FITZWILLIAM (WENTWORTH) ESTATES

BRADFIELD MOORLAND REGENERATION SCHEME

ENVIRONMENTAL STATEMENT SUPPLEMENTARY REPORT ARCHAEOLOGY VOLUME III

paa
Penny Anderson Associates Ltd
Consultant Ecologists

Holling Dale and Bole Edge Plantations

Bradfield

South Yorkshire

Archaeological Survey

Contents

Summary

An archaeological survey of topographical features in Holling Dale, Bole Edge, Brogging Moss, Coo Hill and Fox Hole Carr Plantations revealed a major holloway system, isolated holloways, discrete quarry areas, pits, inscribed stones and drainage ditch systems. These appear to represent predominantly post-medieval activity, with some monuments, such as the holloways, possibly originating in the medieval period. No evidence of prehistoric activity was encountered. The distribution of monuments may be biased by poor visibility in many areas due to dense vegetation and ground cover, as well as disturbance and debris from modern forestry activity. The results of the survey provide a useful insight into the history of this previously un-investigated area of woodland.

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1. Introduction

1.1 Archaeological Services WYAS were commissioned by Penny Anderson Associates Ltd (Consultant Ecologists) on behalf of the Peak District National Park and Fitzwilliam (Wentworth) Estates to undertake an archaeological survey of topographical features at land at the site of Holling Dale and Bole Edge Plantations (and the associated small plantations of Brogging Moss, Fox Hole Carr and Coo Hill), Sheffield, South Yorkshire. In total, the site covers an area of approximately 233 hectares and is located approximately 10 miles to the WNW of Sheffield within the Peak District National Park (centred on NGR SK 225 916) (Figs 1 and 2). The site is bounded to the west and north by open and semi open moor land, to the east by small arable and pasture fields, and to the south by Strines Inn and Strines Reservoir. The investigation has taken place in response to the proposed felling of 65% of the evergreen plantation, returning it through active management strategies to moor land. The area of oak, beech and other broadleaf woodland, together with 50 hectares of pines flanking Mortimer Road, will remain.

1.2 Previously, the area under investigation has received little archaeological attention and very little is known about its history. It appears on the 1st Edition Ordnance Survey (OS) map of 1855 as an extensive area of plantation and consequently has been actively managed for over 150 years. Today the vegetation of the site consists predominantly of Larch and Pines with some small areas of deciduous beech, birch and oak. Large areas of the site have very dense vegetation and ground cover, largely due to recent felling as part of forestry management and subsequent regeneration. As a consequence, approximately 25 hectares of the woodland (10%) were not surveyed due to inaccessibility, and in other areas observations were hampered by bracken, ferns, and general undergrowth (Fig. 3). Forestry debris also hindered the investigation as large areas of matted off cuts and small branches covered the woodland floor in many places. Forestry vehicles have caused extensive disturbance in many areas from rutting and general movement.

1.3 The under lying geology comprises largely of the Mill Stone Grit Series of the Upper Carboniferous (British Geological Survey 1979), with outcrops of sandstone.

2. Archaeological Background

2.1 There is no archaeological information available either from the Sites and Monuments Record or from previous surveys of the study area, although there are numerous SMR entries for Mesolithic and undated flint scatters, microliths, blades, waste and arrowheads from moorland surrounding the site. There are also two significant features approximately 2.5km to the north-east of the plantations; Bar Dyke (Scheduled Ancient Monument 29808) and Cowell Flat prehistoric field system (Scheduled Ancient Monument 29820). Across the valley, to the south and west and on moorland to the east and south-west, landscape surveys carried out between 1994 and 1999 on other holdings have shown the existence of banks, lynchets, holloways (including the Derwent to Bradfield packhorse route), quarries, possible coal pits and possible medieval enclosures (Johnson 2003; Appendix I). All of these

features are found in the vicinity of the plantations in question and therefore there is also the potential for such features to occur within the areas of proposed felling.

2.2 The Thomas Jefferys Map (1775, Sheet 17) shows the study area west of Hallfield to be open moorland and is labelled as 'Hallfield Moor' (Fig. 4). There is no indication of tree cover in the near vicinity. In contrast, the plantation is depicted as managed plantations/woodland on the Bradfield Parliamentary Enclosure Map of 1826. Quarries to the north of Bole Edge Plantation are also noted (Angela Johnson pers. comm.).

