



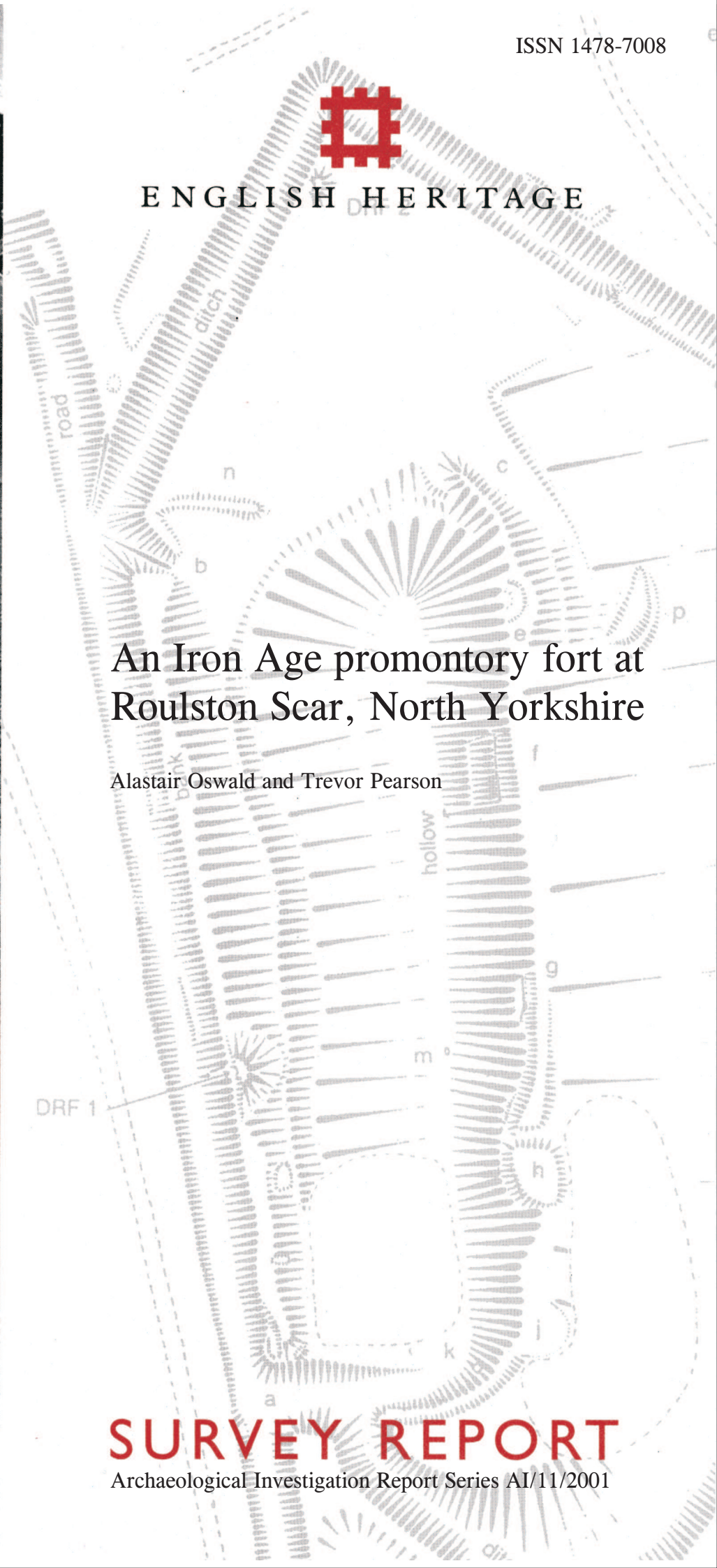
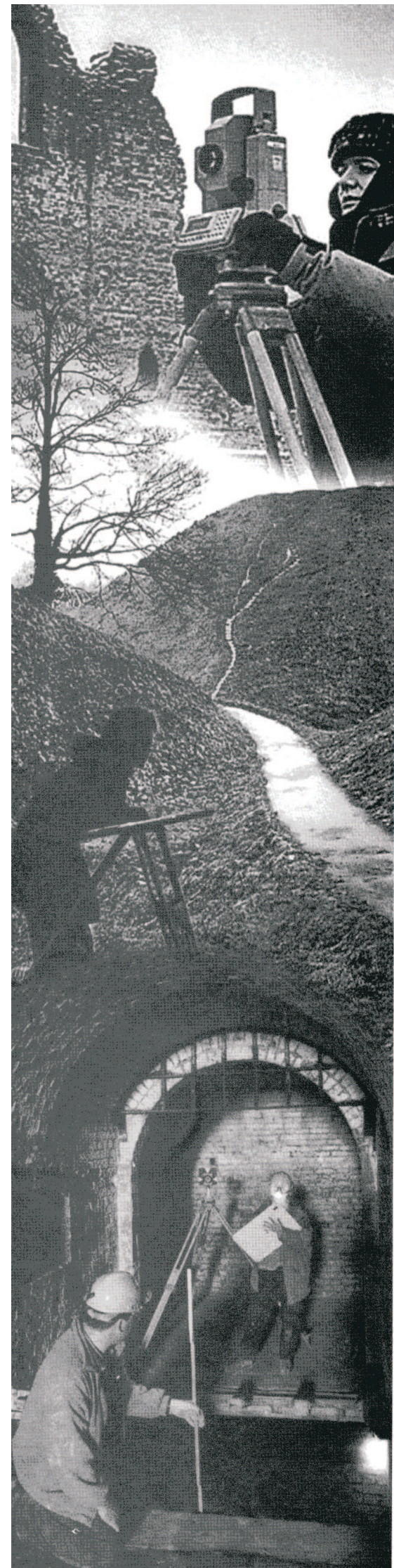
ENGLISH HERITAGE

An Iron Age promontory fort at Roulston Scar, North Yorkshire

Alastair Oswald and Trevor Pearson

SURVEY REPORT

Archaeological Investigation Report Series AI/11/2001





AN IRON AGE PROMONTORY FORT AT ROULSTON SCAR, NORTH YORKSHIRE

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1. INTRODUCTION

Between late July and early August 2001, English Heritage carried out an archaeological investigation of an Iron Age promontory fort at Roulston Scar in North Yorkshire. The research, which was carried out in partnership with the North York Moors National Park Authority, followed a request from Graham Lee, the Archaeological Conservation Officer for the National Park, and was carried out in advance of the completion of a footpath across the southern end of the site by the National Park Authority. In order to establish the likely date of some of the earthworks impinged upon by the course of the footpath, the analytical field survey encompassed a much wider area than the strip directly affected by the construction work. As a result, the investigation was able to define precisely the perimeter of the fort, most of which has never previously been recorded on the ground. It also clarified the relationship of the fort to a nearby linear boundary earthwork known as Casten Dyke South: most previous researchers have mistakenly interpreted the northern side of the fort as a continuation of the dyke, so that it has often been referred to by that name.

Roulston Scar lies at the south-western edge of the Hambleton Hills in the parish of Kilburn High and Low, in the Hambleton district of North Yorkshire, centred at National Grid Reference SE 5149 8152. The land forms part of the North York Moors National Park, but is owned by the Yorkshire Gliding Club, whose clubhouse stands within the monument. The 'scar' element of the place-name refers to the cliff along the western edge of the plateau occupied by the fort. The top of the southern edge of the promontory, called Low Town Brow, commands spectacular views southwards over the low-lying Vale of York. The steep slope below is the site of a well-known hill figure known as Kilburn White Horse, which was created in 1857. The Iron Age fort, whose date was established by excavations in 1969 and 1970, effectively covers the whole of the promontory and is protected as a Scheduled Ancient Monument (number 28298). Casten Dyke South, whose date remains open to

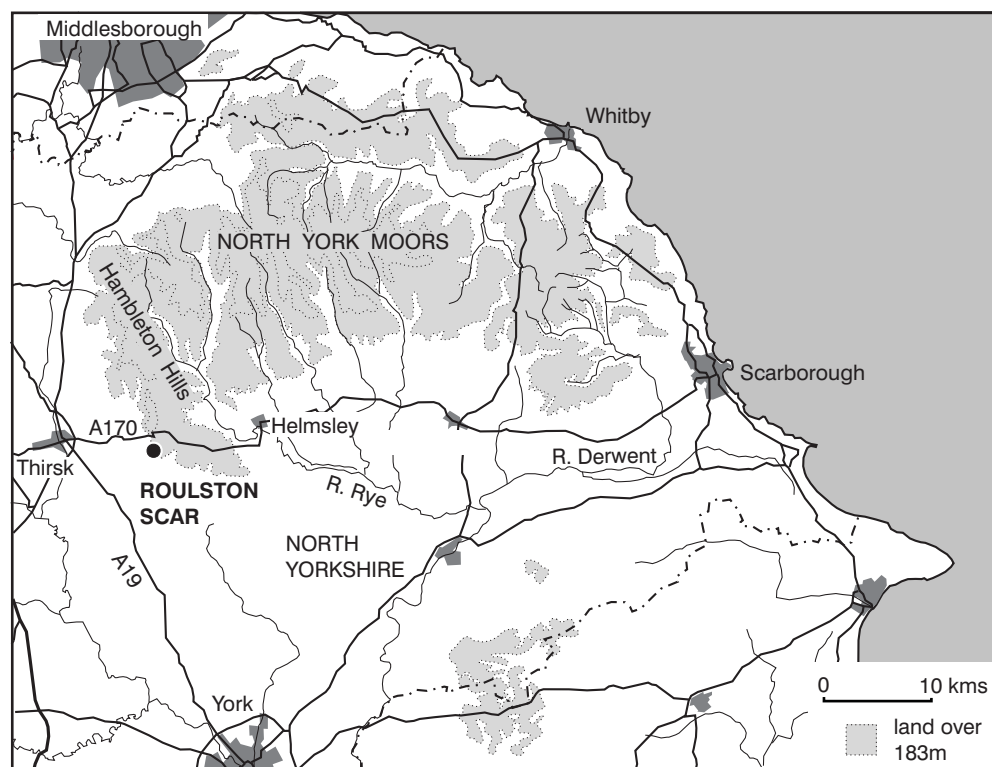


Figure 1.
Location map

question, is similarly protected (number 26934). The monuments are recorded in English Heritage's public archive, the National Monuments Record (NMR), as SE 58 SW 12 and SE 58 SW 51 respectively, and in the Sites and Monuments Record (SMR) for North Yorkshire as 1135 and 1134.01 respectively. The English Heritage field investigation, which covered an area of 30 hectares (74 acres), was carried out at Level 3 standard (as defined in RCHME 1999, 3-4). As a *caveat*, however, it should be noted that at the time of the survey, vegetation conditions were far from ideal for the identification and analysis of surface features. The fieldwork produced an analytical plan of the site as a whole at a scale of 1:2 500 and of the area directly affected by the footpath at a scale of 1:500.

2. GEOLOGY, TOPOGRAPHY AND LAND USE

The cliff known as Roulston Scar forms part of the western edge of an extensive limestone plateau that projects south-westwards from the Hambleton Hills, the plateau effectively forming a corner at the junction of the steep escarpments along the western and southern edges of the North York Moors. The top of the promontory, which reaches a maximum of 286m above sea level, is fairly level as a whole, but slopes gently downwards to the east and south. The underlying geology has also produced a series of low terraces and shallow linear depressions which run from west to east. The summit commands broad views, especially over the low-lying ground to the south and north-west. Hood Hill, an outlying eminence less than 1km to the west which is the site of a supposed medieval motte and bailey, obscures the foreground of the prospect in that direction. Roulston Scar, and the adjacent Ivy Scar, which forms the south-western tip of the promontory, are sheer cliffs of exposed buff-grey gritstone and oolitic limestone (Staniforth 1993, 33). These stand up to *c* 30m in height and are an imposing landmark, especially when seen from the west (Figure 2). Low Town Brow, which forms the southern edge, is an extremely steep slope with a gradient of up to 1 in 1, but it is not sheer at any point nor are there many rock outcrops. The eastern edge of the promontory, at least for the purposes of this report, is defined by a narrow valley known as Boar's Gill (or apparently Posgill in the mid-19th Century) which cuts northwards into the escarpment and bends to the west as it becomes gradually more shallow. A minor stream, which springs near the head of this valley, has cut a deep, steep-sided ravine along the floor of the valley as it runs southwards into the Vale of York. Thus, the natural topography leaves a neck of level ground, some 200m wide at its narrowest, on the northern side of the promontory: this was the point chosen for the most massive stretch of the Iron Age rampart.

The analytical survey identified some evidence for relatively early cultivation, possibly a brief episode of medieval date, on the south-eastern shoulder of the hill (see Section 4.4). Elsewhere, the thin layer of infertile topsoil that covers most of the top of the plateau is likely to have supported heather moorland throughout the whole of the historic period until the earlier 19th Century. From the medieval period



*Figure 2.
View of
Roulston Scar
from the west,
with Hood Hill
to the right
of the frame*

onwards, if not earlier, the moorland would very probably have been used as seasonal rough pasture and much of the area is listed as ‘common’ on the Tithe Map of 1846 (CROb). The names Low Town Brow and High Town Brow (the latter applying to the promontory to the east of Boar’s Gill) suggest that the grazing rights may have been linked informally with the hamlets of Low Kilburn and High Kilburn, which lie at the foot of the escarpment. The Enclosure Map of 1829 and the Tithe Map of 1846 indicate that at some point between those dates, the western and south-eastern tips of the promontory were divided off from the moorland and put down to arable cultivation, although this was apparently not long-lived (CROa; b; Figure 3). The remainder of the plateau was described in the Tithe Awards as ‘moor’ or ‘heath’ and the First Edition of the Ordnance Survey 6-inch scale map surveyed in 1853 depicts a scattering of pools of standing water (Ordnance Survey 1856; see Figure 9). The Second Edition 25-inch scale map, revised in 1910, indicates that these areas remained boggy at that date (Ordnance Survey 1912). At the time of the English Heritage investigation, only one of these pools retained water, but several could still be identified as shallow depressions.

