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A Lidar-enhanced Archaeological Survey of Tilgate Forest, West Sussex

by
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Summary

An archaeological survey of Tilgate Forest was undertaken during 2010/2011 for Forest Enterprise to review the historic environment resource and provide conservation and management recommendations to Forest Enterprise for the heritage of this area of woodland.

Prior to this survey, only six archaeological sites had been identified in Tilgate Forest. This survey used a combination of an innovative airborne lidar survey, traditional desk-top methods and field survey to identify a total of 105 sites. This report discusses the methodology used in the survey, describes the archaeology recorded, and makes recommendations for its conservation and management.

The landscape of Tilgate Forest as experienced today mostly does not reflect its longer term history. Its legibility as a historic landscape has been much reduced through the London to Brighton railway being cut through its eastern edge in 1841 and the M23 motorway cutting it from east to west in the 1970s. It also suffered fragmentation in land ownership when the Tilgate Park Estate was divided up and sold in the mid twentieth century.

The survey showed that, compared to Sheffield Forest or St Leonard's Forest, Tilgate Forest retains relatively few features from its past history as a Forest, working woodland or rabbit warren. A few boundaries and drains found in the south-western section, along with some fine specimen trees in the nearby Tilgate Park, reflect 18th and 19th century land improvement schemes. In the south east of the area traces were found of a series of round fields dating from the early to mid 19th century. These are a highly unusual, and possibly unique, landscape feature.

The standing archaeological remains of an experimental nursery belong to the 20th century, and form an interesting part of the history of later development of this land and of Tilgate Park into an open space close to the new town of Crawley. The recently created cycle trails, jumps and pits are another very modern phenomenon sometimes found in woodlands. They were recorded as they will leave substantial earthworks which, if not recorded, could puzzle future archaeologists as to their form and function.

Although relatively little archaeology now remains within the study area there are important connections with the surrounding landscape. The main threats to the archaeological remains of Tilgate Forest are now wear from heavy recreational use, and from development, particularly in the section north of the M23. This report describes how the most significant heritage assets can be conserved and protected through following a management plan.

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1. Introduction

1.1 Chris Butler Archaeological Services Ltd (CBAS) was commissioned by Forest Enterprise to carry out an archaeological survey and review of the historic environment resource of Tilgate Forest. The objective was to provide recommendations for the conservation and management of its historic environment resource. East Sussex County Council (ESCC) Archaeology Section, working with their counterparts in West Sussex (WSCC), identified the need for the work and set out the brief, and the project was funded by Forest Enterprise and the Weald Forest Ridge Historic Environment Awareness project.

1.2 This report outlines the methodology used in the archaeological survey, then looks at the results of the field survey, summarising the sites identified by period and type. A full listing of all the sites is contained in Appendix 1 to this report. Finally the report covers the recommendations for the conservation and management of the historic environment resource in Tilgate Forest and options for further action, interpretation and research.

Tilgate Forest – definition

1.3 Tilgate Forest is owned and managed by Forest Enterprise on behalf of the Forestry Commission. The area of land now known as Tilgate Forest is only the very small remnant of what was a much larger area of ancient forest and heathland, part of Worth Forest. That part which became Tilgate Forest has changed markedly during the 19th and 20th centuries with the building of the railway in 1841, the splitting up of the older estate lands, the encroachment of the suburbs of Crawley and the construction of the M23 motorway during the 1970's. The boundaries between the land owned by the Forestry Commission and that of Crawley Borough Council are not well marked: close to the conifer plantations are the remnants of earlier ornamental planting with some fine specimen trees and a parkland type landscape. When considering the archaeology of the study area, and its history, it is important to note that the present boundaries are very artificial and the wider landscape context should be taken into consideration.

1.4 The area of land now known as Tilgate Forest (Fig. 1) is located within the western end of the High Weald Forest Ridge AONB. It lies south of Crawley and it is cut in half by the M23 motorway with the eastern boundary formed by the London to Brighton railway which effectively severed both its east-west ancient road connections and its previous associations with Worth Forest. An open area, running north-south, cuts through the southern part of Tilgate forest through which run overhead transmission lines.

Geology

1.5 Tilgate Forest, on the west side of the railway, rises to about 134 metres to the north. The Forest is situated on the westernmost extension of the Hastings Beds which are a mixture and sandstone, sands and clays giving poor sandy soils on the higher ground. The soil is sand, with a subsoil of loam, sand, and stone (Fig. 2).

Topography

1.6 The Worth Forest landscape, of which Tilgate Forest is part, is described in the West Sussex Landscape Character assessment as 'a heavily afforested dissected landscape plateau enclosing a post-medieval rural landscape cut from the forest[1]'. The land is steeper in the south, with a woodland gill running north-south through the centre of the study area. The land rises steadily northwards to a more open plateau-like landscape. The land to the east drops away to the woodland gill of Stamford Brook and the railway line. The area is drained by tributaries of the Rivers Ouse and Mole.

Vegetation

1.7 The area of land now known as Tilgate Forest and owned by the Forestry Commission is an area of a mixture of broadleaf woodland, coniferous plantations and heathland of 149 hectares.

Administration

1.8 Tilgate Forest was part of the Rape of Lewes, and it historically lay within the parish of Worth. The section of the study area north of the M23 is now included in the Borough of Crawley while the area south of the motorway is now part of Slaugham Parish.

Previous surveys

1.9 Prior to this survey the level of knowledge of the extent and significance of archaeological features on Tilgate Forest was not sufficient to allow recommendations for a program of conservation and management works to be developed. Only six archaeological sites were recorded on the West Sussex Historic Environment Record (HER) mapping and database. Two were find spots of prehistoric flint implements associated with an unpublished excavation which has not been accurately located, one was a platform which, although visible on the lidar images, was not located during the survey, one was the site of a brick kiln and brick field noted on the 1st edition OS map of 1874 but with little trace on the ground, and one was a mine pit referred to in a bibliographic source.

1.10 Fieldwalking took place in 2005 on the site of Crawley Waste Management Site, to the southwest of the study area, where eight pieces of worked flint and two well abraded fragments of medieval pottery were found.

[1] http://www.midsussex.gov.uk/Nimoi/sites/msdcpublic/resources/LCA22pt4HighWealdForests.pdf

Lidar surveys – definition

1.11 This survey used lidar data to review the historic environment resource and provide conservation and management recommendations. Airborne lidar (light detection and ranging), also known as airborne laser scanning (ALS), measures the height of the ground surface and other features in large areas of landscape to provide highly detailed and accurate models of the land surface. Originally developed for submarine detection in the 1960s and 70s, it was adopted by the UK's Environment Agency and others such as highways and utility authorities for producing cost-effective terrain maps. Since around 2000, archaeologists have been exploring its potential to recognise and record otherwise hard-to-detect features over large areas.

1.12 Lidar operates by using a pulsed laser beam which is scanned from side to side as the aircraft flies over the survey area, measuring between 20,000 to 100,000 points per second to build an accurate, high resolution model of the ground and the features upon it. Because lidar uses light beams it has the potential to penetrate gaps in the woodland canopy and so record the ground surface under the trees. This can reveal features that would not otherwise be seen, although very dense cover such as rhododendron may prove impenetrable to lidar survey.

1.13 The CBAS survey team's experience with using lidar for a much larger survey[2] assessing some 700 sites on Ashdown Forest, which was one of the first in the country to use lidar on this scale, led to the conclusions that:

- Lidar is capable of identifying a substantial number of new archaeological sites – at least a third more than traditional desktop and walkover methods.
- An experienced lidar interpreter can make reliable identifications of known site types in around 75% of cases using desktop methods.
- Around half of known sites identified by traditional desktop and field survey methods are capable of being enhanced by lidar survey, notably in identifying their full extent and precise location.
- Using lidar images as an additional survey tool before going out into the field enables the ground work to be done faster. The extent and precise geographical location of identified archaeological features can be targeted accurately without the need to carry out a full ground survey.
- However a significant number of archaeological features do not show up on current lidar images and are only detected through field visits: lidar should always be used in conjunction with field work, and 'ground-truthing' through field visits is an essential part of this type of survey.

[2] *Ashdown Forest historic environment resource: a revised lidar-enhanced archaeological survey*. Butler, C, Blandford, V and Locke, A, April 2011.

2. Historical and Archaeological background

Table 1: The archaeological periods referred to in this report are as follows

Palaeolithic	900,000 – 10,000 BC	End of the ice ages
Mesolithic	10,000 – 4,000 BC	Hunter-gatherer societies
Neolithic	4,000 – 2,500 BC	Early agriculture
Bronze Age	2,500 – 800 BC	The first metal working in bronze
Iron Age	800 BC – 43 AD	Start of iron industry in the Weal
Romano-Britis	43 – 410 AD	Iron industry in Weald
Saxon	410 – 1066 AD	Iron industry in Weald
Medieval	1066 – 1500 AD	Iron industry in Weald
Post Medieval	1500 AD to present da	End of iron industry in Weald

Prehistoric

2.1 Large quantities of Mesolithic flintwork have been collected from in and around Tilgate Forest in the past. In 1963 Beckensall undertook excavations in Tilgate Forest (MWS961), although the exact location is not known. Mesolithic flintwork has been recorded as coming from the area of TQ283334 & TQ282334[3], whilst large quantities of flintwork is recorded as coming from his excavations to the north of the survey area at TQ285346, including microliths, microburins, tranchet adzes and debitage. Further Mesolithic flintwork is recorded as coming from Round Field to the south-west of the survey area (TQ271331 & TQ267333)[4].

2.2 The area around Horsham has produced a high density of Mesolithic sites[5], many of them connected to the Horsham Point 'culture'[6]. Many of the sites are only known from surface collections of flintwork, often found eroding from worn paths and tracks, or from unrecorded excavations. Most of these sites are found on low lying valley sides or plateaux, close to streams or springs, and with their broad range of tools and debitage probably represent something more than simple hunting camps and perhaps signify a reduction in human group mobility in the later Mesolithic.

2.3 Small quantities of later prehistoric flintwork have also been found in Tilgate Forest, including fragments from a polished Neolithic axe (MWS4570).

[3] Wymer, J.J. 1977 *Gazetteer of Mesolithic sites in England and Wales*, CBA Research Report **22**.
[4] *Ibid.*
[5] Holgate, R. 1987 'Excavations at Halt Mesolithic site, near Horsham, West Sussex, 1985', *Sussex Archaeological Collections* **125**, 33-9.
[6] Butler, C. 2008 'A Collection of Mesolithic flintwork from the Horsham area: The Standing Collection', *Sussex Archaeological Collections* **146**, 7-18

Roman

2.4 From the Iron Age until the end of the medieval period iron was manufactured in the Weald in small furnaces called bloomeries. A bloomery was a small sandy-clay structure, which could have either been cylindrical, or dome shaped, or a combination of both. Charcoal and ore were placed in the furnace through a hole in the top and air introduced, by bellows through a hole or holes in the side. Eventually the iron collected in a mass, called a bloom, hence the name 'bloomery', and the waste products were run off in a semi-liquid form known as slag[7].

2.5 Roman activity in the area almost certainly centred on the iron industry, with a domestic and industrial area covering some 12 hectares revealed by recue excavations in advance of building development at Broadfield and Southgate West just to the north-west of Tilgate Forest. Many of the stages in manufacturing iron by the bloomery process are represented by features which included ore-roasting areas, three slag dumps, 40 plus smelting furnaces, puddling pits, a water reservoir and a blacksmith's workshop. One of the excavated domestic settlements was found to be surrounded by a ditch and low bank, enclosing a rectangular area, measuring approximately 76m x 63m. Two substantial buildings were uncovered inside this area, as well as various post pits and walls indicating others[8].

2.6 No major Roman roads or settlements are know in the area, but aridgeway track (Margary Track VI) runs west from Ashdown Forest through Turners Hill, and then follows Parish Lane along the southern edge of Tilgate Forest before continuing on to Horsham[9].

Medieval

2.7 The Forests of Tilgate and Worth on the highest ridges of the Weald were never brought under the standard manorial system. These lands were used as outliers (for swine pastures) for the parent manor on the coast, as they were probably valued as hunting grounds for the Saxon kings[10].

2.8 Tilgate was first mentioned in 1296 in tax returns on land owned by William Yllegate (or de illegate). Etymologists say that it has an earlier derivation as Illan geat or the gate of Illan. The name changed over time to Tilgate[11]. The word 'forest' denoting a hunting ground, is derived etymologically not from the Latin *foresta*, but *foris*, meaning land outside the common law. Areas of forest land, not necessarily always wooded, had their own defined boundaries within which Forest Law prevailed[12].

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[7].Hodgkinson, J. *The Wealden Iron Industry* 2008, Tempus,Stroud.
[8] Cartwright, C. (1992) 'The excavation of a Romano-British iron working site at Broadfield, Crawley, West Sussex', *Sussex Archaeological Collections* **130**
[9] Margary, I.D. 1948 *Roman Ways in the Weald*, Pheonix House.
[10] Brandon, P. 2003, *The Kent and Sussex Weald*, Phillimore, Chichester.
[11] Mawer, A. & Stenton, B. 1929 '*The Place-names of Sussex Part 1 Rapes of Chichester, Arundel and Bramber'.* CUP, Cambridge.
[12] Brandon, P. 1974 *The Sussex Landscape*, Hodder and Stoughton, London

2.9 Worth Forest was historically a mosaic of heath, wood and wood pasture rather than continuous woodland. The main task of woodland clearance in medieval times was through assarting (woodland clearance for small scale agriculture) and enclosure.

Post Medieval – ironworking

2.10 Between circa 1550 and circa 1660 the chief non-agricultural economic activity of the area was ironworking. There was a furnace at Tilgate, to the north-east of the study area at TQ284355 (MWS5786), which was in use between the years 1607-1664, but may have been in use even earlier[13]. In 1560 there was a double furnace in Worth Forest, located near the eastern boundary with Tilgate Forest, now where the railway line is situated at TQ290335 (MWS5791). The iron industry exploited the ore and timber resources of the immediate area of what is now known as Tilgate Forest[14]. The principal method of obtaining ore in the westernmost part of the Weald was by the means of minepits. These were vertical shafts, between 1.8 to 2.4 m in diameter that were sunk to the layer or seam of ore. They were widened out to take the maximum amount of ore from them in safety. The pits would be filled in from the next pit or pits dug, leaving a pock marked landscape behind. They were known as mine pits because the local name for ore was 'mine'[15] Tilgate Forest suffered the same fate as St Leonard's Forest and became a heathy waste probably largely devoid of woodland cover.

Post Medieval – the decline of woodland

2.11 Tilgate, as part of Worth Forest (along with the manor of Sheffield in the parish of Fletching and St Leonard's Forest, Horsham) formed part of the extensive Sussex estates of the Duke of Norfolk which were forfeited to the Crown in 1546. Tilgate Forest was probably separated from Worth during the 17th century when it became part of the Tilgate Manor Estate in 1647. The estate passed through the hands of various different owners, from the Lords Bergavenny to Sir Walter Covert and Sir Edward Culpepper in 1566, to the Sergission family until 1865 and then the Ashburnham-Nix family until 1939 when the 2185-acre estate was sold in 74 separate lots. The Ashburnham-Nix family, some of whom were well known amateur horticulturalists, planted many of the ornamental trees. Part of the forest ride in the northern section was once the avenue to Tilgate house, now demolished[16].

2.12 Woodland clearance was achieved by assarting and enclosure in medieval times in a very piecemeal fashion. The destruction of the forest continued through the Civil War and beyond. With the decline of the iron industry the woodland was no longer coppiced and not enclosed, so its regeneration was hindered by grazing animals. Heathland came to pre-dominate in the 17th to 18th century.

[13] Cleere, H. & Crossley, D. 1995 *The Iron Industry of the Weald*. Merton Priory Press, Cardiff
[14] 'Lower Beeding', *A History of the County of Sussex: Volume 6 Part 3: Bramber Rape (North-Eastern Part) including Crawley New Town* (1987), pp. 7-12. URL: http://www.british-history.ac.uk/report.aspx?compid=18379
[15] Cleere, H. & Crossley, D. 1995 *The Iron Industry of the Weald*. Merton Priory Press, Cardiff
[16] http://www.british-history.ac.uk/report.aspx?compid=18380

2.13 Rabbits were introduced during the 17th and 18th centuries and were bred commercially and housed in specially constructed homes called pillow mounds. Pillow mounds vary greatly in length from 6 metres up to 150 metres, most are no higher than a metre and vary between 4 to 8 metres wide, often flanked by a ditch. They are generally rectangular in shape and are aligned at a right angle to the contours. Sometimes these pillow mounds would have been enclosed by boundary banks or walls, to prevent the rabbits escaping, forming part of a large warren[17]. However, the lidar survey of the Weald Forest Ridge revealed that pillow mounds in Sussex vary greatly in their form and not all conform to the conventional 'cigar shape' pillow mound. The heathland was burnt to provide new growth of the vegetation on which the rabbits fed and the rabbits stripped off any regenerating vegetation and thus helped to turn any woodland into a heathland landscape on the poor sandy soils of St Leonard's and Worth Forests.

2.14 It is interesting to note in the adjacent lands to the east (from lidar images) and west (from aerial photographs) that there are substantial remains of pillow mounds surviving, yet none were found in Tilgate during the course of this survey. This may reflect the different ownership of adjacent lands but it is more likely that any pillow mounds that had been constructed in Tilgate were cleared away successfully in later land improvement schemes. If the ground was to have been successfully ploughed and planted the pillow mounds would have had to have been physically removed. It is certainly interesting to note that substantial remains of pillow mounds have been found in St Leonard's Forest but none at Tilgate.

2.15 In the early 19th century it was said that both Worth and St Leonard's Forest only yielded rabbits, but after that some attempt was made to improve and enclose the warrens and turn the land previously used for rabbit farming into arable land. A similar sequence happened at nearby Tilgate Forest, once described as 'no other than a rabbit warren'. During the 19th century, when the pressures for cultivation of marginal lands increased once more, and tile drains were introduced to drain the land, cultivation and improvement, there is historical evidence that the improvement of the land in Tilgate Forest was successful[18]. During the survey some evidence of land drainage was recorded. A variety of drainage ditches survive in Tilgate Forest and some have the appearance of having been there some considerable time, but it is difficult to tell from which period they date. It would appear that land reclamation was more successful in Tilgate than in either Sheffield or St Leonard's Forest.

