to maximise the efficiency and accuracy when hand digitising the boundaries it is recommended to have "snapping" enabled between the boundary attributes and field attributes feature classes. It is also recommended to create the boundaries in the order they are referred to on the data collection forms rather than in ascending order. For instance, field one at Earlye Farm has boundaries 1,2,3,50,57 and 52. This allows for all the boundaries on the same data collection form to be added at the same time and to be added in the order they appear on the form.

Figure 3: (A) Field 1 boundaries in the order they appear on the data collection form. (B) Field 1 boundaries entered into the attribute table in the same order as on the data collection forms.

A



B

Attributes of Boundary

Field No.	Boundary no.	Boundary type	Function	Morphology
01	1	hedge with trees	agarian	sinuous
01	2	hedge with trees	agarian	sinuous
01	3	hedge with trees	agarian	sinuous
01	50	woodland edge	agarian	sinuous
01	57	woodland edge	farm	sinuous
01	52	hedge with trees	farm	straight
02	4	woodland edge	agarian	sinuous
02	64	<Null>	<Null>	<Null>
02	5	watercourse	agarian	sinuous
02	6	hedge with trees	agarian	sinuous

Record: 1 Show: All Selected Records (0 out of 100 Selected) Options

During data entry for boundaries the most efficient methodology is to add the data from all of the boundaries on the form attribute by attribute rather than working through each individual boundary one at a time. For instance, all of the information relating to boundary type would be added in, then function and then morphology etc.

Another way to improve efficiency is to turn off any unnecessary fields and make the columns of the attribute table relatively narrow meaning that more of the attribute table can be seen at any one time. This reduces the need to be scrolling left and right within the attribute table which ultimately improves efficiency.

3.3 Boundary Furniture

Boundary furniture was the first of the point data to be added into the GIS. The most efficient way to enter this data was, again, to work on a field by field basis.

However, during the entry of this data a common issue became apparent. The issue was focused around it being unclear on the field surveyor's notes as to where the boundary furniture was located along the boundary. Gates which make up 69% $^{2\ S.F.}$ of boundary furniture could, typically, be located using aerial photography due to the obvious signs of increased and concentrated use of these areas - figure 4. However, other types of boundary furniture, such as stiles and stock watering locations, were more difficult to locate due to their relatively small size, insignificant representation in aerial photography or due to being obscured by thick tree coverage along the boundaries.

Figure 4: Two clearly identifiable gate locations at which gate locations.

3.4 Earthwork Attributes

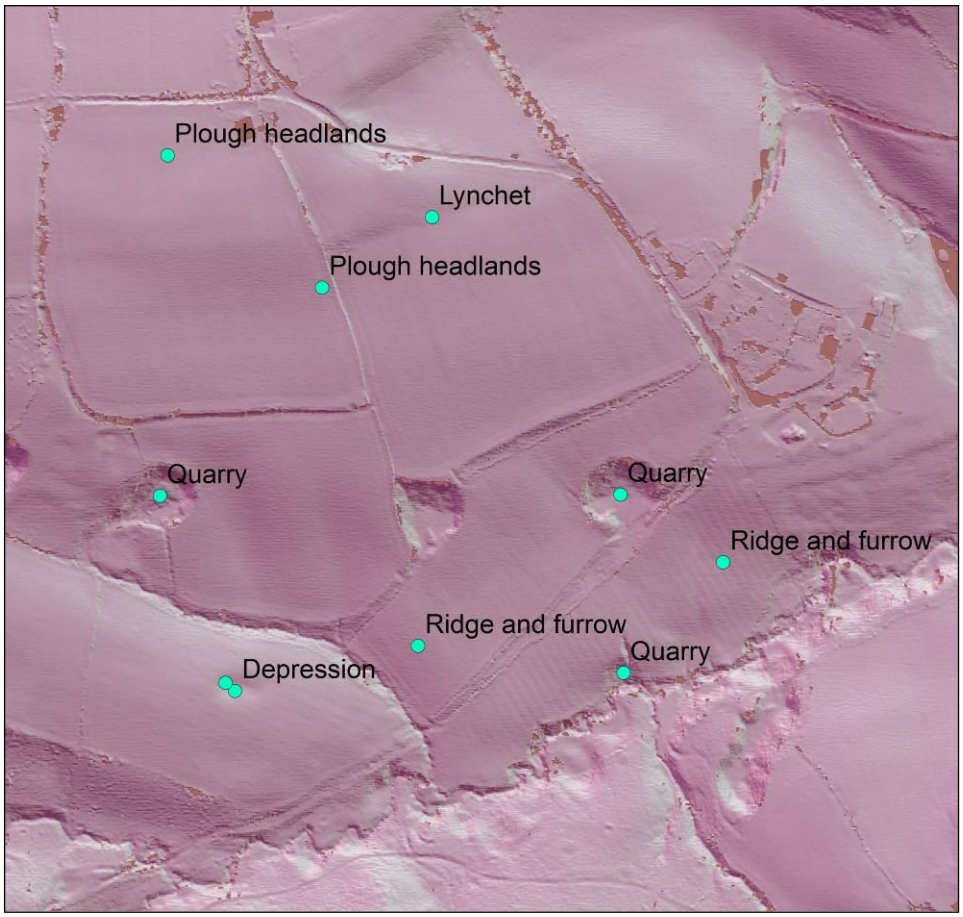
I recommend entering the data for earthwork profiles after the creation of the poly-lines that will represent the boundaries. This is because the necessary boundaries (i.e. those with earthworks) can be selected, copied and then pasted into the earthwork attributes layer.

Data entry efficiency for earthwork attributes can be improved in similar ways to boundary attributes. This means that it is most efficient to work on an attribute by attribute basis rather than to work through each earthwork element individually.

3.5 Archaeology Attributes

Entering the data into the archaeology attributes feature class was similar to data entry into the boundary furniture feature class as both are point data and both are located in GIS using the field surveyor's notes. Similar to how aerial photography was used to help identify boundary furniture, LiDAR (Light Detection and Ranging) data was used to help locate archaeological features – Figure 5.

Figure 5: LiDAR data used to help identify and locate archaeological features.



3.6 Additional Layers

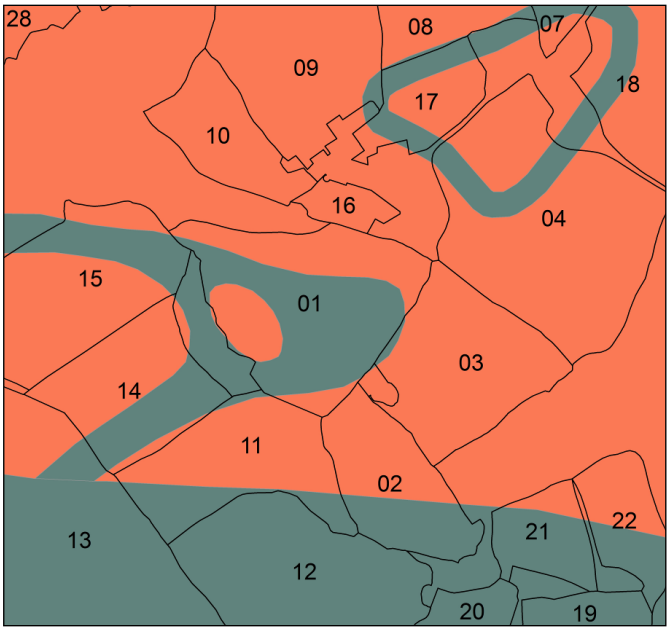
As previously mentioned in the data entry sections for both boundary furniture and archaeological attributes the use of external data layers proved very useful. The additional layers can broadly be put into three categories.

The first categories, which have been mentioned already, were layers used to help locate attributes such as boundary furniture and archaeological attributes. These layers were aerial photography and LiDAR data.

The second category includes layers that reduce the need for data to be entered into the attribute tables. This includes layers containing information such as geology and soil type. This is beneficial because there are instances, see field 1 in figure 6, in which a single entry into an attribute such as geology is not representative.
The final category into which the additional layers may be fit into is supplementary data against which the field data can be compared to or studied within a wider context. Within this category are maps containing historical information (e.g. tithe map and the historical land classification map) which can be overlaid with the field data. Using the tithe map it is possible to identify if fields have lost boundaries and how field names have changed over time. The historical land classification is arguably the most useful layer in this category due to the sheer volume of data contained within this layer.

It is, however, important to note that the above categories are not mutually exclusive since the aerial photography can be used to provide supplementary data regarding boundary types. Whilst the historical land classification map can be used to display land use rather than entering this into the field attributes layer.

Figure 6: Geology information for the Earlye Farm in which grey represents Wadhurst Clay and the orange represents Tunbridge Wells Sand.



4. Issues and Uncertainties

The greatest problem faced during the creation of the GIS was missing data on the collection forms. The issue the arises from missing data is that as a GIS intern who has not seen the field cannot make the judgement call as to what to enter into the GIS and simply leaving the attribute blank is undesirable.

The solution to this, following deliberation with the field surveyor, comes in three parts. The first is to include a catch all negative coded value that can be used by the GIS analyst when the data on the form is unclear or missing in order to indicate that they are uncertain. The second part is on the half of the surveyor to fill in as much of the form as possible and to make the data as clear as possible. However it must be acknowledged that this isn't always possible due to time constraints and the sheer volume of data to be collected. The third part is that post data entry deliberation is often needed between the GIS analyst and the field surveyor in order to reduce any instances in which the uncertain field had to be used. This methodology proved to work well and with time and the gradual improvements of the form the need for post data entry deliberation will likely decrease.

The following is a list of issues to be addressed or followed up on with the field surveyor:

- Field 18 is missing an external boundary profile.
- Field 20 is missing an external boundary profile.
- Boundaries 64 and 29 are both missing profiles.
- Follow up on the positioning of boundary furniture (this was being addressed by the surveyor)
- Boundary 83 has been used in fields 25 and 26 to represent different boundaries.
- Boundaries 76 (field 24), 82 (field 25) and 85 (field 26) are missing historical management information.
- Boundary 86 (field 26) has been ticked twice for historic management.
- Boundary 82 (field 25) is missing current management information.
- Boundaries 85 and 86 (both field 25) and 89 (field 27) are missing boundary biodiversity information.
- Earthwork profile on boundary 79 (field 24) is missing width information for the bank.

In all of above instances where there is missing information the catch all negative coded value has been used and can changed to the necessary value should the information be made available.

5. Recommendations

One of the ways in which I feel the GIS could be improved is through the differentiation between archaeological point features and linear archaeological features. Currently linear features such as lynchets and ridge and furrow assemblages are represented by a single point meaning that the scale, orientation and the number of features is lost. However if represented using line poly-lines the archaeological features could be displayed in a more representative manner - figures 7 and 8. If the

differentiation was adopted accurate field surveyors notes and LiDAR data will be essential for accurately displaying the features.

An additional recommendation is to include hyperlinks to the maps that were drawn on by Nikki and these contain a large amount of data that isn't included within the forms, and therefore the GIS, such as comments and detailed indications of where archaeological features are located.

My final recommendation is in relation to the data collections forms. Currently, all of the columns are all the same colour. I feel it would be beneficial to shade alternating columns in a pale colour to make reading the data notably easier during the data entry process.

Figure 7: A lynchet displayed as (A) point data and (B) as line data.

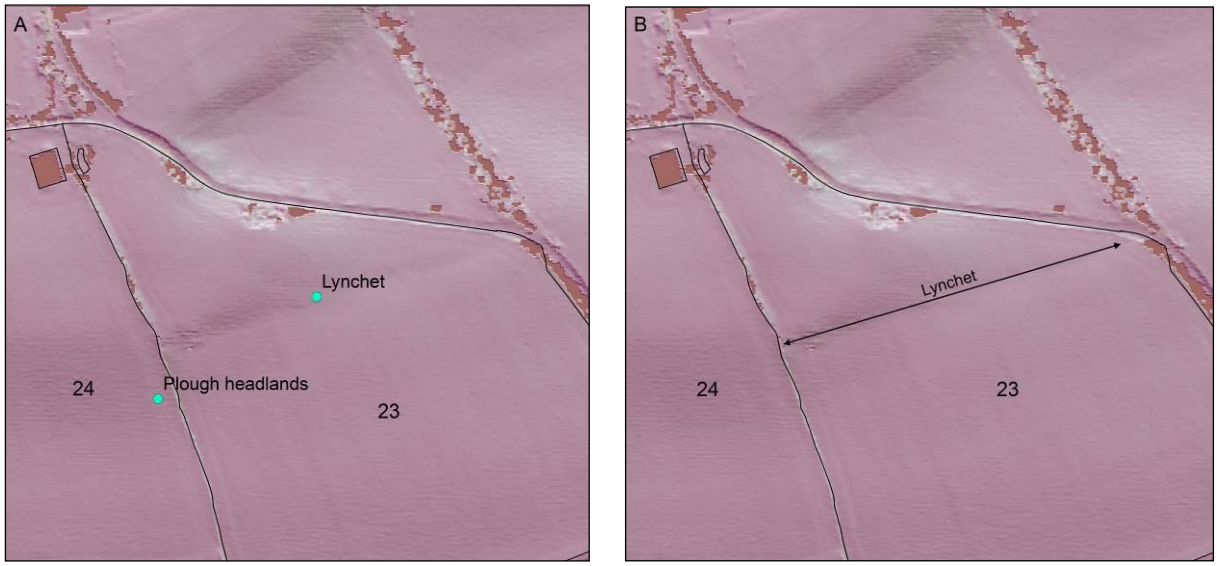
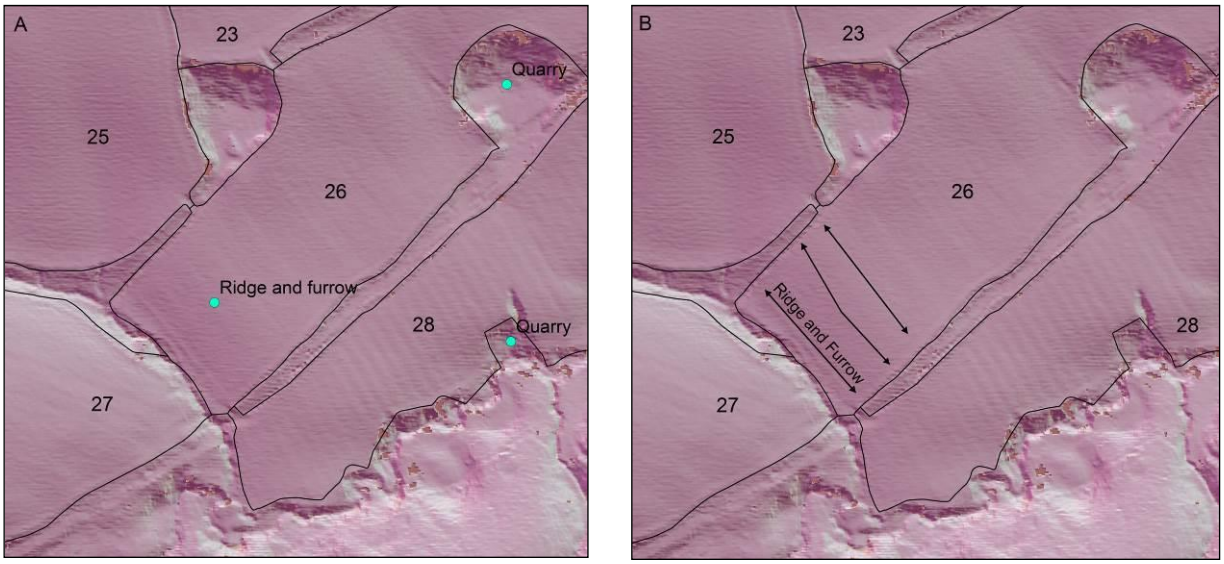


Figure 8: A series of ridge and furrows displayed as (A) point data and (B) as line data.