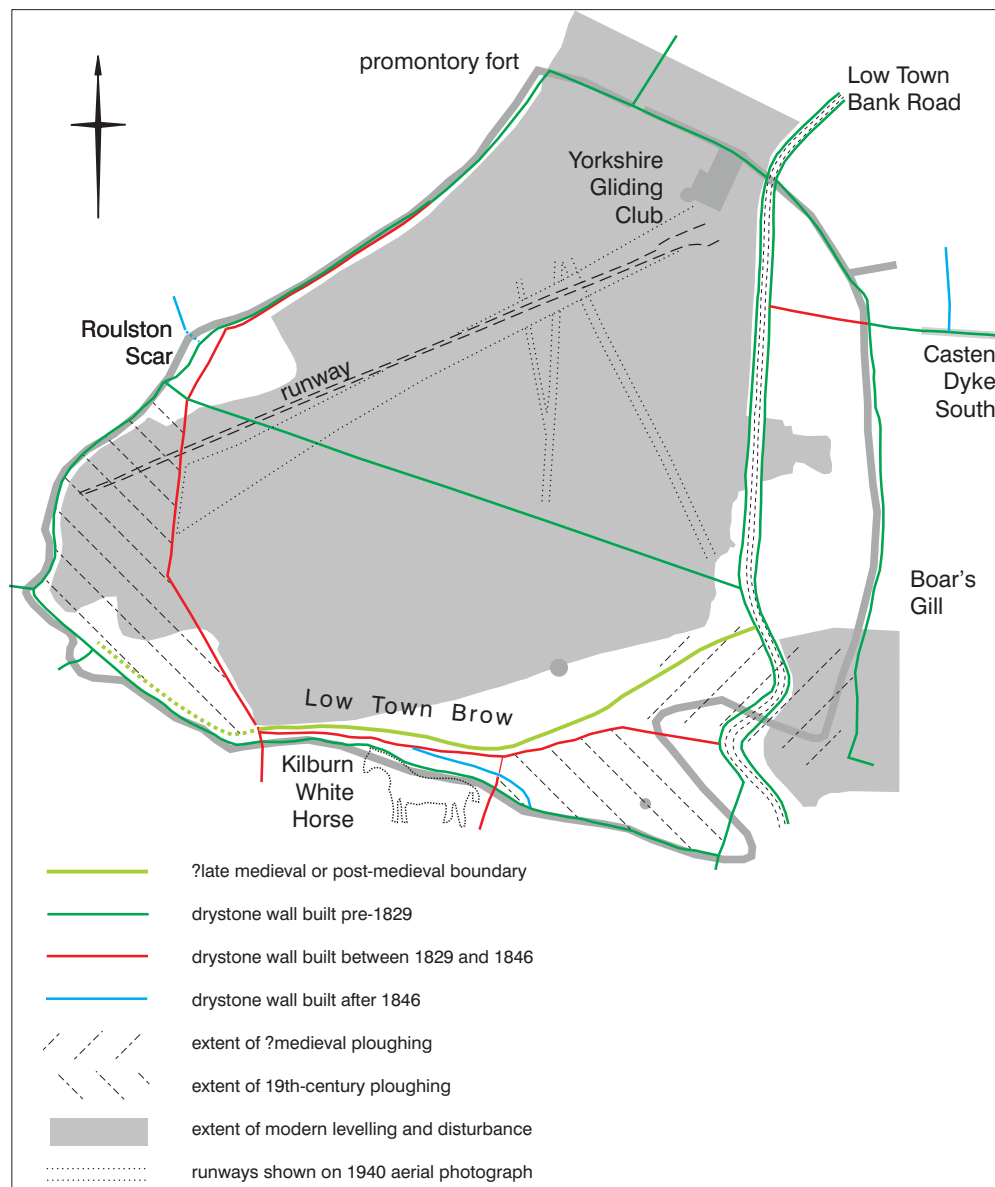
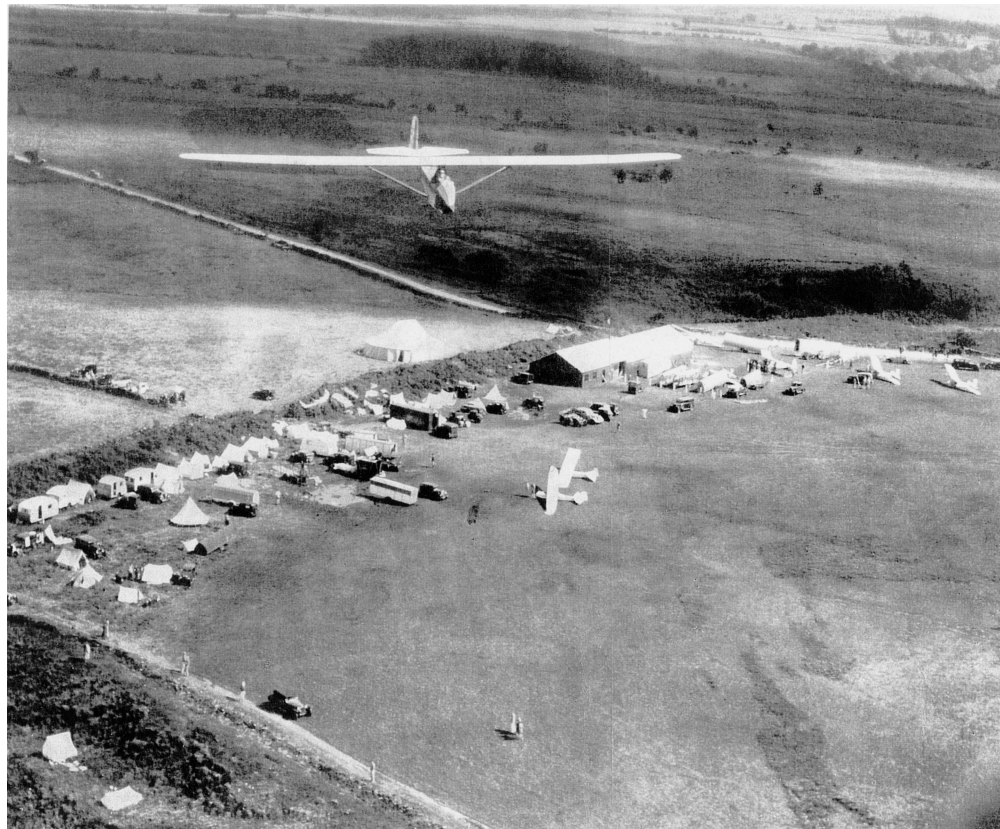


Figure 3.
Land use and
historic field
boundaries

In the course of the 20th Century, several major changes in land-use have transformed the vegetative pattern. Most importantly, since October 1933, the level surface of the plateau has served as a runway for the Yorkshire Gliding Club, initially called the Bradford and County Gliding Club (Riddell 1984, 9-10). As long as the design of the aircraft remained relatively unsophisticated, it was sufficient simply to manage the growth of the heather ground cover and to this end, rabbits were introduced in the mid-1930s; the animals also provided a cash income for the Club (Riddell 1984, 9). The first timber sheds and ancillary buildings were erected in time for the National Championships in 1934 on the same site as the present buildings and a brick hangar, which still stands, was built in 1936. The increasing number of glider launches gradually wore down the surface of the runway until, by the late 1930s, it had reportedly become a 'dustbowl' (Riddell 1984, 12). This erosion would undoubtedly have damaged any archaeological remains that may have existed in the interior of the fort. Early aerial photographs show that the main runway was then on approximately the same alignment as the present one, but that there were several shorter runways which, to judge from the degree of wear, were used less regularly (RAF 1940; see Figures 3 and 6). The earliest known photograph, a copy of which is held by the Yorkshire Gliding Club, was taken from a glider in 1934 and reproduced the following year in a brochure (Figure 4). The rampart of the fort may also have experienced some erosion, for the photograph shows that the bank was a popular vantage point from which to watch the glider launches. Excavations carried out by Tony Pacitto in 1969 and 1970 encountered several 'modern rubbish pits' and other disturbance. During the Second World War, the airfield remained in intermittent military use, but all gliding activity was prohibited and in the post-War years the fortunes of the Club were slow to recover. In 1959, in what proved to be a highly successful attempt to revive membership levels, the construction of the present circular clubhouse was proposed, together with a new workshop and hangar. In 1963, the drainage along the runway was improved and grass was sown (Riddell 1984, 20). At about the same date, the runway was extended to the north into two fields



*Figure 4.
Aerial photograph of
the northern rampart,
taken 1934 (reproduced
by kind permission of
Yorkshire Gliding Club)*

purchased by the Club in 1937, necessitating the levelling of the majority of the northern rampart of the fort. In 1966, levelling, draining and reseeded were carried out over a larger area (Riddell 1984, 23). The extent of this area can be identified on the ground as low earthworks and occasionally as sizeable mounds of bulldozed material. As a result, there is virtually no hope of identifying any surface traces of archaeological features that may once have existed over an area of some 16.4ha (40.5 acres) in the interior of the fort. Work on the hangar proposed in 1959 was eventually started in 1969. It was sited directly on the line of the rampart and a stretch of the bank some 45m long had to be levelled to accommodate it, prompting rescue excavations by Tony Pacitto (see Section 3). The construction of the clubhouse in the interior of the fort just behind the line of the rampart may have resulted in equally significant destruction.

A second major change in land-use was brought about by the Forestry Commission, which, in the mid-1950s, planted a tract of coniferous woodland on the south-eastern shoulder of the promontory (CUCAP 1957). The deep 'backhoe' ploughing undertaken to allow the planting of the trees certainly did considerable damage to the upstanding archaeological earthworks and may well have had an even more severe effect on any features lying below the surface. At the time of the English Heritage investigation, the plantation had reached maturity and some trees were beginning to fall, the upheaval of their rootbowls potentially resulting in further damage to buried archaeological features.

The third major change in land-use is the development of the natural view-point, especially the stretch of Low Town Brow overlooking Kilburn White Horse, as a visitor attraction. This has led to the construction of a car park at the foot of Low Town Brow and another adjacent to the Low Town Bank Road, which cuts through the fort on a north to south alignment. In an attempt to minimise erosion, a number of metalled footpaths have been constructed, one of which follows the southern and western perimeters of the fort and forms part of the Cleveland Way. The path whose construction prompted the investigation by English Heritage was intended to improve access for wheelchair users to the view-point above Kilburn White Horse and to complete the route along the edge of the escarpment by linking the existing footpath with the car park next to Low Town Bank Road.

3. PREVIOUS RESEARCH

The Enclosure Map of 1829 and the Tithe Map of 1846 indicate that in the earlier 19th Century, a number of field boundaries - almost certainly drystone walls - were laid out following sections of the perimeter of the promontory fort and Casten Dyke South (CROa; b; see Figure 3). However, this was doubtless done solely for convenience and does not imply any significant concern for the archaeological remains in their own right. The first record of the monuments themselves is the plan surveyed in 1853 for the First Edition of the Ordnance Survey 6-inch (1:10 560) scale map (Ordnance Survey 1856; Figure 5). It is generally agreed that despite official encouragement, the treatment of archaeological earthworks by the Ordnance Survey in the 19th Century varied according to the interest, skill and resources of the officer in charge of surveying each individual map sheet (Owen and Pilbeam 1992, 64-5). In this instance, for whatever reason, only the most massive stretch of the rampart, that running across the northern neck of the promontory, was mapped, despite the considerable size of the earthwork along the eastern side of the perimeter and the fact that it fairly clearly continues the line of the northern rampart. The name 'Casten Dyke' was applied both to the northern rampart of the fort and to a linear boundary earthwork 1km to the north and this lead was followed by subsequent map editions. The name was later agreed to apply only to the more northerly earthwork, but it had already been widely applied to the fort in archaeological literature, so that the two have come to be distinguished as Casten Dyke North and South. The initial use of the name suggests that the early Ordnance Survey fieldworkers may have interpreted the rampart and the nearby linear boundary earthwork referred to in this report as Casten Dyke South as parts of a single monument. This basic misrepresentation of the plan of the fort was to have important consequences for subsequent interpretations of the site, for the original depiction was perpetuated, at a larger scale, by the First Edition and Second Editions of the 25-inch map and eventually by the current 1:2 500 scale map (Ordnance Survey 1893; 1912; 1978). The only major revision was the depiction of a gap mid-way along the northern rampart; at face value, this would seem to indicate that the gap was created after 1853, but there is other evidence to the contrary (see Section 4.2).

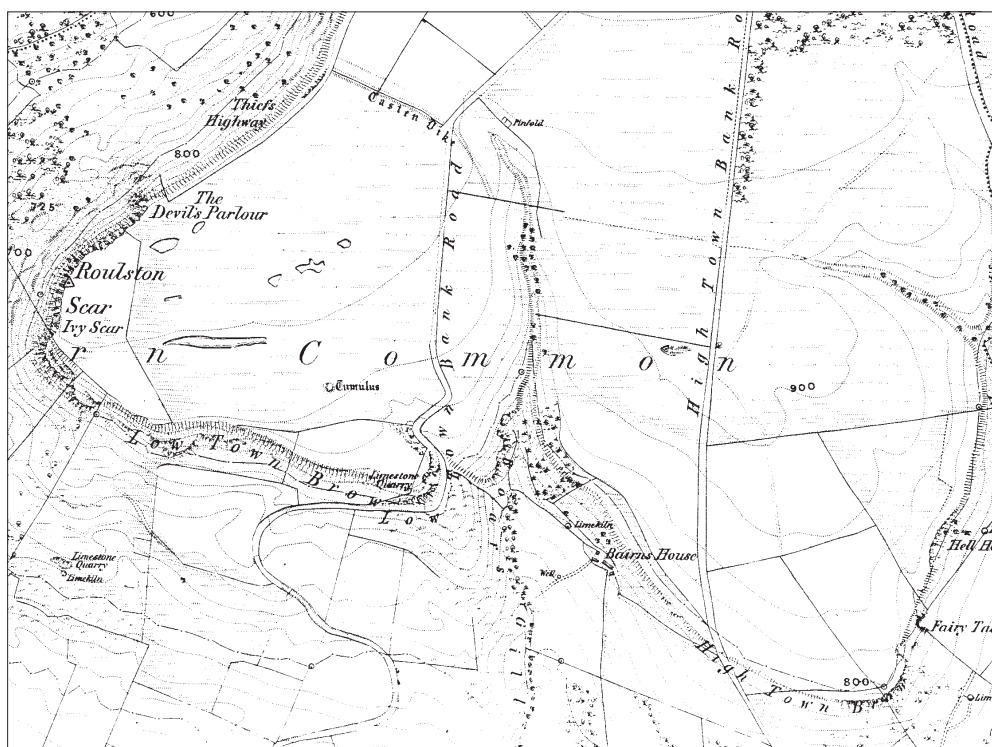


Figure 5.
Map of the fort
surveyed 1853,
reduced from
1:10 560 scale
(reproduced from
the 1856 Ordnance
Survey map)

At some point soon after November 1857, when Kilburn White Horse was completed, the local antiquarian William Grainge visited Roulston Scar. He recorded that the *tumulus* (that is, a Bronze Age barrow or burial mound) in the interior of the fort, which had been mapped by the Ordnance Survey about five years earlier, was about 40 yards (36.6m) in diameter and 6 feet (1.8m) high (Grainge 1859, 351). While such a height is entirely believable, the suggested diameter is unlikely to be genuine and is more than three times that suggested by the Ordnance Survey map and the English Heritage survey. He also commented that the barrow did not appear to have been ‘opened’, that is, looted or crudely excavated by some earlier antiquarian. However, he went on to describe a ‘cup-shaped cavity in the top, about three feet [0.9m] deep’, which is not depicted on the First Edition 6-inch scale map, but is shown on subsequent editions at 25-inch scale (Ordnance Survey 1856; 1893; 1912). The existence of this feature suggests that contrary to Grainge’s belief, the monument almost certainly had been looted or excavated. Turning to the promontory fort and the series of linear boundary earthworks to the north, Grainge remarked that ‘...their situation and structure point them out as the work of a pastoral and warlike people’. In the mid-19th Century, understanding of the duration and character of the prehistoric periods remained very sketchy and Grainge, like most other antiquarians of the day, relied heavily on the accounts of the ‘Celtic’ tribes of the late Iron Age written by Roman historians. Consequently, he suggested that the warlike pastoralists might be equated with the local tribe, the Brigantes, and that the earthworks might have been built by them as defences against the invading Roman army. Describing the northern rampart of the fort, he wrote:

...there is a mound twelve yards [11.0m] wide by about nine feet [2.7m] in height, with a trench of corresponding width and depth on the north side. This has been a work of immense labour; how far it runs in an easterly direction we know not, as we did not explore its full extent.