2.16 Following the 1949 New Towns Act 200 acres of the former Tilgate Estate was zoned as public open space.[19] The Forestry Commission bought 149 hectares of the former Tilgate Forest, part of the once much larger estate, around 1950. Today it is a popular amenity area, although still managed by the Forest Enterprise, with use by walkers, cyclists and an active community of bike trail enthusiasts who have built various jumps and cycle runs whose details can be found on an enthusiast's website[20],[21].

[17] Williamson, T. 2006 *The Archaeology of Pillow Mounds*, Shire Princes Risborough
[18] http://www.british-history.ac.uk/report.aspx?compid=18380
[19] http://www.crawley.gov.uk/stellent/groups/public/documents/otherdocs/int195668.pdf
[20] (http://www.mudtrail.co.uk/trails/tilgate-forest.php)
[21] http://www.moredirt.co.uk/trail/South-East--London/Tilgate-Forest/361/

2.17 These bike trails are interesting in that they have created some substantial earthworks which, if not recorded, could puzzle future archaeologists as to their form and function, when over a period of time they fall out of use and become eroded. In fact there are already a number of eartworks that have become eroded and overgrown, which almost certainly originated as bike trail features.

3. Survey Methodology

3.1 The survey undertaken at Tilgate Forest equates to a Level 2 survey as defined by English Heritage[22]. This level of survey provides a basic descriptive and interpretive record of the archaeological remains within Tilgate Forest, and includes core monument data and the level and form of records that satisfies the requirements of the current standards and approaches to Woodland Archaeology in the south-east of England[23].

The airborne lidar survey

3.2 The Historic Environment Awareness project, funded by English Heritage and the Heritage Lottery Fund, included a lidar survey of the Weald Forest Ridge which produced a detailed digital map of the ground surface allowing the definition of features to within 100mm vertical and 250mm horizontal accuracy.The lidar survey was flown in two tranches, in early 2009 and spring 2010, since it needed to be undertaken at times when the trees were not in leaf. As it covered the entire Weald Forest Ridge, of which Tilgate Forest forms a part, initial analysis began in 2009 for other areas. The methodology established then has been adopted for the present survey.

3.3 In the first year of the Historic Environment Awareness project, lidar images were viewed on screen in ArcMap software, mainly using the composite hill-shaded images lit from the NW (example Fig. 3). Sometimes a single hill-shaded image, lit from the SW, was used to ascertain whether a different detail could be seen from this direction. This was applied to an area of high interest or where linear features run in a roughly N/S direction. The images were viewed at a scale of 1:4000 as this gives an efficient working scale and good resolution. It is sometimes worth investigating areas of specific interest at a scale of 1:2500. It must be noted, however, these extra options are time-consuming and it is not advised to cover large areas using these additional methods of querying the data, but if a small area is to be studied in detail a scale of 1:2500 can be used.

The desk-top survey

3.4 The desk-top study comprised the investigation of the Historic Environment Record (HER) held by WSCC for this area. A study of the available aerial photographs and historic mapping for the area was also undertaken. A full search of historical records and documentary sources was not undertaken as part of this survey. The lidar survey data was studied alongside the photographic and map evidence to identify and transcribe potential features, the results of which were overlaid onto OS mapping as the basis for undertaking the field survey (Fig. 4).

[22] English Heritage (2007) *Understanding the Archaeology of Landscapes*, Swindon, English Heritage.
[23] Bannister, N. & Johnson, C. (2008) *Woodland Archaeology – Setting Standards and Approaches*, Discussion Paper (draft 2).

Historic Landscape Characterisation

3.5 The Historic Landscape Characterisation (HLC) which was undertaken for Sussex (2003-2008) maps the historical attributes of the present landscape to reflect both historic character and historic time depth[24] The HLC (Figs. 5 and 6) shows Tilgate Forest to be an area of woodland surrounded by fieldscapes, designed landscape and recreation areas and the southern part is dated to the early modern period (1800-1913). However, a substantial part of the southern area is heathland with some plantations.

The Field Survey

3.6 The detailed field survey was undertaken on two visits, on 16 and 22 February 2011, by Vivienne Blandford, Chris Butler and Anne Locke. The vegetation was low and there was good access to most of the area, except for areas of particularly dense planting, rhododendron, thick brash deposition or steep slopes. The areas not surveyed are roughly outlined on 'areas not surveyed map' (Fig. 7).

3.7 The survey methodology comprised a systematic walkover of the area, using the lidar as a back up to the visual inspection of the ground surface. The transcribed lidar overlay (see Fig. 4) was used in conjunction with the current OS mapping to identify features and determine their extent. Features previously identified on the lidar were targeted to confirm their presence, identity, and current state. Other features, not on the lidar, were identified during the walkover survey: these were mostly small or negative (sunken) features or in dense cover and would not have showed up on the lidar.

3.8 A written record was made for each earthwork or other site encountered, including information on its dimensions, shape and extent, together with any relationships with other earthworks and sites. Where necessary this information was backed up with sketches and digital photographs. For features not visible on the lidar, measurements were estimated by pacing, and a hand-held GPS (Garmin 60CSx or Magellan Triton) was used to provide an exact location to an accuracy of 5m.

3.9 Each site was entered onto an Excel database, which has been retained in the site archive. A summary extract of the database is included in Appendix 1 of this report detailing all the sites found during the survey. The site information has been added to the West Sussex Historic Environment Record (HER) GIS system, using the HBSMR package, with lines and polygons showing the exact position and extent of the sites transcribed from the lidar overlay where available. Electronic and paper base-maps were also created showing all of the sites found during the survey and are included in this report (Figs. 17 and 18).

[24]N.R. Bannister, *Sussex Historic Landscape Characterisation* Final Report. WSCC, ESCC, EH; English Heritage 2004-5, in press. Characterisation. Conservation Bulletin Issue 47; J. Clark, J. Darlington, G. Fairclough, *Using Historic Landscape Characterisation*. English Heritage 2004.

3.10 During the survey, the ground surface was also inspected for archaeological artefacts, especially areas of recent clearance or path disturbance. However, only one small group of Mesolithic struck flints was recorded during the survey.

3.11 This survey has only considered the above-ground archaeology, and no attempt has been made to investigate the below-ground archaeology. It is likely that there will be many sites, especially those of prehistoric date, within Tilgate Forest that are currently below-ground, and therefore any future groundworks should be closely monitored to ensure that any sites disturbed are fully recorded.

3.12 The archive will be retained by Forest Enterprise, with a copy held in the West Sussex HER at WSCC. A copy of the report will also be deposited in the Library of the Sussex Archaeological Society at Barbican House, Lewes.

4. Results of the Survey

The Desktop Survey

4.1 The HER records were provided by WSCC and amounted to six sites in total that fall within the study area. These sites are listed within Appendix 1. Two were find spots of prehistoric implements associated with an unpublished excavation which has not been accurately located, one was a platform which, although visible on the lidar images, was not located during the survey, one was the site of a brick kiln and brick field noted on the 1st Edition OS map of 1874 but with little trace on the ground and one was a mine pit referred to in a bibliographic source with only an approximate grid reference. Fieldwalking took place in 2005 on the site of Crawley Waste Management Site, to the southwest of the study area, where eight pieces of worked flint and two well abraded fragments of medieval pottery were found. Documents held at West Sussex Record Office, the National Archives on line, British History and the British Library online and materials held by the Sussex Archaeological Society were also consulted.

4.2 In Speed's 1610, Johannes Blaeu's 1650 and Morden's 1695 maps (Figs. 8 to 10), St Leonard's, Tilgate and Worth Forest are clearly emparked and surrounded by smaller deer parks. In Yeakell and Gardner's map of 1778-1783[25] (Fig. 11) the Forests of Worth, Tilgate and St Leonard's are no longer emparked, but form part of a continuous wooded landscape surrounded by numerous small fields and separate small blocks of woodland with concise boundaries. Evidence of the past iron industry is apparent in the hammer ponds and pen ponds. Also shown is the predominance of the large wooded areas along the Weald Forest ridge.

4.3 The early draft ordnance survey map, circa 1813, of the area shows Tilgate Forest to be a mixture, predominately open heathland, with some woodland within the designed garden and landscape of Tilgate Mansion (Fig 12).

4.4 From tithe map evidence (Fig. 13) it is clear that by the time of this map, *c.*1841, that some successful clearance had taken place, and that a number of unusual circular and partly circular fields had been created to the south-west, where a few remnants of these boundaries survive in the south-western part of the study area[26]. From the tithe apportionment no clue is given for the use of these fields, but they may have already been out of use by 1841 as some of the circles have been truncated. Their names vary from Whalebone Field (59 and 60), Grindstone Field (447), Cherry Tree (449) (which is the only name that carries forward into later maps), to Little Sandpit (445), Sandpit (459) and Heath and Furze Field (451). These last three may give a clue to their original purpose or contemporary state of land use. The block of land surrounding these circular fields, shaded green on the tithe map, is a plantation. At some point in time someone had gone to a great deal of trouble to carve out, make boundaries and hedge circular fields. It is an unusual phenomenon.

[25] Yeakell & Gardner, 1778-1783 ESRO AMS 6008-29-16
[26] Tithe Map Worth West, circa 1841

4.5 A brick kiln and brick field is marked on the 1st Edition OS map, *c*.1874 (Fig. 14) centred around TQ26743418 (MWS5135, MWS8724), in the north-western part of the Forest, but no historical details[27] could be found about these brickworks nor much evidence on the ground, except for some possible faint earthworks and trackways. At TQ26753380, just outside the boundary of the Forestry Commission land, are the remains of Keepers Cottage, the gamekeeper's cottage for the original Tilgate Estate.[28] This cottage sits surrounded by the strange circular fields first noted on the circa 1841 Tithe Map and also present on the 1st Edition OS map. Keeper's cottage was not marked on the Tithe Map so it probably postdates 1841.

4.6 The avenue marked on the 1st Edition OS map, which would have been the route to Tilgate Mansion, now marks the boundary to the edge of the Forestry Commission land with that of Crawley Borough Council's Tilgate Park. It is possible that a short stretch of the boundary banks to this avenue was found during the survey.

4.7 A cottage or dwelling in the middle of the Forest was also marked on the 1st Edition OS map and remains of this dwelling and an open well were found during the survey (MWS8698).

4.8 Aerial photographs, taken in 1947, show no obvious signs of any military activity. The mixed woodland cover is dense in places with some substantial areas of more open ground. It is on these aerial photographs that pillow mounds are clearly visible to the south-west, just beyond the boundary of the study area.[29]

4.9 At TQ26653390, some 275 metres north of the gamekeeper's cottage, is a substantial ruined site screened on two sides by a dense shelter belt of conifer planting, possibly the site of an experimental horticultural research station (MWS8714).[30] Aerial photographs taken in 1946 (Fig. 15) show the curving walls, found during the survey, with substantial buildings behind them and possibly the lines of either a walled garden or compartments of nursery beds[31]. The site was used as a plant nursery post-WW2, part of the business of F W Berk & Co Ltd, a horticultural research station was based at the Walled Garden, Tilgate Manor which was later purchased by Crawley Borough Council and supplied much of the planting for Crawley New Town[32].

4.10 These buildings do not appear on any maps and no further details could be found about this site but the aerial photography evidence, and the substantial remains on the ground, would point to this area as being the horticultural research station. The site appears cleared by 1959 (Fig. 16).

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[27] Beswick, M. 2001 *Brickmaking in Sussex*, Middleton Press
[28] First edition OS map
[29] http://www.geog.sussex.ac.uk/grc/info/sussexairphotos/1940/3-3204.jpg

[31] http://www.geog.sussex.ac.uk/grc/info/sussexairphotos/1940/1-4195.jpg
[32] http://www.crawley.gov.uk/stellent/idcplg?IdcService=SS_GET_PAGE&ssDocName=INT195542

4.11 The area that was Tilgate Forest changed markedly during the 20th century when the estate was finally split up and sold, and with the opening of the Pease Pottage stretch of the M23 in 1974 which cut the now much smaller area of Tilgate Forest in half from east to west[33] and destroyed all archaeological features over its course, leaving only one footbridge crossing and making the historic connections between the north and south sections of the study area hard to interpret.

The Lidar and Field Surveys

4.12 The lidar and desktop survey identified 59 potential sites, of which 46, or 78%, were 'ground truthed' during the field surveys undertaken on 16th and 22nd February 2011. The field visits recorded a total of 99 sites including a further 40 which had not been pre-identified on lidar. Sites which had not been pre-identified on lidar were mostly small or negative (sunken) features e.g. platforms and saw pits, or in dense cover. Sites identified on lidar but not ground truthed were mostly substantial linear features like banks and trackways which can be reliably identified from the lidar.

4.13 All the sites found are listed in Appendix 1. The sites are predominantly Post Medieval in date, with most probably dating from the 16th century through to the 20th century. There were no sites that were found during the field survey that can be dated to the Medieval period or earlier with any certainty. However, many of the earthworks, especially banks, are undiagnostic in character, and thus it is possible that some could date from the Medieval period[34], as could some of the sites related to charcoal production.

Archaeological site types

4.14 The main types of site found in the survey are listed and defined in Table 2 overleaf. Common types are shown on the distribution maps; Figs. 19 to 21. These have in some cases been cropped to fit the features concerned, in order to show a greater level of detail.

[33] http://www.ciht.org.uk/motorway/m23londpeas.htm
[34] Rackham, O. 1990 *The History of the Countryside*, J.M. Dent & Sons Ltd, London.

Table 2: Main types of site found

Type of site	Definition	Number
Boundary	Boundary shown on map; may survive as bank	} 28
Bank	Linear earthwork often with associated ditch	}
Cycle trail feature	Banks, tracks and jumping pits created for off-road cycling	10
Ditch, drainage ditch	Water management feature associated with land improvement	7
Mound	Miscellaneous mound of indeterminate function and age.	7
Mine pits and quarries	Quarries probably associated with industrial activity	6
Hollow way	Sunken trackway, worn through use	6
Trackway	Road or trackway, some of which may still be in use	5
Settlement/ industrial site	Site of house and/or industrial activity	4
Charcoal burning platform	Usually circular depression with darker soil	4
Saw pit	Rectangular cut	3
Pond	Man made pond, some of which may be decoy ponds	2
Pillow mound	Long low mound for rabbit husbandry	0

Banks and boundaries (Fig. 19)

4.15 As previously mentioned there is a seamless transition between the woodland and the parkland of Tilgate Park. During the survey more than 20 examples of remaining boundary banks were found, mainly in short sections (Plate 1). No definite wood/forest boundaries were recorded and these must have been removed through land ownership changes and land improvements. On the eastern boundary near to a modern forest track which had been built up and the railway several boundaries were recorded. At TQ28723398 (MWS8690) a low wide bank, with a symmetrical profile 1.5m wide and 0.5m high, possibly marks a late boundary to the estate and it is also mapped as a boundary. In the same area, further south, between TQ28743413 to TQ28823382 and TQ28853378, (MWS8687) is a probable continuation of this bank. There is some evidence of an older road that has been replaced by the forest track and some of these banks could mark the edge of that older road and the old road was truncated by the building of the railway.

Plate 1: Woodland Bank (MWS8736)

4.16 Evidence of the distinctive circular fields referred to in para. 4.4 was found at TQ27313327, along the southern edge of the wood where the bank (MWS8981) was 1.5 m high and 0.5 m high and joins another curving bank (MWS8760) which varies between 1-1.8 m high and 0.5 to 0.75 m wide with a ditch to the west, varying between 0.8 and 1.5 m wide and up to 0.25 m deep (Plate 2). A broad trackway, no longer in use, on the outer edge of the wood parallel to MWS8981 was noted. This road corresponds to one marked on the Tithe Map which passes between the fields through the then plantation. The remains of these banks indicate that they were substantial features but their actual purpose remains an enigma.

Plate 2: Field Bank (MWS8760)

4.17 At TQ27203375 (MWS8710) a substantial boundary bank up to 1m high and 1m wide, with a ditch to the west with an asymmetrical profile, was recorded in an area of dense rhododendron. This is possibly the bank to an old track.

Cycle trail features (Fig. 20)

4.18 The most notable set of earthworks found during the survey were modern cycle trail features. The ingenuity of the enthusiasts was remarkable in the building of tracks on steep slopes, some with boundaries forming a contained racing track and substantial jump like features, some with pits (e.g. Plate 3).

Plate 3: Cycle trail feature

4.19 Eight of the largest and more obvious of these features were recorded as with time these features will become eroded and difficult to identify (e.g. MWS8749 – Plate 4). Examples of these features include MWS8695, where there were 6+ ramps and a well constructed wall that will leave a permanent feature in the landscape, whilst another oval shaped cycle track circuit was terraced into the top of a slope with embanked edges and an internal circuit with mounds and bumps, and a raised central area with numerous cuts, covering an area c.20m by 8m (MWS8741 – Plate 5).

Plate 4: Old cycle trail feature (MWS8749)

Plate 5: New Cycle trail feature (MWS8741)

Other earthworks

4.20 At TQ26823413 (MWS8724) is a rectangular 10m cut near a track with other evidence of ground disturbance and a possible levelled platform area which corresponds to the location of the Brick Kiln/Fields noted on the 1st Edition OS map. At TQ26643376 (MWS8718) a series of five to six low round mounds up to 0.5m high and 3m to 4m across and evenly spaced about 22m apart were noted but their function remains unclear.

Ditches and drainage features

4.21 A series of different types of drainage features were recorded which may date to the time of the 19th century improvements. Today they are situated in dense woodland and do not necessarily relate to more recent forestry activities.

Mine pits and quarries

4.22 There was possible evidence of shallow, surface quarrying at TQ28453366 and TQ28453373 (MWS8683 and MWS8684) but the cover of small pine made it difficult to survey this area. An area of small mine pits each circa 3m across, located on the high ground in the north-west corner of the study area, was found at TQ26783441 and TQ26873437 (MWS8725 and MWS8726). These mine pits would have been a source of ore for the iron industry and are more typical of the mine pits found in the western Weald than those at St Leonard's Forest which are generally much larger[35].