6. Concluding Remarks

Two main elements became apparent by the end of this project. The first of which being the absolute need to test this GIS based approach of storing and representing field data. This must initially be done on a small enough site that this test run can be completed in a short amount of time whilst also being big enough that any unforeseen issues can be addressed and dealt with. Once this has been done and any issues addressed to GIS based approach can be extended across a larger error however the capacity to incorporate any necessary changes must be maintained.

The second element to become apparent is the need to use this data in conjunction with other external data sets such as aerial photography, historical land classification information or LiDAR. This is because in isolation this data, whilst potentially very useful, lacks the wider context that will make it truly valuable to the Fieldscapes project.

Appendix E:

Intern report – Tessa de Ruyter

March 2016

1. Introduction

During my 10-week internship at the High Weald AONB Unit I was part of the Field Systems in the High Weald project team and I was given the opportunity to apply and extent my landscape historian research skills as well as getting to know the day-to-day work the Unit's doing.

'The Field Systems in the High Weald project has been developed in response to the step change in agriculture and the increased pressure this together with new development is having on historic field systems and the local fieldscape character of the High Weald.' (Field Systems in the High Weald Project Design V7, 2015). The pilot aims at producing a High Weald Field Systems Character Statement – 'Understanding Field Systems' – and High Weald Field Systems Assessment Framework – 'How to assess the significance of field systems'. The eventual aim is to produce a Weald 'toolkit' to support the understanding and the conservation of field systems, which is also applicable to other National Character Areas. Altogether this is part of a wider programme which aim is to improve understanding the history and landscape context of field systems in the High Weald in general as well as to enhancing information development.

The project aims are:

1. To better understand the history and landscape context of field systems resource in the High Weald.
2. To inform protection of the distinctive landscape character of the High Weald through identifying the historic character, significance and sensitivity to change, of its field systems – and understanding their relationships with other components in the historic environment in the Weald.
3. To work collaboratively with local authorities, and others, to demonstrate how this understanding can be applied to assist decision-making by planners and land managers, and deepened where appropriate.

My objectives during my internship were:

1. To test the existing field survey and characterisation methodology as developed by Nicola Bannister and to make amendments and recommendations for improving this methodology.
2. To investigate what the differences in applicability of this method are between a field survey and a desk-based approach and what difficulties this method brings.
3. To develop a cost effective method of survey and characterisation of field systems utilising existing information – HLC, HER, LiDAR, historic maps, aerial photos, woodland, meadow and habitat data, etc. – that is replicable elsewhere in England, including specific techniques that

will help deepen understanding of the heritage value of boundaries and the fields themselves.

In order to find out whether the historic field survey method is suitable for non-experts, a three day field survey at Scotney Castle Estate (Little Scotney Farm) was undertaken on 12th, 13th and 14th of October. A week later a desk-based study was used for Earlye farm. The purpose was to note down any difficulties that were met during both surveys as well as to see if there are any differences between the data collection based on field survey or based on a desk approach. This document describes some general issues which concern the field systems project aims and the data recording. Subsequently, any shortcomings and obscurities of the survey form and de GIS data entry in the field systems geodatabase are discussed. This paper also aims to suggest how to reorder the survey forms and the geodatabase as well as how to improve the survey method in such a way that it can be used by non-experts.

2. Issues and uncertainties

General issues

As the Project Design paper explains (version 7), 3 to 5 case studies were selected for undertaking either field surveys or desk-based ones. Eventually these two groups are examined and compared to assess the outcomes of the identification of significant field systems characteristics. The question is how comparison between two different case study areas is possible if these sites are surveyed in a different way (either desk-based, field survey or footpath field survey) and if these sites have different characteristics? How is data comparison possible when not all data is collected or entered into the geodatabase properly? On what information and criteria do we base our decisions regarding the field systems character statement and assessment framework?

Issues involving data recording

Some questions involving data collection arose either during field survey or desk-based study, which should be clarified. Firstly, it is unclear what the relevance is of all different features to be recorded. This is an important issue since the setup of a field system character statement and assessment framework requires a consistent set of criteria. This set of criteria should be defined in such a way that it tells us something about the selection of key features and characteristics regarding field systems.

Secondly, the field systems characteristics to be recorded cannot always be recorded properly from a desk-based study, which causes a more or less incomplete data collection. For instance, from a desk-based study there is no possible way to record data on ecological features. As a consequence, these features cannot be taken into account in the assessment of the field key characteristics and the importance of them.

Some problems were faced regarding the use of different map types. The mastermap was used by Fred to draw the field polygons in GIS. However this map does not always appear to be consistent and does not always correspond with boundaries as indicated on aerial images or the Ordnance Survey map. This should be taken into account when drawing the field polygons either from mastermap or by hand.

3. Survey form

Field attributes

The first problem that was met during the surveys is how to treat and to record different fields and their corresponding boundaries as well as their attributes. Questions involve: should private farmsteads or yards also be surveyed (which are probably not accessible during field survey)?

Size – visual and numerical

It is unclear what the relevance of the option 'visual size' is. First of all this option is based on visual perception rather than numerical values. Second, there should be a dataset (for example mastermap) which provides information on actual field size. However, it should be questioned how accurate and up to date this dataset is, as I encountered several situations where the field size of mastermap did not coincide with the field size that was indicated on aerial photographs or the Ordnance Survey map. We should find out what the difference is between using mastermap and drawing individual field polygons to calculate the field size.

Field shape

A non-expert would probably not know how to judge what field has what shape. The essence of information on field shape should therefore be clarified. Clear examples and illustrations of different field shapes should be included with the form.

Orientation, rationalisation, hydrology

The options 'hanging from' as well as rationalisation and hydrology should be specified. On what maps is boundary loss/gain based? Should you include more options with hydrology (ponds, springs, etc.)? What is meant by hydrology anyway? These uncertainties should be specified by means of an explanatory guide which comes with the form.

Boundary attributes

First of all it should be clear how to define boundaries. Should one boundary between two fields be recorded separately for both fields? Should every boundary be treated as a separate one?

Boundary type

Another problem encountered is how you should treat a boundary, which consists of multiple attributes (for example a hedge and a fence). How to decide whether you should record a fence or a hedge which is behind this fence? Boundary types can be distinguished from maps, but presumed knowledge is required (e.g. on definitions like shaws and hedges). It is not clear what the exact difference is between a hedge, hedge with trees, wooded hedge, woodland edge, shaws, etc. These definitions should be clarified and illustrated in a guide.

Boundary function and relation to other boundaries

It is unclear if boundary function concerns present or historic function. Therefore it is also unclear how boundary relics, which don't function as boundaries anymore, should be recorded. Boundaries could serve multiple functions, e.g. a river could both have a parish boundary function and an agrarian function. More options should be available. It is recommended to add 'and'-options like

agrarian AND parish, as a boundary can serve multiple functions. Should relationships with other field boundaries be included?

Vegetation
It is debatable how important these attributes are. Nikki's GIS specification mentions that the field systems project is not about providing a detailed hedgerow survey (p. 17). Rather it is about 'noting the variety of the woody shrub component together with its ecological diversity'. Furthermore it says that this project does not include botanical survey of hedges. The main objective would be to do an observation on whether a hedge is species rich or poor. It would be worthwhile to include more species options, like 'coppice with standards', riverine or wetland species, to avoid the recording of inconsistent data. Furthermore it is unclear what is considered as historic and modern management.

Boundary furniture
When looking at the fieldscapes GIS dataset it becomes clear that boundary furniture should be indicated either by point or line features. However, the form does not mention furniture location, whereas this is important for the final data entry. Therefore it should be clearly mentioned on the form or in the guide that the exact location of boundary furniture should be indicated on a survey map. Furthermore, more different options explaining furniture type should be added to the form, for example: bridge, culvert, and fence. The GIS boundary furniture attribute table contains a field called 'location from map/form'. It is unclear what is meant by this.

Earthwork attributes and archaeology attributes
It is important that Earthwork attributes are recorded carefully as they can represent former field boundaries. The form only mentions bank (bank could be asymmetrical, symmetrical or lynchet, why these three options?) or ditch. What about clay pits or ancient river courses? What's the difference between earthwork and archaeological data? It should be noted that earthwork and archaeological features can also be situated within fields rather than at the field boundaries. Further questions involve how to record lynchets, or in-field archaeological features on the form. Explanation on 'silted' would also be useful.

4. GIS geodatabase

The different attribute tables of the 'fieldscapes' geodatabase contain a lot of fields that are not completely filled in or don't contain data at all and thus seem to be redundant. The question rises if these fields are relevant to the data collection and question the design of the attribute tables. All shortcomings are displayed in table 1.

Table 1 Imperfections or shortcomings that concern the fieldscapes geodatabase feature classes.

Attribute table	Imperfections/shortcomings	Adjustments
Field attributes	Structure is disorganised, which makes data entry more complicated and inefficient.	Reorder structure in same way as recording

		forms
Boundary attributes	Structure is disorganised, which makes data entry more complicated and inefficient.	Reorder structure in same way as recording forms. Cut out: function other, morphology other, notes, photo refs, adjacent secondary boundary, relation to adjacent secondary boundary
Boundary furniture	What's the purpose of the fields 'location' and 'map or form'?	Delete fields: notes, photo refs, type other.
Earthwork attributes	What does silted mean? Why is a lynchet recorded separately in the archaeology attribute table and why is it part of a bank in the earthwork attribute table?	Delete fields: FID earthwork attributes, polygon number, earthwork number, number of earthworks, size, lynchet, photo refs, and notes.
Archaeological linear features	Entire table is irrelevant; data are recorded in archaeological attributes. Table is contradictory to the other archaeological attribute table.	Delete entire table?
Archaeological attributes	Table also contains data on lynchets and ridge and furrow. Point features are used to record linear features, but point data do not cover the entire scope of some linear features like lynchets. Is this table supposed to contain the heritage data only or also field based survey data? Why are the position in field and the heritage number relevant?	Maybe separate archaeological linear and point features? It's easier however, to have all archaeological features in one attribute table.
Ecological surveys	?	?

5. Scotney field survey

In order to find out whether the historic field survey method is suitable for non-experts, a three day field survey at Scotney was undertaken on 12th, 13th and 14th of October. Nineteen fields were

recorded at Little Scotney Farm. Before undertaking the actual field survey, the forms on the Scotney case study were filled in as much as possible to find out how much of the forms could be completed from desk study.

During the field survey at Scotney I definitely had some trouble filling in the form. It took me a lot of time to understand form's working in the first place. Using the form during field survey was impractical and it took a lot of effort and time to fill it in. That is why, in my opinion, the forms definitely should be simplified and explained.

I noticed that a considerable amount of data could have been filled in beforehand from desk, which I did the next day and this saved me a lot of time. It turned out that some features or attributes even require map observation rather than field observation to record them (for example field and boundary shape, geology and soil, rationalisation). I also tried to compare the data I filled in in advance to the data I collected in-field and found that undertaking a desk-survey beforehand resulted in comparable results as compared to a field survey. This would make the desk-based study remarkably reliable and it could also save you a lot of time. Undertaking a field survey is time consuming, especially when you're not experienced in field surveying. Because of the complexity of the current form, there is a risk not all data would be recorded in a proper way. The recording of several features, like boundary type, historic and modern management and earthwork requires an experienced eye. Presumed knowledge is definitely required to be able to record these kinds of features. Further problems concerning the form and the GIS data entry were already described in sections 3 and 4. Table 2 illustrates what features can be filled in from desk-based study and what maps would be suitable or recommended for this. It also shows what features can be recorded from an actual field survey only.

6. Earlye desk survey

The next step was thus to conduct a desk-based survey for Earlye and see what parts of the forms could be completed and what parts could not. The results are summarised in table 2.

Survey forms

The first page of the form could be filled in relatively easy by means of the modern Ordnance Survey map (OS 10K), aerial photography, geology and soil map, the HLC map and the Ordnance Survey Epochs (OSEs). Due to a lack of data, no information on area, archaeology and field names was available. Again, the problem of how to record fields and boundaries became apparent. Fields should be treated in a consistent way. How would you record boundary relics, which are not currently functioning anymore?