Grainge 1859, 351-2

After these early investigations, in effect no archaeological research into the monument was carried out for almost a century. In May 1957, the aerial archaeologist JK St Joseph took two oblique aerial photographs of the promontory from a distance (CUCAP 1957). However, the primary target for these was evidently Kilburn White Horse (then in its centenary year), so the images revealed little about the fort that had not been recorded previously. In 1960, Nicholas Thomas described the site in his gazetteer of prehistoric England as ‘the largest and strongest of north-eastern Yorkshire’s promontory forts’, dating it provisionally to the 2nd to 1st Century BC (Thomas 1960, 252). Aerial photography was at that time becoming much more widely used as an archaeological technique and Thomas apparently had access to the excellent vertical photographs taken by the Royal Air Force under low evening sunlight in May 1940, which clearly show the earthwork on the eastern side of the fort (RAF 1940; see also Figure 6). Less clear images had been taken in March 1946 and June 1950 (RAF 1946; 1950). Based on this evidence, Thomas made the important observation that the rampart could be seen to continue southwards along the western edge of Boar’s Gill and through field examination he was able to confirm that this eastern perimeter survived as a ‘terrace’. This was the first explicit recognition that earlier plans of the fort were incomplete and that the northern rampart might actually form part of a complete enclosure. He also stated emphatically that the fort should not be confused with Casten Dyke South, which he described as an ‘altogether later earthwork’.



Figure 6.
 Extract from RAF
 aerial photograph
 taken 1940
 (Crown copyright.
 NMR 6382)

Unfortunately, little account was taken of Thomas' observations and the form of the perimeter continued to be fundamentally misunderstood. In an article also published in 1960, Raymond Hayes suggested that the northern rampart of the fort formed part of the linear boundary earthwork known as Casten Dyke South (Hayes 1960, 22 and fig opposite page 28). This suggestion, which made explicit the interpretation first hinted at by the depiction on the Ordnance Survey First Edition 6-inch scale map, was repeated by Hayes in a later discussion (Hayes 1963, 60). From his small-scale plan of the monuments, it seems likely that his understanding of the extent of both monuments relied heavily on the depiction on the then-current 6-inch scale mapping. This was a reduced version of the 25-inch scale mapping carried out in 1910, which in essence replicated the incomplete plan of the monuments made for the First Edition 6-inch scale map in 1853. The map used by Hayes showed the linear earthwork referred to in this report as Casten Dyke South running from the side of Boar's Gill eastwards across High Town Brow towards the head of another valley called Hell Hole, so as to cut off a block of the landscape to the south (Figure 7). It also appeared to show that the northern side of the promontory fort ended against the western edge of Boar's Gill almost directly opposite the western terminus of the linear boundary earthwork. At first glance, therefore, it might reasonably be interpreted as a westward continuation of the same linear boundary, its line interrupted for a short distance by the topography. Casten Dyke North extends north-eastwards from the edge of the escarpment towards the head of a valley called Flassen Gill. Some 5kms further to the north, the Hesketh Dyke runs eastwards from the edge of the escarpment to the head of Sledhill Gill. Hayes noted the similar relationship of all three boundaries to the natural topography and their general association with the much longer linear boundary known as the Cleave Dyke, which is undoubtedly of

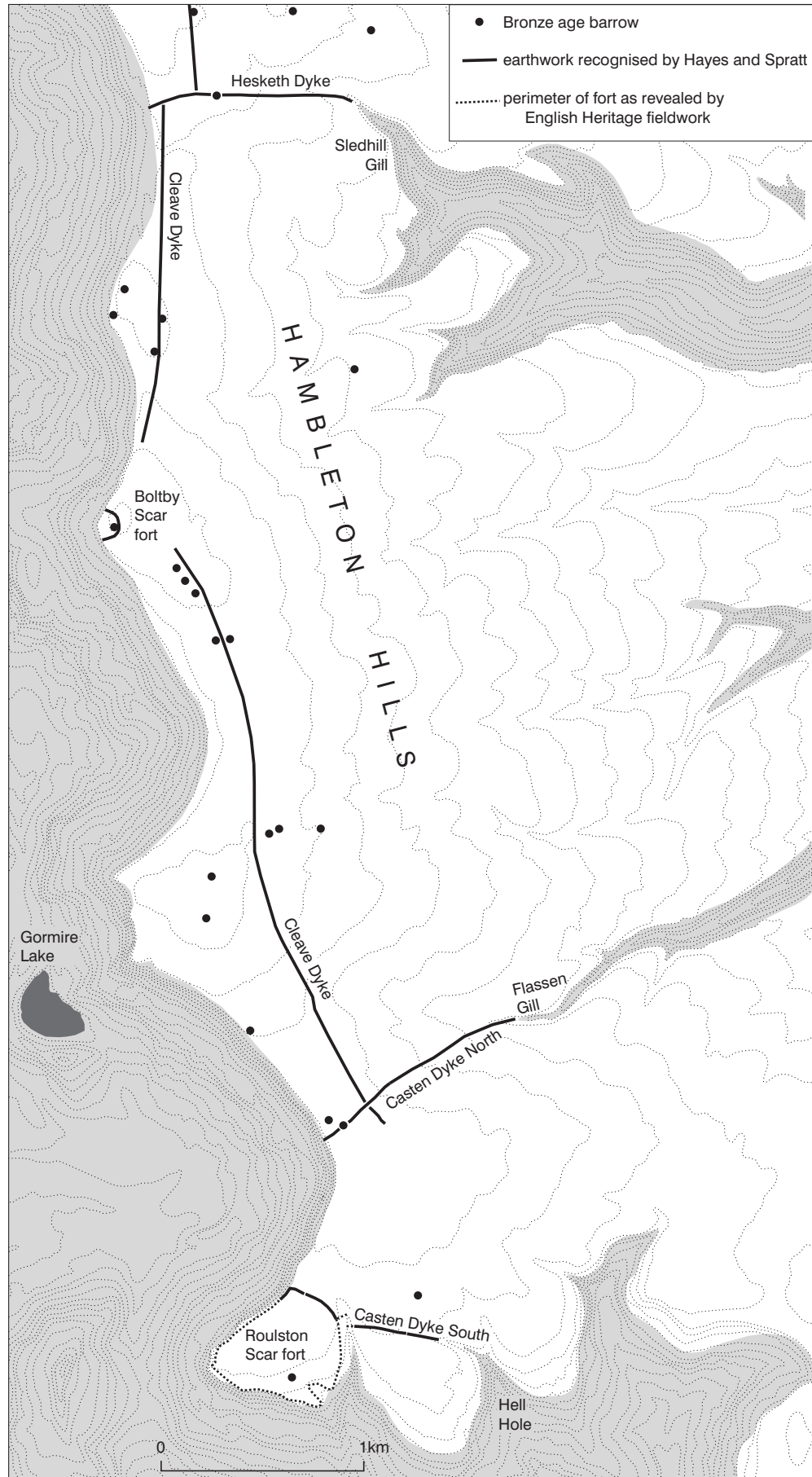


Figure 7.
 The fort
 in relation to
 other earthworks

prehistoric origin. On this evidence, he concluded that all were of similar date, and therefore of prehistoric origin, inferences which the English Heritage investigation suggests to be incorrect.

The majority of the most massive stretch of the rampart was bulldozed without archaeological intervention in the mid-1960s in order to extend the glider runway. The levelling of another stretch in order to construct a second aircraft hanger prompted rescue excavations by Tony Pacitto in 1969 and 1970 (Pacitto 1970; 1971). A series of trenches, whose positions are shown on Figures 9 and 10, were excavated across the threatened earthwork. The excavator concluded that the rampart had been constructed in a single phase as a 'box rampart', that is, an earthen bank reveted with timber and reinforced by an internal framework. However, based on Pacitto's records of his excavations, it can arguably be inferred that there were two phases of construction, a possibility which is discussed in detail in Section 4.2. No pottery was found with which to date the monument conclusively, but the form of the rampart strongly suggested a date in the early/middle Iron Age, around 500 to 400 BC. The results of the excavations were not fully published, but the primary archive material is recorded on microfilm in the National Monuments Record (Pacitto 1969-70). Pacitto also took two useful series of low-level oblique aerial photographs in February 1975 and under a light covering of snow in December 1976, which are also held in the National Monuments Record (Pacitto 1975; 1976). In the wake of Pacitto's work, the site was mentioned in two gazetteers of Iron Age hillforts, the later one referring to it as a 'detached piece of Casten Dyke South' (Challis and Harding 1975, 45; Hogg 1979, 144). As a result, the confusion over the relationship between the two earthworks lingered on.

In February 1977, Frank Colquhoun of the Ordnance Survey Archaeology Division carried out a field examination of the monument to inform the map revision work that underpins current 1:2 500 map sheets (NMRa). A series of vertical aerial photographs had been taken by Meridian Airmaps in July 1972, in low evening sunlight which once again clearly showed the eastern perimeter of the fort in sharp relief (Meridian Airmaps 1972). However, the photographic sortie made by the Ordnance Survey itself in May 1975 was flown when the sun was high (Ordnance

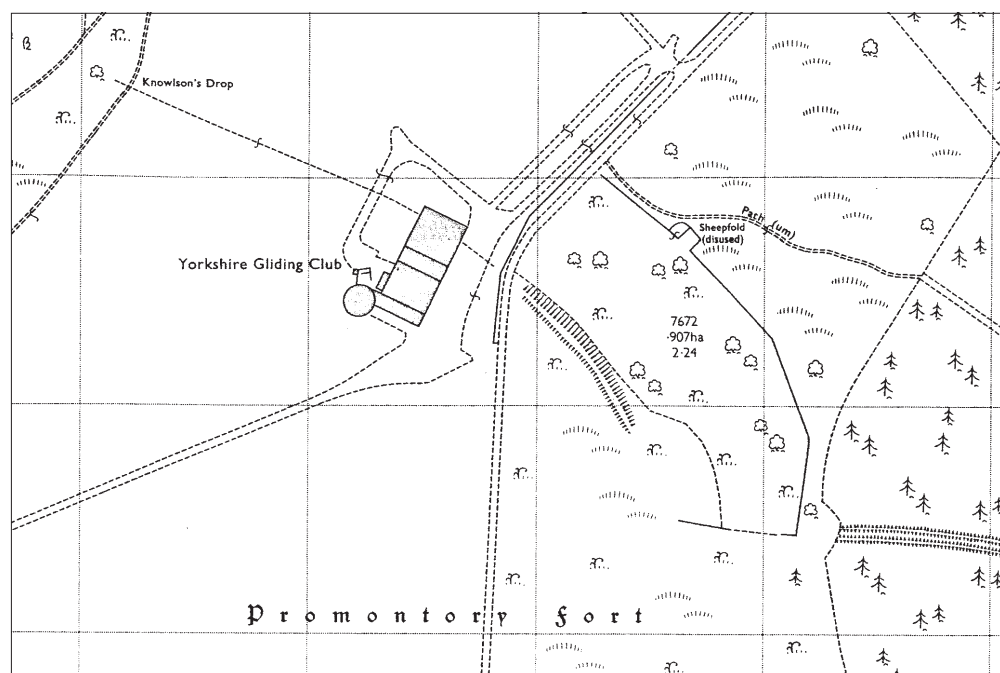


Figure 8.
Map of the fort surveyed 1977, reduced from 1:2 500 scale (reproduced from the 1978 Ordnance Survey map with the permission of Ordnance Survey on behalf of The Controller of Her Majesty's Stationery Office, Crown copyright. License No. GD030859G)

Survey 1975). As a result, while the line of the levelled stretch of the rampart was clearly visible as a cropmark, none of the earthworks were very clear. Perhaps because of this, the course of the levelled stretch was shown as a dotted line on the map, but the section of the earthwork running along the edge of Roulston Scar, which had been depicted on previous maps and still survived in good condition, was omitted (Ordnance Survey 1978; Figure 8). The quality of the photographs perhaps also accounts for Colquhoun's ambivalent interpretation of the monument, for while he described it as a promontory fort, he also followed Hayes' in confusing the course of the rampart with that of Casten Dyke South, suggesting that his examination of the remains was not thorough. His written description refers to a break in the line of the rampart, 100m long, which corresponds very approximately to the breadth of the northern end of Boar's Gill, indicating that, like earlier investigators, he was conflating the two separate earthworks. He acknowledged that since they were physically separated, it was difficult to establish through field survey whether they were contemporary with each other. Yet he went on to suggest that they probably were, the fort thus formed by two linear earthworks which effectively enclosed two different promontories; the English Heritage investigation suggests that neither conclusion is correct. However, Colquhoun also noted that there was no trace of occupation in either of the enclosed areas, an observation which the English Heritage investigation broadly supports.

