

The Evidence of Air Photography

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Introduction

This air photo (AP) survey was commissioned in 2006 as part of the enhancement of survey data carried out in preparation for the final volume of reports on Wharram Percy (*Wharram XIII*). It encompassed prehistoric through to post-medieval remains that were visible as crop marks, soilmarks or earthworks in the township of Wharram Percy. The survey of the pre-medieval archaeology also extended out onto some of the higher ground in the neighbouring townships of Birdsall, Raisthorpe, Burdale and Wharram le Street. The Wharram Percy village earthworks and underlying features, having been the subject of annual excavations between 1950 and 1990 and, more recently, the focus of geophysical survey and ground survey were excluded from this survey (Wrathmell 1996, 4; Linford and Linford 2003; Oswald 2004).

Previous work in the wider township area includes David Hall's study of the medieval ridge and furrow, Stoertz's mapping of the Roman and earlier crop marked archaeology and Hayfield's geophysical surveys at Birdsall Wold and Wharram Grange (Hall in *Wharram XIII*; Stoertz 1997; Hayfield 1987). The results of this work and the information provided on several historic maps (Donkin 1838; Dykes 1836; Ordnance Survey 1854; Ordnance Survey 1855) were used to enhance and inform this air photo mapping survey.

Today the Wharram Percy township landscape is largely under continuous cultivation. The higher ground is divided into large arable fields whilst the steep-sided dales are used mainly for grazing. There is little or no surface water on the plateau and the main water course, the Beck, is fed by a series of springs that rise along the side of the valley where the chalk sits on impermeable clay. Further north, the valley of the Beck is the site of the former Wharram Station and a substantial chalk quarry also now disused.

Methodology

The oblique and vertical air photographs examined for this survey are held by the two national collections, English Heritage's National Monuments Record (NMR) and the University of Cambridge's Air Photo Collection (formerly CUCAP) as well as North Yorkshire's Historic Environment Record (HER), the Yorkshire Archaeology Society and the Wharram Percy Project archive.

Within these collections there were approximately 850 oblique air photographs of the survey area, including some duplicates. Most of the oblique air photographs were taken for archaeological purposes by the aerial surveyors of English Heritage and Royal Commission on the Historic Monuments of England between 1970 and 2003, and for CUCAP between 1948 and 1984. Other photographs were taken by A. Pacitto, P V Addyman, D N Riley and A J Crawshaw, amongst others. The well-preserved

earthworks of Wharram Percy village have attracted much attention from aerial surveyors and these are the focus of a significant proportion of the air photographs. This may have been to the detriment of the surrounding landscape which has received far less coverage. The vertical photographs were taken for military reconnaissance by the RAF between 1946 and 1958, for mapping by the Ordnance Survey in the early 1970s and for planning purposes by Simmons Aerofilms in 2002. The latter were colour photographs, the others, black and white.

These air photographs were examined systematically, under magnification where necessary. The vertical air photographs and appropriate oblique photographs were also examined using a stereoscope. Details of archaeological, natural and modern features and reference points were traced onto acetate sheets attached to carefully selected photographs. These overlays were scanned. Then using the same reference points on the Ordnance Survey 1:2500 scale map data the overlay images were rectified using the Bradford Aerial Photographic Rectification Programme, AERIAL5.14. The Ordnance Survey Land-form Profile digital elevation data was also employed to correct for the errors caused by the uneven ground. Overall accuracy of the rectified plots is within ± 3 metres.

The rectified overlays were collated in a Geographic Information System (GIS, MAPINFO Professional 7.5) and then converted from raster images to vector plots, with reference to photocopies and laser copies of the original prints. The final mapping layers were exported to AutoCAD It® 2000 for printing. The selected archaeological features numbered on the accompanying figures are identified in the text by the use of **Bold** typeface.

Prehistoric and Roman Features (Figs 1.1A to D)

Perhaps the earliest archaeological features identified by this AP survey are the remains of round barrows, either levelled mounds or the in-filled ring ditches that once encircled such mounds. In later prehistory round barrows were constructed in great numbers to mark inhumations and cremations and they continued to be built on a lesser scale in the Roman and Anglo-Saxon periods. Most of the examples at Wharram Percy probably date to the Early to Middle Bronze Age though some perhaps have origins in the Neolithic period (Stoertz 1997, 30 & 33).

