

2. Overview of the project area

2.1 Geology

This section provides a brief overview of the solid and drift geology, together with their dominant industries which have had an impact on the landscape. Solid and drift geology maps are reproduced in Figures 5a and 6.

Solid geology⁴²

The extraction of lead, and sometimes copper, from the Carboniferous limestones of the Pennines from the Medieval period onwards heavily modified the landscape. In some areas they are interbedded with sandstones which contain narrow beds of coal which was also extracted. These hard limestones have also been extensively quarried for buildings and the characteristic dry stone walls of the Dales for many centuries whereas the soft Permian-period Magnesian limestone which runs north-south through the county is an important modern quarry product used crushed for construction and other purposes. Calcareous springs in this strip led to the creation of the spa towns at Harrogate and Ripon in the 18th century. The complex lower and middle Jurassic strata of the North York Moors yield a variety of uses, including Whitby jet utilised for jewellery, an iron industry from the late prehistoric period to the 19th century, coal mining (also in the Howardian Hills) and finally alum and cement working on the eastern and northern fringes. It is used as a building stone which gives the houses and farm buildings of the area their soft creamy colour. Wold chalk, although very soft, is easily cut and was used as a domestic and farm building stone usually with brick corners, window and door surrounds. Small farm quarries are very common; there was an industrial chalk quarry and limekilns near Wharram station.

Drift geology

The topography of the study area is best understood in relation to its glacial history, the last glaciation being so severe it wiped out most of the earlier deposits⁴³ except in some caves at the southern edge of what became the Yorkshire Dales. Ice came into the area from upper Teesdale and the Cheviots, sweeping south past the hard rocks of the uplands, one arm moving through the Vales of Mowbray and York, the other down the Tees Valley and skirting east of the North York Moors; thus the central area of lowland and the sharp cliffs of the coast were created, whilst incursions inland created the Vale of Pickering, Esk Valley and Robin Hoods Bay⁴⁴.