The boundary characteristics could predominantly be identified by using the OS 10K map, Lidar images and aerial imagery. Boundary morphology could easily be derived from the maps. However, from map observation it was not clear how certain boundaries overlap or how they are cut by ditches. From desk-based study it appeared to be impossible to define historic and modern management, as well as species and biodiversity value (see table 2).

Another problem encountered was how to identify archaeological features such as banks, ditches, lynchets, quarries, (sunken) tracks/trails etc. based on Lidar images and aerial photographs. The ideal solution would be having clearly illustrated examples on how to recognize these features from different map types. Another issue is how to determine ditch depth or bank height and width from a Lidar images.

Map use

In some occasions information derived from the OS 10K map is contradictory to aerial photographs. For instance, boundaries indicated on aerial images do not always coincide with boundaries indicated on the OS map or in-field (which was the case at Scotney Farm). Only field survey can rule out any uncertainties.

GIS data entry

De desk-based survey data could only be entered in the field attribute table, earthwork attribute table and boundary attribute table. No archaeological features were recorded, because they couldn't be observed from a desk-based study. I assume a non-expert would face the same problem. From the desk study it became clear that boundary furniture (stiles, stock watering) are difficult to locate due to their relatively small size, insignificant representation in aerial photography or due to being obscured by thick tree coverage along the boundaries. There is no reliable way to record these data. It was not possible to collect data on ecological features from aerial photography.

Table 2 Data recording possibilities for desk or field survey.

Desk / field survey	Attributes	Required and recommended maps
Features which can be recorded from desk study	Field shape	Aerials OS 10K Mastermap
	Size	
	Orientation	
	Physical characteristics	Soil map Geology Lidar + contour map
	Historic field names	Tithe, other available sources
	Archaeology	County heritage data
	HLC type	County HLC data
	Rationalisation	Aerials modern + historic OS 10K, OSE, OSD Tithe Estate maps (if available)
	Boundary type	Aerials OS 10K Lidar
	Boundary function	Aerials
	Morphology	Aerials OS 10K Lidar + contour Map
	Boundary orientation	OS 10K, aerials, any modern map
	Relationship adjacent boundaries	OS 10K, aerials, Lidar

	Slope	Lidar + contour map
	Boundary furniture	Aerials
Features which require field survey	Historic management	NA
	Modern management	NA
	Species	NA
	Biodiversity	NA
	Earthwork dimensions	NA
	Boundary furniture	NA

7. Expert vs. non-expert survey

Above discussed issues illustrate how much difficulties could be experienced by non-experts undertaking a field survey or desk-based survey. Experts, like archaeologists, ecologists, landscape historians, etc. would be able to recognize features in-field as well as from desk much easier because they are well trained and experienced. Non-experts however, e.g. planners, probably will encounter problems in observing and recording field characteristics because they probably don't know exactly what they are looking at. Non-experts probably do not possess the right knowledge to be able to understand, recognize, observe and record field patterns and characteristics in the way that experts would do.

The current field survey method and forms are hard to understand and to use for a non-expert. This is due to several reasons. For non-experts, archaeological features are not easily recognizable in-field. As a consequence there could be a data gap or data collection which is unreliable for assessment methods.

It should be taken into account that certain definitions on the form are likely to be unknown to a non-expert. There is also a difference between a field and a desk-based survey. A desk based study would be even more problematic, because the point of view is literally different in this situation than in-field observation. This makes it even harder to recognize for example different boundary types. Even if certain characteristics are visible from Lidar or aerial images, a non-expert might not recognize these characteristics as such, whereas an expert would recognize these characteristics and would be able to record them. These characteristics include for example ditches and banks, lynchets, quarries, certain hedge types, shaws, etc. To avoid these problems we need to make sure that the form is designed in such a way that incomplete data collection is limited as much as possible.

This brings us to the following possible situations:

4. Field and boundary characteristics that can be observed from maps and images and are recognizable by both experts and non-experts.
5. Field and boundary characteristics that can be observed from maps and images, which are recognizable by experts, but which are not recognizable by non-experts.
6. Field and boundary characteristics that cannot be observed from maps and images and which require field survey to identify them.

8. Recommendations

Based on above mentioned issues the following recommendations are essential for a clear understanding of the forms and survey in general.

Survey guide: 'Tool book'

First, the survey forms should come with a clear instruction guide on how to fill in the forms. This guide should contain some consistent principles of the survey methodology and key definitions (gazetteer, see Bannister 2007, pp. 43-55):

- How to record and number different fields and boundaries and how to recognize them?
- What to do when boundaries overlap or if one boundary functions between two fields?
- How to indicate boundaries, earthwork and archaeological features on a map? Use a set of symbols and abbreviations (like a key) which represent these different features.
- How to use different map types and what maps are suitable for what purposes?

Besides, this guide should contain additional information, definitions and examples about how to recognize different boundary types, function, earthwork (banks, ditches), etc. Features like lynchets, banks and ditches should be well-defined. The flowcharts in Nicola's report on the South East AONBs Woodland Programme (Bannister 2007, appendix 2 & 3, pp. 81-86) could certainly be useful. It might be worth to develop similar flowcharts: 'identification of archaeological features in fields/woodland', which help to identify the following features:

- Linear archaeological features like banks, ditches, lynchets, ways, tracks, etc.
- Linear boundary features: hedges, shaws, woodland edges, walls, ditched, balks, etc.
- Mounds, depressions, quarries, ponds
- Water courses

However, the guide should be compact, clear and manageable. Illustrations are desirable rather than text. In addition to the flowcharts, the guide should include illustrations which contain:

- Aerial examples of boundary types: each possible boundary type should be illustrated and explained.
- Lidar examples of boundary types and earthworks and how not to confuse them with e.g. banks, ditches, lynchets, ridge and furrow, etc.
- How to recognize historic and modern management of boundaries: pollards, stubs, coppice, laid hedges, etc.
- How to use the contour map in combination with Lidar for recording slope orientation
- Examples of boundaries indicated on OS maps: OS 10K, OSE, OSD
- Examples of boundaries indicated on Tithe maps and other historic maps
- Any other relevant illustrations which are relevant

NB: We should bear in mind, that the guide should be compact, yet informative.

Survey form

In order to enhance the simplicity of the form we should look for a way to sort out the form and rearrange it in a logical way. Some features could be eliminated once decided whether certain features are essential or unnecessary. Together with an expert we should carefully look for some set of criteria which can help us to decide what features are more important than other ones. The ideal situation would be a digital recording form where every feature has its drop down box or comments box which should contain some information or links to information and illustrations. As a non-expert, I would recommend the following adjustments to the survey form:

Table 3 Proposed adjustments to be made on the survey form

Attributes and features to be excluded	Attributes and features to be kept
General case study descriptions like civil parish, ecclesiastical parish, district, county, case site reference, survey area should be recorded once for the entire case study (if case study site is not spread over multiple parishes!)	Shape
Field orientation: N-W-S-E	Field orientation: hanging from, but specify relevance
Degree of slope	Physical characteristics
Visual shape	Field names
Size numerical: choose either hectares or acres. Cut out historic size.	Rationalisation
Historic archive?	Archaeology
Source?	HLC
Photo refs?	Boundary type
Relationship to other/secondary boundaries	Boundary function
Boundary relationship to slope	Boundary morphology
Orientation of boundary	Historic + current management
Dominant/key species the field systems project is about 'noting the variety of the woody shrub component together with its ecological diversity'. The main objective would be to do an observation on whether a hedge is species rich or poor. (section 3: vegetation)	Biodiversity value
Cross ref with meadow survey: No idea what is meant by this.	Earthwork, but specify, add also 'boundary relics', both in-field and at boundary
	Boundary furniture

Fieldscapes geodatabase

As a non-expert, I would recommend the adjustments to the attribute tables of the fieldscapes geodatabase as indicated in table 1 (section 4) in order to make data entry more efficient.

Data availability

Additional data such as landownership, land use, field area, HLC, field names must be available and accessible in an easy way. An up to date version of aerials is also required for reliable data collection.

Therefore the aerial photographs should be compared with Google Earth images to see if there's a difference. Archaeological features require an updated archaeological database or map which shows both position in-field and name/explanation of feature.

Appendix F:

Grassland survey forms – Kate Ryland

Survey Area: Earlye Farm Target note 1

Site Ref (central point or each end of linear site): TQ 59491 33140

Recorder: KR

Follow up needed? Yes (No)

Date: 3/7/15

Site description (circle)	(Enclosed field)	Unenclosed area	Road verge	Boundary bank	Other (specify)

Comments: Pasture field in pilot farm

Trees and/or shrubs present in sward? (circle)	Yes	(No)	**Approximate cover of woody species**	0-10%	11-25%	26-50%	51-75%	75%+

Comments (age, species, source of woody species etc.)

Sward characteristics (% of area)	100 % (Short <15cm)	Tall >15cm	Tussocky	Herb-rich areas 90 %	<10% Bare ground	Litter layer	Grass dominated	100 % (Fine grasses)	Other

Comments (depth of litter, amount of bare ground, other features of interest etc.)
A herb-rich, flowery sward with a high proportion of legumes and fine grasses. Oversown with white clover but still species-rich. Creeping thistle locally abundant

Physical features (circle)	Anthills	Ridges	(Wet flush)	Pond	Stream	(Steep slope)	(Dips or hollows)	Other e.g. rock outcrops

Comments (aspect of slope, extent/size of wet features, presence of deadwood etc.)
South-facing slope. Small areas of bare ground around a central slump / hollow. Occasional flushes with rush + lesser spearwort – springlines – in centre + east

NVC grassland community types present (circle)	(MG (neutral grassland))	M (marshy grassland)	U (acid grassland)	CG (chalk grassland)

Comments (details of NVC communities, proportion of different types etc.)
MG5/6 Transition. Crested dogstail / common knapweed herb-rich sward without any of the less common species noted. Oversown with rye grass + white clover

Adjoining habitats and features (circle)	(Woodland)	(Scrub)	(River/ stream)	Open water	Wetland	Grassland	Arable	Unsurfaced track	Urban	Road

Comments (impact of adjoining features, good quality arable margins, presence of footpaths etc)
ASNW gill to south. Outgrown shaw / routeway to north, damaged by cattle access (see below) Managed hedge to east. FP at east end. Steep ditch and asnw to west.

Management (circle)	(Grazed)	Mown	Unmanaged	Other (specify)

Comments (type of livestock, hay crop taken, silage cut etc.)
Cattle

Condition (circle)	(Favourable)	Unfavourable	Neglected	Other

Comments (details)
Well managed by a sympathetic landowner

Historic boundary features (circle)	(Bank)	(Ditch)	Track	Pollards, stubs, large coppice stools	(Shaw)	Notable hedgerow	Notable Trees	Other

Comments (species, size, proximity to other features)
Northern boundary is mixed shaw incl. much hornbeam + ash. Contains complicated bank/ditch system at eastern end. Old fences present. Oak, holly, hazel also present

Garlyn Farm ①

Positive Indicator Species		DAFOF
Achillea ptarmica	Sneezewort	
Agrimonia eupatoria	Agrimony	
Alchemilla spp	Lady's mantle spp	
Anacamptis morio	Green-winged orchid	
Anenome nemorosa	Wood anemone	
Betonica officinalis	Betony	
Briza media	Quaking grass	
Calluna vulgaris	Ling	
Campanula rotundifolia	Harebell	
Carex flacca	Glaucous sedge	
Carex leporine	Oval sedge	
Carex nigra	Common sedge	
Carex panicea	Carnation sedge	
Centaurea nigra	Common knapweed	F
Cirsium dissectum	Meadow thistle	
Conopodium majus	Pignut	
Dactylorhiza spp.	Spotted/marsh orchid spp.	
Danthonia decumbens	Heath grass	
Erica spp.	Heather spp.	
Euphrasia spp	Eyebright spp.	
Filipendula ulmaria	Meadowsweet	
Filipendula vulgaris	Dropwort	
Galium saxatile	Heath bedstraw	
Galium verum	Lady's bedstraw	
Genista tinctoria	Dyer's greenweed	
Glechoma hederacea	Ground-ivy	
Hyacinthoides non-scripta	Bluebell	
Lathyrus linifolius	Bitter-vetch	
Lathyrus pratensis	Meadow vetchling	
Leontodon saxatilis	Lesser hawkbit	
Leontodon hispidus	Rough hawkbit	F
Leucanthemum vulgare	Ox-eye daisy	O
Linum catharticum	Fairy flax	
Lotus spp.	Birds-foot-trefoil spp.	A
Luzula spp.	Wood-rush spp.	
Melampyrum pratense	Common cow-wheat	
Oenanthe pimpinelloides	Corky-fruited waterdropwort	
Oenanthe silaifolia	Narrow-leaved waterdropwort	
Ophioglossum vulgatum	Adders-tongue	
Pedicularis sylvatica	Common lousewort	
Pilosella officinarum	Mouse-ear hawkweed	
Pimpinella saxifraga	Burnet-saxifrage	
Polygala spp	Milkwort spp.	
Potentilla erecta	Tormentil	
Poterium sanguisorba	Salad burnet	
Primula veris	Cowslip	
Pulicaria dysenterica	Fleabane	
Rhinanthus minor	Yellow rattle	
Rumex acetosella	Sheep's sorrel	
Serratula tinctoria	Saw-wort	
Silaum silaus	Pepper-saxifrage	
Silene flos-cuculi	Ragged robin	
Succisa pratensis	Devils-bit scabious	
Tragopogon pratensis	Goats-beard	
Trifolium pratense	Red clover	A
Vaccinium myrtillus	Bilberry	
Veronica officinalis	Heath speedwell	
Viola spp	Violet spp.	