There are two sizeable clusters of round barrows or ring ditches at Wharram Percy, and some smaller groups and isolated examples. West of Wharram Percy House there is a linear arrangement of up to 12 circular burial monuments (**1**: Figs1.1A and C). These appear either as ring ditches, levelled mounds or in one case both; this last example, which also has three near-concentric ring ditches, is the largest and lies near the centre of this group. A little further along Birdsall Wold there are two small circular mounds that may be outliers to this group (**2**). Both Stoertz and the Schedule of Monuments record at least 3 other monuments in this group, presumably from other sources (Stoertz 1997, map 1; RSM20509 and RSM20512). Altogether these monuments suggest a linear cemetery that was built just below one of the highest points in the area on a north-west facing slope.

South of Bella House, there are up to 10 ring ditches and levelled mounds loosely grouped on the wold between Wood Dale, Fairy Dale and Nova Slack. (**3**: Fig. 1.1D). Although their position on the Wold is prominent these monuments were not built on the highest available ground. The barrow builders instead appear to have been attracted to the shoulder of land between Fairy Dale and Nova Slack. As a consequence visibility between some of the monuments in this group was probably impeded. Although perceived here as a group, the lack of visibility between some of the monuments may indicate that they lacked the cohesion of a cemetery.

South of Wharram Percy village site, at Far Hills, there is a smaller group of four or five ring ditches and mounds (**4**: Fig. 1.1A). These were built on a small plateau rising from Raisthorpe Wold. Further south west along the wold there is a scatter of at least nine other ring ditches and two oval enclosures (**5**: Figs 1.1A and C). Moving northward the ground gradually begins to fall away towards the Vale of Pickering and here ring ditches and barrows appear to be largely absent. The exceptions are two possible ring ditches south of Wharram le Street village and another two to the east of Wold Plantation (**6**, **7**: Fig. 1.1D).

The morphology of the ring ditches and round barrows appears to be relatively homogenous though there are some variations. The multi-ditched example west of Wharram Percy House (**1**), with an overall diameter of 28m, is also one of the largest in the whole area. One of the ring ditches west of Wolds Plantation (**7**) has traces of a second outer ditch circuit that is over 40m in diameter. Most of the burial monuments are between 7m and 25m in diameter and have a single ditch, though because many appear only as levelled mounds the arrangement of their ditches is not known.

Iron Age square barrows are a particular feature of the Yorkshire Wolds (Stoertz 1997, 34). There is no air photo evidence here for the extensive and densely-spaced square barrow cemeteries seen in the more easterly parishes of Kilham, Rudston and Grindale (see Stoertz 1997, fig. 17) but there are some small groups and single examples. These monuments generally appear on the air photos as square or near-square ditched enclosures with no evidence of mounds that may once have covered them.

West of Wold Plantation there are remains of two square barrows measuring 16m x 15m and 7m x 7m and a third, less complete example that is 8m wide (**8** Fig. 1.1D). The two smaller examples are on a similar alignment and a large circular pit lies between the two more easterly barrows. Stoertz records two more to the south-east and the plantation may conceal other, perhaps better preserved examples (1997, map 1; **9**: Fig. 1.1D).

On Raisthorpe Wold there is a loose cluster of five square barrows distributed amongst the scatter of ring ditches and oval enclosures (**10**: Fig. 1.1C). These square barrows are between 9m square and 19m square. One of the larger square barrows is

marked as an extant "Tumulus" on the historic Ordnance Survey map of 1854. South of Bella House there are up to four square barrows amongst the ring ditches and round barrows (**11**: Fig.1.1D). The largest of these measures 13m x 13m the others are between 7m and 9m square. The smallest appears to be a square hollow, perhaps a burial pit but other interpretations cannot be discounted. There are possible single square barrows to the south of Wharram Le Street Village and north-west of Wharram Percy House (**12**, **13**: Figs 1.1C and D).