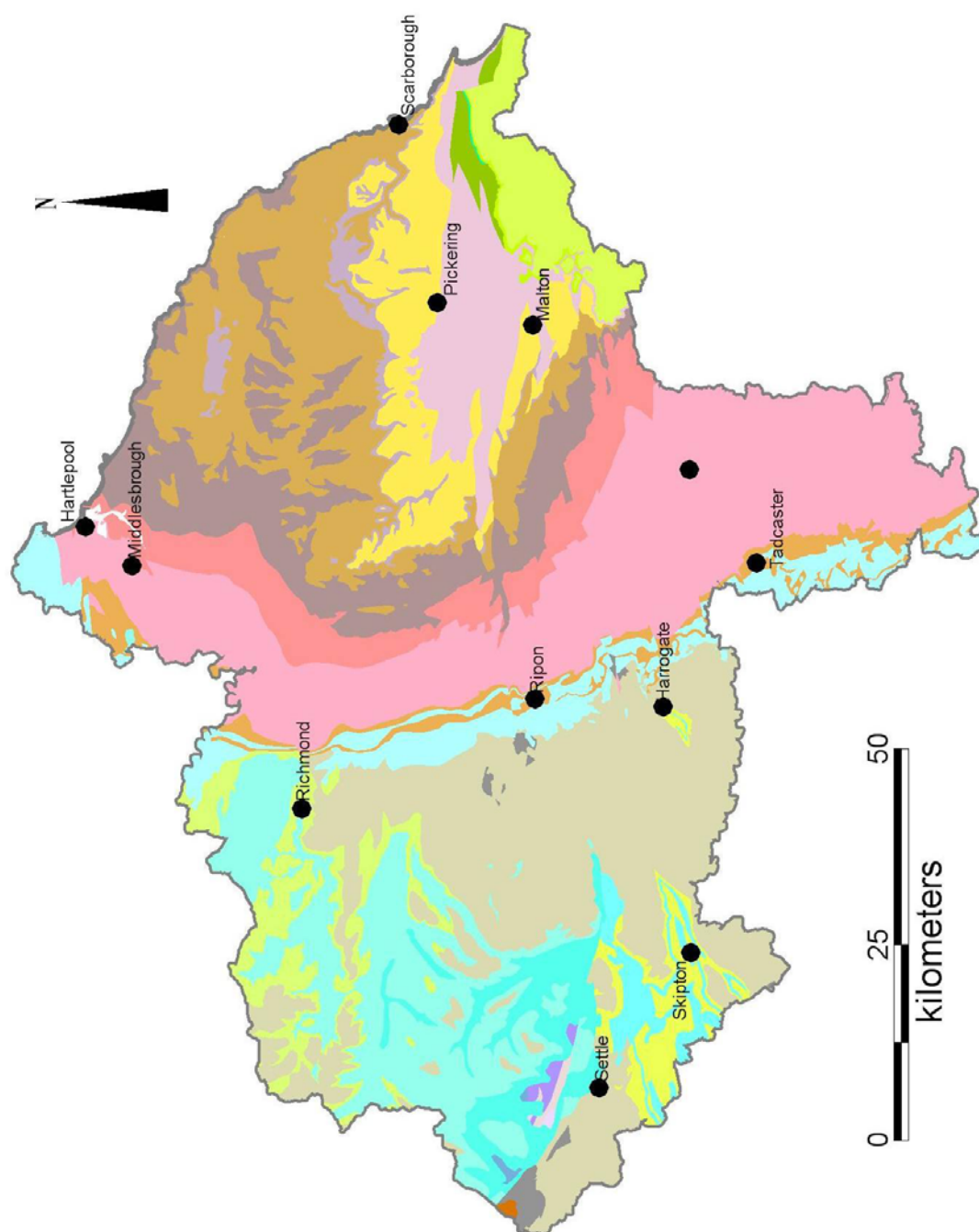
Glacial till or boulder clay was deposited by the ice on much of the lower ground and shows the limits of the ice sheet against the harder rocks of the uplands. It created the undulating topography in parts of the Vale of York seen today and terminal moraines marking the retreat of the ice-blocked valleys creating lake-flats in many of the Pennine dales⁴⁵. Ice had a scouring effect too, deepening and widening valleys in Littondale, upper Swaledale and elsewhere in the Pennines where it bared the limestone, creating pavements of bare rock and removing any signs of earlier human activity.