Don Spratt, the noted Yorkshire prehistorian, was scarcely more confident in his interpretation. In articles published in the same year he referred to the site as a hillfort, probably of early Iron Age date, and as an integral part of Casten Dyke South (1982a, 171; 1982b, 42; see also Spratt 1993, 146 and 152). In his schematic plan of Casten Dyke South, he sketched on the line of a 'berm?', defining part of the eastern side of the fort (Spratt 1982b, fig 4). This term usually implies a level strip, in this case presumably corresponding to the course of the silted ditch. Spratt's use of the word to describe an earthwork whose most imposing element is actually the steep scarp of the outer face of the rampart bank is probably significant. Together with the excessively curvilinear course of the sketched line, it suggests that he may have been relying wholly on the ambiguous term 'terrace' used by Thomas more than twenty years earlier, without making use of aerial photographs or visiting the site on the ground.

Following his excavations at the fort on the escarpment edge at Eston Nab in Cleveland, Blaise Vyner reviewed the evidence from all five sites in the region which could, with varying degrees of confidence, be classed as Iron Age forts (Vyner 1988, 91). Eston Nab itself originated as a palisaded enclosure in the later Bronze Age, possibly around the 8th Century BC, and was subsequently modified several times. This development culminated in the early 5th Century BC in the construction of a bank and ditch with timber elements, comparable to that excavated at Roulston Scar by Pacitto. Vyner also offered a reinterpretation of an alleged 'hearth' excavated in the 1930s in the ditch of the fort on the edge of the escarpment at nearby Boltby Scar (SE 506 857), suggesting that this too might represent the collapsed remains of a burnt timber revetment. Vyner concluded that the three forts potentially belonged to broadly the same period in the early/middle Iron Age. He also repeated Spratt's argument that the enclosure at Boltby Scar seems to have been in use when the Cleave Dyke was laid out, since it occupies a central position in relation to a gap in the linear boundary (Spratt 1982a, 175; Vyner 1988, 94). In Spratt's own revision of his earlier work, he went on to apply this same idea to the promontory fort at Roulston Scar (Spratt 1993, 134). This offered a convincing model of the forts as separate entities occupying nodal locations in a landscape sub-divided by linear boundary earthworks.

In August 1995, an examination was carried out to inform proposals to protect the remaining stretch of the northern rampart of the fort and Casten Dyke South as Scheduled Ancient Monuments (English Heritage 1995). This concluded once again that the earthworks formed part of a single linear boundary linked to the Cleave Dyke, but both proposals were rejected. In March 1997, however, David Pritchard carried out a brief but more effective inspection of the site prior to its protection as a Scheduled Ancient Monument in July of that year as part of English Heritage's Monuments Protection Programme (English Heritage 1997). For the first time, an attempt was made at recording the course of the eastern perimeter reasonably accurately from aerial photographs and the examination on the ground was sufficiently thorough to detect its course into the plantation on the south-eastern shoulder of the promontory. On the other sides, the edge of the high ground was taken to correspond to the probable line of the perimeter.

The analytical survey carried out by English Heritage in 2001 was the first detailed analysis of the surface remains and resulted in the first accurate plan of the whole perimeter, at 1:2 500 scale. The accompanying documentary research was limited to a review of the secondary sources and some primary sources, particularly historic maps held in the County Record Office (CRO) and the excavation plans and section drawings deposited by Tony Pacitto in the National Monuments Record. In addition to the black and white aerial photographs already mentioned, the investigation also made use of specialist oblique aerial photographs in both black and white and colour taken by the Royal Commission on the Historical Monuments of England in January 1997, which are also held in English Heritage's National Monuments Record (RCHME 1997a; b).

4. DESCRIPTION AND INTERPRETATION OF THE SITE

4.1 Barrows

Prior to the English Heritage investigation, one round barrow had been recorded within the area covered by the survey, centred at National Grid Reference SE 5153 8139 (marked as Barrow A on Figure 9). This monument, very probably of early Bronze Age date (approximately 2000 BC to 1500 BC) was first recorded by the Ordnance Survey in 1853 as a *tumulus* (Ordnance Survey 1856). The later 25-inch scale map depiction, together with William Grainge's description of 1859, indicates that the barrow was *c* 11m in diameter and 1.8m high (Ordnance Survey 1893; Grainge 1859, 351). Grainge also described 'a cup-shaped cavity in the top', which almost certainly results from looting or an undocumented antiquarian excavation, although the antiquarian did not believe any such damage to have occurred. It is worth noting in passing that this is not depicted on the First Edition map, although it appears on subsequent map editions at 25-inch scale, giving the impression that the disturbance occurred at some point between 1853 and 1859. However, the omission from the earlier map can probably be put down due to the small scale of the depiction, for it seems unlikely that Grainge, who was evidently aware of the possibility of earlier excavations, would not have recognised it as such, had it occurred within the preceding few years. The later map depictions at larger-scale show that the pit had been cut into the mound from the south, partially levelling that side of the earthwork. Aerial photographs show that the monument still survived in June 1950, but by 1968, it was reported by Raymond Hayes in his role as the Ordnance Survey's local archaeological correspondent as having 'entirely disappeared' (RAF 1950; NMRb). This suggests that the mound was levelled in the course of the improvements to the glider runway carried out in 1963 and 1966. However, Christopher Allanson, carrying out map revision work in November 1976, was able to recognise 'some slight ground disturbance' (NMRb). The English Heritage investigation indicates that the southern half of the mound remains reasonably well defined and still stands to a height of 0.2m; in other words, it is sufficiently well preserved that some features may survive below ground. The monument was evidently carefully sited on a 'false crest' to ensure that it would have been visible on the horizon when viewed from the south and east.

The analytical survey identified another possible barrow in the vicinity (Barrow B), centred at National Grid Reference SE 5159 8128. The mound is roughly circular, *c* 8m in diameter and up to 0.3m high. It lies within the area described as 'arable' on the Tithe map of 1846, so it is likely that it originally stood to a greater height and had already been somewhat degraded by the time the Ordnance Survey recorded the area in 1853 (CROb; Ordnance Survey 1856). While the remains of Barrow A can be interpreted with some confidence as being of Bronze Age date, the same cannot be said of Barrow B on the evidence of surface survey alone. Don Spratt (1993, 151) has made the point that ploughing and other disturbance tend to make it difficult to distinguish between the plans of smaller Bronze Age round barrows and Iron Age square barrows, and in terms of its size, Barrow B would be typical of the norm for Iron Age square barrows (Mytum 1995, fig 3.1). A number of these monuments, which seem to have been constructed between the 4th and 1st Centuries BC, lie on the North York Moors, particularly on the southern escarpment, the nearest examples currently known lying some 21kms due north at Carlton Bank and 27kms to the east at Cawthorn Camps (centred at NZ 518 025 and SE 788 901 respectively). Like Barrow A, Barrow B was clearly sited with care in relation to the topography: it stands on the crest of the hill at the mid-point of a slight natural indentation, so that it would have been visible on the horizon when seen from the foot of the escarpment to the south.

4.2 The Iron Age promontory fort

As a result of the English Heritage field investigation, the perimeter of the fort can now be seen to be an almost complete circuit some 2.1kms (1.3 miles) in length, describing an irregular triangle in plan, with an internal area of 24.5ha (60.5 acres). Some 67% of the interior, an area of 16.4ha (40.5 acres) was deliberately graded or infilled to improve the glider runway in the 1960s and now retains negligible traces of earthworks, most of which do not warrant detailed examination through field survey. The English Heritage investigation therefore concentrated on the rampart itself and the narrow band of ground immediately inside it which has been least affected by recent activity. At the time of the survey, scrub and dense bracken covered much of this area and it is not impossible that slight features surviving as earthworks B for example, house platforms or other evidence for prehistoric occupation B may have been overlooked or misinterpreted as a result. The largest expanse of undisturbed moorland, where prehistoric features are likely to be best preserved both as earthworks and below ground, lies to the east of Low Town Bank Road (see Figure 3). Although much of this area is covered only by heather and bilberry bushes, no firm evidence for prehistoric settlement was identified by the English Heritage investigation, concurring with observations made by previous fieldworkers.

Historic Ordnance Survey mapping and early aerial photographs indicate that the most massive section of the perimeter was the stretch crossing the neck of level land on the northern side of the promontory, which Tony Pacitto's excavations established was the remains of a 'box rampart' (see below). Most of this had been levelled by 1970, but the early map and aerial photographic sources allow the course and extent of the destroyed earthworks to be plotted fairly accurately. The description given by Raymond Hayes, who examined the earthwork a few years before its destruction, confirms that made a century earlier by William Grainge (Hayes 1960, 22; Grainge 1859, 351-2). On average, the bank was 7.2m wide and 3.0m high, comprising earth and limestone rubble; it was surmounted by a dilapidated drystone wall, which almost certainly corresponds to a post-medieval field boundary shown on historic maps from 1829 onwards. The external ditch was up to 5.4m wide and 0.9m deep, although the First Edition 6-inch scale map indicates that only its western end was well preserved as an earthwork (Ordnance Survey 1856). The English Heritage fieldwork and early aerial photographs show that there was also a substantial counterscarp bank extending along the northern lip of the ditch (RAF 1940). The eastern part of this had apparently already been ploughed flat by 1940 and the western part had been somewhat degraded by 1950, which probably explains why Hayes made no mention of its existence.

In 1969 and 1970, Tony Pacitto carried out excavations to examine the last major stretch of the rampart then surviving west of Low Town Bank Road, in advance of the levelling of that section of the earthwork. He then concluded, and still considers, that his findings demonstrated the existence of a 'box rampart' constructed in a single phase. This form of defence, which is characteristic of the early/middle Iron Age, would have presented a vertical external face up to 4m in height, with a walkway along the top probably screened by a palisade (Cunliffe 1991, fig 14.3). However, reconsideration of Pacitto's own records of his excavations suggest that more than one phase of construction may be represented (English Heritage is grateful to Tony Pacitto for considering this theory, for which the author takes sole responsibility). His trenches revealed two lines of fairly large, closely-spaced post-holes running parallel to each other at an average distance of 2.2m apart, cut into the ground surface preserved beneath the main rampart bank (Pacitto 1969-70; 1970; 1971; see also Figure 10). These were interpreted by Pacitto as settings for upright timber posts

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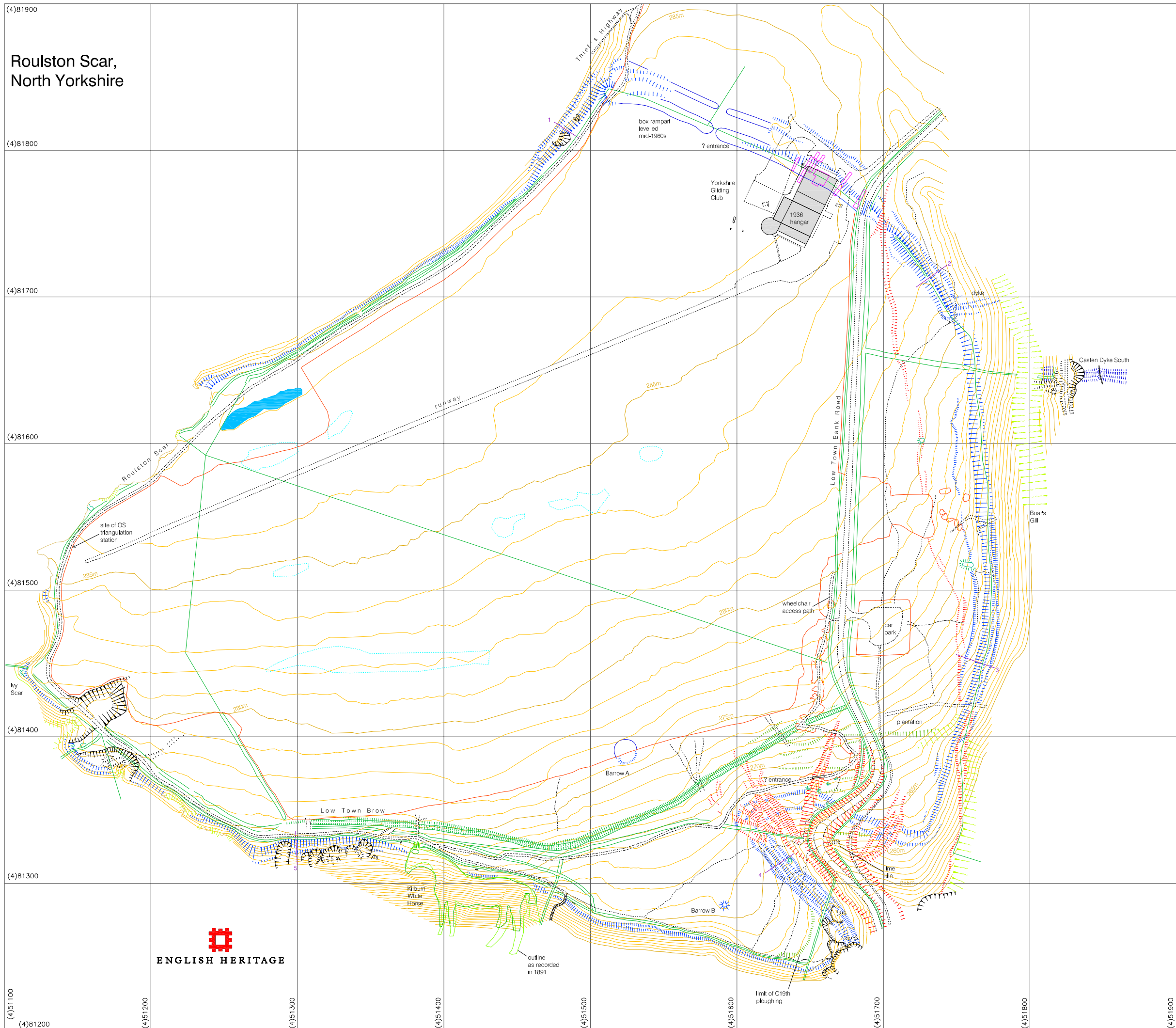