The township and its environs were crossed by a number of long linear features (see Fig. 1.1A). Most have been greatly levelled and appear only as crop marks or soilmarks, which often makes it difficult to differentiate them as either trackways or boundaries. It has been argued that such a distinction may not be so clear cut because some boundaries were subsequently used as routes though the Wolds and, moreover, some boundaries followed the path of existing trackways (Fenton-Thomas 2003, 41-42). None of the linear features within this area have been dated but Fenton-Thomas suggests the earliest examples on the Wolds may have their origins in Neolithic period.

Three substantial multi-ditched linear features converge close to the Malton to Beverley Road, near Towthorpe Plantation (see Fig. 1.1D). The branch running from the direction of Bella House (**14**) has an overall width of 30m and comprises two pairs of ditches running either side of a broad 12-15m berm. The second branch (**15**) runs between the junction and Nova Slack; it is up to 30m wide and has three ditches. The inner ditch runs closer to the northerly outer ditch so forming a berm some 15m wide between it and the southerly outer ditch. The other branch runs from the junction south-westward into the head of Fairy Dale (**16**). On the air photographs the more northerly section of this branch appears as three distinct ditches but further south just one broad hollow is indicated by the crop marks.

The arrangement of these multi-ditched linear features is more suggestive of a boundary than a simple trackway. Soil and chalk from the ditches was probably mounded to form banks, but there is no surviving evidence for these on the air photographs. The arrangement of features at the junction between these three boundaries, although partially obscured by the Malton to Beverley road, suggests that they were interlinked and contemporary with one another.

The multi-ditched linear feature south of Wharram Percy House, on Raisthorpe Wold was probably also a substantial boundary (**17**: Fig. 1.1C). Stoertz's mapping shows that it ran north-eastward from the head of Honey Dale and over the wold ridge and appears to have ended near the head of Deep Dale (1997, map 1). The southern section appears as three parallel ditches over 30m wide; just two ditches are visible in the northern section. Where this boundary narrows it also converges with two other ditches. One runs between two of the three boundary ditches before departing on a slightly more northerly and sinuous route towards Deep Dale (**18**). The other runs east to west along the ridge and appears to abut the sinuous ditch (**19**). These ditches may also be of prehistoric date.

Stoertz's mapping also suggests the presence of multi-ditched boundaries to the west of Wharram Percy House and between Wold Plantation and Wharram le Street village (1997, map 1). The crop marks and soilmarks of the Wharram Percy House boundary (20: Fig. 1.1C) on the air photographs seen by this project suggest the presence of only one ditch. However it was marked as an earthwork "entrenchment" on the Ordnance Survey First Edition map (1855 Sheet 142) and so it may have been more substantial than it now appears to be from the air. This map also records another "entrenchment" in a north to south alignment which is concealed by an extant field boundary.

Between Wold Plantation and Wharram le Street village Stoertz recorded two short sections of boundary, comprising of three and four parallel ditches (21: Fig. 1.1D) running along a natural depression (1997, map 1). This survey found the evidence less convincing and perhaps attributable to modern drainage and natural infilling of the slight depression that runs south-west to north-east through this area.

There are probable trackways running along North Grimston Wold, across Great Hog Walk (22, 23: Fig. 1.1B), between Bella House and Wharram le Street village (24), and north of Wold Plantation (24, 25: Fig. 1.1D). Shorter sections of double ditches to the north-west and south-east of Wharram Percy House (26 and 27) and running southward from North Plantation (26, 27, 28: Fig. 1.1C) may also have been trackways. These possible trackways generally have two ditches, several have evidence of rutting or are slightly hollowed in parts, and some are flanked by enclosures and fields. In addition they appear to run along the lengths of the plateaux, maintaining where possible a level route. Those ditches that are thought to be boundaries tend to run across the contours often between the heads of the dales and using these deeply cut valleys to extend their length. Part of the North Grimston Wold trackway (22) is flanked by elements of the Wharram Grange villa complex (29), suggesting it was in use during the Roman period (see Fig. 1.1B).