⁴² Taylor 2003, 8-10

⁴³ Atkinson 2003, 10

⁴⁴ Atkinson 2003, 11

⁴⁵ Atkinson 2003, 12



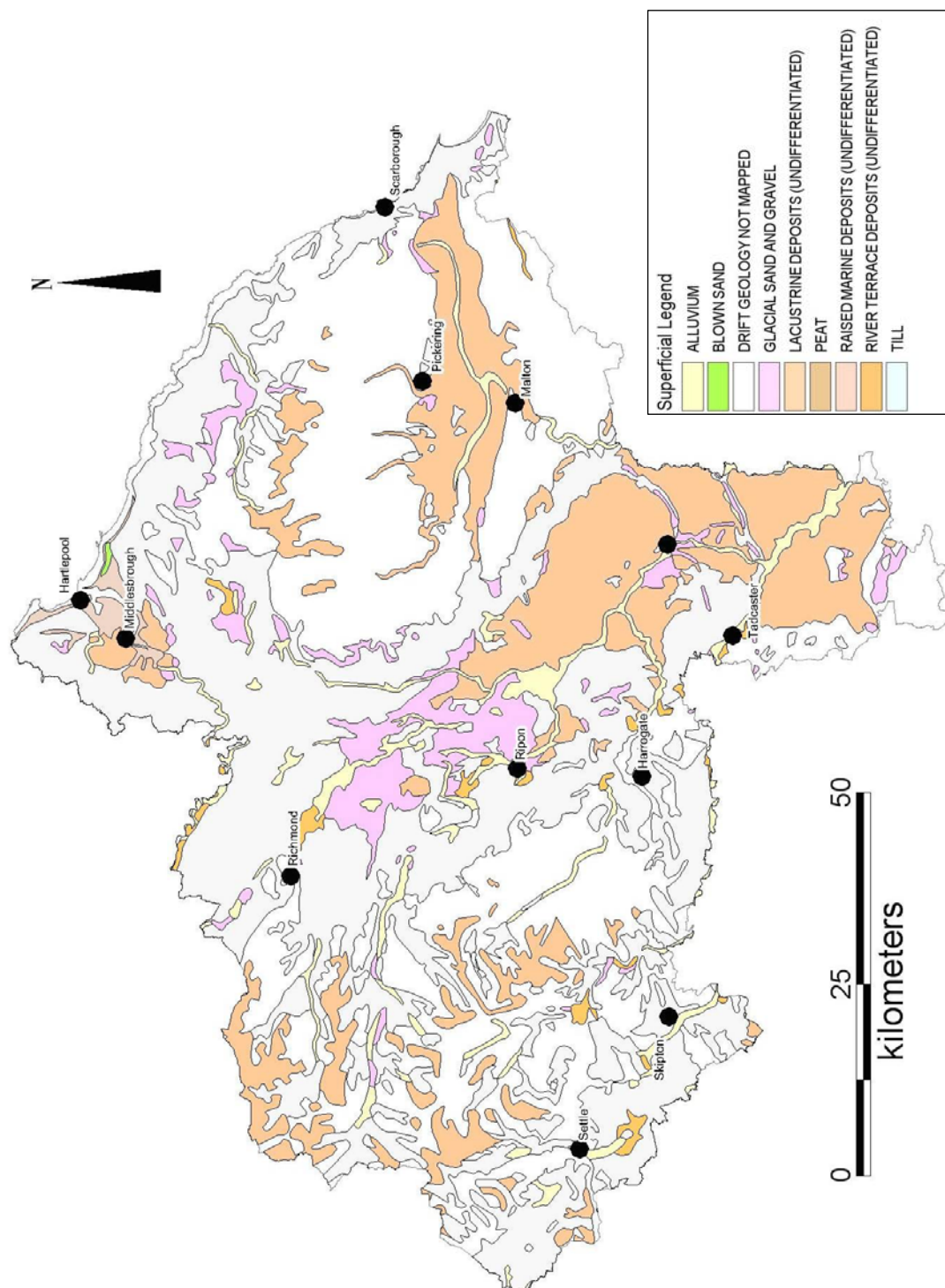
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Figure 5a Solid geology within the HLC project area (see Figure 5b for key)