Figure 9.
English Heritage plan of the
promontory fort
at 1:2 500 scale

KEY

NATURAL FEATURES

- rock outcrop / cliff edge
- natural scarps
- contours at 1m intervals (5m intervals highlighted)
- standing water and boggy ground
- extent of standing water and boggy ground as depicted on historic maps

ARCHAEOLOGICAL FEATURES

- Bronze Age and Iron Age earthworks, and Casten Dyke South
- approximate extent of prehistoric earthworks as depicted on historic maps and photographs
- medieval or later trackways
- medieval or later cultivation remains
- post-medieval field boundary
- post-medieval quarries and associated trackways and spoil heaps
- 19th-century field boundaries surviving as earthworks
- 19th-century field boundaries as depicted on historic maps
- Kilburn White Horse as recorded in 1891
- Second World War weapons pits

MODERN FEATURES

- standing buildings
- roads, tracks and paths
- extent of modern levelling, disturbance and spoil
- trenches excavated by Tony Pacitto in 1969 and 1970
- profiles across ramparts (see Figure 12)

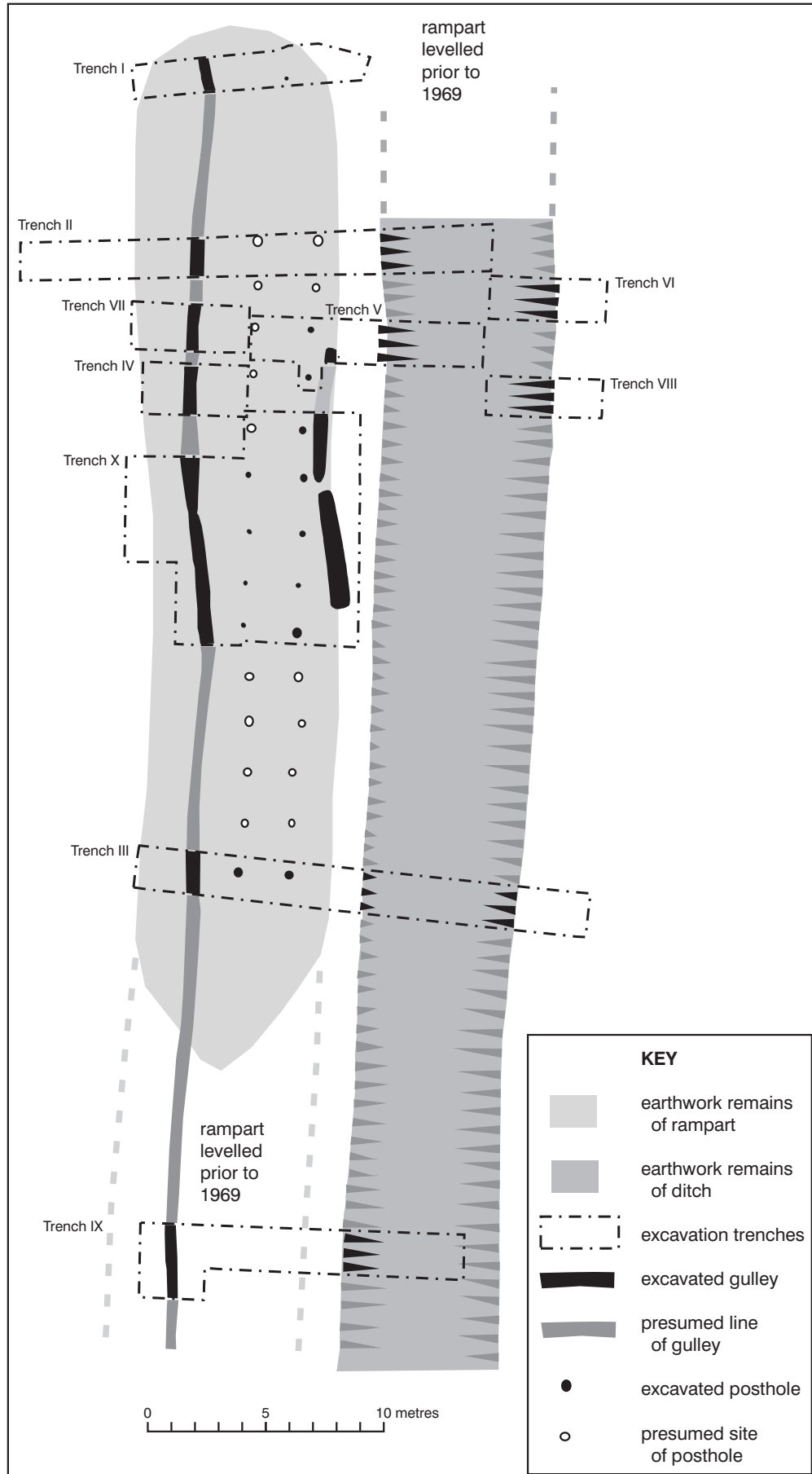
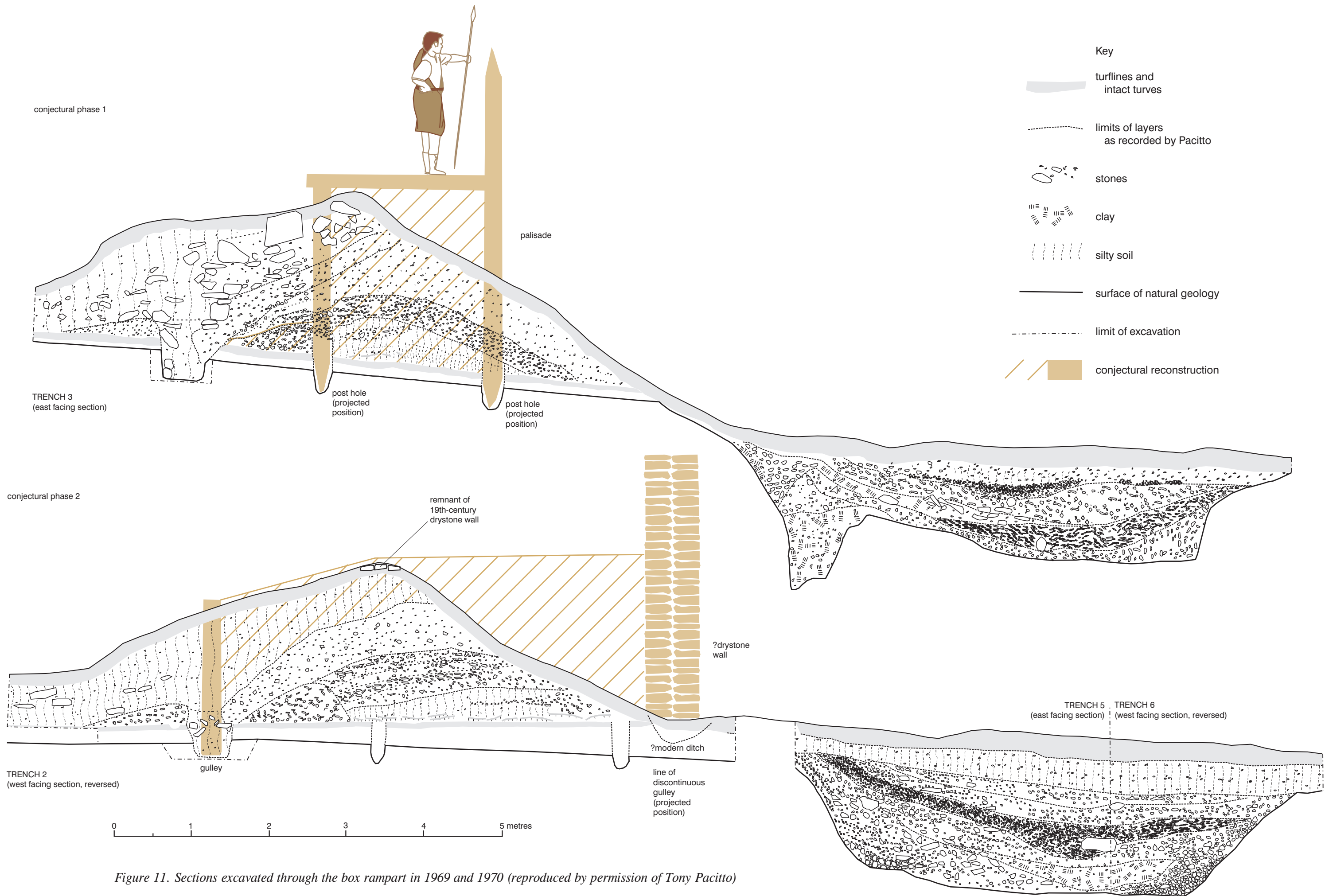


Figure 10.
Plan of the
main features
excavated in
1969 and 1970
(reproduced by
kind permission
of Tony Pacitto)



which would have reinforced the core of the box rampart, but may be re-interpreted as evidence for posts designed to support timber hoardings forming the front and back of a relatively narrow early rampart. The rear of the structure may have been buttressed by a low dump of earth, although this may have been added in a later episode. This deposit was interpreted by Pacitto as upcast from a gulley running along the rear of the rampart, which may actually relate to a second major phase of construction. The position of the outer line of post-holes shows that the base of the conjectured early rampart would originally have been separated from the ditch by a level berm more than a metre wide. At least one of the excavated sections suggests that the ditch which accompanied this first phase of the rampart may also have been relatively narrow, with a flat base and nearly vertical sides, its profile presumably in part reflecting the geological nature of the limestone into which it was cut. It is possible to infer that this first rampart fell into disrepair and that the material that formed its core then slumped outwards and downwards. In what may be interpreted as a second major phase of building, a deep gulley was cut through the tail of the collapsed material from the earlier phase, its meandering course slightly at odds with the straight lines of post-holes. In places, the gulley was found to contain the carbonised remains of timbers, presumably the remnants of upright posts. At the front of the rampart, a shallow, discontinuous gulley was dug running parallel to the deeper gulley at the rear. The depth of this feature suggests that it is unlikely to have held timber posts, but it may have provided a foundation for some other form of façade, such as a drystone wall. The rampart was also heightened and broadened by dumping material between these two lines. The ditch may have been widened in the same constructional episode and the sides cut to a more sloping profile (see Figure 11).

The First Edition 25-inch scale map surveyed in 1891 and subsequent editions indicate that there was a gap in the box rampart approximately mid-way across the narrow neck of the promontory, very close to the line of the present landing strip (Ordnance Survey 1893). The gap is not shown on the First Edition 6-inch scale map surveyed in 1853, but this may be due to the limitations of the scale, for the depiction also omits the major interruption immediately to the east of Low Town Bank Road, which certainly existed in 1853 (Ordnance Survey 1856). The cropmark of the ditch, where it is visible on aerial photographs, seems to confirm that the gap was indeed an original feature. As such, it can be interpreted with some confidence as the position of an original entrance - possibly the only one - into the fort. Circumstantial support for this theory can be found in the central position of the gap in relation to the approach dictated by the natural topography and the fact that it was flanked on either side by almost perfectly straight stretches of rampart, which are both characteristics typical of entrances into Iron Age forts. Historic maps from 1829 onwards indicate that immediately to the west of the gap, a post-medieval field boundary on the north joined the wall running along the top of the rampart at right angles. This suggests that the gap continued to be used as a gateway until the levelling of the earthwork took place.

The levelling of the box rampart carried out in the 1960s was extremely thorough: the earthwork has effectively been destroyed over a distance of some 190m. However, as noted by Spratt (1989, 44), faint traces of stretches of the main rampart, ditch and counterscarp bank still survive, suggesting that some features, including the post-holes of the box rampart and the important primary silts of the ditch, probably survive below ground. Even at the point where Low Town Bank Road crosses the earthwork, the outer face of the rampart can still be detected as a distinct scarp. However, of this originally massive box rampart, only the westernmost end, at the point where it reaches Roulston Scar, and the easternmost end, to the east of Low Town Bank Road, remain well preserved.

At the western end, the very terminus of the box rampart survives: the rampart bank stands 1m high, with a ditch of corresponding depth, whose steep sides indicate that it is cut into the underlying limestone. The terminus of the counterscarp bank is also fairly prominent. All these earthworks terminate abruptly at the edge of the escarpment, indicating that the box rampart ended at this point, but all three elements of the defences are continued south-westwards along the contour in a slightly different form for a further 75m (see Figure 12, profile 1). The main rampart is continued by a precipitous scarp up to 4m high, clearly produced by simply cutting back into the already steep face of the natural slope. Presumably, this would have been surmounted by a timber palisade, which would have effectively continued the face of the box rampart. In two places, quarries which are probably of medieval or later date have bitten into the line of the scarp and these later features account for the sinuous line of the earthwork depicted on historic Ordnance Survey maps. The course of the ditch, originally probably narrow and steep sided, can now be traced as a level berm up to 3m wide. The aerial photograph taken in 1934 held by the Yorkshire Gliding Club shows several tents standing on this inaccessible ledge (see Figure 4). The counterscarp bank, like the main rampart, is essentially continued by a scarp formed by a slight accentuation of the steep natural slope: though it stands no more than 0.4m high internally, its outer face is up to 1.5m high.

To the east of Low Town Bank Road, the earthwork remains of the box rampart are well preserved over a distance of *c* 100m. From a point just west of the road, the course of the circuit starts to bend southwards and so begins to converge with the contours of the western side of Boar's Gill. The use of the natural slope in this way - a common characteristic of Iron Age forts - would have effectively maintained the formidable external appearance of the defences, while reducing the effort necessary to construct them, for this stretch of the bank stands only 1.0m high internally, while its outer face remains a steep scarp up to 3.0m high (Figure 12, profile 2). The ditch survives only as a level berm, its width defined by the low counterscarp bank, which, like the bank of the main rampart, is far more prominent on the exterior. In the interior, a broad, shallow depression running along immediately behind the rampart is likely to represent a quarry hollow, presumably the source of some of the material used to form the core of the box rampart. A gap in the bank immediately east of Low Town Bank Road is almost certainly not an original entrance; it appears to have been worn down by traffic passing along a hollowed trackway, which is probably of medieval or later date (see Section 4.5).