The trackway that sweeps across Great Hog Walk (23) has been traced by geophysical survey beneath the remains of Wharram Percy village almost as far east as the bridge (Linford and Linford 2003, fig.8. features G04 and G05; see Fig. 1.1A). At its northern end this trackway appears to terminate at the point where it meets the later township boundary, but it may have continued unseen beneath or alongside the modern trackway that continues northward on the same alignment and may have connected with the North Grimston Wold trackway (22). The Great Hog Walk trackway (23) is flanked by enclosures and fields (31 and 32: Fig. 1.1B) suggesting that it was the earliest of these features. The rectilinear enclosure at the north-western edge of the village earthworks (33) has been partially excavated and was probably used or occupied from the later 2nd or 3rd century to the mid-4th century AD. To the east, the excavation of Site 60 indicated that the trackway was at least as early as Master Period 2, assigned to the late Iron Age or Early Roman period (Rahtz & Watts 2004, 278, 302).

There are, within this area, several single ditch boundaries that may also have been first used in later prehistory. These were most probably field boundaries, demarcating allotments of arable cultivation or stock grazing but there is relatively little evidence of articulated field systems. The parallel arrangement of ditches flanking the trackway south of Wharram Le Street village is perhaps an exception (**34**: Fig. 1.1D). It may be that other field boundaries were defined by fences or hedgerows without ditches. Across the survey area there are also numerous enclosures, mainly rectangular in plan, some of which may have been associated with settlement. There are three possible hut circles amongst the fields south of Wharram le Street village (**35**: Fig. 1.1D), which are perhaps the remains of a small open settlement. However, on the air photographs there are no visible signs of occupation evidence within any of the rectangular enclosures.

The presence of a Roman villa has been surmised in the enclosure complex near Wharram Grange (**29**) and another within the rectangular enclosure on the north-west corner of Wharram Percy village (**29**, **33**: Fig. 1.1B; Rahtz et al 1986; Linford & Linford 2003, 6). At the Wharram Grange enclosure complex the greatest concentration of Roman building debris was recovered from a rectangular enclosure at its centre, which was detected by geophysical survey but not visible on the air photographs (Hayfield 1987, fig. 14). The arrangement of the Wharram Percy enclosure and surrounding features, as revealed on the air photographs and by geophysical survey is similar to the overall plan of features at Wharram Grange. There is a similar group at the north-eastern end of Birdsall Wold (**36**), although the results from Hayfield's field-walking do not indicate that this site had the same status as the Wharram Grange or Wharram Percy examples. The Birdsall Wold example lies at the northern end of a long arrangement of rectangular enclosures that appear to be aligned along one side of an intermittent broad ditch (**37**, **38**: Fig. 1.1B). These conjoined enclosures are visible on air photographs over a distance of 530m and may well have linked with other similar enclosures detected by geophysical survey at Birdsall High Barn Farmstead (see Hayfield 1987, fig. 8).

This arrangement is common on the Yorkshire Wolds, although many examples appear to be more complex and are typically aligned along a trackway (see Stoertz 1997, fig. 26). The axial ditch in the Birdsall Wold group may have originated as a trackway and possibly pre-dated the enclosures. Although there is no visible evidence of settlement within any of the enclosures within this group, this is not to say that occupation remains do not or did not exist; however other functions such as stock management should also be considered (Hayfield 1987, 62). Furthermore, there is some degree of overlap between these enclosures suggesting that they were not all in use at any one time.

There are other rectilinear enclosures, some closely associated with the trackway across Great Hog Walk (**31**), perhaps two abutting the trackway north of Wold Plantation (**39**), a pair on Raisthorpe Wold (**40**) and another overlooking Nova Slack (**41**). Between the Beverley and Malton Road and Towthorpe plantation there is a large rectangular enclosure that abuts one of the major boundaries, this would appear to be a relatively rare occurrence (**43**: Fig. 1.1D; AP162).

The relationships between different types of features observed in this small area reflect observations made by others about the wider Wolds landscape. There is some coincidence between the routes of the major linear features and the location of Neolithic, Bronze Age or Iron Age burial monuments. West of Wharram Percy House, for example, two entrenchments and a long ditch converge close to one of the largest monuments in the linear cemetery (1: Fig. 1.1C). South of Wharram Percy House the intersection of a major boundary (17) with two other ditches (18 and 19) is also a particular focus for the ring ditches and square barrows scattered along the ridge (5 and 10: Fig. 1.1C).