CRETACEOUS		WEALDEN GROUP - MUDSTONE, SILTSTONE AND SANDSTONE
CRETACEOUS		GAULT FORMATION AND UPPER GREENSAND FORMATION (UNDIFFERENTIATED) - MUDSTONE, SANDSTONE AND LIMESTONE
CRETACEOUS		WHITE CHALK SUBGROUP - CHALK
JURASSIC		WEST WALTON FORMATION, AMPHILL CLAY FORMATION AND KIMMERIDGE CLAY FORMATION (UNDIFFERENTIATED) - MU
JURASSIC		CORALLIAN GROUP - LIMESTONE, SANDSTONE, SILTSTONE AND MUDSTONE
JURASSIC		KELLAWAYS FORMATION AND OXFORD CLAY FORMATION (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
JURASSIC		RAVENSCAR GROUP - SANDSTONE, SILTSTONE AND MUDSTONE
JURASSIC		LIAS GROUP - MUDSTONE, SILTSTONE, LIMESTONE AND SANDSTONE
TRIASSIC		TRIASSIC ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
TRIASSIC		TRIASSIC ROCKS (UNDIFFERENTIATED) - SANDSTONE AND CONGLOMERATE, INTERBEDDED
PERMIAN		PERMIAN ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
PERMIAN		PERMIAN ROCKS (UNDIFFERENTIATED) - SANDSTONE AND CONGLOMERATE, INTERBEDDED
PERMIAN		ZECHSTEIN GROUP - DOLOMITISED LIMESTONE AND DOLOMITE
CARBONIFEROUS		PENNINE LOWER COAL MEASURES FORMATION AND SOUTH WALES LOWER COAL MEASURES FORMATION (UNDIFFERENTIATE
CARBONIFEROUS		MILLSTONE GRIT GROUP [SEE ALSO MIGR] - MUDSTONE, SILTSTONE AND SANDSTONE
CARBONIFEROUS		YOREDALE GROUP - LIMESTONE WITH SUBORDINATE SANDSTONE AND ARGILLACEOUS ROCKS
CARBONIFEROUS		BOWLAND HIGH GROUP AND CRAVEN GROUP (UNDIFFERENTIATED) - LIMESTONE
CARBONIFEROUS		BOWLAND HIGH GROUP AND CRAVEN GROUP (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
CARBONIFEROUS		YOREDALE GROUP - LIMESTONE, SANDSTONE, SILTSTONE AND MUDSTONE
CARBONIFEROUS		DINANTIAN ROCKS (UNDIFFERENTIATED) - LIMESTONE WITH SUBORDINATE SANDSTONE AND ARGILLACEOUS ROCKS
SILURIAN		SILURIAN ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
SILURIAN		WENLOCK ROCKS (UNDIFFERENTIATED) - SANDSTONE AND CONGLOMERATE, INTERBEDDED
ORDOVICIAN		ASHGILL ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
ORDOVICIAN		ORDOVICIAN ROCKS (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE

Figure 5b Key to solid geology map in Figure 5a

Modern exploitation of drift geology has impacted upon the landscape, for example the large-scale sand and gravel extraction in the Vale of Mowbray. The glacial till has been quarried for building stones in the area for hundreds of years, many buildings and walls or wall footings showing large cobbles of mixed material. In contrast, the impact of centuries of peat cutting for domestic and industrial (lead smelting) fuel in the uplands and Vale of Pickering are as yet only poorly mapped and even less understood.