A change in the form of the defences occurs at the point where the circuit draws closest to the edge of Boar's Gill. Here, the bank that represents the remains of the box rampart ends abruptly, its originally squared terminus now slightly distorted by a footpath that has worn a gulley into the earthwork. At the same point, a dyke formed by a broad, shallow ditch with an equally broad bank up to 0.3m high along its southern side turns at right angles away from the rampart and extends down the slope for 32m to the very edge of the steep-sided ravine running along the base of the valley. The sharp change of angle in its alignment in relation to the rest of the perimeter suggests that it cannot be interpreted as the remnant of an earlier linear earthwork running across the neck of the spur. Rather, the relationship of the dyke to the rampart indicates that the two earthworks are broadly contemporary; in other words, the dyke formed part of the defences of the fort. Given the possibility of more than one constructional phase raised by Tony Pacitto's excavations, however, it is uncertain to which phase the dyke might belong. To the south of the intersection of the two earthworks and along most of the southern escarpment, the two upstanding elements of the box rampart - the main rampart and the counterscarp bank - are

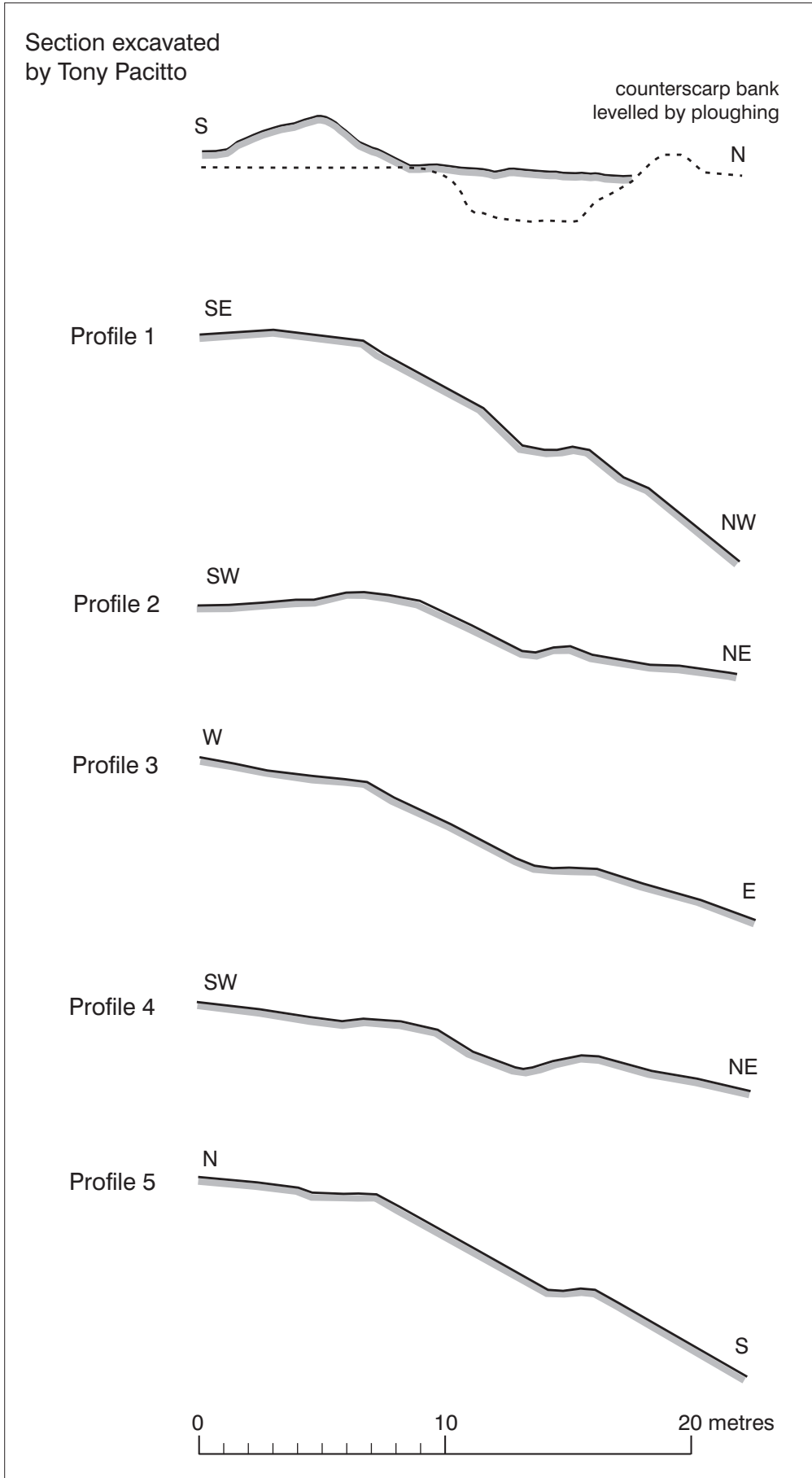


Figure 12.
English Heritage
profiles across
the defences

continued by scarps created by cutting into the natural slope, without any upstanding banks of significant size. Again, the upper scarp would presumably have been surmounted by a timber palisade, which would have effectively continued the face of the box rampart. The intervening ditch survives at best as a narrow strip of level ground (Figure 12, profiles 3-5); this is the terrace or berm referred to by Thomas (1960, 252) and Spratt (1982b, fig 4) respectively. The edge of the quarry hollow behind the box rampart also continues as a prominent scarp, effectively creating a broad, level terrace immediately behind the rampart. As aerial photographs taken under low evening sun conditions clearly show, the earthwork is well preserved in this form along much of the western side of Boar's Gill, except where damaged by later activity (RAF 1940; Meridian Airmaps 1972). However, from a point just within the edge of the forestry plantation, the Iron Age defences are much more difficult to trace, even where their course turns sharply westwards, diverging from the contours and crossing the level shoulder of the escarpment. The deep ploughing undertaken in advance of the tree planting in the late 1950s only partly accounts for the condition of the earthworks, for they are equally slight outside the plantation, on the slope immediately to the west of Low Town Bank Road. It seems likely that ploughing at a much earlier date may also have played a significant part in degrading the earthworks (see Section 4.4).

At the south-east corner of the fort, the line of the defences turns sharply inwards, following the contours of a natural gully, and thus describes a U-shaped re-entrant. A series of deeply eroded trackways, probably of medieval date but possibly of earlier origin, ascend the natural gully and cut through the rampart, so that it survives only intermittently and even then as a very slight earthwork. Given that the gully provides the only means of relatively easy access onto the plateau from the south, it is possible that there was a second gateway at this point, but surface survey can detect no physical evidence to support the suggestion. If so, the natural topography would have allowed the approach to be overlooked by the ramparts on both sides, creating an arrangement similar in defensive and visual effect to the 'hornworks' added to the gateways of certain hillforts in the late Iron Age. At the most southerly point of the fort, a low scarp diverges from the line of the quarry hollow inside the rampart and follows the contour in a smoother curve, so that it lies as much as 25m behind the rampart. This may conceivably be of Iron Age origin, but is more likely to represent a lynchet marking the limit of 19th-century ploughing.

Beyond the natural gully and along the whole southern edge of the promontory, the defences are fairly consistent in their form and generally well preserved, although intermittently cut into by small-scale quarries, Second World War emplacements, and the back of Kilburn White Horse. The relationship of the artificial defences to the natural barrier created by Ivy Scar and Roulston Scar, the cliffs at the south-western tip of the promontory and along its western side, is not as straightforward as it might first appear. Although it is logical to assume that the cliffs would have existed in some form in the Iron Age, the English Heritage investigation indicates that there has been considerable erosion even since the early 19th Century (see Section 4.6). This implies that there may have been much more significant changes in the form of the cliffs in the far greater time span since the fort was built. This possibility is supported by the impression that the Iron Age defences have been cut away at the points where they reach the cliff edges, while what appears to be an isolated fragment of the defences survives where the erosion has been less severe. In other words, it is not safe to assume that there were no artificial defences along the cliff edges. At the north-eastern end of Roulston Scar itself, what seems to be a short stretch of counterscarp bank survives, hinting that the defences retained the same form around

the whole western end of the promontory. Beyond this point, as far as the south-western end of the massive and well preserved stretch already described, only a single line of earthwork can be traced as a faint sharpening of the natural slope. However, it is not impossible that a second line has been masked by the steepness of the natural slope or by the earthworks of the post-medieval field boundaries running along the brow of the slope.

Given the history of land-use in the majority of the interior of the fort, there is little chance that any traces of prehistoric settlement would have survived, still less that these could be identified by surface survey. However, since parts of the interior were clearly poorly drained until the work done in the 1960s, it is open to question how much of the large internal area would ever have been suited to long-term occupation. The English Heritage investigation examined spoil resulting from the construction of the path in the south-east corner of the fort and upcast from animal burrows in the north-east corner in search of pottery or other occupation debris, but none was found. In view of the extensive damage done to the interior, the parcel of land to the east of Low Town Bank Road is an important resource, for much of this ground has evidently never been ploughed or otherwise disturbed (see Figure 3). A thorough examination was carried out, but despite the well-preserved condition of the surface and the relative lack of dense vegetation cover, no clear evidence was found for prehistoric settlement, in the form of the typical ‘hut circles’ or level platforms constructed to carry buildings. However, in spite of heavy bracken cover, it is apparent that the course of the scarp defining the quarry hollow behind the rampart is not regular, but occasionally describes sinuous curves. This could simply reflect variations in digging technique, but evidence from numerous other Iron Age forts indicates that the sheltered strips immediately behind ramparts were favoured locations for settlement. Where the quarry hollows were not already broad enough to accommodate buildings, it was common practice to cut back into the slope, producing the sort of scalloped edge evident in a few places at Roulston Scar.

4.3 Casten Dyke South

The relationship between the Iron Age promontory fort and the linear boundary earthwork known as Casten Dyke South has repeatedly been the foundation for speculation and debate, almost all of which has been based on a confused and incomplete understanding of the extent of both monuments (see Section 3). The English Heritage field investigation leads to two major conclusions concerning this relationship: firstly, that Casten Dyke South is a distinct entity that is physically separate from the promontory fort and, secondly, that there are no grounds for supposing that the dyke is contemporary with the fort, or nearly so. Rather, the plan relationship of Casten Dyke South to the fort, together with the much more sharply-defined form of the boundary earthwork, strongly support Nicholas Thomas’ (1960, 252) view that it is an ‘altogether later earthwork’.

The Ordnance Survey First Edition 6-inch scale map surveyed in 1853 shows that Casten Dyke South once extended from west to east in a virtually straight line for approximately 350m between the eastern edge of Boar’s Gill and the head of another steep-sided valley called Hell Hole (Ordnance Survey 1856; see Figure 5). The First Edition 25-inch scale map surveyed in 1891 shows that by that date, the eastern end of the earthwork had been levelled, probably to facilitate arable agriculture, leaving a well-preserved fragment some 25m long immediately east of the track called High Town Bank Road (Ordnance Survey 1893). In the course of the English Heritage field investigation, a brief examination was undertaken of the present head of Hell

Hole, which has itself been subject to deliberate infilling, to determine whether any trace of the original terminus of the boundary earthwork could still be discerned. The steep gradient at that point has protected the surface from the effects of agricultural improvement and it is possible to identify the slightest hints of a ditch-like earthwork merging with the head of the valley, but this may well be a gully produced by natural water erosion. The section of the earthwork to the east of High Town Bank Road that remained intact in 1891 was probably levelled and ploughed over in the 1960s, since it can still be identified on aerial photographs taken in 1950 (RAF 1950). As a result, all that survives in good condition as an earthwork is the stretch *c* 270m long that lies in the coniferous plantation between the western edge of the High Town Bank Road and the eastern side of Boar's Gill. Of this section, which is protected as a Scheduled Ancient Monument, only the westernmost end, where the boundary meets the side of Boar's Gill, was surveyed in detail by English Heritage.

The linear boundary comprises a substantial bank up to 0.9m high, with a steep-sided ditch up to 1.1m deep on its northern side and a counterscarp bank of minimal size along the northern lip of the ditch. The form of the earthwork therefore indicates that the boundary was intended to enclose the land to the south, that is, the promontory known as High Town Bank, which covers an area of *c* 23ha (57 acres). The bank has a fairly flat top which may originally have carried a palisade, hedge or fence, although there is no surface evidence to support this speculation. In terms of its size, form and the relatively crisp appearance of the earthworks, Casten Dyke South is very similar to Casten Dyke North. The Enclosure Map of 1829 and the Tithe Map of 1846 indicate that the linear earthwork was used as a field boundary in the earlier 19th Century and that other field boundaries in the vicinity were laid out on the same orientation (CROa; b). However, unlike Casten Dyke North, where the dilapidated remains of a drystone wall survive intermittently along the top of the earthen bank, there is no evidence that Casten Dyke South was ever modified in this way.

At the eastern edge of Boar's Gill, Casten Dyke South has been cut into by a small quarry, which was evidently begun and abandoned in the period between 1853 and 1891 (Ordnance Survey 1856; 1893). It has been assumed that the terminus of the boundary earthwork was destroyed by this operation, but the final few meters actually survive to the west of the quarry, continuing on the same line until it becomes indistinguishable from the steep side of the ravine. For this short stretch, the bank is overlain by the remains of a dilapidated drystone wall. This turns northwards immediately west of the track that served the quarry to follow the eastern edge of Boar's Gill, corresponding to a field boundary shown on maps from the First Edition 6-inch scale map onwards (Ordnance Survey 1856). Although this wall continues on the same alignment to the west of Boar's Gill, there is no evidence that the underlying earthwork ever did so. Thus, there is no physical connection whatsoever between Casten Dyke South and the promontory fort and there are no grounds for interpreting them as detached parts of a single monument. On the contrary, there is a pronounced mismatch between the point at which Casten Dyke South meets Boar's Gill and the point at which the Iron Age dyke running eastwards from the fort meets it, which strongly suggests that the two may well be far removed from each other in terms of date. This inference is supported by the striking difference in the condition of the two earthworks: the Iron Age dyke is slight, with a degraded appearance, while Casten Dyke South is a substantial earthwork with steep, crisply defined sides. It may also be argued, more equivocally, that the general plan relationship between the linear boundary earthwork and the fort suggests Casten Dyke South to be the later of the two monuments.