Stoertz suggested that Bronze Age barrows were used as ‘landmark foci towards which earthworks were laid out’ and that these in turn ‘provided focal alignments for the construction of the Iron Age square barrows...’ (1997, 65). However, if as Fenton-Thomas argues some boundaries were re-defining earlier Neolithic and Bronze Age routes then the presence of these monuments may have been incidental to the construction of the later boundaries and may partly explain the inter-visibility that is observed between some of the barrows.

Anglo-Saxon Features

The cumulative evidence of the numerous excavations at Wharram Percy village points to significant Anglo-Saxon settlement in the area. The physical evidence recovered so far includes Grubenhäuser, two of which were constructed within the possible Roman or earlier trackway (23: Fig. 1.1B) where it runs beneath the village (Rahtz and Watts 2004, 88).

Interpretation of the results of geophysical survey combined with information from some of the outlying excavation trenches suggests that a number of curvilinear anomalies identified to the west of the village may represent the core area of Middle Saxon activity (Linford and Linford 2003, 10). These curvilinear anomalies and associated discrete features were not visible on the air photographs. Some occur within areas of pasture and others in fields where crop mark development has usually been poor and specialist photographic coverage is very sparse.

The medieval features (Fig. 1.2)

The principal medieval features identified on the air photographs were the ridges and furrows produced by ploughing, lynchets, baulks, field boundary markers and trackways. The remains of ridge and furrow, mostly levelled and appearing as soilmarks or crop marks, was visible over approximately one fifth of the township. However, from his field observations of fragments of surviving ridges and headlands and soilmark furrows, David Hall reconstructed ridge and furrow throughout the township except on the steep slopes of the dales (see *Wharram XIII*, Ch. 17). The ridges visible on the air photographs are often about 10-11 metres wide; Hall’s schematic depiction does not attempt to record accurately their widths. Henry Best of Elmswell, who farmed on the Wolds dipslope in the early 16th century, indicates that

his 'broad lands' were 28 feet wide (Woodward 1984, 303, *sub* 'land(e)'), and therefore of a similar scale to those recorded at Wharram Percy.

Much of the ridge and furrow had probably been levelled by the time of the earliest photographs. By the 1970s earthwork ridge and furrow only survived to the immediate west of the village and in a small area to the north-west of Bella House. Some pre-medieval features were visible beneath the remains of ridge and furrow, particularly on Great Hog Walk (eg **23** and **31**). Where the ridges survived better and for longer it is possible that they may still conceal underlying features. Geophysical survey and excavation have amply demonstrated that pre-medieval remains survive below the Wharram Percy village earthworks (eg Linford and Linford 2003, fig 6).

The medieval settlement was confined to Wharram Percy village and, in addition to the results of numerous excavations, English Heritage's archaeological survey and investigation provides an interpretative plan view of these remains (Oswald 2004, fig. 9). Oswald identified at least four access points into the village: from the eastern side of Deep Dale, from the south side of Drue Dale, from Great Hog Walk and from the east in the area of the railway bridge. The air photographs show a broad hollow way (**44**) leading across Great Hog Walk from the strip plantation to the north-western corner of the village remains and Oswald's Road 1B (2004, fig. 10). This hollow way is quite distinct from the possible Iron Age or Roman trackway (**23**: see *Wharram XIII*, Ch. 7). This distinction is born out within the village area by the geophysical survey which indicated that the earlier route lay some 15m north of the later one (Linford and Linford 2003, fig.8. features G04 and G05). The Great Hog Walk hollow way appears to have formed a spine for the layout of the medieval plough furlongs.

To the north of the hollow way the long and narrow parcels of ridges appear to be divided by banks or baulks (**45**). One particularly well-defined boundary appears to extend north of the township boundary. Evidently part of this feature and another to the west survived until the nineteenth century because they are marked on the Ordnance Survey First Edition map as defaced boundaries and hedgerows (1854, sheet 143). Similar embankments are visible on the south side of the hollow way (**46**) and north-west of Bella House (**47**). Some of them run counter to the direction of ridges on David Hall's survey, and in view of their late survival, these may be features of the post-medieval infield (especially in view of the one crossing the township boundary).