Negative Indicator Species		DAFOR
Anthriscus sylvestris	Cow parsley	
Arrhenatherum elatius	False oat-grass	
Cirsium arvense	Creeping thistle	LF
Cirsium vulgare	Spear thistle	
Galium aparine	Common cleavers	
Heracleum sphondylium	Hogweed	
Helminthotheca echioides	Bristly ox-tongue	
Plantago major	Greater plantain	
Rumex crispus	Curled dock	R
Rumex obtusifolius	Broad-leaved dock	
Pteridium aquilinum	Bracken	
Senecio jacobaea	Common ragwort	R
Urtica dioica	Nettle	

Other notable species (flora and/or fauna)		
Cynosurus cristatus	(Crested) dogstail	A
Trifolium repens	White clover	A
Prunella vulgaris	Selfheal	F
Cirsium palustre	Marsh thistle	LF

Survey Area: Earlys Farm Target note 2				Site Ref (central point or each end of linear site): TQ 59176 53096				
Recorder: ICR		Follow up needed? Yes (No)		Date: 3/7/15				
Site description (circle)	(Enclosed field)	Unenclosed area	Road verge	Boundary bank	Other (specify)			
Comments: Pasture field in pilot farm								
Trees and/or shrubs present in sward? (circle)	Yes	(No)	**Approximate cover of woody species**	(0-10%)	11-25%	26-50%	51-75%	75%+
Comments (age, species, source of woody species etc.): A very few woody seedlings present near the northern edge – these will soon be grazed out								

Sward characteristics (% of area)	Short <15cm (70%)	Tall >15cm (30%)	Tussocky	Herb-rich areas (90 %)	Bare ground (<10 %)	Litter layer	Grass dominated	Fine grasses (80%)	Other

Comments (depth of litter, amount of bare ground, other features of interest etc.): Light cattle grazing. Some stands of creeping + marsh thistle. Varied sward height

Physical features (circle)	Anthills	Ridges	(Wet flush)	Pond	Stream	Steep slope	Dips or hollows	Other e.g rock outcrops

Comments (aspect of slope, extent/size of wet features, presence of deadwood etc.): Small flushes marked by areas of rush and marsh thistle

NVC grassland community types present (circle)	(MG (neutral grassland))	M (marshy grassland)	U (acid grassland)	CG (chalk grassland)

Comments (details of NVC communities, proportion of different types etc.): MG5/6 transition. A very herb-rich semi-improved sward with a high cover of legumes especially red clover, white clover + birdsfoot trefoil. Excellent field for pollinators

Adjoining habitats and features (circle)	(Woodland)	Scrub	River/ stream	Open water	Wetland	(Grassland)	Arable	Unsurfaced track	Urban	Road

Comments (impact of adjoining features, good quality arable margins, presence of footpaths etc.): Mixed wood ASNW to SW and ASNW gill to SE. Grassland areas to north and west, separated by hedges.

Management (circle)	(Grazed)	Mown	Unmanaged	Other (specify)

Comments (type of livestock, hay crop taken, silage cut etc.): Cattle grazed

Condition (circle)	(Favourable)	Unfavourable	Neglected	Other

Comments (details): Creeping thistle controlled by topping

Historic boundary features (circle)	Bank	Ditch	Track	Pollards, stubs, large coppice stools	Shaw	(Notable hedgerow)	Notable Trees	Other

Comments (species, size, proximity to other features): Managed hedgerow on south west on western side of field. To north is recently managed area of wooded stream/ ditch and copse.

Earlye Farm 2

Positive Indicator Species		DAFOF	Negative Indicator Species		DAFOR	
Achillea ptarmica	Sneezewort		Anthriscus sylvestris	Cow parsley		
Agrimonia eupatoria	Agrimony		Arrhenatherum elatius	False oat-grass		
Alchemilla spp	Lady's mantle spp		Cirsium arvense	Creeping thistle	LLA	
Anacamptis morio	Green-winged orchid		Cirsium vulgare	Spear thistle		
Anenome nemorosa	Wood anemone		Galium aparine	Common cleavers		
Betonica officinalis	Betony		Heracleum sphondylium	Hogweed		
Briza media	Quaking grass		Helminthotheca echioides	Bristly ox-tongue		
Calluna vulgaris	Ling		Plantago major	Greater plantain		
Campanula rotundifolia	Harebell		Rumex crispus	Curled dock		
Carex flacca	Glaucous sedge		Rumex obtusifolius	Broad-leaved dock		
Carex leporine	Oval sedge	LF	Pteridium aquilinum	Bracken		
Carex nigra	Common sedge		Senecio jacobaea	Common ragwort		
Carex panicea	Carnation sedge		Urtica dioica	Nettle		
Centaurea nigra	Common knapweed					
Cirsium dissectum	Meadow thistle					
Conopodium majus	Pignut					
Dactylorhiza spp.	Spotted/marsh orchid spp.					
Danthonia decumbens	Heath grass					
Erica spp.	Heather spp.					
Euphrasia spp	Eyebright spp.					
Filipendula ulmaria	Meadowsweet		Other notable species (flora and/or fauna)			
Filipendula vulgaris	Dropwort					
Galium saxatile	Heath bedstraw					
Galium verum	Lady's bedstraw		Cirsium palustre	Marsh thistle	F	
Genista tinctoria	Dyer's greenweed		Cynosurus cristatus	Crested dogstail	A	
Glechoma hederacea	Ground-ivy		Juncus spp.	Rushes	O	
Hyacinthoides non-scripta	Bluebell		[illegible]			
Lathyrus linifolius	Bitter-vetch		Prunella vulgaris	Selfheal	F	
Lathyrus pratensis	Meadow vetchling		Ranunculus bulbosus	Meadow buttercup	F	
Leontodon saxatilis	Lesser hawkbit		Trifolium repens	White clover	A	
Leontodon hispidus	Rough hawkbit		Festuca rubra	Red fescue	A	
Leucanthemum vulgare	Ox-eye daisy					
Linum catharticum	Fairy flax		Cirsium [illegible]			
Lotus spp.	Birds-foot-trefoil spp.	A	Buzzard			
Luzula spp.	Wood-rush spp.	O	Meadow brown			
Melampyrum pratense	Common cow-wheat					
Oenanthe pimpinelloides	Corky-fruited waterdropwort					
Oenanthe silaifolia	Narrow-leaved waterdropwort					
Ophioglossum vulgatum	Adders-tongue	Reported				
Pedicularis sylvatica	Common lousewort					
Pilosella officinarum	Mouse-ear hawkweed					
Pimpinella saxifraga	Burnet-saxifrage					
Polygala spp	Milkwort spp.					
Potentilla erecta	Tormentil					
Poterium sanguisorba	Salad burnet					
Primula veris	Cowslip					
Pulicaria dysenterica	Fleabane	O				
Rhinanthus minor	Yellow rattle					
Rumex acetosella	Sheep's sorrel					
Serratula tinctoria	Saw-wort					
Silaum silaus	Pepper-saxifrage					
Silene flos-cuculi	Ragged robin					
Succisa pratensis	Devils-bit scabious					
Tragopogon pratensis	Goats-beard	O				
Trifolium pratense	Red clover	A				
Vaccinium myrtillus	Bilberry					
Veronica officinalis	Heath speedwell					
Viola spp	Violet spp.					

Survey Area: Earlys Farm Target note 3				Site Ref (central point or each end of linear site): TQ 59426 33225					
Recorder: KR			Follow up needed? Yes / (No)				Date: 3/7/15		
Site description (circle)	(Enclosed field)	Unenclosed area	Road verge	Boundary bank	Other (specify)				
Comments: Pasture field in pilot farm. North of target note 1 field another side of shaw. Gentle slopes in SE but otherwise more or less level									
Trees and/or shrubs present in sward? (circle)	Yes	(No)	**Approximate cover of woody species**	(0-10%)	11-25%	26-50%	51-75%	75%+	
Comments (age, species, source of woody species etc.)									
Sward characteristics (% of area)	(Short <15cm) 90%	Tall >15cm	Tussocky	Herb-rich areas 60%+	(Bare ground) <10%	Litter layer	Grass dominated	(Fine grasses) 80%	Other
Comments (depth of litter, amount of bare ground, other features of interest etc.) Equivalent to fields 1+2 which are adjoining. Species-rich semi-improved sward, rich in legumes with red clover [illegible], common sorrel, yarrow etc. but other areas have white clover & perennial rye-grass prominant. Most diverse areas of sward in east. Signs of over-seeding in past.									
Physical features (circle)	Anthills	(Ridges)	(Wet flush)	Pond	Stream	(Steep slope towards)	Dips or hollows	Other e.g rock outcrops	
Comments (aspect of slope, extent/size of wet features, presence of deadwood etc.) South facing slope with uneven ground and faint ridges visible especially in east. Occasional flushes with rush and lesser spearwort near the pond.									
NVC grassland community types present (circle)	(MG (neutral grassland))	M (marshy grassland)	U (acid grassland)	CG (chalk grassland)					
Comments (details of NVC communities, proportion of different types etc.) MG5/6 transition. High cover of legumes and species-rich pockets but also areas of less botanical interest. Useful habitat for pollinators									
Adjoining habitats and features (circle)	(Woodland)	Scrub	River/ stream	Open water	(Wetland)	(Grassland)	Arable	Unsurfaced track	Urban	Road
Comments (impact of adjoining features, good quality arable margins, presence of footpaths etc) W+S boundaries are recently coppiced and fenced hedge/shaw/ditch. Large pit and pond (almost dry) on N edge. Large wooded pit + shaw on S edge. Hedge at eastern end.									
Management (circle)	(Grazed)	Mown	Unmanaged	Other (specify)					
Comments (type of livestock, hay crop taken, silage cut etc.) Cattle and sheep									
Condition (circle)	(Favourable)	Unfavourable	Neglected	Other					
Comments (details)									
Historic boundary features (circle)	(Bank)	(Ditch)	Track	Pollards, stubs, large coppice stools	(Shaw)	Notable hedgerow	Notable Trees	Other	
Comments (species, size, proximity to other features) Shaw on S side less many features of interest. Prominent bank + ditch on N edge of shaw within field. N edge of field has v. large bank and shaw with hazel, ash coppice and oaks									

Earlye Farm 3

Positive Indicator Species		DAFOF
Achillea ptarmica	Sneezewort	
Agrimonia eupatoria	Agrimony	
Alchemilla spp	Lady's mantle spp	
Anacamptis morio	Green-winged orchid	
Anenome nemorosa	Wood anemone	
Betonica officinalis	Betony	
Briza media	Quaking grass	
Calluna vulgaris	Ling	
Campanula rotundifolia	Harebell	
Carex flacca	Glaucous sedge	
Carex leporine	Oval sedge	R
Carex nigra	Common sedge	
Carex panicea	Carnation sedge	
Centaurea nigra	Common knapweed	O
Cirsium dissectum	Meadow thistle	
Conopodium majus	Pignut	
Dactylorhiza spp.	Spotted/marsh orchid spp.	
Danthonia decumbens	Heath grass	
Erica spp.	Heather spp.	
Euphrasia spp	Eyebright spp.	
Filipendula ulmaria	Meadowsweet	
Filipendula vulgaris	Dropwort	
Galium saxatile	Heath bedstraw	
Galium verum	Lady's bedstraw	
Genista tinctoria	Dyer's greenweed	
Glechoma hederacea	Ground-ivy	
Hyacinthoides non-scripta	Bluebell	
Lathyrus linifolius	Bitter-vetch	
Lathyrus pratensis	Meadow vetchling	
Leontodon saxatilis	Lesser hawkbit	
Leontodon hispidus	Rough hawkbit	
Leucanthemum vulgare	Ox-eye daisy	
Linum catharticum	Fairy flax	
Lotus spp.	Birds-foot-trefoil spp.	FLA
Luzula spp.	Wood-rush spp.	
Melampyrum pratense	Common cow-wheat	
Oenanthe pimpinelloides	Corky-fruited waterdropwort	
Oenanthe silaifolia	Narrow-leaved waterdropwort	
Ophioglossum vulgatum	Adders-tongue	
Pedicularis sylvatica	Common lousewort	
Pilosella officinarum	Mouse-ear hawkweed	
Pimpinella saxifraga	Burnet-saxifrage	
Polygala spp	Milkwort spp.	
Potentilla erecta	Tormentil	
Poterium sanguisorba	Salad burnet	
Primula veris	Cowslip	
Pulicaria dysenterica	Fleabane	O
Rhinanthus minor	Yellow rattle	
Rumex acetosella	Sheep's sorrel	
Serratula tinctoria	Saw-wort	
Silaum silaus	Pepper-saxifrage	
Silene flos-cuculi	Ragged robin	
Succisa pratensis	Devils-bit scabious	
Tragopogon pratensis	Goats-beard	
Trifolium pratense	Red clover	A
Vaccinium myrtillus	Bilberry	
Veronica officinalis	Heath speedwell	
Viola spp	Violet spp.	

Negative Indicator Species		DAFOR
Anthriscus sylvestris	Cow parsley	
Arrhenatherum elatius	False oat-grass	
Cirsium arvense	Creeping thistle	OLF
Cirsium vulgare	Spear thistle	
Galium aparine	Common cleavers	
Heracleum sphondylium	Hogweed	
Helminthotheca echioides	Bristly ox-tongue	
Plantago major	Greater plantain	
Rumex crispus	Curled dock	O
Rumex obtusifolius	Broad-leaved dock	
Pteridium aquilinum	Bracken	
Senecio jacobaea	Common ragwort	
Urtica dioica	Nettle	

Other notable species (flora and/or fauna)		
Cirsium palustre	Marsh thistle	O
Lolium perenne	Perennial ryegrass	A
Trifolium repens	White clover	A
Cynosurus cristatus	Crested dogstail	A
Plantago lanceolata	Ribwort plantain	F
Ranunculus spp.	Buttercup spp.	FLA
Meadow brown		
Ringlet		
Small Heath		
Meadow grasshopper		

Survey Area: Earlye Farm Target note 6	Site Ref (central point or each end of linear site): TQ 59287 33507 to TQ 59102 33301	
Recorder: KR	Follow up needed? Yes / (No)	Date: 3/7/15

Site description (circle)	Enclosed field	Unenclosed area	Road verge	Boundary bank	(Other) (specify) Hedgebank

Comments: South facing bank supporting a mixed, dense, managed hedgerow. Bank c. 1m high but varied profile along its length

Trees and/or shrubs present in sward? (circle)	(Yes)	No	Approximate cover of woody species	0-10%	11-25%	(26-50%)	51-75%	75%+

Comments (age, species, source of woody species etc.)
Hedgerow species extend into the grassy bank at its base

Sward characteristics (% of area)	Short <15cm 10%	Tall >15cm 20%	Tussocky 20%	Herb-rich areas (20%)	Bare ground <10%	Litter layer 50%	Grass dominated	Fine grasses	Other

Comments (depth of litter, amount of bare ground, other features of interest etc.)
Very varied within the narrow strip of grassy bank / field edge habitat. Structurally complex. Includes rabbit digging, livestock grazing and weedy patches of tall herb.