[35] Butler, et. al. 2011 *A Lidar-enhanced Archaeological Survey of St. Leonards Forest, West Sussex*, CBAS

Trackways and hollow ways (Fig. 21)

4.23 Some significant sections of braided trackways were found in different locations which correspond to routes through the woodland/heathland which predate the building of both the railway and the M23. At TQ28323375 there is a series of approximately six roughly parallel trackways (MWS8733) aligned N/S that are up to 1m deep and 2 - 3m wide which have been truncated by the motorway (Plate 6). In the south-eastern section of the forest there are two separate sections of braided trackways (MWS8700 and 8767). One set aligned E-W at TQ28593343 (MWS8700) is a double hollow way 0.25 to 0.3 m deep, 1m wide and 4m apart aligned roughly E-W. This would have been part of the east-west route into Worth Forest which was cut off by the railway. It is still in good condition.

Plate 6: Braided trackways crossed by modern path (MWS8733)

Settlement/industrial sites

4.24 Centred on TQ26643388 (MWS8714) are substantial remains of demolished buildings with some walls up to circa 0.5m high (Plate 7). Remains also include a rectangular platform with two sides edged in brick circa, 35m by 20 m, with narrow ramp (possible barrow ramp) in the SE corner. The platform is fringed by a shelter belt of tall conifers whose outline is visible on the lidar images. To the west is an entrance way, adjacent to some demolished buildings, which has remains of wide steps with curving brick walls on either side in a 1920s/1930s style which are clearly visible on the 1947 aerial photograph (Fig. 15).

4.25 Demolition debris includes pre-cast concrete, metal beams, water tank and corrugated sheeting and is spread over a wide area circa 100m across. The bricks are frogged and include samples of Warnham (Sussex Brick Co. *c*.1899-1903[36]) and some Keymer bricks. Nearby is either evidence of domestic garden escape vegetation, or nursery escape, in the form of a pear tree, daffodils and a fine example of an early flowering pink rhododendron cultivar. The aerial photographs show a track leading northwards in the direction of Tilgate Park and these remains are probably the site of the experimental nursery referred to in para. 4.9, which, although obviously substantial from the remains left behind, was short lived as it appeared on no maps consulted during the desk-based survey and the site appears clear on the 1959 aerial photograph (Fig. 16).

[36] Beswick, M. 2001 *Brickmaking in Sussex*, Middleton Press

Plate 7: Experimental Nursey (MWS8714)

4.26 At TQ28583370 are the remains of a small dwelling (MWS8698) that is marked on the 1st Edition OS map. Nearby is brick lined open well, 3m deep which has probably been in-filled to some extent. The surviving loose bricks are largely unfrogged, 22cm by 11 cm depth 6cm. with one brick stamped 'Sussex Brick Estates' (Warnham post-1903[37]). There is evidence, in the debris, of peg tiles and hipped roof tiles. A pint glass milk bottle (Bottled by the Milk Safety First Company – Mid 20th century) and panel bottle glass were amongst the broken fragments of domestic waste. A saw pit was found close to this dwelling.

4.27 A large sub-rectangular platform/mound at TQ28843368 (MWS8693) was immediately adjacent to the boundary fence, and may have crossed it, near to the railway cutting. It measured approximately 32m by 20m and 2m high approx, with a flattened top. It is possibly connected to the railway construction and may have been a base for workers huts or building equipment.

4.28 Slightly further to the south was 'D' shaped mound, at TQ28833353 (MWS8694), 33m long, 2m high. It had possibly been truncated by the forest track as the straight side of the mound, facing the track, had been cut into facing track and it was possible to see that the mound was made up of solid clay with irregular lumps of sandstone within mound. The mound was covered in brash and its function unknown.

4.29 A large pond bay bank (MWS8753) associated with New Pond is situated on the south-western boundary of Tilgate Forest (Plate 8). New Pond is one of the 'header' ponds for the Tilgate Furnace that was situated to the north-east of the Forest.

[37] Beswick, M. 2001 *Brickmaking in Sussex*, Middleton Press

Plate 8: Pond Bay to New Pond (MWS8753)

Charcoal burning platforms

4.30 Given the close proximity of the iron producing furnace it would be expected that more charcoal burning platforms would be identified in this woodland area. However, only four charcoal burning platforms were positively identified during this survey and it is likely that evidence of others was obliterated by the 19th century land improvement schemes.

Saw pits

4.31 Four saw pits were found during the survey; one at TQ28713414 (MWS8686) was close to a track and near to the motorway was in good condition and possibly a late 19th or early 20th century example (Plate 9). Another example in good condition was found near to the dwelling as previously mentioned in para. 4.25.

Plate 9: Saw Pit (MWS8686)

Military archaeology

4.32 There is an unsubstantiated internet reference to there being a WW2 ammunition dump around the site of the nursery (MWS8714)[38].

4.33 The Canadian Air Force was stationed at Tilgate Park to the north of the study area during WW2. The huts they used as a dormitory (to the north of the study area boundary) survived and were used by community and recreational groups from the 1950s until they were damaged in the 1987 storm and subsequently replaced[39].

Flintwork Scatter

4.32 A small group of struck flint was collected from the eroded surface of parallel tracks centered on TQ28283349 and extending for 50m north and south of this point. The pieces comprised 3 hard hammer-struck flakes, 6 soft hammer-struck flakes, 6 bladelet fragments, 2 fragments & 2 fire-fractured flints. Most of the pieces are soft hammer struck and have platform preparation, and are all typically Mesolithic in character[40].

4.33 The location of this group of Mesolithic flintwork corresponds to the location given for the discoveries made by Beckensall in 1963, and suggests that the site covers a large area, which is not inconsistent with other similar sites in the Horsham area. This does not suggest that the Mesolithic occupation site was extensive, but probably represents repeated visits to the same preferred location over a long period of time.

[38] http://skuds.org/2005/10/secret-crawley-no-2-whalebone-plantation/
[39] http://www.crawley.gov.uk/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=559
[40] Butler, C. 2005 *Prehistoric Flintwork*, Tempus Publishing Ltd

5. Recommendations for conservation and management

Management mapping

5.1. Recommendations for the conservation and management of the archaeological resource of Tilgate Forest have been summarized in the management mapping using red, amber and green areas (see Table 3 and Fig. 22). More detailed mapping is provided in the separate folder of A3 maps. Customised map extracts of the area at any scale can also be obtained on request from the West Sussex HER. The full GIS layer could be provided to Forest Enterprise, to enable them to print out their own customised maps as required.

5.2. Sites were assessed for their significance, condition and vulnerability and mapped on a GIS layer, using hatched polygons with red, amber and green colour-coding for management purposes (see Table 3). These maps give a quick overview of not only the type of archaeological features found but in many cases the extent of the archaeological feature and also the possible value of the given area. Key features are visible and labelled within the areas.

5.3. Some of the above sites which fall into different categories may be of such proximity to each other that they will be form part of one category, which will be of the highest designation according to the above criteria.

5.4. Groups of similar features such as braided trackways/holloways, areas of quarrying, trench systems are polygonised in one area. This method will aid the mapping of the data entry into the HER and lessen the number of polygons needed, and thus simplify the mapping.

5.5. 'Cab cards', booklets as developed for the Weald Forest Ridge project, will be available for use by Forest Enterprise staff and contractors alongside the specific management mapping. When the final version has been completed these wil be distributed to all interested parties. A cab card is a small spiral-bound booklet suitable for use in the cab of a working vehicle. It contains drawings and photographs of commonly encountered archaeological features that may be found by contractors when working in wooded landscapes. Using simple procedures it contains ideas for mitigating damage by forestry vehicles. There is a pocket in the back which can be used to hold a map of the working area.

Table 3: Management Mapping Summary

The management mapping uses the specifications A (red), B (amber) and C (green) where:

- A: may be equivalent to nationally designated or sites of equivalent significance
- B: regionally or locally designated sites or sites of equivalent significance
- C: all other sites of a recognisable archaeological type which do not fall into the above categories.

'A' (red) category sites include:

- Enclosures, barrows and possible associated field systems.
- Existing bloomery sites where there may be additional activity noted from lidar evidence, such as quarries (which ordinarily would fall into the 'C' category) and possible platforms, enclosures etc.
- Pond bays and other water management features (holding ponds).
- Pillow mounds and associated possible boundary banks to warrens.
- Good examples of military trench systems and rifle ranges.
- Settlement sites and enclosures (with possible hollow ways associated with them).
- A good example of hollow ways, braided trackway features and roads no longer in use. Ridge and furrow where positively identified by ground truthing.
- A good example of charcoal platforms where positively identified.
- Significant boundaries sometimes identified by map regression.
- Data already recorded on the Historic Environment Record taken from bibliographic sources, excavations or find spots etc.

Some, hitherto unknown, sites which fall into category A may be suitable for scheduling in due course. Any new features identified from interrogating the lidar images would have to be verified on the ground before proceeding.

'B' (amber) category sites include:

- Other charcoal platforms.
- Other military trench systems
- Other boundary banks where the confidence level of recognition is high.
- Other hollow ways, braided trackways and older trackways.

'C' (green) category sites include:

- All other boundary banks which do not fall into the above categories.
- Areas of quarrying and mine pits unless they are associated with other features as already stated.
- Field boundaries which are no longer extant but may be able to be dated from map regression.
- Trackways/access tracks which are not always currently mapped on modern maps but may be able to be dated from map regression but may still be in use

Some of the above sites which fall into different categories may be of such proximity to each other that they will be form part of one category, which will be of the highest designation according to the above criteria

Condition of the Tilgate Forest historic environment resource

5.6. One of the objectives of the field survey was to record the current state of the archaeology in Tilgate Forest, assess the damage that has been caused in the past, and potential for future damage to the surviving archaeology.

5.7. Changes to Tilgate Forest in the 19th and 20th century would have destroyed an unknown number of archaeological sites and have altered the landscape to the extent that it no longer reflects its history. Its legibility as a historic landscape was much reduced through the London to Brighton railway being cut through its eastern edge in 1841 and the M23 motorway cutting it from east to west in the 1970s. It also suffered fragmentation in land ownership when the Tilgate Park estate was divided up and sold in the mid twentieth century.

5.8. The greatest detrimental factors in Tilgate Forest today are the wear from heavy recreational use such as mountain biking and off-road motorcycling, and from housing development in the section north of the M23, parts of which have been proposed for the site of a new university, commercial or residential use[41]. Vegetation – tree roots and bracken, along with some rhododendron – is also a threat as it can cause significant damage to earthworks and below ground archaeology. However, established trees can also provide stability to archaeological earthworks, and as such can assist in the preservation of earthworks such as banks. Fly tipping has occurred in several places in the northern section and is likely to recur as long as vehicle access to the forest is not effectively restricted. Animal damage is not that common, and generally the sites which remain are in fair to good condition.

5.9. While the remaining archaeological resource in Tilgate Forest is relatively thin, it is important to identify the most significant surviving remains in order to preserve them for the future, and to enable the visiting public to be able to see and understand them. It is also important to record any archaeological remains which come to light in future through clearance or development activity. It is clear from the results of this survey that there are some preserved archaeological sites surviving in the forest, which provide an insight to the past land use of this landscape. It is also important to understand that many changes have taken place over time, and the archaeology that can be seen today often represents only the more recent use of the landscape.

5.10. It should also be noted that this survey has only assessed the visible above-ground archaeology, and it is likely that there are numerous archaeological sites preserved below ground, for which little evidence survives to be seen today, as evidenced by the large assemblages of Mesolithic flintwork collected from Tilgate Forest in the past. These sites are more likely to date from the earlier periods; prehistory through to the Medieval period. Any future work on the Forest involving scraping, drainage or stump removal should take into account the potential impact on the below-ground archaeology.

[41] http://www.crawley.gov.uk/stellent/groups/public/documents/otherdocs/int106796.pdf

5.11. A set of guidelines has been put forward for preserving cultural features in woodlands[42], and it is proposed that these should form the basis for the future conservation and management of the archaeological resource in Tilgate Forest. Prior to any clearance of scrub, bracken etc or mowing of new areas, the archaeological map should be consulted to ensure that no known archaeological site would be affected by the work.

Specific management recommendations by site type

Trackways and hollow ways

5.12. A number of trackways and hollow ways are still in use as paths and tracks today, and are therefore subject to wear and damage from people, horses and forestry vehicles.

5.13. Others are no longer used, and are frequently overgrown with bracken and small trees and scrub. Apart from groups of associated hollow ways or where hollow ways are associated with other features within management areas, it is not proposed to recommend any remedial or special action that needs to undertaken for their conservation. However, consideration must be given to any work carried out on or around these sites, which may result in damage.

Banks

5.14. Consideration should be given to clearance of all vegetation from the bank and ditch (Plate 10), except for any established trees, which now form an integral part of its structure, so should be left in-situ. No new fences should be constructed on a boundary bank, and consideration given to moving any current fences from the top of the bank. Any intervention on a bank should be carried out under archaeological supervision, as work may produce crucial dating evidence.

Plate 10: Bank (MWS8750) covered with trees and bracken

[42] Bannister, N. 2007 *The Cultural heritage of woodlands in the South East*, South East AONBs Woodland Programme.

5.15. Being linear features, many of the other banks cover considerable distances, although the full extent of many found during the survey could not be established. Often a bank will have a ditch on one or both sides, although it will frequently have been silted up and difficult to determine. Most banks are covered with bracken, gorse and scrub, whilst many have been cut through or disturbed by tracks in more recent times. Action should be taken to stop future damage by vehicles to any bank, and they should be treated with caution in mown areas. Each bank and an area of up to 2m on each side should be considered as if it were a defined management area.

Mine pits

5.16. The mine pits are relatively robust and no particular measures are proposed to protect them. However where they are in dense rhododendron any clearance or development in their vicinity should take the opportunity to record their extent, as this could not be seen from the lidar or during the survey.

Earthworks and mounds

5.17. This group of sites are varied in their nature and mostly unidentified and undated. Some of the larger earthworks should be treated in the same way as the enclosures above. The remaining sites may not be within management areas, but should be managed with care to ensure that there is no damage to the earthwork or its immediate surroundings. Any work undertaken on or around these features should be carried out under archaeological supervision to enable any artefactual or dating evidence to be recorded, as this will then assist in the identification of the earthwork and enable a more appropriate management strategy to be put in place.

Woodland industrial sites – saw pits and charcoal burning platforms

5.18. Relatively few woodland industrial sites were discovered. These and any other sites discovered should be treated with care during any clearing of vegetation or mowing. It is likely that during the clearance of trees, especially in areas of plantation, further evidence for woodland industrial activity may be encountered. Activity involving tracked vehicles within the areas of charcoal platforms should be avoided and brush should not be deposited on them. It is highly likely that there may be further evidence of the early iron working industry in the area along the two gill streams.

Management principles

5.19. Management recommendations in this report are derived from the management options set out for the HLS scheme in the Natural England scheme handbooks[43], from the principles set out in Dr Nicola Bannister's work on the cultural heritage of woodland in the South-East[44], and from English Heritage guidance.

[43] HD options in Natural England, 2010 *Higher Level Stewardship – Third Edition*, February 2010 and ED options in Natural England, 2010 *Entry Level Stewardship – Third Edition*, February 2010

[44] Bannister, N, 2007 *The cultural heritage of woodlands in the South East*

5.20. In summary, the main principle is to minimise any disturbance to archaeological sites. Different features may require different approaches to their management and long-term preservation. The following is a summary of the main management principles, which it is suggested are including in any future overall management plan for Tilgate Forest and in management plans for forest areas and archaeological features:

- For any proposed works, produce a cultural heritage management plan and include an annotated map showing all the archaeologically sensitive areas and features. This can be derived from the management maps included in this report or provided by the West Sussex HER.

- Inform all workers and contractors of the cultural heritage of Tilgate Forest and the location of individual features. Cab cards (see para 5.5) may be useful for this. Consider marking out particularly sensitive sites prior to operations using posts, tape and/or flags.

- Prior to undertaking activities within Tilgate Forest, plan access and extraction routes, and other facilities to avoid archaeological features and sites.

- Maximum damage occurs during scraping or tree root removal: take advice before undertaking work of this kind in archaeologically sensitive areas.

- Trailed swipes mowing at right angles to ground features will cause incremental damage.

- Avoid taking machinery over earthworks or buried sites. If this is unavoidable, select one point and cover with brash or other protective material. Remove after use. Avoid using such an area when the ground conditions are wet or after periods of heavy rainfall.

- Avoid ground preparation and drainage works over archaeological sites and in archaeological sensitive areas.

- In woodland, manage sites as open glades.

- Avoid scrubbing up on sensitive sites by cutting the vegetation or using an approved selective herbicide. Discourage burrowing animals without disturbing the ground surface.

- Site facilities such as car parks away from archaeological sites. Maintain existing routeways, restore any drainage channels and reinstate any old paths with a suitable covering.

- Maintain, and if possible restore, any water features, having due regard for any archaeological potential of any accumulated silts and deposits. Do not drain any wet, mirey areas that are not on public rights of way.

- Do not use, or allow the use, of metal detectors on archaeological sites, or in areas where there may be archaeological sites.

- If archaeological remains and finds are discovered while working, leave them undisturbed and make a report to the County Archaeologist or appointed archaeologist (finds have a greater significance when left in place, and if removed from context they can become meaningless). Archaeological sites discovered by Forest staff or visitors should be recorded and periodically added to the West Sussex HER.

- Features currently under woodland are generally stable until the trees fall; the current high deer population will prevent under-storey development.

- Invasive tree scrub removal should not cause damage but avoid non-essential tractor/forwarder use over archaeology.

- The piling up or burning of brash and other debris should be avoided in archaeologically sensitive areas as this can obscure, change or damage the historic environment. Mounds created by brash or spoil from scraping should be recorded and mapped to avoid future confusion with archaeological remains.

- Extensive forest fires should be reported to the County Archaeologist to allow investigation of any potential archaeology that has been exposed.

6. Discussion and options for additional action, interpretation and further research

6.1 Prior to the survey only six archaeological sites had been recorded on the West Sussex Historic Environment Record (HER) for Tilgate Forest. An excavation of a Mesolithic site had taken place in 1963, around TQ28253335 (MWS961 and 4579), but no report was published and accurate location of the excavated site is uncertain. A combination of lidar, desk-top study and field survey has identified or enhanced knowledge for a total of 105 sites. Of these 59 were pre-identified on lidar and 40 were only found during the walkover survey. There is further potential for identifying further, as yet undiscovered, archaeological sites across the Forest, especially sites that have no above ground features.