To the north of Wharram Percy village (**48**) and between Deep Dale and Wood Dale (**49**) ditch-like features have been observed between contiguous blocks of ridge and furrow. It is not clear if these were deliberately excavated ditches or just slightly deeper furrows. It is possible that they again relate to the post-medieval reuse of the ridges rather than arrangement of the original plough furlongs. The examples between Deep Dale and Wood Dale (**49**) are marked on Dykes map of 1836. A similar feature on land south of Drew Dale (**50**) may also have been used as an access route into the south-western corner of the village, coinciding as it does with Oswald's Track 16 (2004, fig. 10).

The post-medieval and modern features (Fig. 1.3)

Undoubtedly many of the boundaries and trackways that evolved in the medieval and perhaps even the earlier periods continued in use through to the 19th century and later. The origins of some features that appear on the earliest Ordnance Survey maps have already been discussed (e.g. **20** and **45**).

Historic maps dating from the first half of the 19th century record several routes crossing the Wharram Percy township and running along its boundaries (**51-58**) (Dykes 1836; Donkin 1838; Ordnance Survey 1854 and Ordnance Survey 1855). Where some of these trackways cut across ridges on Great Hog Walk it is evident that they are of a later date than the ploughing. The B1248 Malton to Beverley Road (**52**) is the only route that today is in use as a significant vehicular thoroughfare. The trackway (**58**) running along the southern edge of Wharram Percy township is today classed as a bridleway and forms part of the Wolds Way, whilst parts of the east to west route through the village (**53**) are followed by the Centenary Way. East of Bella House this route way follows the line of a prehistoric multi-ditch boundary (**14**), the remains of which were possibly the source of the “Sodwall Close” fieldname recorded on the historic estate map (Dykes 1936). Other sections of the post medieval trackways survive only as local access for farms, footpaths or simply as field boundaries.

Ground investigations and excavations have revealed the remains of several dozen buildings and structures within Wharram Percy village. Many of these were also visible on the air photographs, though not re-mapped for the purposes of this survey. Beyond the village evidence for structural remains is scarcer. In the field to the west of the village there is a small, discrete rectangular area of chalky rubble (**59**) that is visible in bare soil. It is probably the foundations of a structure, but being some 19m long and 9m wide it is more likely to be an animal pen than a roofed building, which is appropriate for its position. This feature survived as earthworks overlying the ridge and furrow until at least 1946 but appears to have been completely levelled by 1977. However it was probably in a ruinous state by the middle of the nineteenth century since it is recorded in the same manner as some of the Wharram Percy village remains on the Ordnance Survey map of 1854. On this particular map this structure is depicted in a slightly different orientation to that observed on the air photographs but this appears to be a surveying error that was corrected in later editions (e.g. Ordnance Survey 1891).

In the field to the north of the village there is a larger structure measuring 21m x 20m (**60**). It survived as an earthwork until at least 1946 and also clearly overlay the ridge and furrow, but it does not appear on any of the available historical mapping (e.g. Ordnance Survey maps of 1854 and 1891). This feature was probably a stock enclosure. With the benefit of hindsight it is just possible to detect the remains of the mill site (**61**) in the north of the township on the air photographs. These remains were revealed in far greater detail by ground survey in 2002 (*Wharram X*, 16-19).

A common feature of the higher ground in particular are small circular and sub-circular hollows, which are generally less than 20m in diameter and often much smaller. These were ponds, puddled with clay to prevent water loss through the permeable chalk and dug to provide valuable drinking water for grazing livestock. The construction of one of them is recorded in expenditure accounts relation to the creation of Bella farm in the 1770s (*Wharram XII*, 10).

As common as the ponds are small quarry pits. Most of these are identified as chalk pits on the Ordnance Survey First Edition or subsequent maps. Whilst some of these pits do not appear on the earliest maps but are depicted on later editions, it is not clear whether this is because these were dug after 1854-55 or because they simply were not recorded by Ordnance Surveyors at that time. Most of these were probably for small-scale local use; only the example in the valley of the Beck developed into a larger extraction operation.

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