Physical features (circle)	(Anthills)	Ridges	Wet flush	Pond	Stream	Steep slope	Dips or hollows	Other e.g rock outcrops

Comments (aspect of slope, extent/size of wet features, presence of deadwood etc.)
Single anthill noted. S facing bank

NVC grassland community types present (circle)	MG (neutral grassland)	M (marshy grassland)	U (acid grassland)	CG (chalk grassland)

Comments (details of NVC communities, proportion of different types etc.)
N/A Botany most notable grassland species noted. Woodland vernal species probably also present.

Adjoining habitats and features (circle)	Woodland	Scrub	River/ stream	Open water	Wetland	(Grassland)	Arable	Unsurfaced track	Urban	Road

Comments (impact of adjoining features, good quality arable margins, presence of footpaths etc)
Hedge is mixed and apparently of old origin. Grassland is rather poor semi-improved, typical of the site - resown with white clover + rye grass but high cover of legumes. Excellent hedge + good invertebrate habitat

Management (circle)	(Grazed)	Mown	Unmanaged	Other (specify)

Comments (type of livestock, hay crop taken, silage cut etc.)
Rabbit + cattle graze parts of the bank
Hedge is managed by cutting

Condition (circle)	(Favourable)	Unfavourable	Neglected	Other

Comments (details)
Mixed conditions along bank/hedge are valuable. Important that grazing continues to keep variety of sward heights.

Historic boundary features (circle)	(Bank)	Ditch	Track	Pollards, stubs, large coppice stools	Shaw	(Notable hedgerow)	Notable Trees	Other

Comments (species, size, proximity to other features)

Earlye Fern (6)

Positive Indicator Species		DAFOF	Negative Indicator Species		DAFOR	
Achillea ptarmica	Sneezewort		Anthriscus sylvestris	Cow parsley		
Agrimonia eupatoria	Agrimony		Arrhenatherum elatius	False oat-grass		
Alchemilla spp	Lady's mantle spp		Cirsium arvense	Creeping thistle	O	
Anacamptis morio	Green-winged orchid		Cirsium vulgare	Spear thistle	R	
Anemone nemorosa	Wood anemone		Galium aparine	Common cleavers	F	
Betonica officinalis	Betony	LF	Heracleum sphondylium	Hogweed	R	
Briza media	Quaking grass		Helminthotheca echioides	Bristly ox-tongue		
Calluna vulgaris	Ling		Plantago major	Greater plantain		
Campanula rotundifolia	Harebell		Rumex crispus	Curled dock	O	
Carex flacca	Glaucous sedge		Rumex obtusifolius	Broad-leaved dock		
Carex leporine	Oval sedge		Pteridium aquilinum	Bracken	O	
Carex nigra	Common sedge		Senecio jacobaea	Common ragwort		
Carex panicea	Carnation sedge		Urtica dioica	Nettle	O	
Centaurea nigra	Common knapweed	O				
Cirsium dissectum	Meadow thistle					
Conopodium majus	Pignut					
Dactylorhiza spp.	Spotted/marsh orchid spp.					
Danthonia decumbens	Heath grass					
Erica spp.	Heather spp.					
Euphrasia spp	Eyebright spp.					
Filipendula ulmaria	Meadowsweet		**Other notable species (flora and/or fauna)**			
Filipendula vulgaris	Dropwort					
Galium saxatile	Heath bedstraw					
Galium verum	Lady's bedstraw		Potentilla sterilis	Barren Strawberry	F	
Genista tinctoria	Dyer's greenweed		Festuca rubra	Red fescue	OLF	
Glechoma hederacea	Ground-ivy	OLF	Cynosurus cristatus	(Crested) dogstail	OLF	
Hyacinthoides non-scripta	Bluebell		Bromus hordeaceus	Bromes	F	
Lathyrus linifolius	Bitter-vetch		Hypericum perforatum	Perforate St John's	O	
Lathyrus pratensis	Meadow vetchling	O	Stellaria holostea	Greater Stitchwort	O	
Leontodon saxatilis	Lesser hawkbit		Stachys sylvatica	Hedge woundwort	O	
Leontodon hispidus	Rough hawkbit		Hiuga reptans	Bugle	O	
Leucanthemum vulgare	Ox-eye daisy		Hypochaeris radicata	Rough cat's ear	O	
Linum catharticum	Fairy flax					
Lotus spp.	Birds-foot-trefoil spp.	O				
Luzula spp.	Wood-rush spp.					
Melampyrum pratense	Common cow-wheat		Small skipper			
Oenanthe pimpinelloides	Corky-fruited waterdropwort		Small heath			
Oenanthe silaifolia	Narrow-leaved waterdropwort					
Ophioglossum vulgatum	Adders-tongue					
Pedicularis sylvatica	Common lousewort					
Pilosella officinarum	Mouse-ear hawkweed					
Pimpinella saxifraga	Burnet-saxifrage					
Polygala spp	Milkwort spp.					
Potentilla erecta	Tormentil					
Poterium sanguisorba	Salad burnet					
Primula veris	Cowslip					
Pulicaria dysenterica	Fleabane					
Rhinanthus minor	Yellow rattle					
Rumex acetosella	Sheep's sorrel					
Serratula tinctoria	Saw-wort					
Silaum silaus	Pepper-saxifrage					
Silene flos-cuculi	Ragged robin					
Succisa pratensis	Devils-bit scabious					
Tragopogon pratensis	Goats-beard					
Trifolium pratense	Red clover	O				
Vaccinium myrtillus	Bilberry					
Veronica officinalis	Heath speedwell					
Viola spp	Violet spp.	F				

Survey Area: Earlye Farm Target note 9					Site Ref (central point or each end of linear site): TQ 59815 32554				
Recorder: ICR			Follow up needed? Yes (No)		Date: 3/7/15				
Site description (circle)	Enclosed field	Unenclosed area	Road verge	Boundary bank	Other (specify)				
Comments: Narrow field on south facing slope in southern block of pilot farm.									
Trees and/or shrubs present in sward? (circle)	Yes	(No)	**Approximate cover of woody species**	(0-10%)	11-25%	26-50%	51-75%	75%+	
Comments (age, species, source of woody species etc.)									
Sward characteristics (% of area)	Short <15cm (90%)	Tall >15cm (10%)	Tussocky	Herb-rich areas (40%)	Bare ground (<10%)	Litter layer	Grass dominated	Fine grasses (70%)	Other
Comments (depth of litter, amount of bare ground, other features of interest etc.) Sward varies considerably across the field. Upper slopes are rather poor, semi-improved grassland but the lower slopes are much more herb-rich									
Physical features (circle)	Anthills	Ridges	(Wet flush)	Pond	Stream	(Steep slope)	Dips or hollows	Other e.g rock outcrops	
Comments (aspect of slope, extent/size of wet features, presence of deadwood etc.) South-facing slopes and flushes with much more in the lower, southern areas near the stream. A useful, flowery area in south with valuable features for invertebrates									
NVC grassland community types present (circle)	(MG (neutral grassland))	M (marshy grassland)	U (acid grassland)	CG (chalk grassland)					
Comments (details of NVC communities, proportion of different types etc.) Upper slopes are MG6, lower slopes have MG5 characteristics with high cover of clovers, birdsfoot trefoil and fine grasses along with increased proportion of common herbs.									
Adjoining habitats and features (circle)	(Woodland)	Scrub	(River/ stream)	(Open water)	Wetland	(Grassland)	Arable	(Unsurfaced track)	Urban	Road
Comments (impact of adjoining features, good quality arable margins, presence of footpaths etc) Much of this part of Earlye Farm has large fields cut for silage. Wooded pond in the corner. Hedges/ treelines to the east and west. Wooded stream to south with a muddy track + crossing point.										
Management (circle)	(Grazed)	(Mown)	Unmanaged	Other (specify)						
Comments (type of livestock, hay crop taken, silage cut etc.) Cattle grazed and some selective mowing / topping (presumably weed control)										
Condition (circle)	(Favourable)	Unfavourable	Neglected	Other						
Comments (details)										
Historic boundary features (circle)	(Bank)	(Ditch)	Track	Pollards, stubs, large coppice stools	Shaw	Notable hedgerow	Notable Trees	Other		
Comments (species, size, proximity to other features) Banks and ditches associated with the wooded boundaries on the N, E and W sides of the field										

Earlye Fiori 9

Positive Indicator Species		DAFOF	Negative Indicator Species		DAFOR	
Achillea ptarmica	Sneezewort		Anthriscus sylvestris	Cow parsley		
Agrimonia eupatoria	Agrimony		Arrhenatherum elatius	False oat-grass		
Alchemilla spp	Lady's mantle spp		Cirsium arvense	Creeping thistle	O	
Anacamptis morio	Green-winged orchid		Cirsium vulgare	Spear thistle		
Anenome nemorosa	Wood anemone		Galium aparine	Common cleavers		
Betonica officinalis	Betony		Heracleum sphondylium	Hogweed		
Briza media	Quaking grass		Helminthotheca echioides	Bristly ox-tongue		
Calluna vulgaris	Ling		Plantago major	Greater plantain		
Campanula rotundifolia	Harebell		Rumex crispus	Curled dock		
Carex flacca	Glaucous sedge		Rumex obtusifolius	Broad-leaved dock		
Carex leporine	Oval sedge		Pteridium aquilinum	Bracken		
Carex nigra	Common sedge		Senecio jacobaea	Common ragwort		
Carex panicea	Carnation sedge		Urtica dioica	Nettle		
Centaurea nigra	Common knapweed	LO				
Cirsium dissectum	Meadow thistle					
Conopodium majus	Pignut					
Dactylorhiza spp.	Spotted/marsh orchid spp.					
Danthonia decumbens	Heath grass					
Erica spp.	Heather spp.					
Euphrasia spp	Eyebright spp.					
Filipendula ulmaria	Meadowsweet		Other notable species (flora and/or fauna)			
Filipendula vulgaris	Dropwort					
Galium saxatile	Heath bedstraw					
Galium verum	Lady's bedstraw		Bank clover	Trifolium ochroleucon	A	
Genista tinctoria	Dyer's greenweed					
Glechoma hederacea	Ground-ivy	LO				
Hyacinthoides non-scripta	Bluebell					
Lathyrus linifolius	Bitter-vetch					
Lathyrus pratensis	Meadow vetchling					
Leontodon saxatilis	Lesser hawkbit					
Leontodon hispidus	Rough hawkbit					
Leucanthemum vulgare	Ox-eye daisy					
Linum catharticum	Fairy flax					
Lotus spp.	Birds-foot-trefoil spp.	FLA				
Luzula spp.	Wood-rush spp.					
Melampyrum pratense	Common cow-wheat					
Oenanthe pimpinelloides	Corky-fruited waterdropwort					
Oenanthe silaifolia	Narrow-leaved waterdropwort					
Ophioglossum vulgatum	Adders-tongue					
Pedicularis sylvatica	Common lousewort					
Pilosella officinarum	Mouse-ear hawkweed					
Pimpinella saxifraga	Burnet-saxifrage					
Polygala spp	Milkwort spp.					
Potentilla erecta	Tormentil					
Poterium sanguisorba	Salad burnet					
Primula veris	Cowslip					
Pulicaria dysenterica	Fleabane					
Rhinanthus minor	Yellow rattle					
Rumex acetosella	Sheep's sorrel					
Serratula tinctoria	Saw-wort					
Silaum silaus	Pepper-saxifrage					
Silene flos-cuculi	Ragged robin					
Succisa pratensis	Devils-bit scabious					
Tragopogon pratensis	Goats-beard					
Trifolium pratense	Red clover	LF				
Vaccinium myrtillus	Bilberry					
Veronica officinalis	Heath speedwell					
Viola spp	Violet spp.					