6.2 The survey demonstrated that Tilgate Forest retains relatively few extant features attesting to its past history as a Forest or working woodland. Tilgate became detached from the larger area of Worth Forest in the mid 17th century and the successive owners were partially successful in their land reclamation schemes and a few boundaries and drains found in the south-western section may reflect the land improvement schemes. The London to Brighton railway cut through its eastern side in the 19th century and Tilgate Forest obviously suffered some further dereliction in its landscape when the estate was divided up and sold in the mid twentieth century and later when the M23 was built. Three times during its history Tilgate became detached from its wider landscape, and when considering the archaeology of the study area, and its history, it is important to note that the present-day boundaries are very artificial and the wider landscape context should be taken into consideration.

6.3 The traces were found of a series of round fields found in the south east of the area date from the early to mid 19th century and a highly unusual, possibly unique landscape feature.

6.4 The standing archaeological remains of the experimental nursery belong to the 20th century and form an interesting part of the history of later development of this land, and Tilgate Park, into an open recreational space close to the new town of Crawley. The bike trails reflect another very modern phenomenon sometimes found in woodlands, a developing example of contemporary archaeology. They were recorded as they will leave substantial earthworks which, if not recorded, could puzzle future archaeologists as to their form and function.

6.5 The significance of the archaeological resource should be recognised by fully incorporating the archaeology, and measures for its management and conservation, into the management plan for the ongoing management of Tilgate Forest. A realistic and manageable plan should be developed to ensure that those working in Tilgate Forest are aware of the location and significance of the archaeological sites. Furthermore, they should be aware of appropriate and suitable management options that can be used on these sites, to ensure that they are not damaged in the future.

Additional action

6.6 There are a number of additional actions which would help ensure that the importance of the archaeological resource in Tilgate Forest is recognised, enhanced and protected:

- Tilgate Forest staff should receive training to enable them to recognise and manage the archaeological resource. This could be through a combination of attending a presentation on this survey and accompanied site visits.
- For areas of impenetrable cover where there is not good lidar imagery, opportunities should be taken to survey whenever significant amounts of vegetation are cleared either through management works or through forest fires.
- Lidar can also be used to map the vegetation cover, in order to prioritise management for example identifying where areas impenetrable to lidar indicate extent of rhododendron cover.

Interpretation

6.7 There are opportunities to feature lidar-enhanced discoveries in engaging the public and creating greater public awareness of the archaeology in Tilgate Forest, through publications, leaflets, sign boards, talks, guided and un-guided walks and exhibitions.

Further research

6.8 There are further opportunities for community involvement work with local archaeological organisations and institutions to initiate further survey and other archaeological investigations so that there is a better understanding of the archaeological resource in Tilgate Forest. These might include:

- further survey of the traces of the possibly unique landscape of round fields to the southeast of the study area, and documentary research to establish who created them and why, and
- further survey, documentary research and excavation to establish the history and function of the nursery site at MWS8714, particularly if development in this area proceeds.

Such studies can be carried out in conjunction with CBAS Ltd, who have a proven track record in co-ordinating and organising this type of work.

7. Acknowledgements

7.1 We would like to thank Katie Harris of Forest Enterprise, Mark Taylor, Rachel Salter and John Mills of the West Sussex county archaeology section, Casper Johnson and Greg Chuter of the East Sussex county archaeology section and Lyn Palmer, Historic Environment Awareness Project Officer for the Weald Forest Ridge for their assistance with and enthusiasm for this project.

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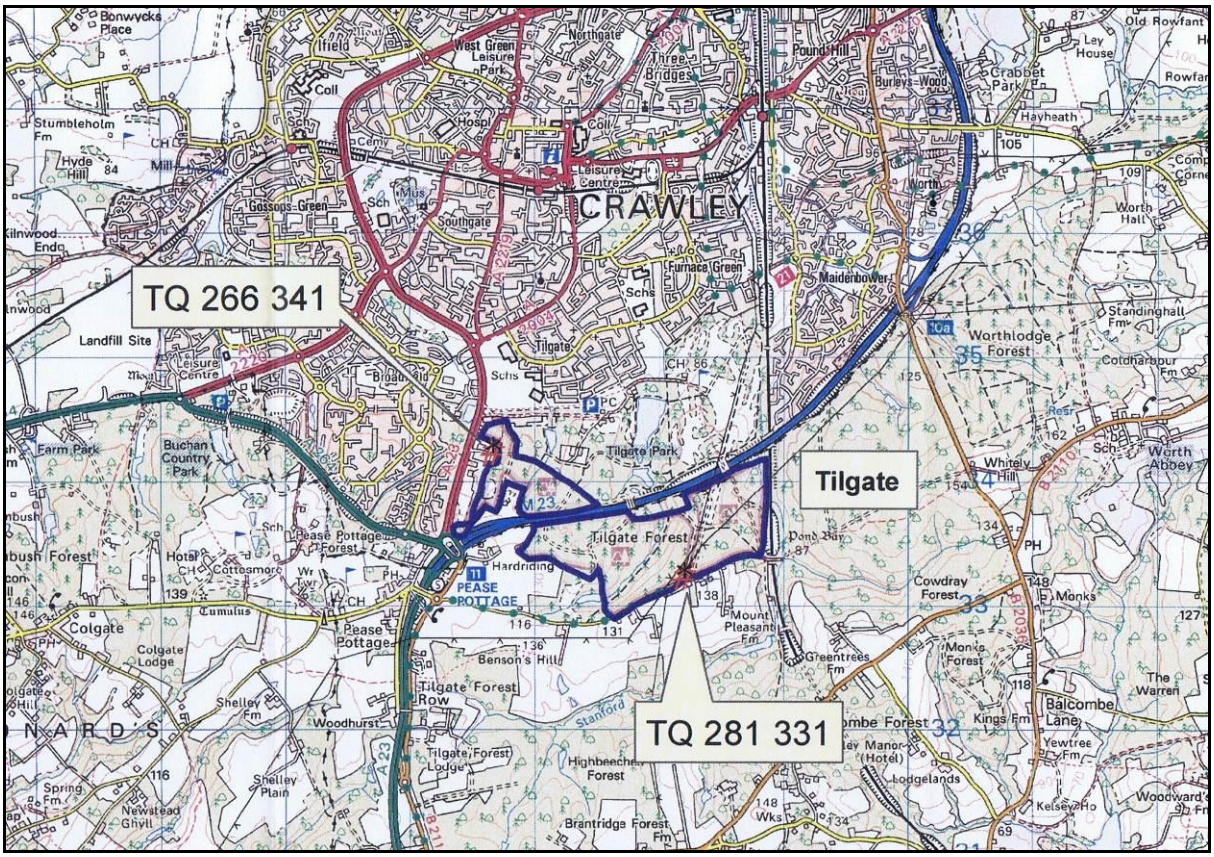

Fig. 1: Tilgate Forest: Location Map

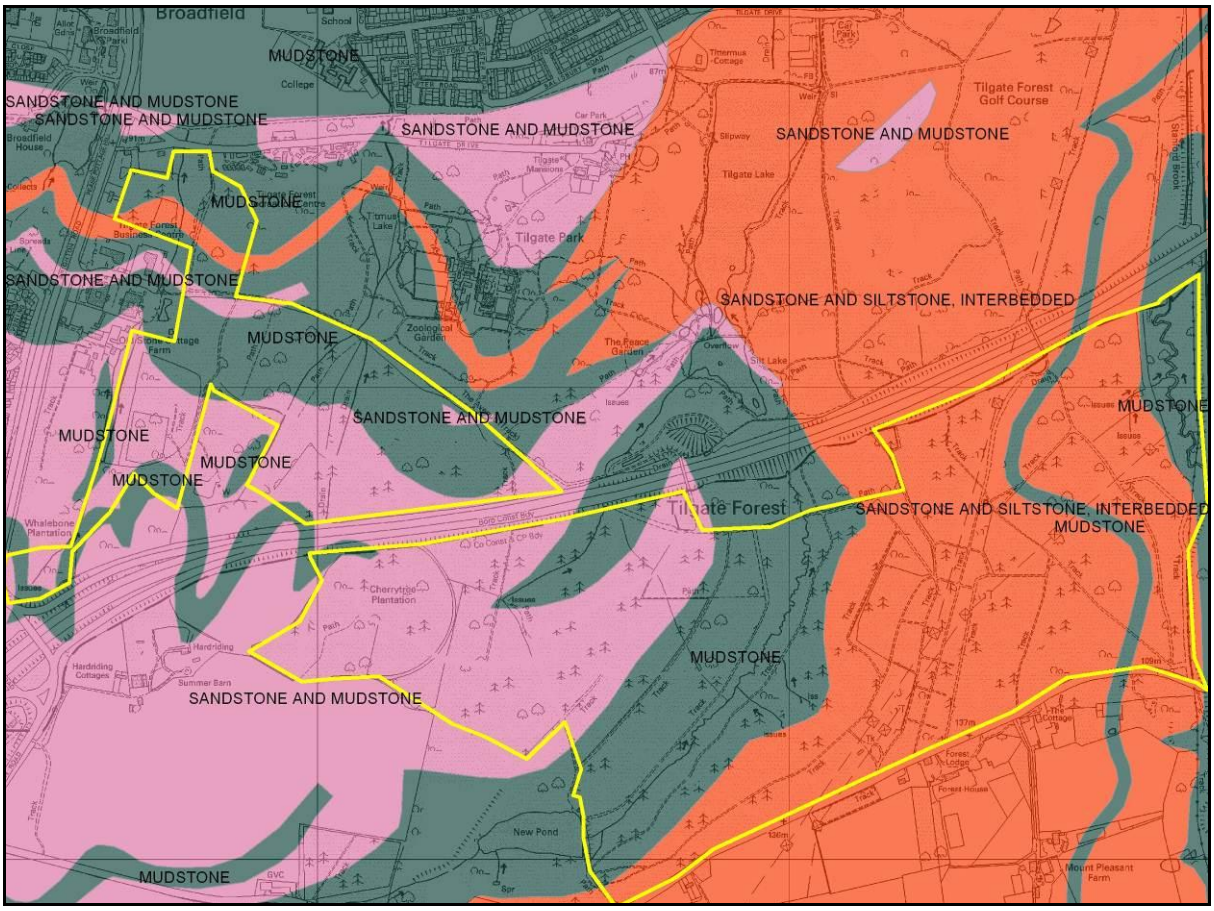

Fig. 2: Tilgate Forest: Geology

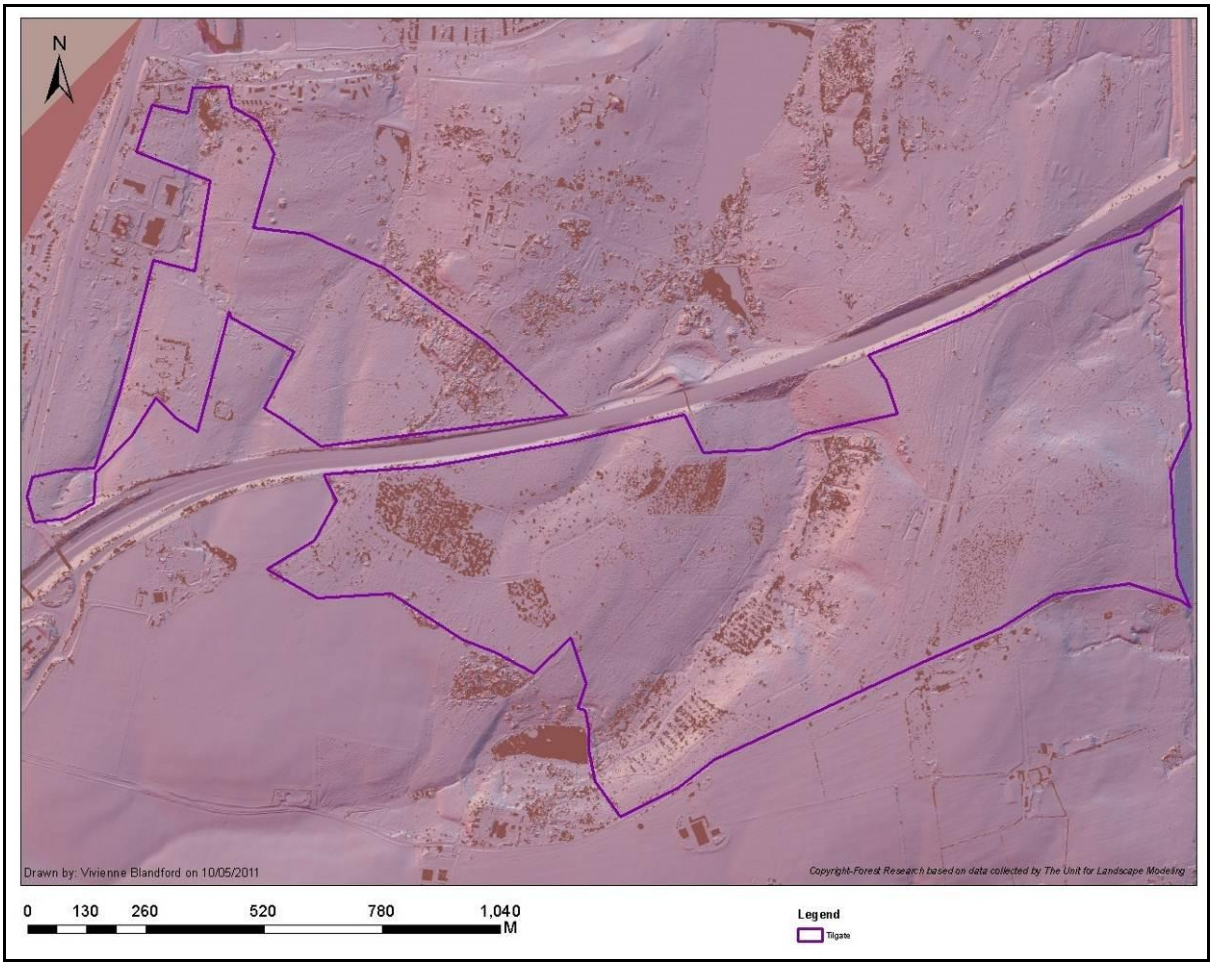

Fig. 3: Tilgate Forest: Hill shaded lidar image

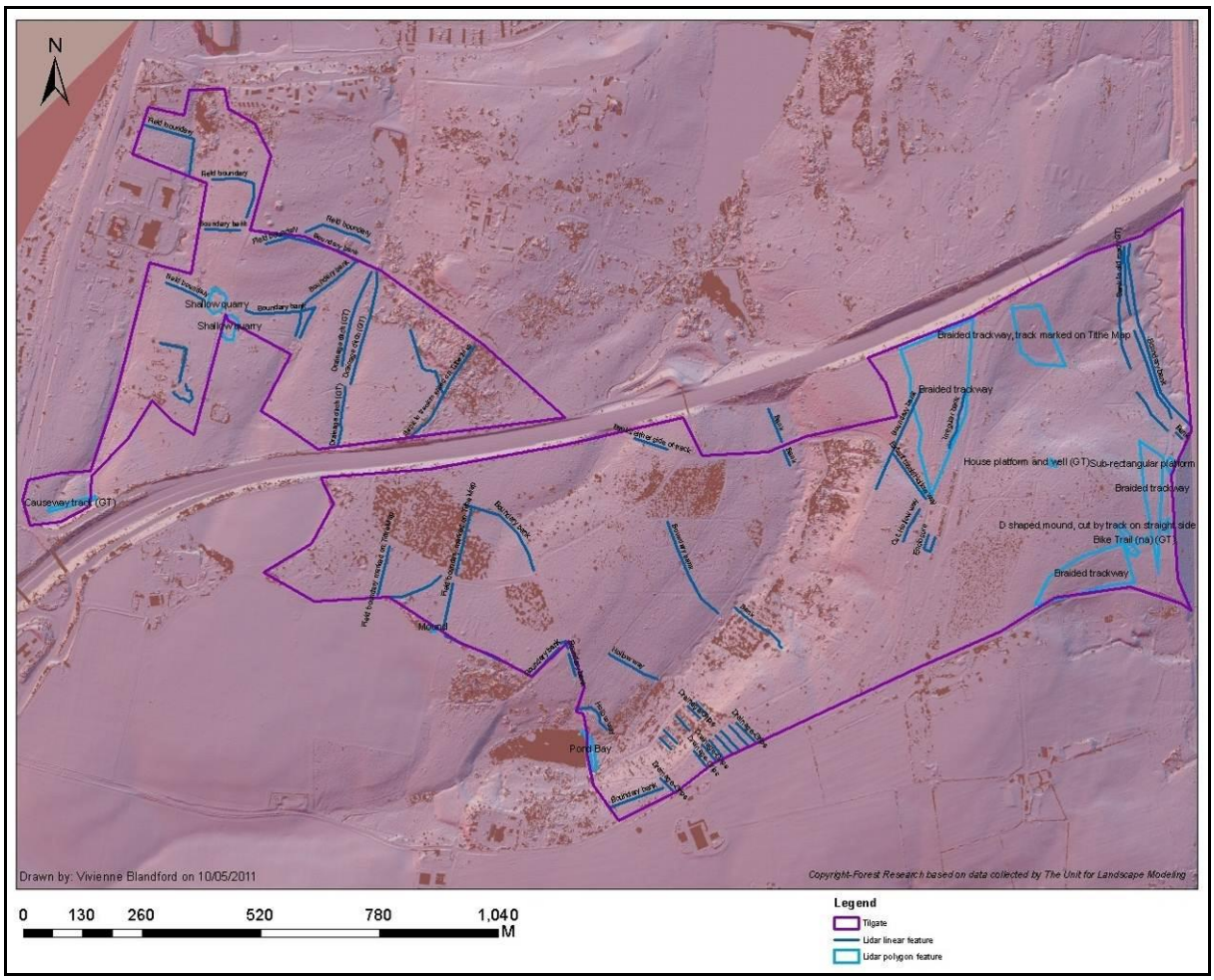

Fig. 4: Tilgate Forest: Transcribed layer derived from lidar

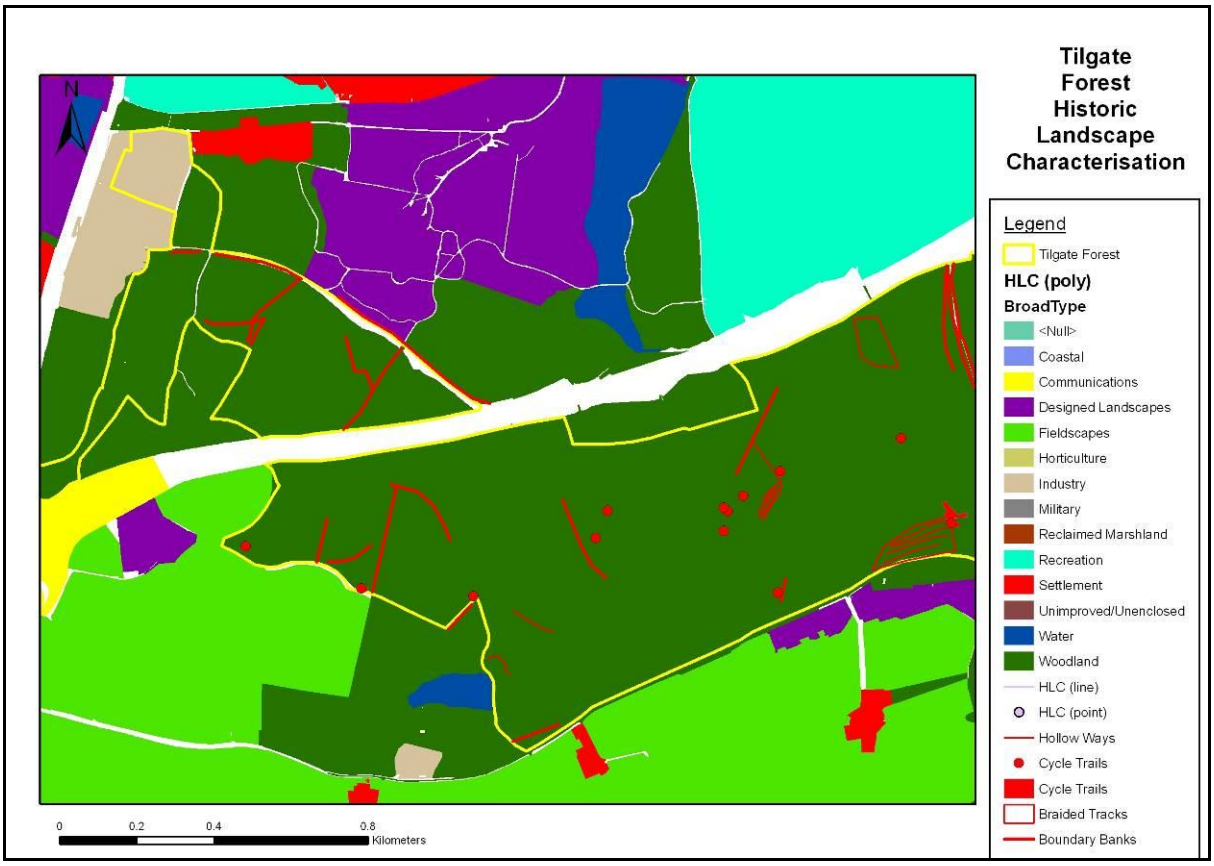

Fig. 5: Tilgate Forest: Historic Landscape Characterisation (HLC) with sites overlaid