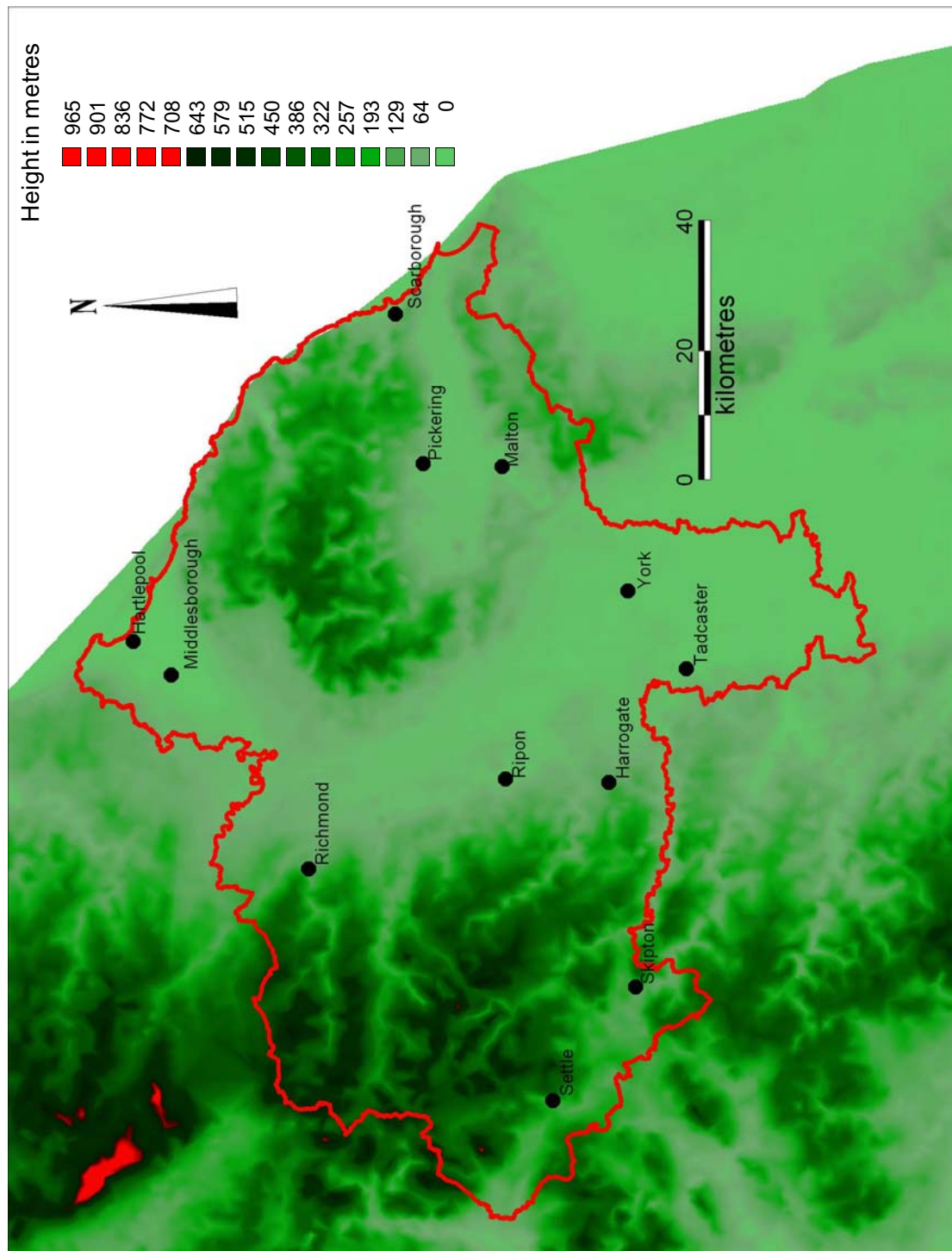
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Figure 6 Drift geology within the HLC project area

2.2 Topography

The width of the project area covers 93 miles (150km) from east to west, stretching almost from coast to coast from Scarborough and Filey on the east coast to just beyond Settle in the west, less than 12 miles (18km) from the west coast at Morecambe Bay. From north to south, the area extends for 76 miles (122km) from north of Hartlepool to below Tadcaster, just below the M62 motorway in the south. Given these dimensions, it is not surprising that the topography of the area is highly varied, being a product of geology and geological processes, creating here a series of well-known rich and varied landscapes, from the rugged coast of the North York Moors on the east to the Selby lowlands in the south, see Figure 7. Two main areas of upland draw the eye, the Pennine chain in the west dominated by the limestone Three Peaks of Whernside (736m), Pen-y-Ghent (694m) and Ingleborough (723m) in the south and Rogan's Seat (672m) and Angram Common (716m) further north. The North York Moors massif is lower, achieving a maximum height of 454m on Cockayne Ridge and 433m on Westerdale Moor but with notable outliers of the Eston and Upleatham Hills (183m and 179m respectively) between Guisborough and the Tees estuary and the Howardian Hills with 172m on Yearsley Moor. Frequently unnoticed as an upland block are the Yorkshire Wolds which reach 220m at Wharram Percy Farm.

Some areas are sharply defined by scarp slopes, such as the northern edges of the North York Moors and Wolds and the dramatic rise of the Carboniferous limestone on the south side of the Dales but elsewhere the hills fall more gently down to the broad lowlands where the many rivers running off the uplands and down valleys slow down and deposit their load in the shallow north-south lowland created by the ice. Two estuaries, the Tees and the Esk, outfall on the coast. There is no estuary at the eastern end of the Vale of Pickering because it is blocked by a moraine, forcing the river systems to flow inland. South of York, the Humberhead Levels create a broad low-lying area with low topography and often wet soils.