Survey Area: Garlyne Farm Target Note 13					Site Ref (central point or each end of linear site): TQ 60042 32497				
Recorder: ICR			Follow up needed? Yes (No)		Date: 3/7/15				
Site description (circle)	Enclosed field	Unenclosed area	Road verge	Boundary bank	Other (specify)				
Comments: Formerly several smaller fields, now one unit with relict hedgerows and treelines									
Trees and/or shrubs present in sward? (circle)	Yes	No	**Approximate cover of woody species**	0-10%	11-25%	26-50%	51-75%	75%+	
Comments (age, species, source of woody species etc.): Occasional seedlings + mature trees of mixed species along old boundary lines									
Sward characteristics (% of area)	Short <15cm 95%	Tall >15cm	Tussocky 5%	Herb-rich areas 20%	Bare ground 1%	Litter layer	Grass dominated 40%	Fine grasses 80%	Other
Comments (depth of litter, amount of bare ground, other features of interest etc.): Extremely varied sward reflecting past history as several different fields.									
Physical features (circle)	Anthills	Ridges	Wet flush	Pond	Stream	Steep slope	Dips or hollows	Other e.g rock outcrops	
Comments (aspect of slope, extent/size of wet features, presence of deadwood etc.): Deadwood piles in south and some deadwood in standing trees. Several banks and hollows. Varied aspects, slopes and level areas. Deep towards stream in N									
NVC grassland community types present (circle)	MG (neutral grassland)	M (marshy grassland)	U (acid grassland)	CG (chalk grassland)					
Comments (details of NVC communities, proportion of different types etc.): Some MG5 on north-facing slopes. Mostly MG6 elsewhere. Tiny fragment of MG5 in northeast of field on north-facing lower slopes. Very herb-rich around bridge over stream									
Adjoining habitats and features (circle)	Woodland	Scrub	River/ stream	Open water	Wetland	Grassland	Arable	Unsurfaced track	Urban	Road
Comments (impact of adjoining features, good quality arable margins, presence of footpaths etc): A very mixed area but good supporting features - lower quality grassland sward is made more valuable by surrounding habitats - is good invertebrate area									
Management (circle)	Grazed	Mown	Unmanaged	Other (specify)					
Comments (type of livestock, hay crop taken, silage cut etc.): Cattle grazing. Tussocks mown.									
Condition (circle)	Favourable	Unfavourable	Neglected	Other					
Comments (details)									
Historic boundary features (circle)	Bank	Ditch	Track	Pollards, stubs, large coppice stools	Shaw	Notable hedgerow	Notable Trees	Other	
Comments (species, size, proximity to other features): Shaws + scrub on south edge. Wooded edge of lane to coast. Stream in north-west. Various banks + hollows within field on old boundary lines. Mature oaks on margins and standing dead (ash) oak on northern edge.									

Eartys Farm (13)

Positive Indicator Species		DAFOR
Achillea ptarmica	Sneezewort	
Agrimonia eupatoria	Agrimony	
Alchemilla spp	Lady's mantle spp	
Anacamptis morio	Green-winged orchid	
Anenome nemorosa	Wood anemone	
Betonica officinalis	Betony	
Briza media	Quaking grass	R
Calluna vulgaris	Ling	
Campanula rotundifolia	Harebell	
Carex flacca	Glaucous sedge	R
Carex leporine	Oval sedge	
Carex nigra	Common sedge	
Carex panicea	Carnation sedge	
Centaurea nigra	Common knapweed	LF
Cirsium dissectum	Meadow thistle	
Conopodium majus	Pignut	
Dactylorhiza spp.	Spotted/marsh orchid spp.	
Danthonia decumbens	Heath grass	
Erica spp.	Heather spp.	
Euphrasia spp	Eyebright spp.	
Filipendula ulmaria	Meadowsweet	
Filipendula vulgaris	Dropwort	
Galium saxatile	Heath bedstraw	
Galium verum	Lady's bedstraw	
Genista tinctoria	Dyer's greenweed	
Glechoma hederacea	Ground-ivy	
Hyacinthoides non-scripta	Bluebell	
Lathyrus linifolius	Bitter-vetch	
Lathyrus pratensis	Meadow vetchling	
Leontodon saxatilis	Lesser hawkbit	
Leontodon hispidus	Rough hawkbit	LF
Leucanthemum vulgare	Ox-eye daisy	
Linum catharticum	Fairy flax	
Lotus spp.	Birds-foot-trefoil spp.	OLA
Luzula spp.	Wood-rush spp.	R
Melampyrum pratense	Common cow-wheat	
Oenanthe pimpinelloides	Corky-fruited waterdropwort	
Oenanthe silaifolia	Narrow-leaved waterdropwort	
Ophioglossum vulgatum	Adders-tongue	
Pedicularis sylvatica	Common lousewort	
Pilosella officinarum	Mouse-ear hawkweed	VLA
Pimpinella saxifraga	Burnet-saxifrage	
Polygala spp	Milkwort spp.	
Potentilla erecta	Tormentil	
Poterium sanguisorba	Salad burnet	
Primula veris	Cowslip	
Pulicaria dysenterica	Fleabane	
Rhinanthus minor	Yellow rattle	
Rumex acetosella	Sheep's sorrel	
Serratula tinctoria	Saw-wort	
Silaum silaus	Pepper-saxifrage	
Silene flos-cuculi	Ragged robin	
Succisa pratensis	Devils-bit scabious	R
Tragopogon pratensis	Goats-beard	
Trifolium pratense	Red clover	F
Vaccinium myrtillus	Bilberry	
Veronica officinalis	Heath speedwell	
Viola spp	Violet spp.	

Negative Indicator Species		DAFOR
Anthriscus sylvestris	Cow parsley	
Arrhenatherum elatius	False oat-grass	
Cirsium arvense	Creeping thistle	F
Cirsium vulgare	Spear thistle	
Galium aparine	Common cleavers	
Heracleum sphondylium	Hogweed	
Helminthotheca echioides	Bristly ox-tongue	
Plantago major	Greater plantain	
Rumex crispus	Curled dock	
Rumex obtusifolius	Broad-leaved dock	
Pteridium aquilinum	Bracken	
Senecio jacobaea	Common ragwort	
Urtica dioica	Nettle	

Other notable species (flora and/or fauna)		
Trifolium repens	White clover	A
Cirsium palustre	Marsh thistle	LF
Lolium perenne	Perennial ryegrass	A
Agrostis spp	Bent-grass	A
Festuca rubra	Red fescue	A
Ringlet		
Gatekeeper		
Common blue		

Appendix G:

Magnetometer Survey of Earlye farm – HAAG

EARLYE FARM

WADHURST
EAST SUSSEX
TN5 6LA

GEOPHYSICAL SURVEYS

NGR TQ 597 329

SURVEY CODES FRANTEF1, 2 & 3

Report by
Kevin and Lynn Cornwell
Joint Field Officers
Hastings Area Archaeological Research Group

Registered Charity No. 294989

May 2016

Summary

The Hastings Area Archaeological Research Group (HAARG) were approached by Sally Marsh, Co-Director, High Weald AONB Partnership and asked if HAARG would like to undertake magnetometer surveys within the High Wealden AONB.

Two sites were identified and this report relates to Earlye Farm.

Earlye Farm is a historic working farmstead set within the undulating hills of the High Weald in Frant and Wadhurst. Parts of the present farmstead date from the C15 based on a survey of the farmhouse. However, the name dates from at least the C13 meaning "eagles clearing".

This work was undertaken in April and May 2016, over 3 days.

The surveys revealed features including the remains of a building, field systems, ridge and furrow ploughing, boundary banks and ditches, the mains gas pipeline and smaller pipelines.

Cover Picture – 15th Century Farmhouse at Earlye Farm, Wadhurst.

Content

Figures

1.0 Introduction

In June 2015 Kevin and Lynn Cornwell from the Hastings Area Archaeological Research Group (HAARG) were approached by Sally Marsh, Co-Director, High Weald AONB Partnership and asked if HAARG would like to undertake magnetometer surveys within the High Weald AONB. After further discussions and field work by the unit a subsequent project design was issued by Dr. Nicola Bannister, Landscape Archaeologist for the unit in April 2016.

The project design (Bannister 2016) highlighted two farms and this report relates to Earlye Farm, Wadhurst, East Sussex [centred on National Grid Reference (NGR) TQ 597 329] (see Figures 1 & 2). Three areas within the farm were identified to survey:

Site A - Curtilage of Earlye farmstead [TQ 59748 32925].	Survey Code – FRANTEF1.
Site B - Furnace Field [TQ 60295 33442].	Survey Code – FRANTEF2.
Site C - Assart Fields [TQ 60087 32510].	Survey Code – FRANTEF3.

These have been indicated on Figure 3.

2.0 Geology

The underlying geology of the sites is Tunbridge Wells Sand with Wadhurst Clay to the south of Assart field (British Geological Survey).

All the areas surveyed are pasture, used for animal grazing.

3.0 Significance of the Sites and Historical Background (by Dr. Nicola Bannister)

The 'Significance of the Sites and Historical Background', has been compiled by Dr. Nicola Bannister (Bannister 2016) and has been reproduced in this section of the report with her permission.

Earlye Farm is a historic working farmstead set within the undulating hills of the High Weald in Frant and Wadhurst. The parts of the present farmstead date from the C15 based on survey of the farmhouse. However, the name dates from at least the C13 meaning "eagles clearing". This suggests that there was settlement here before the present farmhouse was built. The objective of the survey here is to undertake a geophysical survey around the present farmstead to try and see if there are any below ground features which may be part of earlier settlement, for example on the west side of the farm where there appears to be a levelled platform and also to see if there are any below ground structures which relate to earlier boundaries. In addition, there is an area in the south-east corner of the farm in old "assart" fields where there may have been a dwelling. There is also present in these fields are ridge and furrow, old banks, remains of a well and other extant boundary features. The objective here is to see what if any features survive below ground level, including evidence for settlement, farm buildings and associated boundaries.

Further documentary research is ongoing.

4.0 Scope, Objectives and Methodology

4.1 Scope and Objectives

Within the project design 'Geophysical Survey Brief' (Bannister 2016), are a number of aims and objectives. The use of geophysical survey and analysis forms part of the wider "Field systems in the High Weald Project Design - Aims and Objectives".

The objectives of the geophysical surveys are:

Identify and undertake survey of parts of selected case study areas to inform the context and history of the current field system and its associated settlement/farm.

Identify potential and possible evidence for earlier settlement and their relationship to the present field system surviving below ground and which may influence the character of the present one.

To establish the potential evidence for previous settlement sites and associated field systems.

4.2 Methodology

The magnetometer surveys were conducted using a Bartington Dual Sensor Grad 601-2 Magnetometer with the results being processed in Geoplot version 3.00.

The Grad 601-2 consists of two high stability fluxgate gradiometers suspended on a single frame. Readings relate to the different localised magnetic anomalies compared with the local soils magnetic background. Each gradiometer has a 1m separation between the sensing elements so enhancing the response to weak anomalies.

An important consideration when conducting a magnetometer survey is the locality of any fencing. Multi-stranded wire fencing can produce a large distortion in the local magnetic field so magnetic data should be collected at least 1m away for each strand of wire but the disturbance can be detected up to 5m away (Gaffney & Gater 2011, 81). When conducting a magnetometer survey a 5m 'exclusion zone' is maintained around the edge of the field.

The survey grids measuring 40 x 40m were laid out with respect to field boundaries to ensure the survey maximised the number of complete grids and minimised the number of partial grids. The location of the first grid was measured by tape to known fixed points recorded on an OS map or by using the website NGR Finder.

The magnetometer was set to record 4 readings per meter transverse, surveying in a zig-zag pattern with the magnetometer set to a sensitivity of 0.03 nanoTeslas (nT). A balance station was set up on site in a 'metal free area' and the magnetometer was prepared for use at this point in accordance with the manufacturer's guidelines with regular re-zeroing at this point to prevent distortion of results.

As part of the data processing, to minimise interference from surface scatters of modern ferrous materials and ceramics, the data was 'clipped' and 'de-spiked' to remove any large 'spikes' or 'peaks'. The 'high pass filter' was applied to remove low frequency, large scale

spatial detail, typically a slowly changing geological "background" response. This was followed by the 'zero mean grid' and 'zero mean traverse' applications. Finally, the 'low pass filters' and 'interpolate processes' were used to produce an interpretable image.

5.0 Results and Interpretation

The results of the magnetometer surveys within the Curtilage of Earlye farmstead, Furnace Field and Assart Fields of Earlye Farm can be seen at Figures 4, 6 & 8 with graphic interpretations of the results at Figures 5, 7 & 9.

A selection of features have been represented in different colours on the graphic interpretations with areas surveyed outlined by a fine black line and subdivided into 40m squares. The project design suggested survey areas (Bannister 2016) are indicated by a series red dots and modern metal fences/hedges have been indicated in green.

5.1 Curtilage of Earlye Farmstead

The magnetometer results (Figure 4) have highlighted a series of pipelines (coloured red and labelled A-D on Figure 5). These show up as strong regular linear features with a pattern of increasing and decreasing magnetic responses (Geoplot Manual 5-26 and Gaffney & Gater 2011). Two of the pipes (labelled A & B) run from TQ 59769 32889 and TQ 59809 32860 terminating at the concrete lid and manhole cover in the centre of the field (TQ 59776 32871) to the south of the farm house (see cover photograph with manhole in foreground). Another pipe (labelled C) runs from the farmyard and enters the survey area at TQ 59782 32885 and leaves through the gateway at TQ 59822 32853. A further pipeline has been identified to the east of the survey area (labelled D at TQ 59619 32912) and is likely to be the main gas pipeline. Its presence within the field is evidenced by an official marker within the hedge at TQ 59652 33009.

A small ditch (TQ 59752 32889, coloured mauve) is likely to have been for drainage due to the farmsteads location on higher ground and 2 lines of post holes/small pits (TQ 59748 32886 & TQ 59696 32887, black dots) can be seen in two locations on Figure 5. Their use/purpose is unknown.

In the centre of the site (TQ 59720 32915) a large pond has been used as a rubbish tip for a number of years. This contained large qualities of ferrous material including barred wire and corrugated iron. Around the edge of this feature to the south, the ground was built up with bricks, sandstone and concrete rubble (colour brown and labelled 1).

An area to the north west of the pond (TQ 59701 32926, coloured brown and labelled 2) within the survey area and measuring 8 x 8m is of particular interest. This area of disturbed ground containing brick, tile and sandstone is associated with a demolished building and discussions with Mr. Gingell confirmed this was the site of an earlier building.

The results to the north-west of the barn (TQ 59748 32925 have been affected by the barn structure and this has been indicated by a large black area on the magnetometer results and interpretation figures (Figures 4 & 5).

5.2 Furnace Field

The magnetometer results can be seen at Figure 6 and these highlight a number of features. Running across the field in an east to west direction between TQ 60244 3354 to TQ 60402 33513 is a modern plastic water pipe (Pers. Comm. B Gingell) with the fill of the trench showing as a white line. This has been indicated on the interpretation at Figure 7 in red.