4.4 Early cultivation remains

As described in Section 4.2, a lengthy stretch of the Iron Age rampart at the south-eastern corner of the promontory is so slight that it can barely be traced on the surface. To the west and east of this stretch, however, the defences survive as prominent earthworks, suggesting that the intervening section must have been actively degraded in some way. To the north of the line of the rampart, the field investigation identified a series of low, discontinuous scarps, running parallel to each other along the slope, mostly at a distance of no less than 6m apart. These are most plausibly interpreted as small lynchets resulting from an episode of ploughing, which, given that the largest of the earthworks stands only 0.3m high, seems unlikely to have been prolonged. The cultivation remains are somewhat reminiscent of those which are generally produced by medieval ridge and furrow cultivation, where the direction of ploughing follows the contours, but the earthworks are not strictly diagnostic of any particular period. In the absence of firmer dating evidence, all that can be stated with confidence is that the episode of cultivation post-dates the abandonment of the Iron Age defences and predates the trackways (which are presumed to be of medieval or later date on the basis of their form), given that the trackways cut through the lynchets. To the west of Low Town Bank Road, the westward extent of the lynchets corresponds broadly with the limit of the levelled stretch of the rampart. To the east of the road, identification of such slight earthworks is rendered impossible by the disturbance caused by the forestry plantation, but the end of one relatively large scarp, which may represent the northernmost limit of the early cultivation at this point, seems to correspond broadly to the point at which the Iron Age rampart becomes more difficult to trace.

The northernmost limit of the cultivation also seems to correspond approximately to a fairly pronounced natural scarp which may reflect a change in the underlying geology. Work carried out in advance of the construction of the wheelchair access path indicates that the shallow topsoil at this point overlies a compacted but friable sandy subsoil of unknown depth (in excess of 20cms), which perhaps represents decomposed gritstone. This relatively light and well-drained subsoil would have been far more attractive from an agricultural point of view than the surrounding limestone and William Grainge, who visited while the area was under arable cultivation, commented that ‘...along the edge the soil is of a good quality’ (1859, 350). The geological circumstances may also help to account for the slight condition of the defences, for assuming the rampart bank was constructed predominantly of the same sandy material, it would have been particularly susceptible to erosion, which may have been dramatically accelerated when the topsoil was disturbed by the ploughing.

4.5 Medieval and later trackways

The English Heritage investigation recorded a number of hollow ways, which were first described in passing by William Grainge as ‘deep traces of ancient trackways’ (Grainge 1859, 352). On the basis of their form, all the trackways are interpreted as being of medieval or later date, although none were in use so late in the post-medieval period as to be shown on historic maps. However, it is not impossible that some of the routes originated in the Roman period or even earlier.

The principal route is marked by a series of interweaving hollow ways which ascend the natural gully at the south-eastern corner of the promontory. Low Town Bank Road, which the Enclosure Map shows to have existed in the same form since at least 1829, follows the course of the most deeply eroded (and therefore most intensively

used) of these tracks. There are shallower hollow ways on either side of the road, but most have followed the gully overlooked by the re-entrant in the defences of the fort. As mentioned in Section 4.2, this hints that there may have been an original Iron Age entrance into the fort at this point.

Another route is represented by the single hollow way that gradually ascends the western side of Boar's Gill and eventually converges with Low Town Bank Road just outside the northern perimeter of the promontory fort. At the south, the track joins the line of the Iron Age ditch and follows it for some way before obliquely crossing the rampart. At the north, it passes through a gap in the rampart which seems to have been produced entirely by the erosion caused by regular traffic.

Another route, only a short section of which was examined by the English Heritage investigation, is the path known as Thief's Highway, which obliquely ascends the steep north-western side of the promontory. According to local tradition, the name refers to the use of the promontory in the medieval period by robbers, who would keep watch for rich pickings passing through the low-lying country below.

4.6 Post-medieval quarrying

The field investigation identified a number of small-scale limestone quarries, most of which can be assigned with certainty to the 19th Century on the basis of map evidence. All of the remaining few quarries physically cut into the promontory fort and therefore post-date its disuse, but it is impossible to date them with greater precision. A post-medieval origin may be reasonably assumed for these too, given that there is no obvious context for stone extraction at an earlier date.

No quarries are shown on the Enclosure Map of 1829 or the Tithe Map of 1846 (CROa; b). However, since these maps are somewhat schematic and were not intended to be as comprehensive as later Ordnance Survey mapping, the absence of any depiction of such features cannot be taken as firm evidence that they did not exist. The largest example recorded by the English Heritage investigation, which lies at the south-eastern corner of the promontory and cuts into the line of the Iron Age rampart, is marked as a 'Limestone Quarry' on the First Edition 6-inch scale map (Ordnance Survey 1856). This indicates that it was still in active use when the survey was carried out in 1853, but it was evidently disused by 1891, for it is marked as 'Old Quarries' on the First Edition 25-inch scale map (Ordnance Survey 1893). This later map also shows an 'Old Limekiln', which was sited next to Low Town Bank Road and must have been used to burn the limestone extracted nearby. The kiln survives in poor condition as a slight indentation in the side of the hollow way, with fragmentary traces of buried drystone walling visible around the perimeter. Its small size indicates that it was probably built to slake lime for use as an agricultural fertiliser nearby, perhaps on the promontory itself. Two other quarries, those to the west of Kilburn White Horse and at the western end of Casten Dyke South, were also marked as 'Old Quarries' on the map, implying that they had come into existence after 1853 and gone out of use before 1891.

The field survey identified slight traces of trackways leading north-eastwards from two of the quarries lying to the west of Kilburn White Horse. This would imply that the extracted stone was transported across the promontory and back to Low Town Bank Road. It is therefore possible that it too was burned in the limestone quarry described above, but it is equally possible that it was carted away for use as a building material elsewhere. It is difficult to account for the inaccessible position of the small

quarries that bite into the rampart on the north-west of the promontory, unless the stone was intended for use in the immediate vicinity. These may therefore have been used to obtain stone for the construction of the drystone walls that formed the field boundaries nearby, which would suggest them to have been in use for a brief period in the early 19th Century.

4.7 Post-medieval field boundaries

The Enclosure Map of 1829 and the Tithe Map of 1846 provide evidence for a number of field boundaries which are no longer in use (CROa; b; see Figure 3). A few of the boundaries were evidently laid out in the interval between 1829 and 1846, and the form of most of the others suggests that they were probably built in the preceding decades as part of the programme of land enclosure in the early 19th Century. As mentioned above, some of the boundaries followed the lines of earlier earthworks, including the eastern side of the Iron Age fort, Casten Dyke South and the medieval hollow ways. The condition of the boundaries varies, but all survive to some degree as low, stony banks, which seem to represent the dilapidated remains of drystone walls. Much of the stone may well have been deliberately removed for re-use elsewhere, for in certain more inaccessible areas, the walls remain relatively well preserved. A few of the boundaries were apparently disused by 1891, but the majority seem to have been maintained until after 1910 (Ordnance Survey 1893; 1912). It is clear that the size of Kilburn White Horse was largely constrained by the pattern of the pre-existing field boundaries, but the field survey indicates that the wall running along the brow of the hill was re-aligned by some 10m so as to skirt around the northern edge of the figure.

In several places at the western end of the promontory, the field boundaries can be seen to have been cut away by cliff falls and erosion. Although map evidence shows that there have not been any major changes in the line of the cliff, the condition of the boundaries indicates that up to *c* 2m of the edge may have been lost since the 19th Century. This observation has important consequences for the understanding of the form of the Iron Age defences at this point, for it is possible that a considerable area may have been lost over the course of the preceding two and a half millennia.

One boundary is anomalous in form, comprising a fairly substantial earthen bank with a ditch running alongside it on the north. The earthwork follows a slightly sinuous course westwards from Low Town Bank Road for at least 400m, eventually merging with later boundaries at an indeterminate point near the south-western tip of the promontory. The boundary is not depicted on any historic map and can therefore be presumed to be of somewhat earlier origin than the drystone walls described above. In form, it is comparable to 'head dykes', which were often laid out in the medieval period to define the limit of cultivated land, although it overlies and therefore post-dates the hollow ways, which are themselves thought to be of medieval or later date. It is also clear that the bank may have been re-used as a boundary since the 1960s, since a number of relict fence-posts still stand along its line. The form of the boundary is comparable to Casten Dyke South, in that, with the ditch on the northern side of the bank, it seems to have served to enclose the land to the south. Its course approximately follows the natural scarp which seems to mark the northern limit of a strip of more sandy sub-soil along the edge of the promontory, although it post-dates the traces of arable agriculture which also extend as far north as this line (see Section 4.4). It therefore seems likely that the boundary served to define the limit of cultivable land and is of post-medieval or, at the earliest, late medieval origin.

4.8 Kilburn White Horse

Since its creation in 1857, a large number of short articles have been written about Kilburn White Horse, which is the northernmost hill-figure in Britain and the largest single figure in the country. The summary in this report draws principally on the antiquarian William Grainge's (1859) brief description and the detailed account of the history of the landmark compiled by Banks and Thorpe (1998).

The idea of the horse was conceived in the earlier 19th Century by Thomas Taylor, a native of Kilburn, following a visit to the famous white horse at Uffington in Berkshire, which is believed to be of late Iron Age origin. Taylor himself was working in London, so wrote to his friend, John Hodgson, then the schoolmaster in Kilburn, to propose the project and suggest Low Town Brow as a suitable site. The figure at Uffington lies close to an Iron Age hillfort and, although the coincidence has previously gone unremarked, this may have been a factor in the choice of location for Taylor's version. It seems unlikely that it was realised at the time just how close the figure really was, for its back physically cuts into the line of the Iron Age defences. According to popular tradition, the work was completed entirely by the pupils at Hodgson's school, one of whom wrote a poem about his experience. While the children were undoubtedly involved, Grainge records that on the day of its completion on 4 November 1857, thirty-three 'men' were employed in the work. The size of the horse was evidently constrained by the pattern of pre-existing field boundaries, but the English Heritage survey identified a slight re-alignment of the wall along the brow of the slope, which had originally passed over the site of the horse's ears. The figure was created by driving stakes into the ground to define the outline and then exposing the oolitic limestone that underlies the turf in the interior. Due to the buff-grey colour of the limestone, 6 tons of lime were required to whitewash the surface adequately. The fractured nature of the geology made it impossible to achieve a smooth surface and the form of the tail had to be modified to conform to the topography. During the Second World War, the figure was probably camouflaged (see Section 4.9). From the 1980s onwards, chalk chippings have been used to ensure that the horse remains white.

The horse has been cleaned and repaired on many occasions and this work has gradually modified its original shape, most notably through the gradual enlargement of the head and the foreshortening of the tail and the legs, especially the hind pair. The horse is now 93m long and 58m tall (or 31m high in the vertical plane). The height of the figure was originally recorded as 278 feet (84.7m), not taking into account the steep gradient of the hillside. The aerial photograph of 1940 shows that the horse then had relatively long legs (RAF 1940), but in 1949, the height was recorded as 228 feet (69.5m). This suggests that the figure may never have fully recovered from its abandonment during the Second World War and that it has subsequently diminished further in size.

4.9 Second World War remains

The effectiveness of the German invasion strategy was revealed to the British military command by the rapid enemy progress through the Low Countries in the early months of 1940. Their method was to capture airfields through parachute and glider landings and immediately to import fighter planes in order to achieve local dominance in the air in advance of a full invasion by ground troops. The high ground of the North York Moors, as a large expanse of fairly even topography with relatively little tree cover or other obstruction, was considered a likely location for airborne

landings. Yorkshire Gliding Club, which had been founded in 1933, hosted several competitions in the mid-1930s which were attended by German glider pilots. One of these, Rudolf Haslinger, stayed for several months in the summer of 1937 in order to train English would-be glider pilots and to receive training himself (Riddell 1984, 12). As a result, it seems highly likely that at the outbreak of the war, the existence of the tried and tested glider landing ground at Roulston Scar would have been known to the German military command. Indeed, it may have been considered of particular strategic value, given its proximity to the potential invasion beaches on the east coast and its location on the edge of the high ground with good visibility to the south and west.

Orders were issued that Kilburn White Horse, which made the adjacent airfield easily recognisable from the air as well as facilitating navigation to other nearby airfields, should be camouflaged for the duration of the war (Banks and Thorpe 1998, 12). However, such precautions were generally not put into effect until after August 1940 and the RAF aerial photographs taken in May of that year confirm that no attempt had been made to disguise the figure by that date (RAF 1940). Indeed, the recollections of individuals serving in the area suggest - remarkably or perhaps wrongly - that the figure may not have been concealed at all (information from John Harwood, Defence of Britain Project). The aerial photographs also show that at that date the landing strip itself was not camouflaged or protected by obstructions, such as anti-glider trenches or abandoned vehicles, and there is again some uncertainty as to whether these standard precautions were ever actually implemented. Instead, the promontory was used for gunnery practice for 5.5-inch and perhaps 25-pounder field artillery, firing at targets sited on an expanse of Laskill Pasture, some 12.5kms to the north-east (centred at SE 58 92). The airfield was also briefly used as a training area for Bren gun carriers by a detachment from the 12th Battalion Green Howards and three searchlights were deployed on the promontory, though their role in the wider scheme of defence is unclear (information from John Harwood). At about the same time, a 'dummy airfield', that is, a decoy designed to divert bombing from genuine airfields nearby, was constructed some 2kms to the north on Cold Kirby Moor (centred at SE 515 837), initially with a number of replica Whitley bombers deployed on the site. Later, it was actively used as a 'satellite landing ground' for the airfield at Dishforth, but there is no evidence that the landing strip at Roulston Scar was used either as a decoy or as a real landing ground (information from Roger Thomas, Military Support Officer, English Heritage). Despite the proximity of the two airfields to each other, it is believed that the decoy related to the numerous RAF airfields on the low-lying ground to the south and west, rather than to the airfield of the Yorkshire Gliding Club. In summary, given that the airfield was an established glider landing ground that had actually been used by German pilots in the years running up to the war, what little evidence there is suggests a relatively low level of defensive planning with regard to Roulston Scar.

However, the English Heritage field investigation identified a small number of well-preserved emplacements that can be interpreted with confidence as being slit trenches and weapons pits of Second World War date. None of these are visible on the RAF aerial photographs of May 1940, which suggests that they may have been put in place in late 1940 or early 1941, and almost certainly before 1943. In most cases, defences for airfields were initially constructed and used by regular army units under the command of the RAF, while in the later years of the war, as the invasion threat diminished, they were generally taken over by the Home Guard (information from Roger Thomas). All the positions survive as sharply-defined earthworks: the trenches survive to a maximum depth of 0.6m and many are protected by low

embankments, generally on the upslope side. Assuming that normal military field engineering practice was adhered to, this would imply that the intended direction of fire was towards the airfield (War Office 1944). Most of the emplacements are sited just below crests and this would have enabled the defenders to fire over the crest towards the airfield from positions that would have been concealed from any disembarking enemy troops. The siting would also have enabled them to fulfill the second function required of airfield defences - to defend the perimeter of the airfield from external attack. Three of the weapons pits are sited on the edge of the escarpment at the south-western end of the promontory and may also have been intended as look-out posts, since they command impressive prospects across the low-lying ground to the west and south. At least five two-man slit trenches are located around the head and sides of the natural gully at the point where the Old Town Bank Road ascends the escarpment and were probably intended to command the approach from the south.