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Figure 7 Topography of the HLC project area (outlined in red)

2.3 Thematic overview of the Historic Environment of the Project Area

An area with the size and geographical complexity of North Yorkshire and the Lower Tees Valley does not lend itself easily to a summary overview, which inevitably leaves out more than it could ever include. However, it is felt important to provide some sort of assessment for the user and so a thematic approach has been taken, covering the themes of settlement, religion and ceremony, communication, industry, defence and agriculture, with examples from all periods spread throughout the project area. The emphasis is on elements visible in the current landscape, reflecting human activity for over 5,000 years.

Settlement

Prehistoric activity, generally, is not difficult to find but upstanding settlement is rare and tends to be most obvious on the thin limestone soils of Craven, for example the hut circles on Malham Moor⁴⁶, although other sites do exist for example the Bronze Age enclosure on Westerdale Moor, Castleton⁴⁷. One of the most visible prehistoric settlements is the late Iron Age site at Stanwick, north of Scotch Corner, where large earthwork embankments encircled an oppidum or proto-town and have been incorporated into later park and field boundaries⁴⁸.

Scarborough possibly has the earliest origins of any extant town in the area, developing from a late Bronze Age/early Iron Age promontory fort⁴⁹ closely followed by a Roman signal station, both making use of the natural promontory. However these do not constitute major settlement whereas Roman York, which was founded around AD 71, developed into an important legionary fortress and civilian settlement⁵⁰.

The towns of York, Hartlepool and Whitby have important Saxon monastic settlements which possibly included control of markets and/or maritime trade at river mouths or crossings⁵¹.

Small market towns tend to be situated in the rural lowlands/upland fringe except where river valleys contained settlements and communication routes as at Hawes in upper Wensleydale, Reeth in Swaledale and Egton in Eskdale⁵². Whitby and Hartlepool were positioned differently, being on the coast, and they had the multiple benefits of monastic settlement, market and port. Many other market towns began life as Saxon settlements but may have been remodelled in the 12th century with broad main streets to accommodate markets as at Yarm and Stockton and Northallerton whereas Thirsk, Richmond and Skipton were influenced in their plans by the development or insertion of a castle. Harrogate had a late start, developing from a scattered collection of hamlets into a well-established spa town by the end of the 18th century⁵³.

⁴⁶ White 1997, 27 and fig 15

⁴⁷ Crosthwaite 1986, 29

⁴⁸ Wheeler 1954

⁴⁹ Pearson 2005, 2

⁵⁰ Butler *ed.* 1971

⁵¹ Petts and Gerrard 2006, 65

⁵² Daniell 2003, 103

⁵³ Morrison 2003, 203

The largest settlements today are in the Tees estuary industrial conurbation from Hartlepool to Redcar, whilst York, Harrogate and Scarborough continue to flourish as modern business and commercial centres.

Religion and ceremony

Throughout the project area are many good stone sources but perhaps curiously there is very little in the megalithic tradition that elsewhere typifies prehistoric ceremonial and funerary sites. Exceptions include the Devil's Arrows standing stones at Boroughbridge, stone circle(s) at the High Bride Stones on Sleights Moor and the Yockenthwaite stone circle in Littondale. Stone was used for rock art which tends to be found in specific areas where suitable rock types are found, such as the lower Wharfe valley (millstone grit), Fylingdales Moor (Jurassic sandstone)⁵⁴ and on Feldon Ranges above Richmond. For large ceremonial monuments earthen features banks with stony fills were often used for henges, as at Thornborough east of Masham, Castle Dykes near Aysgarth and Yarnbury⁵⁵ near Grassington.

Most evident in this theme are the medieval and post-medieval parish churches, especially in rural areas where they are most visible, towering above the village often in an elevated position as at Pateley Bridge or set apart as at Great Ouseburn. Selby and Whitby abbeys, Ripon, St Hilda's at Hartlepool and York Minster form notable landmarks, some with their origins as Saxon minsters.