To the north of the survey area (centred on TQ 60308 33487, coloured mauve) are the remains of a series of field systems. Gaffney and Gater (2011, 143) comment *'these features are notoriously difficult to date even with excavation as they can produce little dating evidence'.* Additional features to the east of the site (TQ 60233 33334 & TQ 60197 33321, coloured mauve) may also be associated with field systems; however, their association with the main 'field system' cannot be confirmed.

5.3 Assart Fields

The magnetometer results for Assart Fields are at Figure 8. Assart Fields contained a number of boundary banks with one containing a quantity of sandstone. This runs from a large oak tree (TQ 60052 32511) towards the north west corner of the pond (TQ 60056 32470). A further bank runs north east to south west from TQ 60027 32451 to TQ 60058 32436 and these features have been indicated by a series of green dashes on the interpretation at Figure 9.

The boundary banks and survey results suggest the recommended survey area proposed by Dr. Nicola Bannister (2016) would previously have been three fields and this is confirmed using the 1846 tithe records (ESCC Website TD/E63). The magnetometer results highlighted substantial previous agricultural activity in the form of ridge and furrow ploughing (coloured brown on Figure 9) on each field. The NGR for each field and the ploughing direction are given below:

A. TQ 60103 32495 – north east/south west.
B. TQ 60024 32490 – north west/south east.
C. TQ 60051 32421 – east/west.

To the south of the survey area a two sided boundary bank can be seen on the ground and is highlighted on the magnetometer results by the omission of ridge and furrow ploughing on its western side. The purpose of the 'dug out area' (centred at TQ 60107 32426) could not be confirmed by the survey, however 20m to the south is the 'well' referred to in the project design (Bannister 2016). This feature was identified by a large 'slab of concrete' and 'metal tube' sticking out of the ground. An 'exclusion zone' was maintained around the feature during the survey, however for a radius of 7m the magnetometer was 'off the scale', recording maximum readings of 100nT. The feature also distorted the data and subsequent results for the remainder of the survey square for a further of 10-15m.

6.0 Discussions

6.1 Limitations

The size of the survey areas and intrusion of modern debris, particularly around the farmyard has limited the potential evidence for previous settlement sites and associated field systems.

A larger survey similar to the one being conducted by HAARG (Cornwell forthcoming) on behalf of Hastings Borough Council in the Hastings Country Park would enable a better understanding of features identified and earlier land use.

6.2 Findings

The surveys at Earlye Farm did identify a number of interesting features including two rows of post holes and a possible 'house platform' next to the pond in the Curtilage of the Farmyard, a field system of unknown date in Furnace Field and ridge and furrow ploughing in Assart Fields.

7.0 Sources Consulted

Bannister, N. (2016). Field Systems in the High Weald HE 7056 Project Design by High Weald AONB Geophysical Survey Brief Final (dated 04-04-16).
Gaffney, C. & J. Gater (2011). *Revealing The Buried Past Geophysics for Archaeologists.* Brimscombe Port Stroud, Gloucestershire: The History Press.
Geoplot Version 3.00v for Windows Instruction Manual Version 1.97 April 2005. Geoscan Research, Bradford, West Yorkshire.

Website Consulted:

Frant Tithe Map 1802-46 (TD/E63) - https://apps.eastsussex.gov.uk/leisureandtourism/localandfamilyhistory/tithemaps/MapViewDual.aspx?ID=112761&X=559737.5&Y=132928.75&SF=1.5875&Ref=&L=tm_wadhurst&px=0&py=0 [accessed 10 May 2016]

National Grid Reference Finder – www.gridreferencefinder.com [accessed 8 May 2016]

8.0 Acknowledgements

The authors would like to thank the following people for their assistance in this project:

Bill Gingell of W H Gingell & Son for allowing access.
Dr. Nicola Bannister, Landscape Archaeologist at the High Weald AONB Partnership for arranging the project.
HAARG members Richard Axe, Roy Dunmall, Martyn Ellis and Bob Washington for assistance in the field.

9.0 Report Distribution

Sally Marsh, Co-Director at the High Weald AONB Partnership.
Dr. Nicola Bannister, Landscape Archaeologist at the High Weald AONB Partnership.
Bill Gingell of W H Gingell & Son.
HAARG members Richard Axe, Roy Dunmall, Martyn Ellis and Bob Washington.

Figure 1 – Earlye Farm (highlighted by the red pin on Google Earth image) in relation to Frant, Mark Cross and Wadhurst, East Sussex.

Figure 2 – Earlye Farm (highlighted by the blue pin on Google Earth image) in relation to Gingell, Spring Cottage, Partridge Lane and the B2099 (Frant to Wadhurst road).

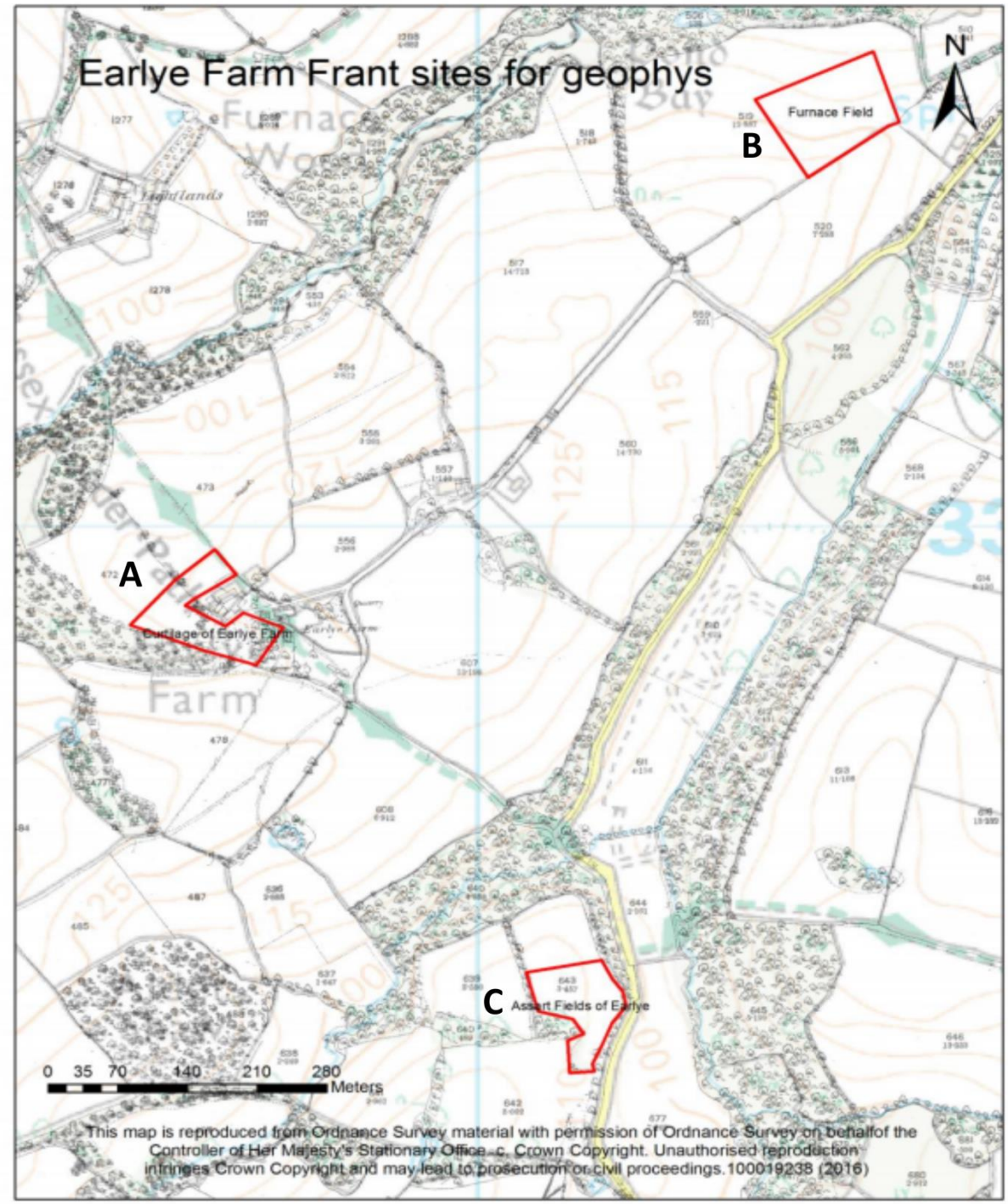


Figure 3 – The red areas are indicative of the areas to be surveyed rather than absolute areas (Bannister 2016). The survey areas including the Curtilage of Earlye farmstead (labelled A), Furnace Field (B) and Assart Fields (C).

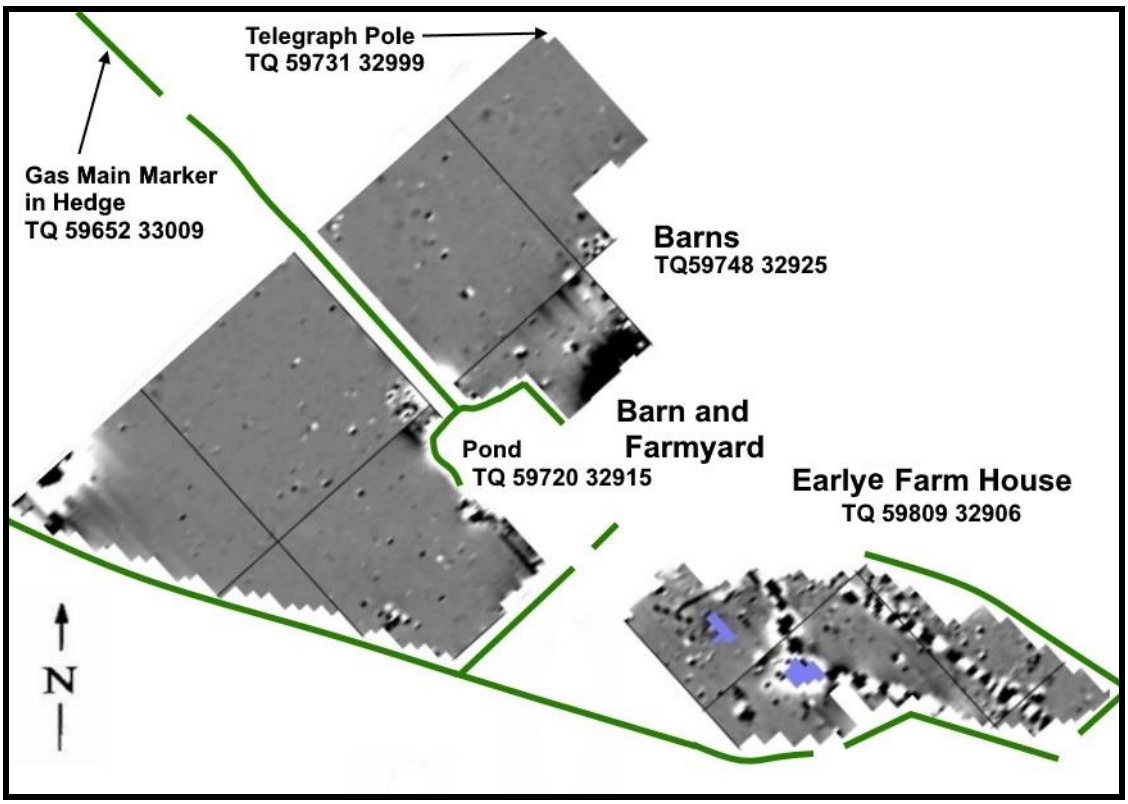


Figure 4 – The results of the magnetometer survey of the Curtilage of Earlye farmstead, Wadhurst. Grid sizes 40x40m.

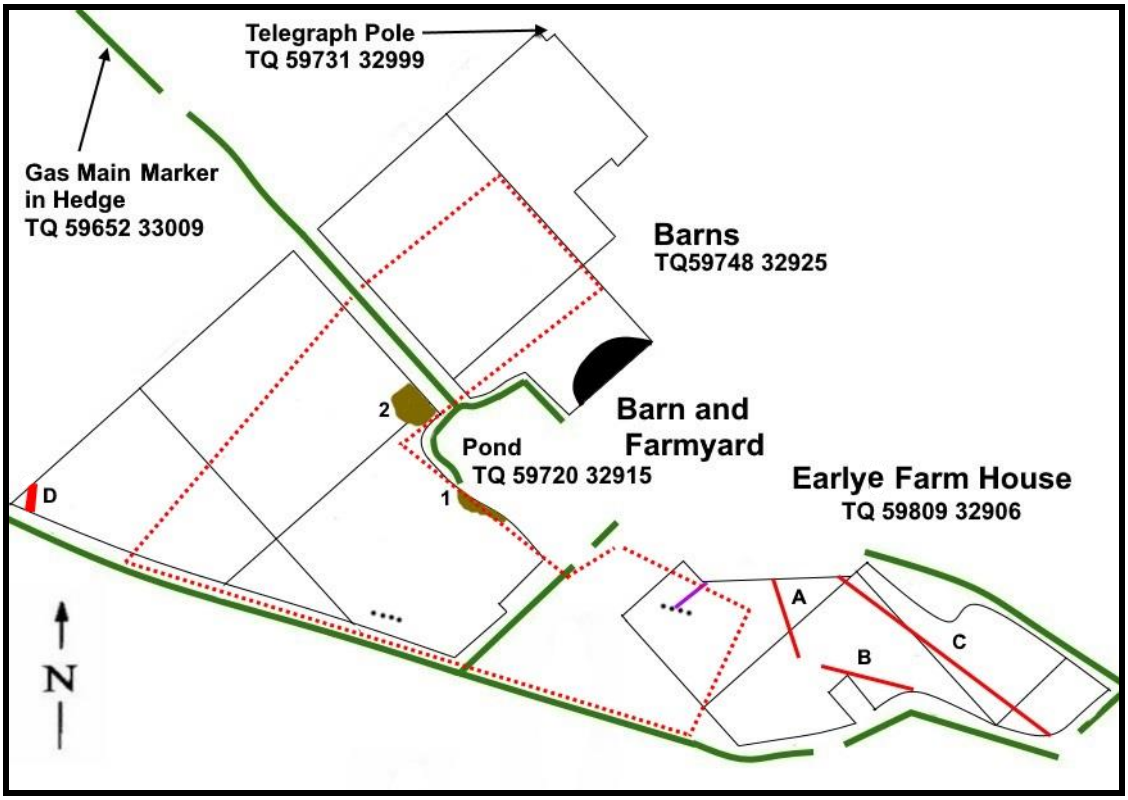


Figure 5 - The graphic interpretation of the magnetometer survey of the Curtilage of Earlye farmstead, Wadhurst. Grid size 40x40m.