5. DISCUSSION

The key outcome of the English Heritage investigation is the discovery that the rampart of the Iron Age fort can be traced around the whole edge of the plateau, rather than just across its northern neck, as has been widely accepted in the past. To some degree, the accurate definition of the line of the perimeter merely confirms the long-held - but previously somewhat insecure - assumption that the site could be classified as a 'promontory fort'. However, the accurate survey also allows previous estimates of the area to be revised upwards to the more precise figure of 24.5ha, underscoring the assertion made by Nicholas Thomas (1960, 252) that the fort is the largest and strongest in north-east Yorkshire. Indeed, it is amongst the largest in the British Isles, rivaling some of the biggest examples on the chalk downland of southern England and considerably exceeding even the most extensive phase of the fort on Traprain Law on the northern edge of the Lammermuir Hills in southern Scotland (*c* 16ha). With the possible exception of the largely destroyed fort at Bunbury near Alton in Staffordshire (up to *c* 40ha), the fort on Roulston Scar is by far the largest in the surrounding region, dwarfing hillforts such as that on Mam Tor in Derbyshire (6.4ha), on Ingleborough (6.5ha) and the possible example underlying the defences of Scarborough Castle (*c* 7ha). While acknowledging its exceptional size, Blaise Vyner has pointed to structural similarities with the hillfort at Boltby Scar, which has been dated to the late Bronze Age on the evidence of a single sherd of a 'bucket urn' sealed within the rampart, discovered during excavations in 1938, and the hillfort at Eston Nab in Cleveland, whose box rampart has been dated to the early/middle Iron Age, around the early 5th Century BC, by radiocarbon determination (Vyner 1988, 90-1).

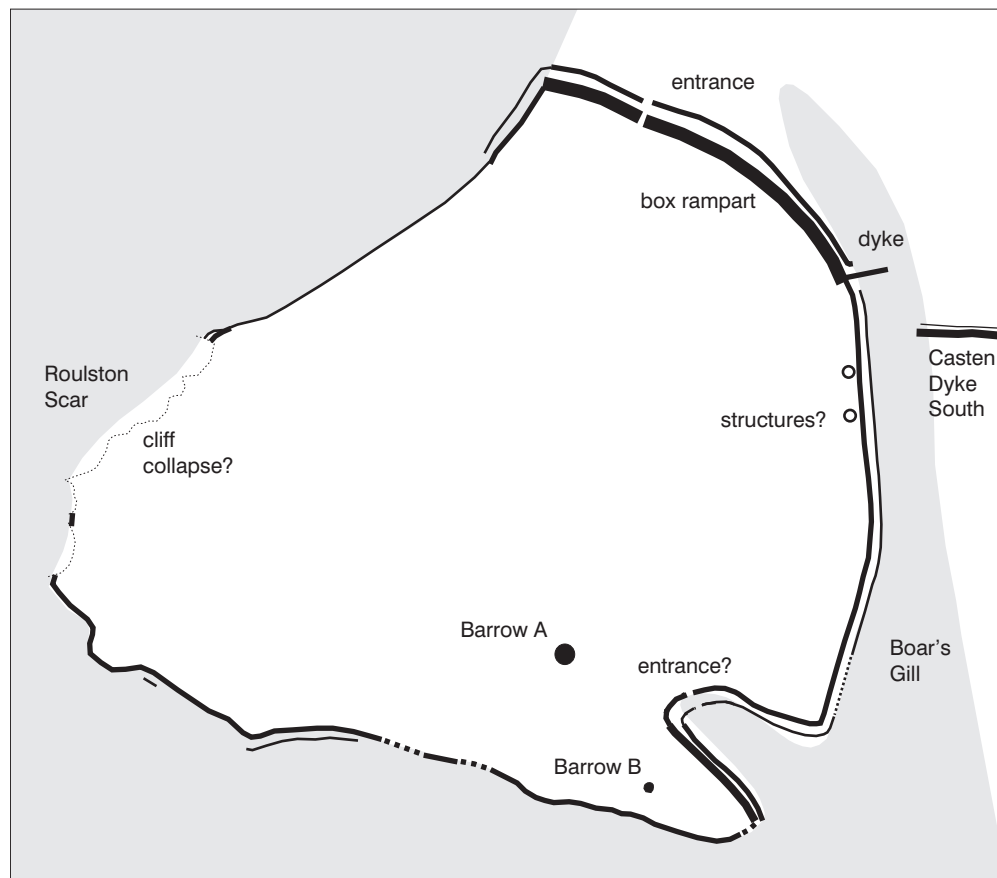


Figure 14.
English Heritage
interpretative plan
of the fort

The re-interpretation of Tony Pacitto's excavated evidence proposed in Section 4.2 suggests that the box rampart may have reached its eventual impressive proportions in at least two phases and the constructional technique adopted for the rest of the perimeter would certainly have reduced the labour required to create an impression of strength. Nonetheless, the fact that earthworks were constructed at all along the naturally steep parts of the escarpment is a measure of the investment of effort in creating the outward impression of impregnability. In view of this 'work of immense labour', as the antiquarian William Grainge described it, the absence of any compelling evidence for settlement in the interior, either from Pacitto's excavations or from the surface survey, is all the more striking. By comparison, excavation of the much smaller fort at Easton Nab in Cleveland revealed evidence for circular structures interpreted as houses and a sizeable assemblage of pottery and other artefacts (Vyner 1988). Similarly, excavation of the structurally similar hillfort at Grimthorpe on the western edge of the Yorkshire Wolds recovered evidence for four-post structures, which are usually interpreted as grain stores, and sherds from about seventy different pots (Stead 1969). Admittedly, a larger sample of the interior of both these forts was excavated, but the field survey has discovered negligible evidence for structures from a relatively large area. The environment on Roulston Scar may have been very different in the early/middle Iron Age and may even have been altered dramatically by the need for mature timber for the construction of the defences. However, historic maps suggest that since the medieval period at least, parts of the interior have actually been too boggy to be suitable for long-term habitation. Traditionally, the enclosure of such a large, apparently empty space would usually have been interpreted in terms of the management of livestock and the provision of a short-term stronghold for large numbers of people living in the environs of the fort. Such theories essentially echo Grainge's view in the mid-19th Century that the monument was the work of a 'pastoral and warlike people', but its role may have been much more complex.

Given the conspicuous siting of the monument, it is possible that architectural display was a major factor in the size of the fort and the design of the defences. Knowledge of late Iron Age tribal territories remains sketchy, but, based on the distribution of square barrows, a phenomenon which appears to be associated with the Parisi, it seems likely that the North York Moors may have marked the territorial boundary between the Brigantes to the north and the Parisi to the south (Stead 1979; Mytum 1995, 35-6). If future work were to prove Barrow B to be a square barrow, this isolated example would suggest that Roulston Scar may have lain on the very western edge of the territory. Arguably, these social distinctions are imprecise and can be relied on still less for the early/middle Iron Age, that is, the period during which the hillfort was built. Yet in his discussion of the form of the defences at Grimthorpe, Ian Stead (1969, 157) argued that where narrow box ramparts have been identified in southern England, they appeared to have localised distributions, perhaps indicative of a tribal grouping. The form of the box rampart at Roulston Scar finds a close parallel with that of the box rampart at Grimthorpe, and perhaps with those at Boltby Scar and Easton Nab. It could therefore be argued that the distribution may point to a shared material culture at a date well before the construction of the first square barrows. Monumental forts sited on or near the tribal boundary, such as that at Roulston Scar and, to a much lesser degree, those at Boltby Scar and Easton Nab may well have acted as - and even been designed as - impressive and highly visible tribal emblems, which would have served literally as landmarks. The square barrows on the North York Moors, which were perhaps built more than a century later than the fort, seem to have been similarly sited, in locations which made them visible from large tracts of low-lying ground to the south.

The discovery of the dyke running from the eastern terminus of the box rampart to the edge of the ravine in Boar's Gill also sheds new light on the function of the defences. The dyke, in conjunction with the box rampart, would have effectively blocked the natural route down the valley, which must have offered the easiest access between the Hambleton Hills and the low-lying ground. In this context, the speculative identification of a gateway at the head of the re-entrant on the south-eastern side of the fort assumes greater importance. If such a gateway existed, the fort would have surrounded and thus controlled the route between the low and high ground. It has been argued that the Hambleton Street, the ancient trackway which follows the Cleave Dyke and the western escarpment of the Hambleton Hills, may be of late Iron Age origin (Hayes 1960; Spratt 1993, 169). The point at which this descended the southern escarpment seems to have lain several kilometres to the east of Roulston Scar, but its existence may point to a considerable volume of traffic between the low and high ground. If the Hambleton Hills were used as seasonal pasture in prehistory, as they were from the medieval period onwards, the traditional idea of livestock management may well be applicable to the fort on Roulston Scar, although clearly not a full explanation of the scale of the monumental enclosure. The boggy ground in the interior, although unsuitable for permanent habitation, might have provided grazing and adequate temporary settlement at certain seasons.

Arguably the most important consequence of the improved understanding of the form of the perimeter of the fort is the resolution of the confusion between the fort and Casten Dyke South, showing them to be two entirely separate monuments, of which Casten Dyke South appears to be the later by some considerable margin. The superficial appearance of an earthwork can obviously seldom be relied upon as a precise indicator of its date; for example, sections of the nearby Cleave Dyke, which is undoubtedly of prehistoric origin, have clearly been recut at a much later date so that their appearance is deceptively fresh. In this instance, however, there is no sign that Casten Dyke South was ever comprehensively remodelled and its relatively crisp condition by comparison with the fort concurs with the evidence provided by the plan relationship between the two monuments. In short, the superficial appearance of the linear earthwork is perhaps the most accurate dating evidence currently available. A prehistoric origin can be ruled out with some confidence, but beyond this, while a medieval origin can be plausibly suggested, any proposal as to the date of the linear boundary earthwork must remain speculative.

This conclusion in turn has wider implications for the understanding of the so-called 'Cleave Dyke System', that is, the Cleave Dyke itself and the series of linear boundary earthworks that run perpendicular to it. The Cleave Dyke itself is indisputably of prehistoric origin, and its plan relationship with the Hesketh Dyke strongly suggests that this is contemporary or perhaps earlier. Casten Dyke North, like the Hesketh Dyke, is aligned on a round barrow and incorporates the mound into the bank. This relationship has previously been implicitly accepted as an indication that the boundary earthwork is likely to be of prehistoric origin, but actually only proves that it was not built before the early Bronze Age. Rather, the striking similarity in form and condition between Casten Dyke North and Casten Dyke South seems to suggest that both may have been built at approximately the same date and at a much later time than the Cleave Dyke, possibly in the medieval period. In this context, it is worth recording that Casten Dyke North not only cuts through the Cleave Dyke, as previous investigators have recognised, but also that at the point where the two intersect, a stretch of the Cleave Dyke has been re-cut to form a ditch of similar form and size to Casten Dyke North. The greater depth and sharpness of this short stretch makes a pronounced contrast with the unmodified earthwork, again

hinting at a long interval between the two constructional episodes. Likewise, in terms of form and condition, Casten Dyke North and South contrast with the Hesketh Dyke, which is the only one of the boundaries running perpendicular to the Cleave Dyke for which there is any firm evidence for a prehistoric date. In summary, until more accurate dating evidence becomes available for the various individual boundaries, it seems inappropriate to regard them as a single 'system' of fixed date and function. Instead, they seem to represent the eventual outcome of a process of land management which has evolved over the course of many centuries.

6. METHODOLOGY

The field investigation was carried out by Alastair Oswald and Trevor Pearson, with assistance from Stewart Ainsworth. Rachel Cubitt of Scarborough Archaeological and Historical Society helped as a volunteer.

The majority of the survey was carried out using a satellite-based Trimble dual frequency Global Positioning System (GPS). The base receiver was set up immediately to the south of the Gliding Club buildings on a temporary survey station and two remote receivers (Trimble 4700 and 4800 models) were used to record the remains, working independently in real-time kinematic mode. The profile/section across the ramparts was derived from the same data. The co-ordinates of the base receiver were calibrated to the National Grid (OSGB97) using Trimble Geomatics software, based on the position of the receiver relative to Ordnance Survey active GPS stations at Carlisle, Glasgow and Newcastle. In the area covered by coniferous plantation, where visibility of the sky was at best poor, it was necessary to use conventional survey equipment. A Leica TC1610 electronic theodolite with integral distance measurement (Total Station) was used to traverse between two points already fixed by GPS survey. The resulting plan was plotted at 1:500 scale and 1:2500 scale via Key Terrafirma, AutoCAD and Coreldraw 8 software. Minor details of the plan were supplied with tape measures using standard graphical techniques. The CAD-based drawings were prepared by Alastair Oswald, Trevor Pearson and Rachel Cubitt. A number of digital photographs taken during the fieldwork are held on disk as part of the project archive. Research on the Second World War remains was carried out by Roger Thomas, English Heritage's military support officer, with help from John Harwood of the Defence of Britain Project. The report as a whole was researched and written by Alastair Oswald, and edited by Stewart Ainsworth.

The site archive has been deposited in English Heritage's National Monuments Record, Great Western Village, Kemble Drive, Swindon SN2 2GZ, to where applications for copyright should be made (reference number: SE 58 SW 12).

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During the later stages of the fieldwork and the initial stages of the production of the report, Rachel Cubitt of Scarborough Archaeological and Historical Society helped as a volunteer: her hard work, enthusiasm and initiative are much appreciated. Tony Pacitto agreed to the reproduction of archive material from his excavations in Figures 10 and 11. John Harwood, of the Defence of Britain Project, provided valuable information about the use of the area in the Second World War.

Above all, thanks are due to Yorkshire Gliding Club for allowing access to their land and facilities throughout the fieldwork, as well as for sharing their knowledge of the history of the Club. The warm welcome, helpfulness and interest in the archaeological research shown by staff and members alike made the fieldwork a very enjoyable task.

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