Communication

In this area of well-defined topography, with high plateaux cut by rivers and broad lowland valleys in between, communication routes in the pre-modern era were determined by the availability of river crossings, condition of flood plains and density of wood and scrub. Prehistoric routes can be seen in some co-axial field systems in the Dales⁵⁶ and from the air as cropmarks in many parts of the project area. A number of Roman roads have been recorded in the study area (see Figures 8 and 9). The present A1(M) road through North Yorkshire follows the course of Roman Dere Street for much of its length, an important part of military infrastructure to aid the movement of troops north to Hadrian's Wall⁵⁷.

The Great North Road (actually a series of trade routes) has long been a major north-south communication route linking the south of England with Scotland. East-west routes were also important for transporting goods to and from the coastal ports of the Tees, Whitby and Scarborough, the river at York (with connections to the road system) and bringing wool and lead from the Pennines and alum and ironstone from the North York Moors. Drove roads and pack horse routes such as the paved trod or medieval pannier way on Lealholm Rigg, North York Moors are relatively rare survivals in unforgiving territory, sometimes with wayside crosses as markers⁵⁸.

The great Cistercian monasteries created an extensive network of trackways to connect the abbeys with their granges and lands and to transport goods from the uplands down to the mother house on lower ground. The most extensive series of

⁵⁴ Brown and Chappell 2005, 32

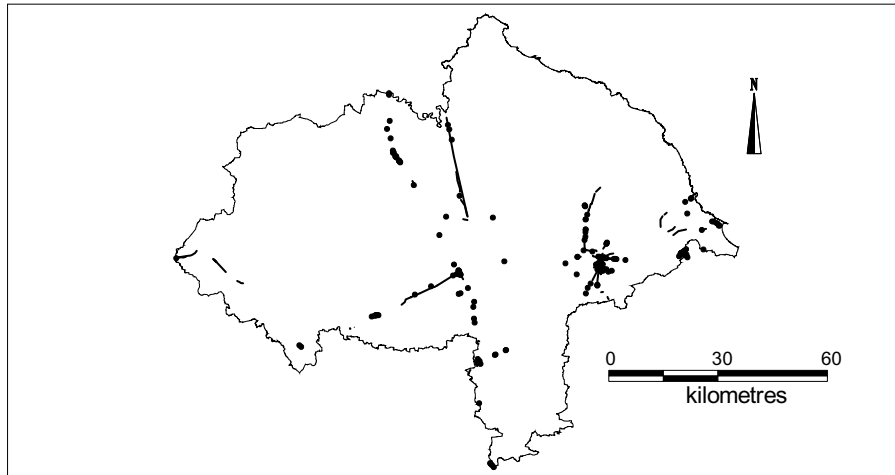
⁵⁵ <http://www.outofoblivion.org.uk/record.asp?id=518>

⁵⁶ <http://www.outofoblivion.org.uk/roads.asp>

⁵⁷ Wilson 2003, 48

⁵⁸ Daniell 2003, 101-104

new roads were created from the mid 18th century onwards in the form of turnpikes which facilitated commerce between both manufacturing and market towns⁵⁹.



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Figure 8 *Roman roads identified within the project area*



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Figure 9 *Probable course of the Roman road from Northallerton northwards to the Tees, seen in the field boundaries slightly to the east of the bright green line.*

Canals followed and, together with rivers, were the best option for moving heavy goods until the creation of the railway network in the 19th century. From its beginnings at Stockton on Tees, the rail network grew to have considerable influence on the landscape ranging from major engineering works and the headquarters of the dominant North Eastern Railway in York to the tunnels and viaducts such as the

⁵⁹ Sheils 2003, 128-9

famous Ribbleshead Viaduct on the Settle to Carlisle route⁶⁰. Hundreds of miles of lines stretched across the countryside connecting rural areas, villages and towns and a whole architectural style was created in the building of stations, hotels, signal boxes and crossing-keepers houses.