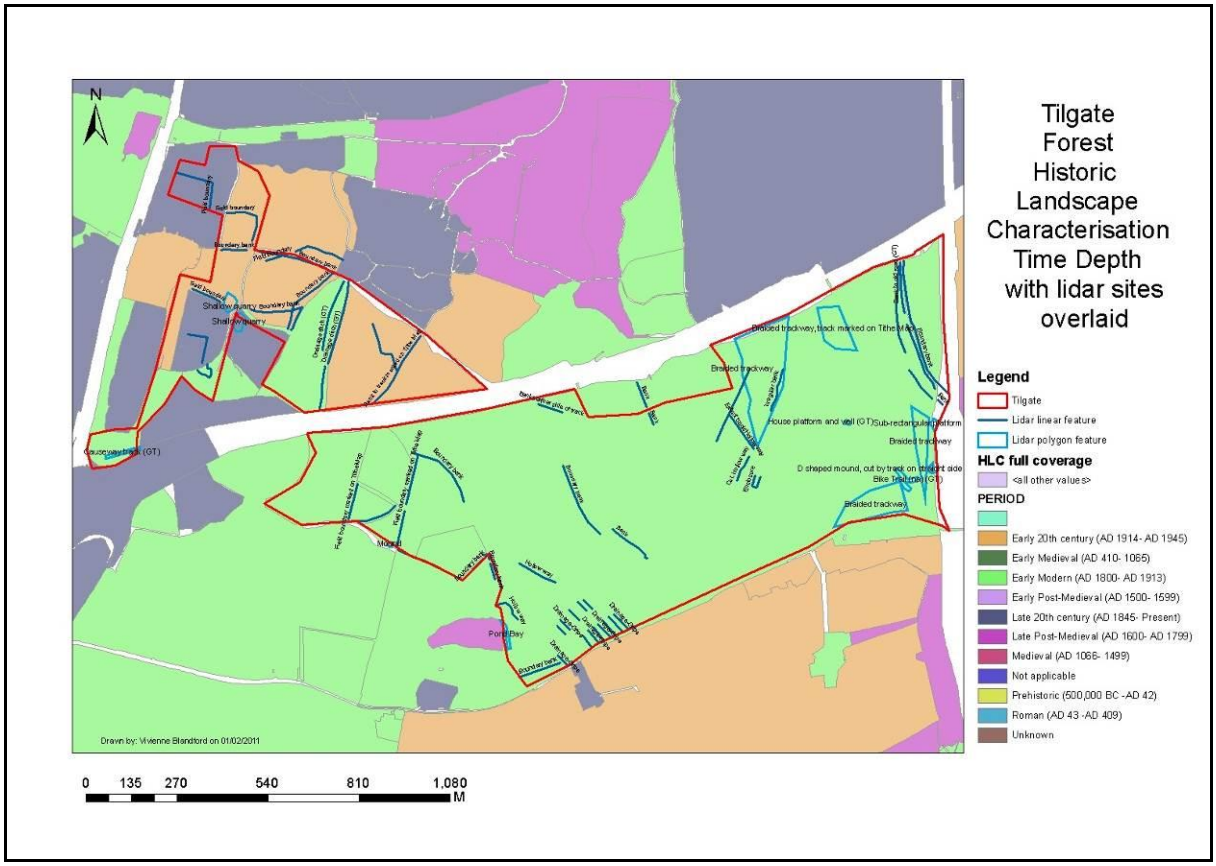

Fig. 6: Tilgate Forest: Historic Landscape Characterisation (HLC) with sites overlaid

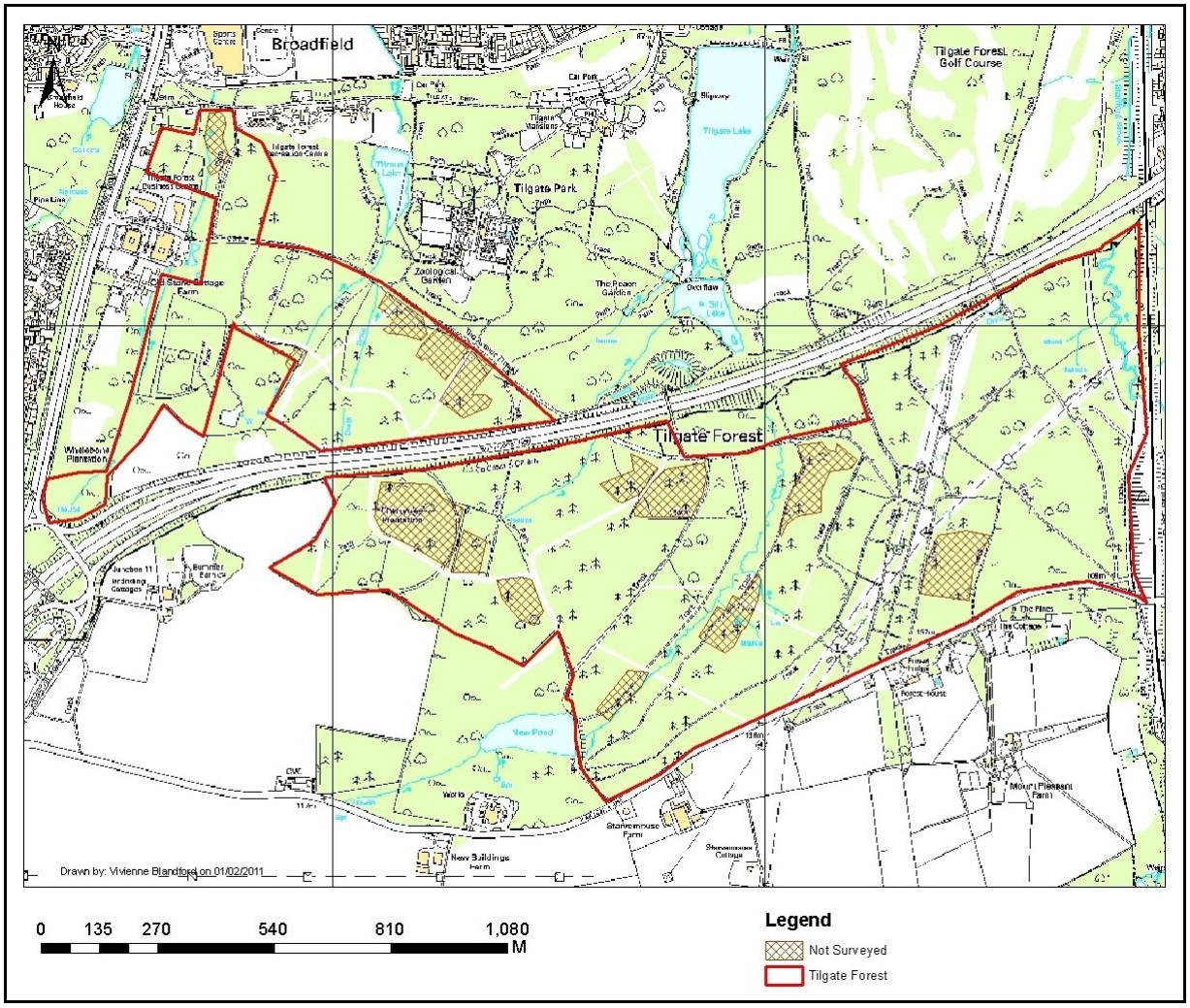

Fig. 7: Tilgate Forest: Areas which were not surveyed

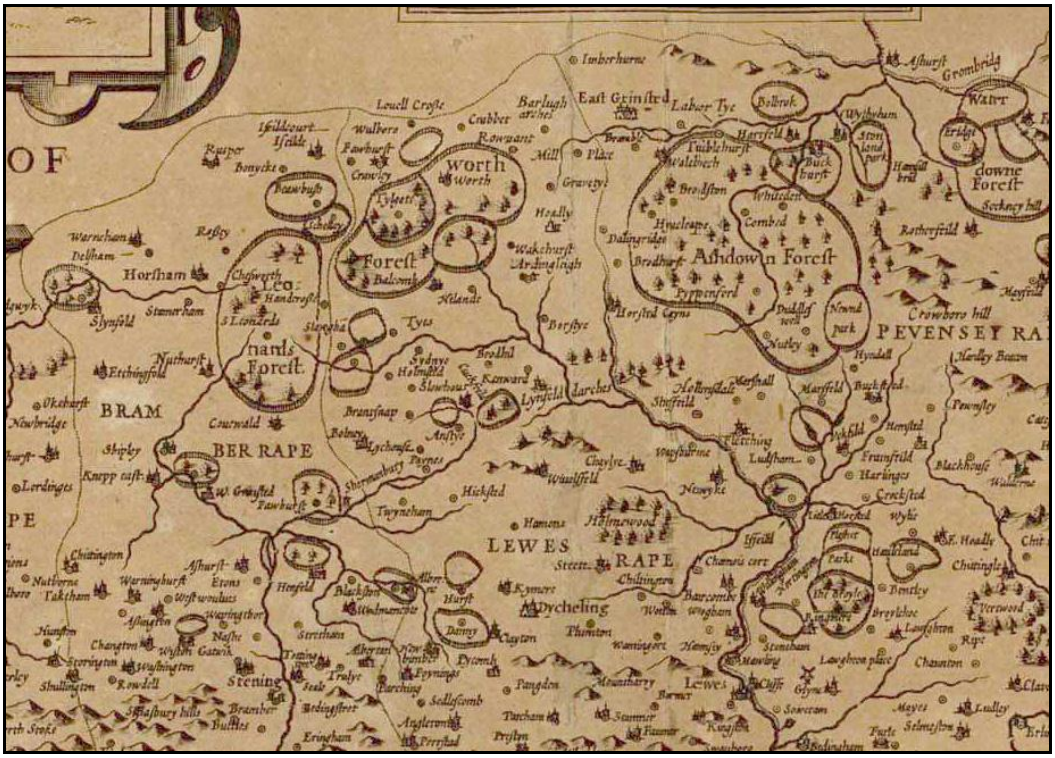

Fig. 8: Tilgate Forest: Speed's 1610 map of Sussex

Fig. 9: Tilgate Forest: Johannes Blaeu's 1650 map of Surrey (including parts of Sussex)