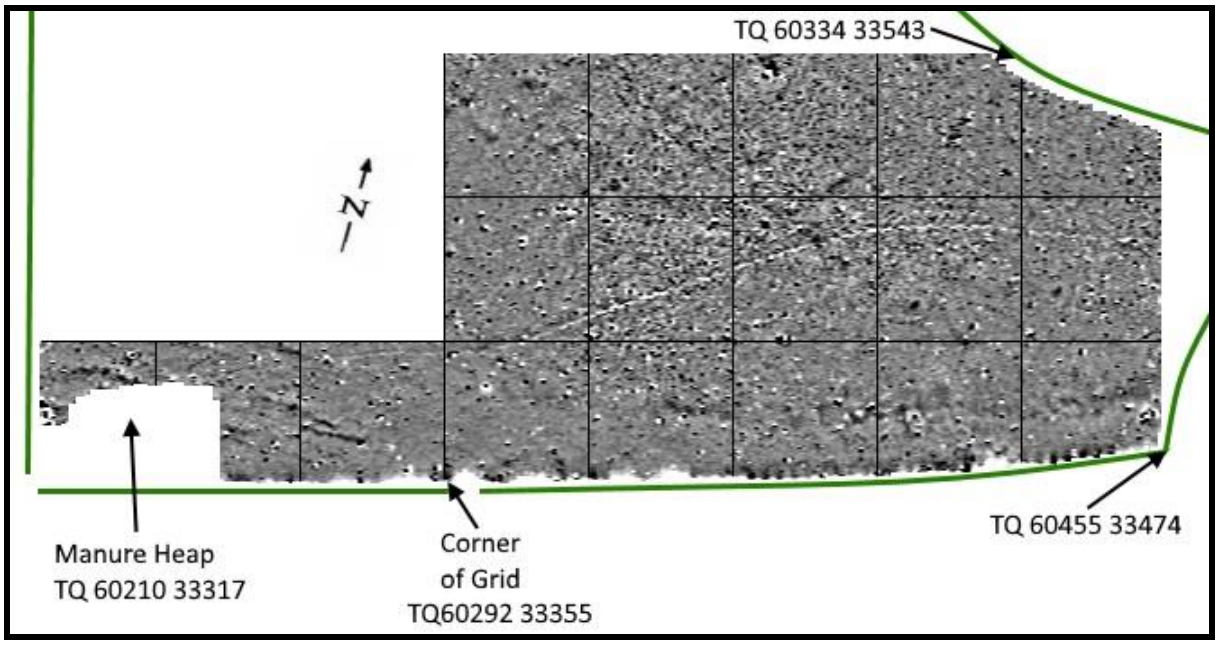


Figure 6 – The results of the magnetometer survey of Furnace Field, Earlye Farm, Wadhurst. Grid sizes 40x40m.

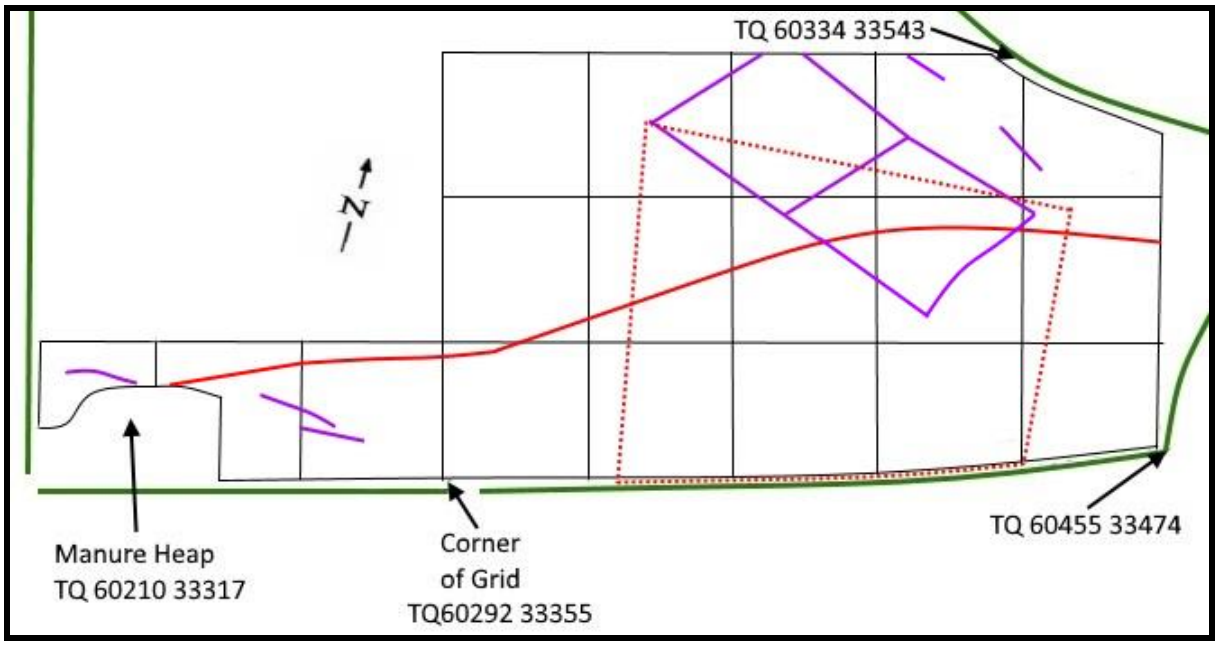


Figure 7 - The graphic interpretation of the magnetometer survey of Furnace Field, Earlye Farm, Wadhurst. Grid size 40x40m.

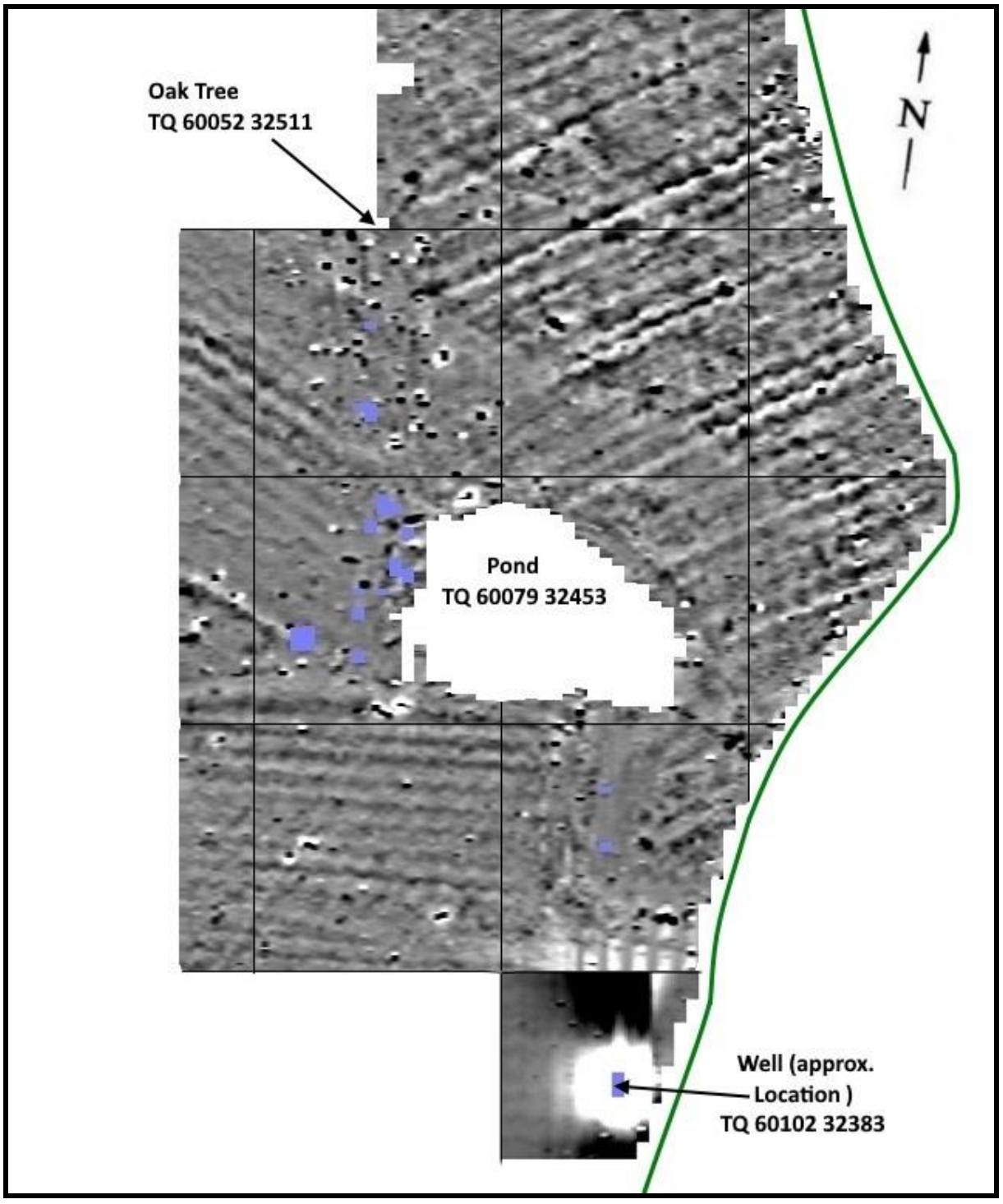


Figure 8 – The results of the magnetometer survey of Assart Fields, Earlye Farm, Wadhurst. Grid sizes 40x40m.

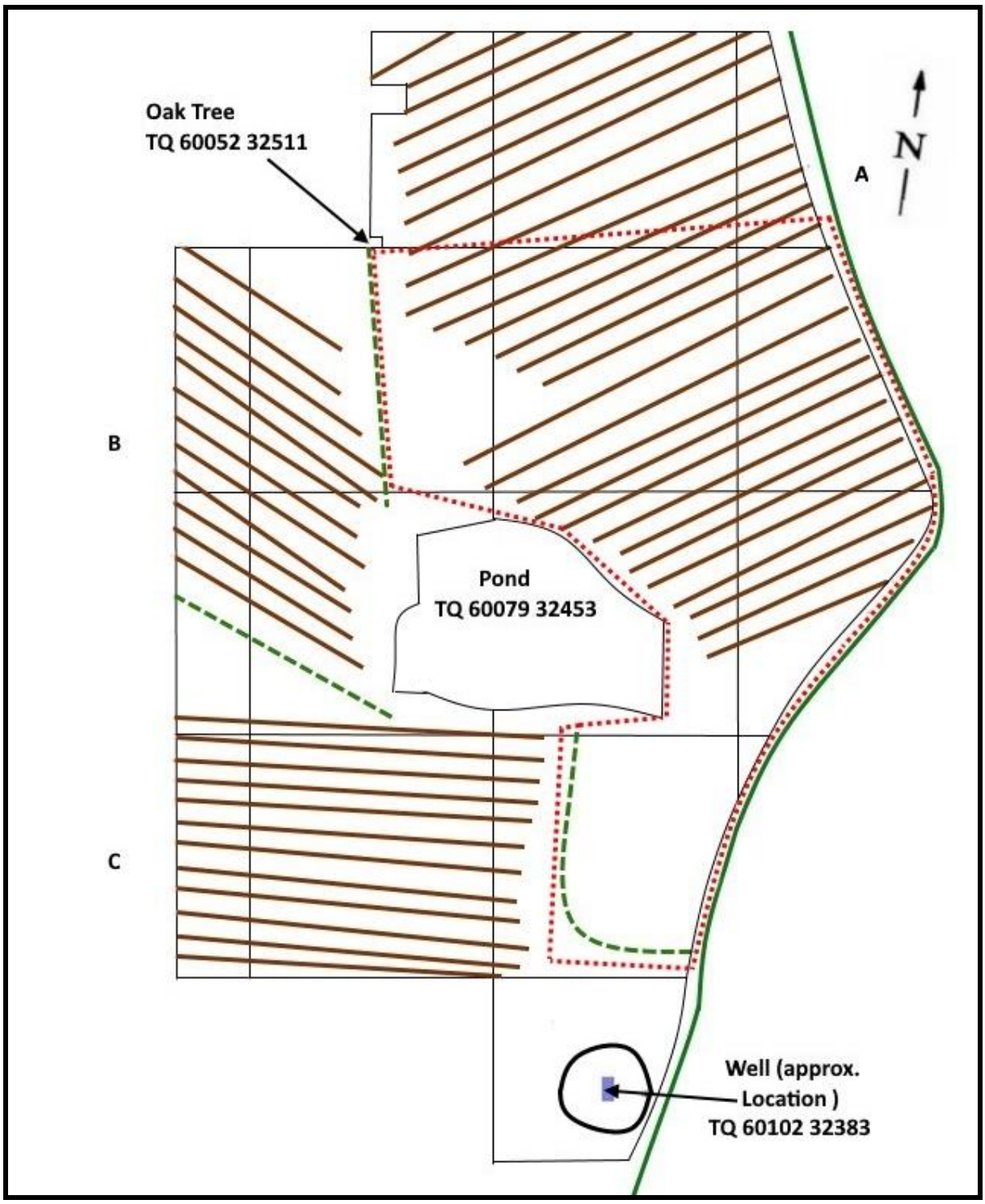


Figure 9 - The graphic interpretation of the magnetometer survey of Assart Fields, Earlye Farm, Wadhurst. Grid size 40x40m.