Industry

The complex geology in the project area supported extractive industries for obtaining a variety of raw materials including lead, lime and coal from the eastern Pennines and ironstone, coal, alum and lime from the North York Moors and Eston Hills. Salt, lead and coal were probably exploited early, there are Roman lead ingots from near Pateley Bridge, otherwise our knowledge comes from documents from the great monastic houses at Fountains and Rievaulx which describe rentals and agreements for both lead and iron, industries whose importance continued for several hundred years as well as the surviving remains. In the post medieval period alum production dominated the north east part of the Moors and ironstone from there was taken to the Tees estuary foundries for production into finished goods⁶¹.

Textiles became industrially important in the 18th and 19th centuries with manufacture impacting on the landscape as flax mills clustered on the western side of the North York Moors and wool, worsteds and cotton mills dominating the wetter south-west from Skipton to Ingleton⁶².

Defence

Earliest visible defensive structures may be the late Bronze Age/Iron Age palisaded enclosures as at Eston Nab⁶³ in Redcar and Cleveland and Staple Howe in Ryedale, though whether built to defend against animals or people is uncertain. There are many Roman forts such as Elslack, the legionary fortress at York and later Roman signal stations on the coast which signify the strategic importance of the area.

Medieval castles abound due to Norman military consolidation (Knaresborough), Scottish raids (Northallerton), and royal building (Middleham)⁶⁴. Some made big impacts on the landscape by influencing the development of the town as at Richmond or forcing considerable reorganisation of existing settlement as at Cawood and Helmsley.

The Second World War had a great impact on the area, when the Vale of York became virtually one huge landing strip with airfields every few miles⁶⁵. The low-lying parts of the east coast are vulnerable to invasion and attack, prompting the creation of signal stations as early as the Roman period and measures such as Heugh Gun Battery at Hartlepool were installed in the 19th century but continued in use until 1944⁶⁶. Catterick Camp has developed, since 1915 when troops first occupied it⁶⁷, to

⁶⁰ Sheils 2003, 132

⁶¹ Lee and White 2003, 163-190

⁶² Lawton 2003, 186-188

⁶³ http://www.teesarchaeology.com/new/eston_hills.html

⁶⁴ Matthieu 2003, 82-84

⁶⁵ Halpenny 1982, 7

⁶⁶ http://www.teesarchaeology.com/new/heugh_indepth.html

⁶⁷ <http://www.richmond.org/guide/history.html>

become the Army's base in the northern UK⁶⁸, with extensive ranges on the edge of Swaledale as well as built development with barracks and other buildings.

Agriculture

In North Yorkshire agriculture has been an important influence for over 5, 000 years and continues to be so today as the county remains predominantly rural. Much visible early farming is confined to the uplands where subsequent activity has not obliterated it, such as the co-axial field systems on Calverside Moor, Swaledale⁶⁹, Westerdale Moor⁷⁰ and Lofthouse (Nidderdale). Cropmark evidence reveals large areas of field systems in the lowlands but by its nature does not contribute to the visible landscape character today. Best places for upstanding sites of this type in the lowland are the few remaining commons in the Humberhead Levels such as Skipwith Common to the south of York which also has post-medieval line pits for retting flax.

The medieval period is clearer, with fossilised strip fields at Middleton (Pickering), ridge and furrow fields such as at Stainsby⁷¹ Middlesbrough, Poppleton Ings York and probably the piecemeal enclosure at Timble⁷².

There are a large number of planned and model farmsteads in the old North Riding which has more dating from 1750-1790 than any other area⁷³, and consequently is likely to have had an impact on field patterns though research would be needed to establish if this is the case. A good example of this farm building type is at Birdsall Home Farm, with an early 19th century example at Demesne Farm Fylingdales and five planned farmsteads in Kirkleatham parish all built 1760-1770 with eighteenth century enclosures strongly visible around.

⁶⁸ Archaeological Services Durham University 2007, 2-3

⁶⁹ White 1997, 20-21

⁷⁰ Crosthwaite 1986, 29

⁷¹ http://www.teesarchaeology.com/new/stainsby_indepth.html

⁷² HLC record HNY1803

⁷³ Wade Martins 2002, 222