Fig. 10: Tilgate Forest: Morden's 1695 map of Sussex

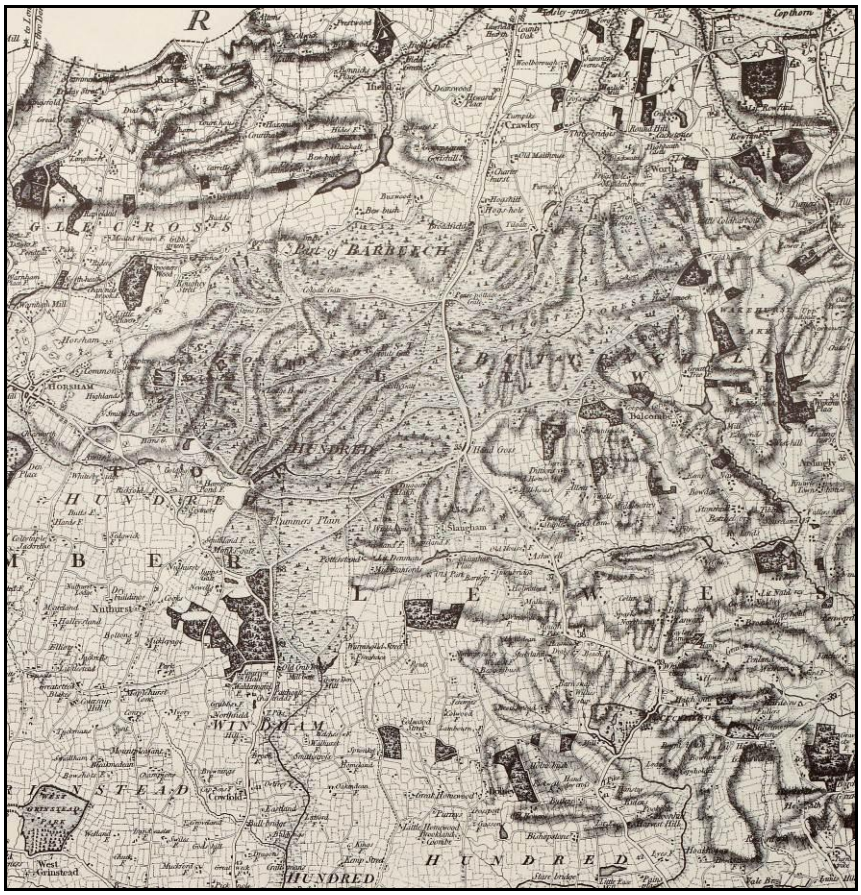

Fig. 11: Tilgate Forest: Yeakell and Gardner map of Sussex, 1778-1783

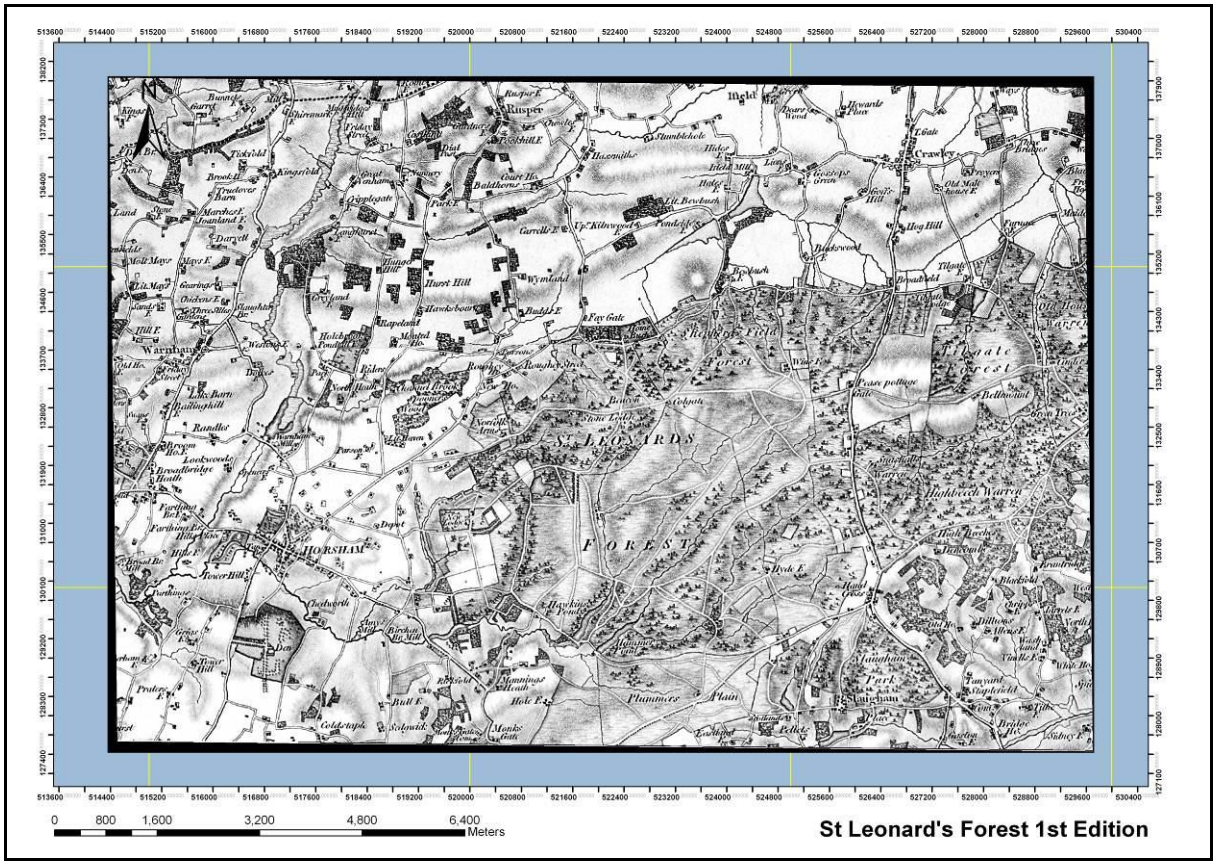

Fig. 12: Tilgate Forest: Early draft 1st Edition OS map, c. 1813

Fig. 13: Tilgate Forest: Tithe Map (Worth West) c. 1841

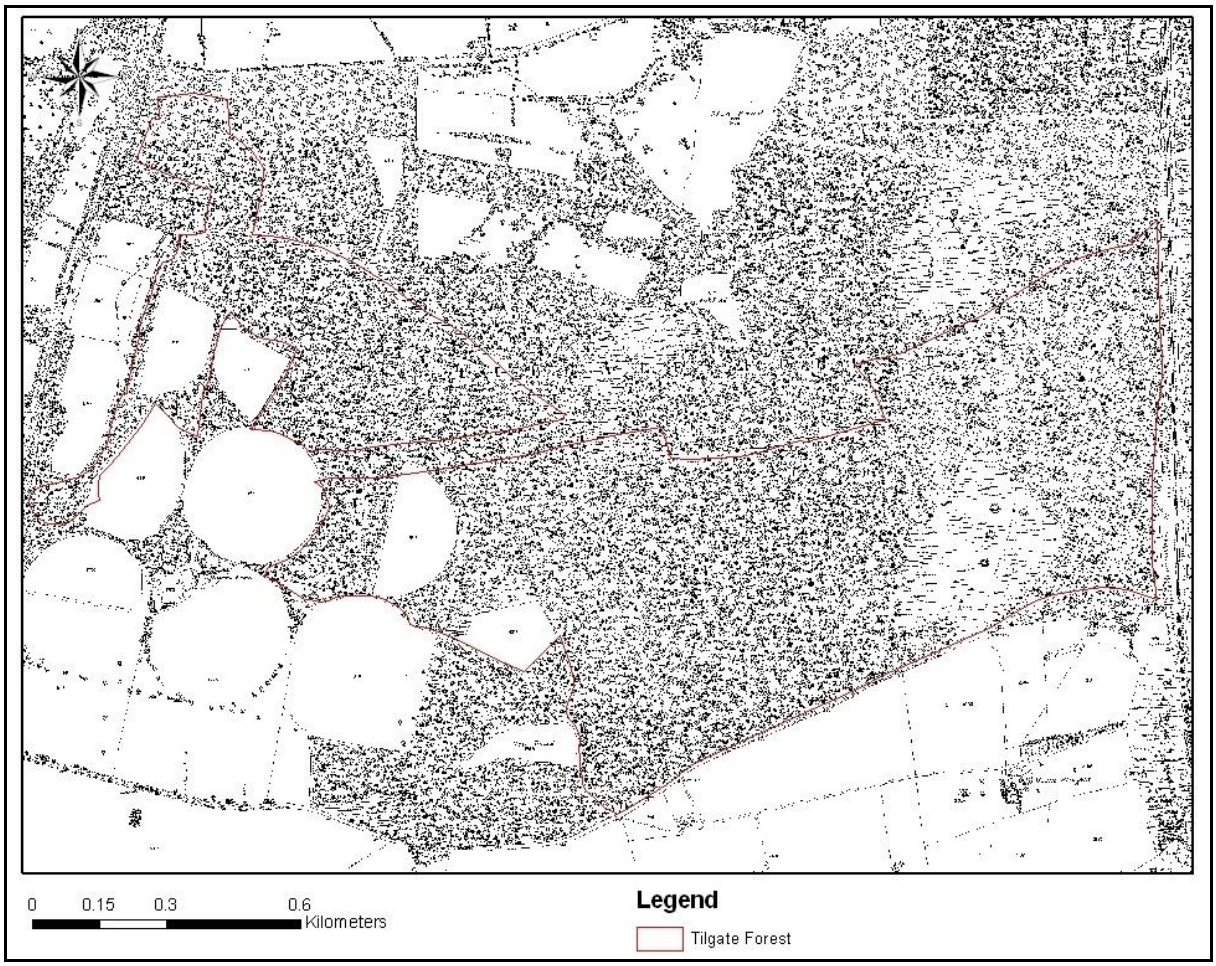

Fig. 14: Tilgate Forest: 1st Edition OS map, 1874

Fig 15: 1946 Aerial Photograph RAF/1069/UK/1451

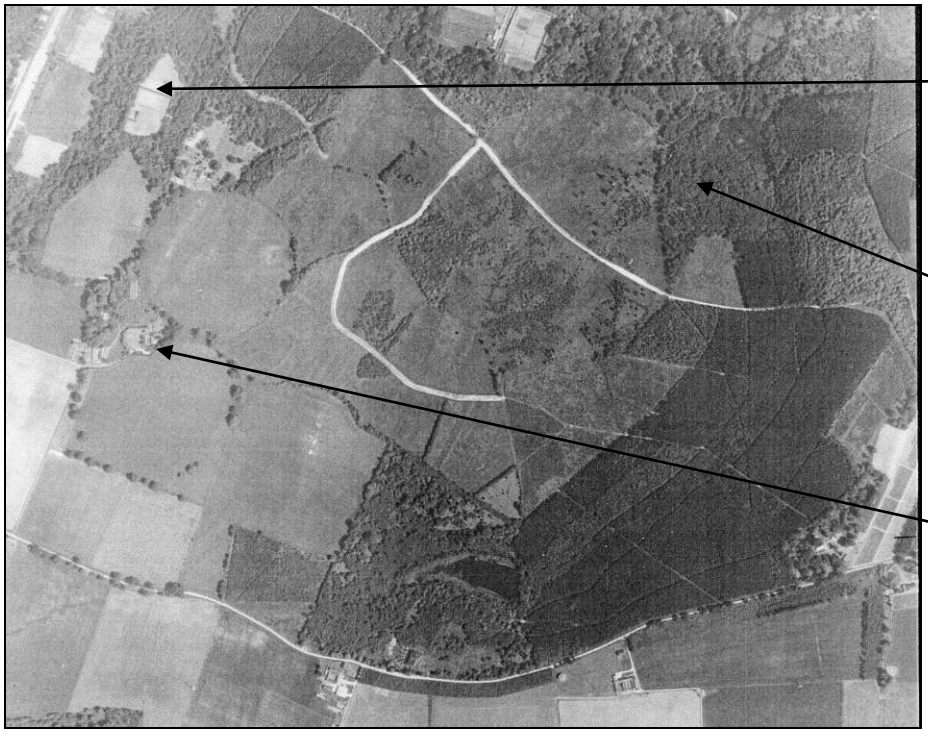

Fig 16: 1959 Aerial Photograph RAF/58/2938

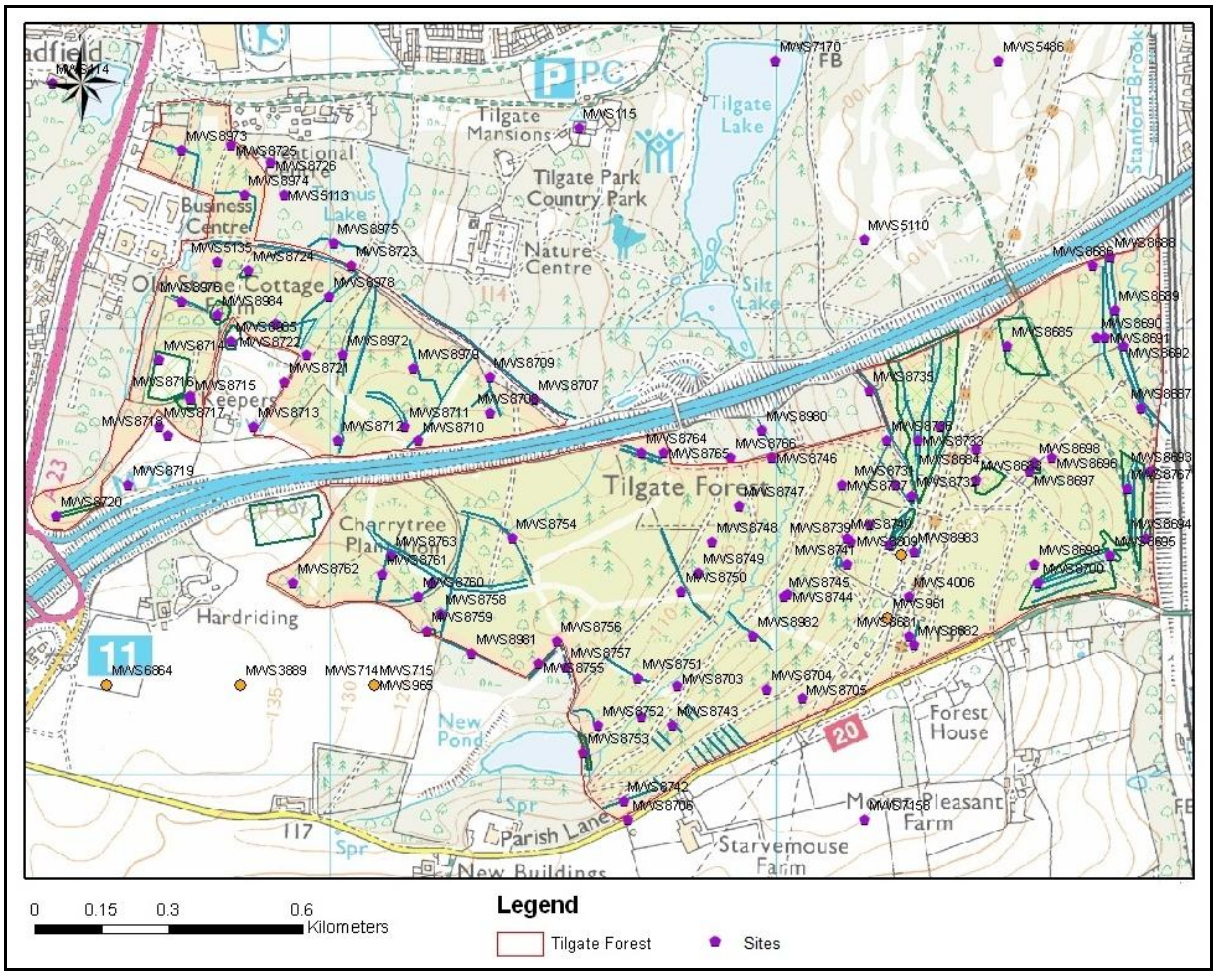

Fig. 17: Tilgate Forest: Results of survey showing sites by West Sussex HER reference (MWS) number

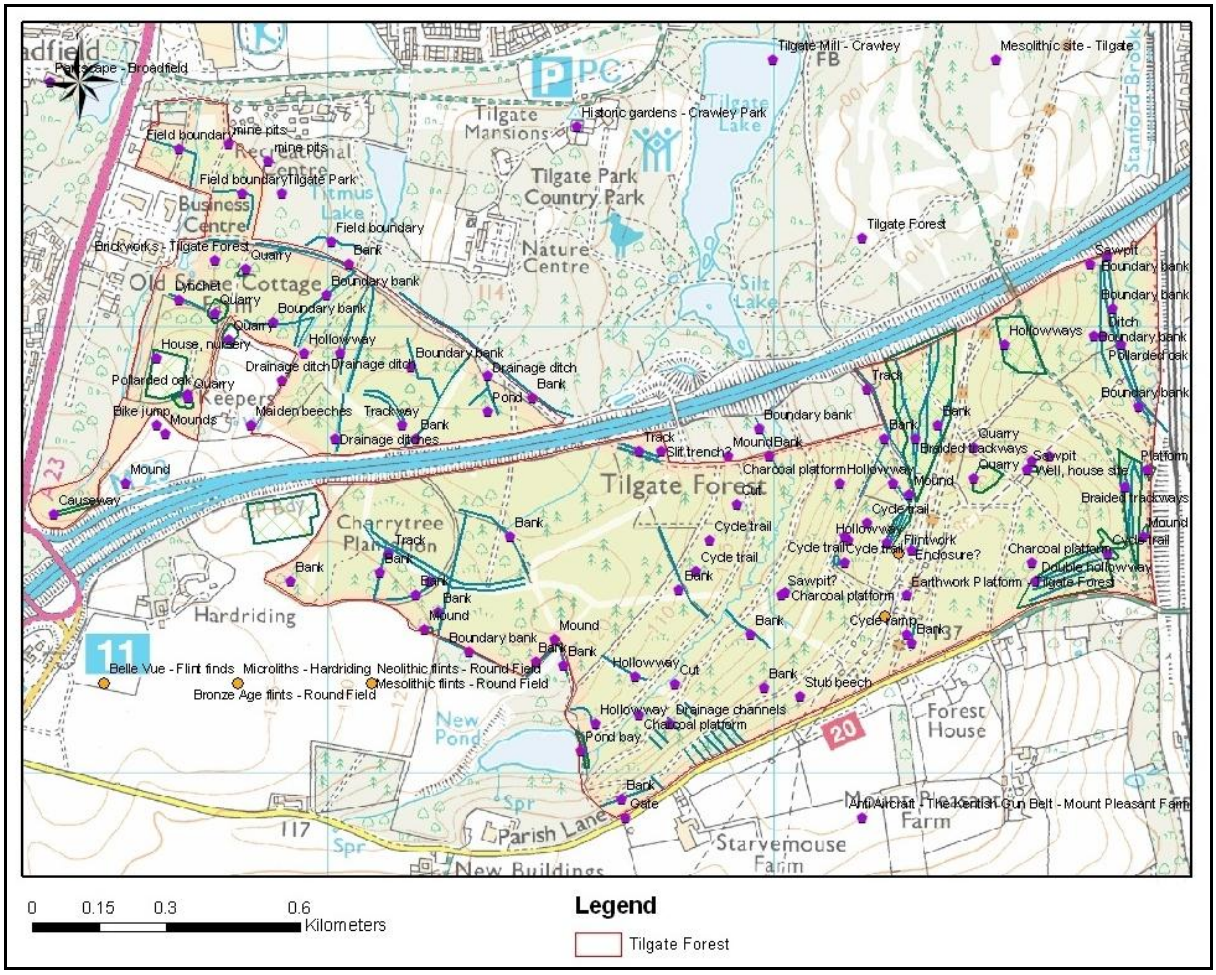

Fig. 18: Tilgate Forest: Results of survey showing West Sussex HER sites by name

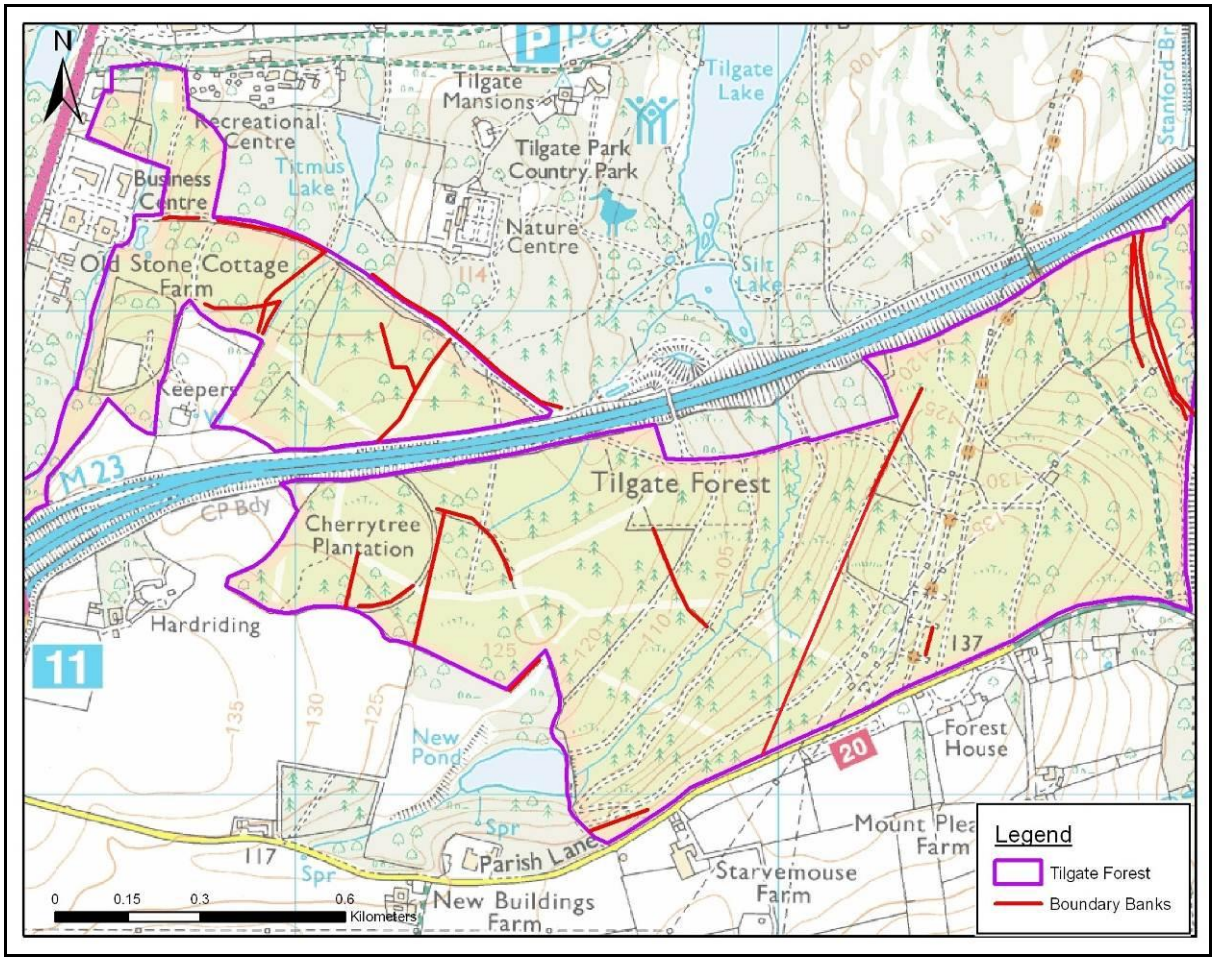

Fig. 19: Tilgate Forest: distribution map of boundaries

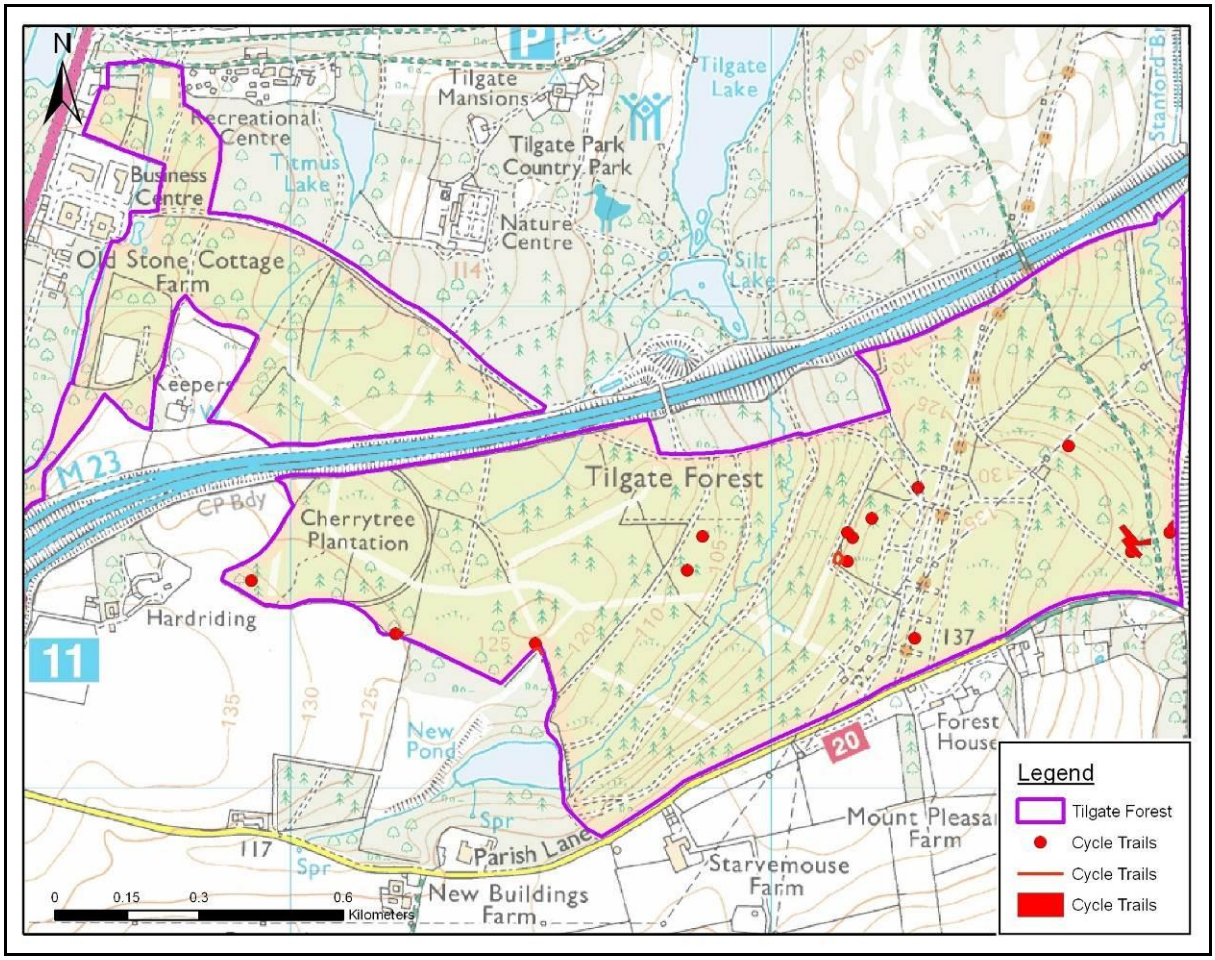

Fig. 20: Tilgate Forest: distribution map of cycle trail features

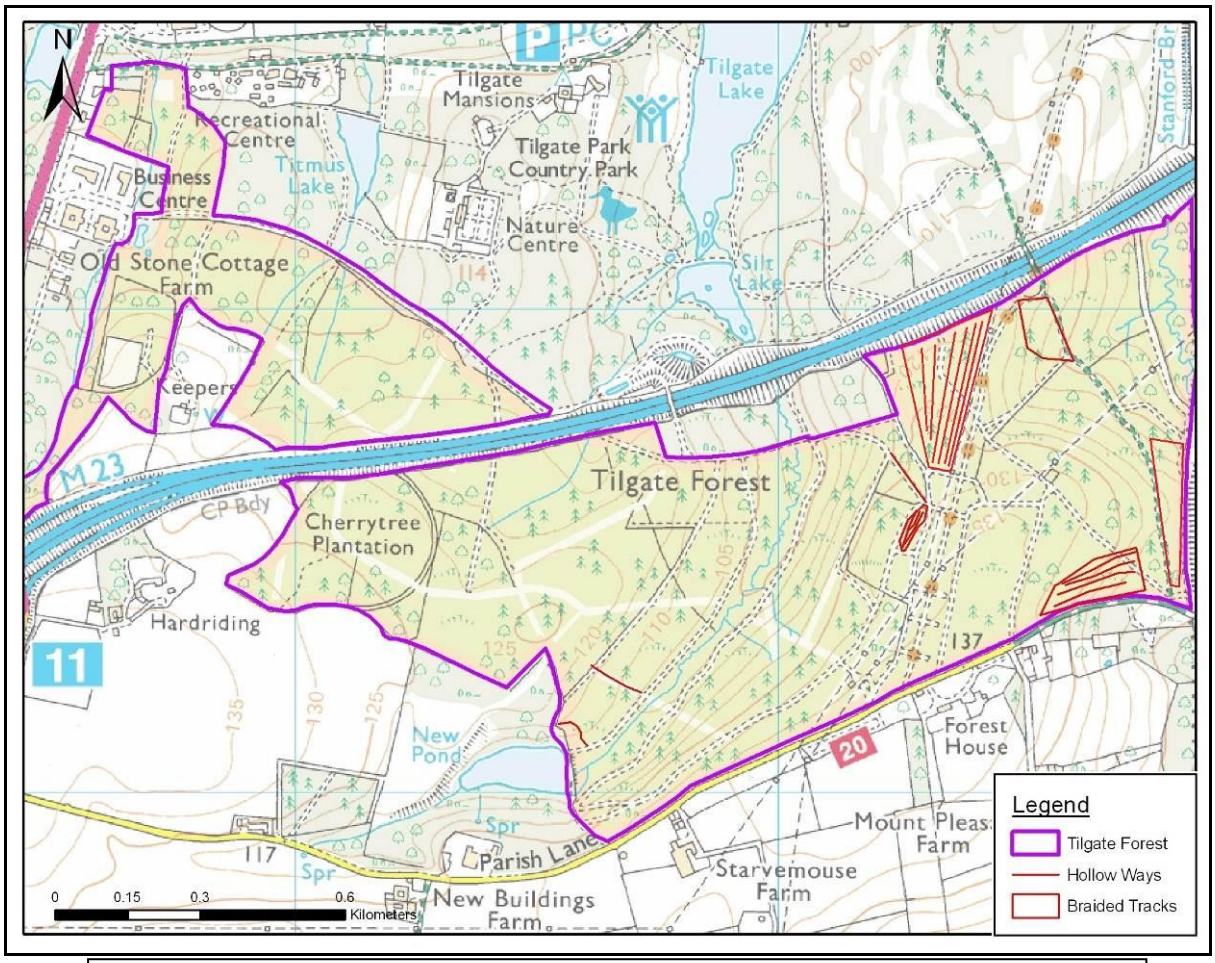

Fig. 21: Tilgate Forest: distribution map of routeways

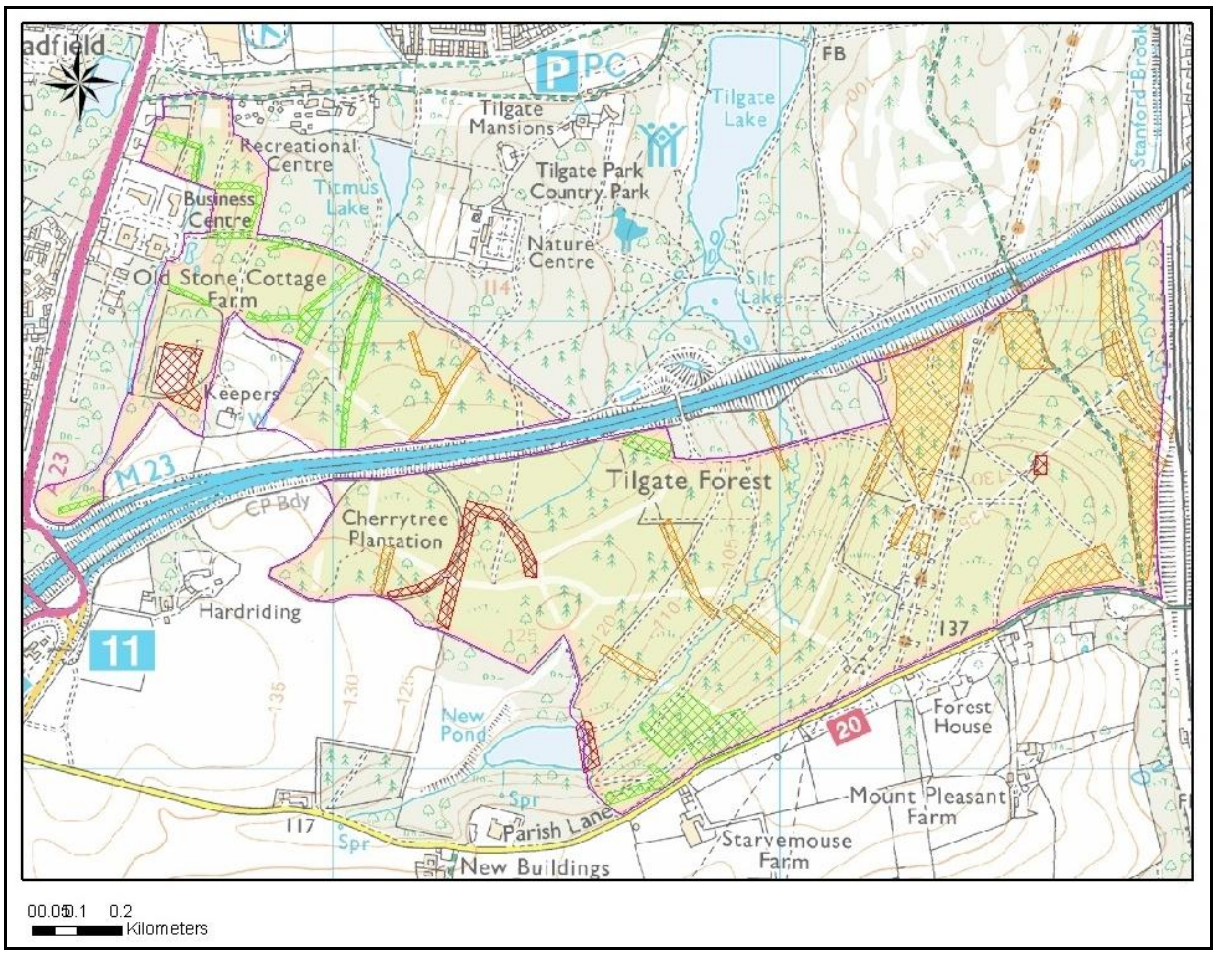

Fig. 22: Tilgate Forest: archaeological management areas
(see definitions, para. 5.7)

Chris Butler Archaeological Services Ltd

Established in 2002, Chris Butler Archaeological Services Ltd is available for lidar interpretation, woodland archaeological surveys, flintwork analysis, project management, military archaeology, desktop assessments, field evaluations, excavation work, watching briefs, field surveys and field walking, post-excavation services and report writing.

During 2010/2011 Chris Butler, Vivienne Blandford and Anne Locke carried out a series of lidar-enhanced surveys of woodland and heathland areas across East and West Sussex, at Old Lodge (part of the historic area of Ashdown Forest) for the Sussex Wildlife Trust, and in Tilgate Forest, Tilgate Forest and Tilgate Forest for Forest Enterprises.

Chris Butler, MIFA, Cert. Ed. has been an archaeologist since 1985, and formed the Mid Sussex Field Archaeological Team in 1987, since when it has carried out numerous fieldwork projects, and was runner up in the Pitt-Rivers Award at the British Archaeological Awards in 1996. Having previously worked as a Pensions Technical Manager and Administration Director in the Financial Services Industry, Chris formed Chris Butler Archaeological Services at the beginning of 2002.

Chris is a Member of the Institute for Archaeologists, a committee member of the Lithic Studies Society, and is a part-time lecturer in Archaeology at the University of Sussex. He continues to run the Mid Sussex Field Archaeological Team in his spare time.

Chris has particular expertise in prehistoric archaeology, flintwork, and military remains of all eras. As well as the Phase 1 survey of Ashdown Forest he has also carried out surveys of Broadwater Warren and Tudely Woods for the RSPB together with other woodland surveys for private individuals.

He specialises in prehistoric flintwork analysis, but has directed excavations, landscape surveys and watching briefs, including the excavation of a Beaker bowl barrow, a Saxon cemetery and settlement, Roman pottery kilns and a Mesolithic hunting camp.

Vivienne Blandford, MA, is a landscape archaeologist responsible for assessing and interpreting the Weald Forest Ridge lidar images which will be used in this project. This includes transcribing (creating lines and polygons) on the lidar images and creating a separate GIS layer and database of the archaeological features found. In the Ashdown Forest and Old Lodge projects, and as a volunteer working in other areas of the Weald Forest Ridge, she has pioneered methods for ‘ground truthing’ a selection of the lidar features in the field to assess whether the judgement made by looking at the images on screen is correct. She has also worked with community groups testing and teaching surveying methods in woodland landscapes.

Vivienne is local to Ashdown and Tilgate Forest and has a good understanding of the historic and cultural landscape and the type of archaeology likely to be found there. She has experience in desk-based research and fieldwork for the preparation of cultural and historic landscape context assessments for specific areas and in the preparation of Conservation Management Plans. She is an Affiliate member of the IFA.

Anne Locke, MA, has been working on the East Sussex HER since 2008, including evaluating it for an English Heritage-funding audit and benchmarking review. She has extensive experience of creating HER records through inputting several thousand new sites onto the East Sussex HER, including those contributed by Chris Butler in Phase 1 of the Ashdown Forest survey, and in using the lidar transcriptions produced by Vivienne Blandford to enhance existing HER records and to record new features.

Anne has an MA in Managing Archaeological Sites (UCL 2005) and good all-round knowledge and understanding of the historic environment of Sussex, acquired through over ten years participation in volunteer field archaeology as part of Chris Butler's Mid Sussex Field Archaeological Team, and study at Sussex University. She is an Affiliate member of the IFA and worked in the English Heritage policy team on a temporary contract during 2010.

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Appendix 1 Summary of archaeological sites in Tilgate Forest

Survey ref	W Sussex HER ref (MWS no.)	NGR	Type of site	Description	Visible on lidar 1=Y	Related sites	Vegetation	Condition	Risks [+ photo nos.]
Already on HER	MWS961	TQ28593458	Flintwork scatter, mesolithic	Extensive excavation of a Mesolithic site commenced by Beckensall on Forestry Commission land, in Tilgate Forest in 1963.					
Already on HER	MWS4006	TQ283334	Platform	Terraced platform c. 7m x 6m is cut into the slope.				Not located on survey	
Already on HER	MWS4570	TQ28593458	Neolithic axe	From Beckensall unpublished excavation 1963					
Already on HER	MWS5113	TQ269343	Mine pit	Mine pit in Tilgate Park, referred to in Cleere and Crossley					
Already on HER	MWS5135	TQ26753415	Brick works	Brick kiln and field shown on 1st edition OS map 1874					
Already on HER	MWS7923	TQ 2689933571	Flintwork and pottery	Fieldwalking on Crawley Waste management Site, Pease Pottage. Eight pieces of worked flint and two well abraded fragments of medieval pottery were found scattered across the area of the survey. The paucity of artefacts suggests that no archaeological remains associated with a possible settlement are likely to be within the study area					
TI001	MWS8681	TQ28303331	Cycle trail features	Rectangular mound, 3.5 m long, 1.25 wide, 1 m high with quarry hole to NE. non-antiquity			Middle of track	n/a	3951

TI002	MWS8682	TQ28313329	Boundary bank	Low linear bank, no ditch 0.25 m high, aligned NE-SW with higher land to NE, forming step like feature. Wood compartment	1		Edge of plantation	fair	
TI003	MWS8683	TQ28453366	Quarry	Possible evidence of very shallow surface mining, disturbed ground but past evidence of forestry work and tree throws	1		Very dense unthinned young pine, difficult to survey		
TI004	MWS8684	TQ28453373	Quarry	Possible evidence of very shallow surface mining, disturbed ground on steeply sloping land but past evidence of forestry work and tree throws			Very dense unthinned young pine, difficult to survey		
TI005	MWS8685	TQ28523396 to TQ28573396	Hollow ways/Braided Trackway	Series of Hollow ways/Braided trackway aligned N-S varying between 1 to 1.5 m deep, 2m wide running up steep slope towards what used to be a road called the Avenue	1		Mixed coniferous and deciduous open woodland	good but some damage by bike trails	3952
TI006	MWS8686	TQ28713414	Saw pit	Rectangular pit, 3m by 1m to 0.5 m deep on level ground near track and motorway! Possible late sawpit			Open ground, well spaced coniferous trees	Fair	3954
TI007	MWS8687	TQ28743413 to TQ28823382 and TQ28853378	Boundary Bank	Boundary bank aligned N-S with round, symmetrical profile between 1m wide, 0.25 to 0.3 m high with ditch to E. At southern end boundary bank nearly 2m high. Bank then diminishes and ends	1		Edge of track, coniferous trees planted on it	varies from good to poor	3955/6

TI008	MWS8688	TQ28753416	Boundary Bank	Running parallel with TI007 is another bank, possiibly part of old road through forest, ditch to east. The Forest road here is made up to higher level but entire road is 15 me across to where there is another bank and ditch	1		Forest track	good in places	
TI009	MWS8689	TQ28763404	Boundary Bank	Continuation of east bank, nearest to stream, symmetrical in profile, 1m wide 0.5 m high	1		Bracken covered	Fair	
TI010	MWS8690	TQ28723398	Boundary Bank	Low wide bank, symmetrical profile 1.5 m wide, 0.5 m high,	1		Coniferous trees planted on it and lichen covered	Good	
TI011	MWS8691	TQ28743398	Ditch	Strange curving ditch approx 30 cms wide and 20 cms deep, very slight moss covered banks to either side. Curves round higher ground but then truns uphill and continues over bank TI011. Cannot be a drainage ditch as it goes uphill			Deciduous trees in very wet ground	Good	3957-3959
TI012	MWS8692	TQ28783396	Boundary marker	Pollarded oak, girth approx 3m on boundary bank				Good	3960
TI013	MWS8693	TQ28843368	Platform	Large sub-rectangular platform/mound up against boundary wire near to railway cutting. 32m by 20 m and 2 m high approx, flattened top. ? Something to do with railway construction, huts for workers?	1		Open ground near fence	Good	3961/2
TI014	MWS8694	TQ28833353	Earthwork	Mound 33 m long, 2 m high, roughly D shaped, cut on straight side facing track. Solid clay with sandstone, covered in brash	1		Open ground next to track	Good	

TI015	MWS8695	TQ28753349 to TQ28623371	Cycle trail features	Series of 6+ ramps and wall for bike trail, well constructed and will leave permanent feature in landscape	1		Beech woodland	Good!	3963-6
TI016	MWS8696	TQ28623371	Cycle trail features	More ramps			Beech woodland	Good	3967
TI017	MWS8697	TQ28573368	Sawpit	Rectangular pit, 2.5 m by 1m to 0.5 m deep, moss covered straight edges, close to track			Edge of track, some evidence of other planting, rhododendron	good	3968
TI018	MWS8698	TQ28583370	Well and Dwelling	Brick lined open well, 3m deep with remains of house marked on 1st ed OS. Mainly unfrogged bricks, 22cm by 11 cm depth 6cm. One frogged brick 'Sussex Brick Estates'. Peg tiles and hipped roof tiles. Glass milk bottle and panel bottle glass.			Evidence of domestic planting	poor	3972-81
TI019	MWS8699	TQ28583347	Charcoal platform	Evidence of charcoal platform, charcoal flecks and dark soil , 8-10m			Open woodland	poor	
TI020	MWS8700	TQ28593343	Braided trackway/Hollow way	Double hollow way 0.25 to 0.3 m deep, 1m wide 4 m apart aligned roughly E-W	1			good	
TI021	MWS8701	TQ27703313	Charcoal platform	Charcoal platform 10 m diametre cut into slope to 1m at back, lip on front edge, darkened soil			Dense woodland	good	
TI022	MWS8702	TQ27233343	Drainage ditch	Drainage ditch down to stream, slight banks either side 0.5 wide and 0.5 deep, Banks round and sinuous ditch			Dense woodland	good	

TI023	MWS8703	TQ27783320	Cut	Hole 2m x 3m , 1.5 m deep			Dense woodland	fair	
TI024	MWS8704	TQ27983319	Boundary bank	Low shallow bank, aligned NNW-SSE roughly 0.75 m wide, 0.25 high, ditch to south side			Dense woodland	poor	
TI025	MWS8705	TQ28063317	Boundary marker	Stub beech, indicator of previous woodland compartment			Open woodland	good	
TI026	MWS8706	TQ27673290	Gate	Iron gate by westerly end of Tilgate Forest			Old entrance	fair	
TI027	MWS8707	TQ27463384	Boundary Bank	Bank running roughly NW-SE, parallel to boundary track. Symmetrical profile, 0.25m high and 0.5m wide	1				
TI028	MWS8708	TQ27363381	Pond	Rectangular pond 4m x 2m and 0.75m deep.					
TI029	MWS8709	TQ27363389	Drainage ditch	Drainage ditches or grips 0.5m wide and 0.25m deep with rounded banks. Extend from motorway and join in a 'Y' shape. Run into very dense cover, difficult to survey.	1		Dense woodland with rhododendron and fallen trees.		
TI030	MWS8710	TQ27203375	Boundary bank, possible trackway	Substantial boundary bank up to 1m high and 1m wide, ditch to W, assymmetrical profile. Possibly bank to old track.	1				
TI031	MWS8711	TQ27173378	Trackway, road?	Rounded banks 0.5m high running either side of track 10m wide, higher ground on either side. Possibly old road? NGR taken from centre of track.	1				

TI032	MWS8712	TQ27023375	Drainage ditch	Deep drainage ditch 0.5m deep, no banks, curving, marked on OS as drains					
TI033	*MWS8713*	TQ26833378	Boundary markers?	Two maiden beeches 12m apart, 2.5-3m in girth.					

TI034	MWS8714	Around TQ26643388	Dwelling, industrial site, brickworks? Military site?	Substantial complex of demolished buildings with standing remains up to c 0.5m. Shelter belt of conifers enclosing two sides of brick-edged working platform c. 35m x 20m with barrow ramp in SE corner. Entrance to adjacent building has remains of wide steps with curving brick walls on either side of apparent 1920s/1930s style. Demolition debris includes pre-cast concrete, metal beams, water tank and corrugated sheeting and is spread over a wide area c 100m across. Bricks include Warnham (Sussex Brick Co.) and Keymer. Domestic occupation is suggested by pear tree and daffodil planting and an early pink cultivated rhododendron. Appears to have been occupied into 20th century. Possibly related to the brick field/kiln shown to the north of here on the 1st edition and 2nd edition OS maps, but there is now no sign of activity at this location. Unsubstantiated reference to a WW2 ammunition dump here on internet at http://skuds.org/2005/10/secret-crawley-no-2-whalebone-plantation/. Substantial structures are visible on 1940 aerial photograph at http://www.geog.sussex.ac.uk/grc/info/airphotos-historic/1940/index.html but site appears cleared on the HER 1947 aerial photograph. The site was used as a plant nursery post-WW2, part of the business of F W Berk & Co Ltd, a horticultural research station based at the Walled Garden, Tilgate Manor, later purchased by Crawley Borough Council, which supplied much of the planting for Crawley New Town [http://www.crawley.gov.uk/stellent/idcplg?IdcService=SS_GET_PAGE&nodeId=256 and V Blandford, pers. comm].	1	TI035		Demolished close to ground level. Substantial brick, metal and concrete remains displaced but still on site.	In area proposed for development. Site appears unknown so risk of clearance without recording. Potential community archaeology project? Potential risk of ordnance if WW2 use?

TI035	MWS8715	TQ26693384	Quarry	Area of rectangular quarry pits with banks between, up to 1.5m deep. Some fly tipping on top of older demolition material apparently from TI034. Seem too small to be main quarries for the scale of activity at TI035.	1	TI035			
TI036	MWS8716	TQ26693385	Boundary marker	Pollarded oak 4m in girth, standing on slight bank					
TI037	MWS8717	TQ26623378	Cycle trail feature	Double berm with square pit in between 2m wide and 1m deep, beside track. Apparently out of use, could be taken for an atypical saw pit.					
TI038	MWS8718	TQ26643376	Mounds	5 to 6 low round mounds up to 0.5m high and 3 to 4m across and evenly spaced about 22m apart. Noticeable because of fresh bracken growth. No signs of ditches. On brow of hill. Function unclear.					
TI039	MWS8719	TQ26553365	Mound	Subcircular mound c20m circumference and 1m high, very loose soil.					
TI040	MWS8720	TQ26393358	Causeway, trackway, bank	Track running on substantial causeway across wet ground in area of 80-100 year old maiden beeches. Concrete and ceramic motorway drain inserted under causeway but causeway appears older. Some stub trees alongside. Further W at TQ26353359 there is a 0.5m high bank curving to the S of the track with a symmetrical profile.	1				
TI041	MWS8721	TQ26903388	Drainage ditch	Drainage ditch 0.5m wide and deep, no banks, cut channel, leads into inaccessible bamboo clump. Cut by track.					
TI042	MWS8722	TQ26953394	Hollow way?	Parallel rounded banks near track junction on slope. Possible disused hollow way.					

TI043	MWS8723	TQ27053414	Boundary bank	Bank 0.5m high and wide, ditch to N, running parallel and SW of forest boundary track. Continues to W boundary of forest.	1				
TI044	MWS8724	TQ26823413	Quarry, brick kiln?	Rectangular cut c. 3m x 10m and 1.5m deep leading off track, other irregular cuts and hollows and possible platform nearby. Corresponds to position of brickfield on 1st edition OS map and brick kiln on 2nd edition OS but no evidence of structures.	1				
TI045	MWS8725	TQ26783441	Mine pits	Area of small mine pits each c. 3m across.					
TI046	MWS8726	TQ26873437	Mine pits	Area of small mine pits each c. 3m across, to north of track.					
TI047	MWS8730	TQ2825633515	Hollow way	3m wide & 1.2m deep, orientated N/S. NGR at south end. Towards its north end there are parallel shallow hollow ways on its east side	1	TI048 & 50			
TI048	MWS8731	TQ28273365	Hollow way	Extant track heads NW downslope becoming hollow way 5m wide & 0.75m deep at east end	1	T!047			Track wear
TI049	MWS8732	TQ2830633624	Mound	Irregular shaped mound at track junction intersection 15m long, 7m wide & 0.6m high	1			poor, cut into	
TI050	MWS8733	TQ28323375	Braided trackways	Series of parallel trackways running N/S. Up to 1m deep and 2 - 3m wide. Up to six parallel tracks noted. Truncated by motorway.	1	TI047		Some vehicle rutting & path wear	Track wear
TI051	MWS8734	TQ28373378	Boundary Bank	Very irregular bank 1.5m wide & 0.6m high running N/S along west side of cleared area Looks very recent and probably result of clearance below pylons	1				

TI052	MWS8735	TQ28213386	Track	Extant track as slight hollow way with bank on east side up to 2m wide & 0.5m high. Trace of ditch on east side	1			Damaged by windblown trees	Roots & tree clearance
TI053	MWS8736	TQ28253375	Boundary bank	Bank 1.3m wide & 0.7m high with slight trace of ditch on each side at north end. Can be traced south alongside track and then through woodland at top of slope above stream. At TQ2817833527 cut by path & cycle track. Also located at south end of wood (TQ27954 33108) where it is 1.5m wide, 0.4m high	1			Some wear where crossed by paths, and erosion.	Path wear, roots
TI054	MWS8737	TQ28153365	Charcoal platform	Oval platform 10m x 6m terraced into slope. Dark soil and charcoal present. Pre-dates trees planted within it.					adj cycle trail
TI055	MWS8738	TQ28213356	Cycle trail feature	Mound on track 1.5m x 0.6m & 0.4m high with adjacent rectangular cut 1m x 0.7m & 0.5m deep					Cycle trail wear
TI056	MWS8739	TQ28173352	Cycle trail feature	Ramp and mound on track on east side of bank TI053		TI053 & 57			Cycle trail wear
TI057	MWS8740	TQ28163353	Cycle trail feature	Close to above are three small cuts forming a cresent running parallel to and on east side of bank (TI053). (a) is 5m x 1.3m & 1m deep (b) is 1.5m x 1m & 1m deep (c) is 2.5m x 1m & 0.4m deep		TI053 & 56			Cycle trail wear
TI058	MWS8741	TQ28163347	Cycle trail feature	Oval shaped cycle track circuit terraced into top of slope with embanked edges. Has internal circuit with mounds and bumps, and raised central area with numerous cuts. Covers area c. 20m X 8m. Many other cuts and mounds in surrounding area.	1			Worn and eroded	Cycle trail wear
TI059	MWS8742	TQ27663294	Boundary Bank	Low bank SW-NE orientated 1m wide and 0.3m high. No ditch.	1				Roots & tree clearance

TI060	MWS8743	TQ27773311	Drainage	Shallow gullies 1.5m apart and 0.3m wide 0.2m deep in pairs	1				rutting
TI061	MWS8744	TQ2802933406	Charcoal platform	Oval platform 10m x 7m cut into shallow slope. Dark soil					Trees
TI062	MWS8745	TQ28023340	Saw pit	Possible filled in saw pit 5m x 1.5m only 0.2m deep with some evidence of spoil around edge.Note cycle trail excavations nearby					Trees
TI063	MWS8746	TQ2799233709	Boundary Bank	Short length of bank on west side of stream, 1.5m wide 0.6m high. No ditch				Vehicle rutting	
TI064	MWS8747	TQ2791933601	Cut	Oval to D-shaped cut 3m x 2m water filled and no spoil mound					
TI065	MWS8748	TQ2785833522 to TQ2788633516	Cycle trail feature	Series of cuts and mounds along and beside E/W track					Cycle trail wear
TI066	MWS8749	TQ2782733451	Cycle trail feature	Complex series of earthworks, comprising cuts and mounds and ramp forming single feature. Other mounds and ramps noted nearby.					Cycle trail wear
TI067	MWS8750	TQ27793341	Boundary bank	Bank running NW-SE 1.5m wide & 0.6m high, but very degraded in places. No obvious ditch.	1			Vehicle rutting	Trees, bracken
TI068	MWS8751	TQ2769333215	Hollow way	On extant track NW-SE at its SE end before joining main track it forms a hollow way 3m wide & 1m deep	1			Path wear	Path wear, roots
TI069	MWS8752	TQ2760233110	Hollow Way	NW-SE hollow way? Runs into level area east of pond bay (TI070). 4m wide & 3m deep. NGR at east end	1	TI070			Tree roots
TI070	MWS8753	TQ27573305	Pond bay	Pond bay bank for New Pond (see OS map)	1	TI0769, New Pond			Tree roots

TI071	MWS8754	TQ27413353	Boundary bank	Bank 1m wide & 0.4m high with ditch on east side 0.8m wide & 0.2m deep. Continues along west side of track to south to join curving bank (TI072) where it is 1.8m wide & 0.75m high with ditch 1.5m wide and 0.25m deep on north side on south edge of wood (note broad trackway on outer edge of wood here (not in use)).	1	TI072 & 75			Roots
TI072	MWS8755	TQ27473325	Boundary bank	Bank 1.5m wide and 0.5m high along southern edge of wood	1	TI071			Roots
TI073	MWS8756	TQ27513330	Mound	Modern L-shaped mound/bank blocking track referred to in TI071 at point it enters Tilgate Forest. 4m x 4m, 2m wide & 1m high. Associated broken post & rail fence	1	TI071			
TI074	MWS8757	TQ27533324	Boundary bank	Bank 1.3m wide & 0.3m high with ditch on east side 0.6m wide & 0.2m deep. Runs along western edge of Forest for 100m	1				Roots
TI075	MWS8758	TQ27253336	Boundary bank	N/S bank 1.5m wide & 0.2m high. Slight ditch on east side 0.75m wide & 0.15m deep	1	TI071		Windfallen trees	Roots & tree clearance
TI076	MWS8759	TQ27223332	Mound	Mound 10m x 6m & 1m high oval in shape but very irregular	1				Roots

TI077	MWS8760	TQ27203340	Field boundary	Curving field boundary bank 1m wide & 0.25m high with slight ditch on east side, or drop to lower level. At south end curves round and runs 5m inside wood but then peters out on wood edge. At north end can be seen as double bank, each 1 to 1.5m wide & 0.3-0.5m high, and 6m apart, meets bank TI071. Lost in plantation in central area. Part of boundary of one of circular fields visible on 1st edition OS map - this one known as Cherry Tree Plantation.	1	TI071		vehicle rutting	Roots
TI078	MWS8761	TQ27123345	Boundary bank	Bank 1.8m wide & 0.5m drop on west side, becomes less distinct further north	1				Roots
TI079	MWS8762	TQ26923343 approx	Mound	50m in from west edge of wood and 50m in from south edge of wood in SW corner of Forest. N/S aligned, 40m long, 8m wide & 1m high				Rabbit digging	Roots, rabbits
TI080	MWS8763	TQ27143349	Trackway	Extant trackway with banks along each side, more prominent on north side. Irregular and cut through. Max dimensions 2m wide & 0.5m high	1				Roots, vehicle damage
TI081	MWS8764	TQ27703372	Trackway	Extant trackway with bank 5m inside wood on east side runs parallel to track 1m wide & 0.3m high (max). Similar bank inside wood on west side of track	1				Roots
TI082	MWS8765	TQ27753372	Cut; slit trench?	Cut 3m x 0.8m & 0.5m deep. Resembles slit trench, earth mounded slightly around three sides. Situated in wood 5m from track junction					Roots
TI083	MWS8766	TQ27903371	Mound	Small circular mound 5m diameter & 0.6m high in centre of cleared area in young birch plantation					Roots

TI084	MWS8767	TQ28793364	Braided trackways	Area of braided trackways visible on lidar.	1				
TI085	MWS8809	TQ28283349	Flintwork scatter, mesolithic	Small group of struck flint found on eroded surface of parallel tracks centered on NGR and extending for 50m north and south of NGR - comprises 3 hard hammer-struck flakes, 6 soft hammer-struck flakes 6 bladelet fragments, 2 fragments & 2 fire-fractured flints - All Mesolithic in character					Erosion & vehicle wear
FID1303	MWS8972	TQ27033394	Drainage ditch	Previously ground truthed	1				
FID1294	MWS8973	TQ26673440	Field boundary	Identified on lidar, not ground truthed	1				
FID1295	MWS8974	TQ26813430	Field boundary	Identified on lidar, not ground truthed	1				
FID1300	MWS8975	TQ27013419	Field boundary	Identified on lidar, not ground truthed	1				
FID1296	MWS8976	TQ26673406	Lynchet	Identified on lidar, not ground truthed	1				
FID1304	MWS8977	TQ26883401	Boundary bank	Identified on lidar, not ground truthed	1				
FID1301	MWS8978	TQ27003407	Boundary bank	Identified on lidar, not ground truthed	1				
FID1305	MWS8979	TQ27193391	Boundary bank	Identified on lidar, not ground truthed	1				
FID1456	MWS8980	TQ27973377	Bank	Identified on lidar, not ground truthed	1				
FID1311	MWS8981	TQ27323327	Boundary bank	Identified on lidar, not ground truthed	1				

FID1455	MWS8982	TQ27953331	Bank	Identified on lidar, not ground truthed	1				
FID1331	MWS8983	TQ28313350	Enclosure?	Identified on lidar, not ground truthed, may relate to electricity pylon	1				
FID626	MWS8984	TQ26753403	Quarry	Identified on lidar, not ground truthed	1				
FID627	MWS8985	TQ26783397	Quarry	Identified on lidar, not ground truthed	1				