2.3 The 1st Edition OS map of 1855 (Fig. 5) shows a similar area of plantation as exists today, but with more extensive tree cover to the north-east in Thornseat and Harrison Plantations. A system of forestry access tracks is also evident and many are still in current use. There are no discrete features located on the 1st Edition OS map. Of note, however, is the extensive quarrying area located on the northern boundary of Bole Edge Plantation. The quarry is labelled as 'Sandstone' and appears, along with Thornseat Quarry to the north, on the modern OS map (Fig. 2). An area of plantation to the east of these quarries appears to have been felled after 1826 and returned to improved moorland pasture as it appears today (*op. cit*.). To the south-east of this is a system of more curvilinear tracks that appears to provide access from the road to the east towards the quarry areas. This only appears as one main trackway on the modern OS map. Also of note is the quarry at Foulstone Delf, labelled as 'Gritstone' on the 1st Edition OS map, that is located just outside the study area to the south-west. Locating the aforementioned former holloway, and accurately locating the smaller quarry area to the west that partly falls within the study area, may be possible during this survey

3. Method

3.1 A written brief for the archaeological survey of Holling Dale and Bole Edge Plantations was prepared by the Assistant Conservation Archaeologist at the Peak District National Park Authority (Appendix I). A detailed Project Design was then prepared by Archaeological Services WYAS (Appendix II).

3.2 A Level 2 survey was undertaken which involved a systematic walk-over of the area, noting the presence/absence of archaeological features, deposits and surface finds. Areas of impenetrable undergrowth and any areas where the walk-over was not possible were highlighted. A sketch plot of each feature, deposit and surface find (or a discrete collection of each) and a textual description was made.

3.3 The aims of the archaeological Level 2 survey were:

- to collect sufficient data to establish the presence or absence of archaeological remains within the woodland area,
- to determine the extent, condition, quality of survival, character, importance and date of any archaeological remains present.
- to gather sufficient information to enable the assessment of the potential and significance of the archaeology of the site and the impact that woodland management and public access may have on the archaeology present.

3.4 To facilitate the survey the plantations were divided into four compartments. Compartment 1 is located to the north-west and includes Holling Dale Plantation. It is the largest compartment at approximately 70.8 hectares and is bound by moorland to the north and west, Compartments 3 and 4 to the east, and Compartment 2 to the south. Compartment 2 is located in the south of the study area and is approximately 41.7 hectares in size. It is bound by Compartments 1 and 3 to the north, parliamentary field systems to the south, and moorland to the west. Compartment 3 is approximately 64.7 hectares in size and is located in the south-east of the study area. It is bound by parliamentary field systems to the east and Compartments 2, 1 and 4 to the south, west and north respectively. Compartment 4 is located in the north-east of the study area and is approximately 55.8 hectares. It is bound by Mortimer Road to the south-east, semi-moorland and quarries to the north and east, and Compartments 1 and 3 to the west and south respectively. The compartmentalisation of the woodland aids the surveying of areas and the collation of primary data.

3.5 A systematic walkover of each compartment was carried out to facilitate the survey of archaeological monuments. By covering the area in each compartment using transects of approximately 40m in width, the aim was to examine the woodland as consistently as possible. The distance between transects was only estimated, however, and when tree cover, dense vegetation, or steep slopes were encountered, some deviation from the line did occur. The steep slopes of the stream valleys within Compartments 1 and 2, for example, were visually inspected from above and below

3.6 Each feature or group of features was assigned a unique identifier number or group of numbers in accordance with the GPS system. This constituted the primary index for the field archive. For each feature, the compartment number was also identified, as well as a classification of the type of monument and a suggested date whenever possible. The classification of the features followed the lists of accepted terms outlined in the standard thesaurus of monument types (RCHME 1998), although this had to be modified in certain circumstances due to a lack of detail for smaller scale features.

3.7 Where ground and vegetation cover allowed, a Trimble Geo-Explorer differential GPS receiver was used to locate each monument to an accuracy of 1/2500 (i.e. better than +/- one metre). The GPS system was tested against known survey points and was found to be accurate to 2-3m with four location satellites, and sub-meter accuracy was achieved with five or more location satellites in X, Y and Z axes. The majority of the survey within the study area was carried out with four or five location satellites and occasionally six or more. The positioning data were processed in the field using Fastmap software. This allowed individual sites to be visually located on a digital Ordnance Survey base-map and for descriptive data to be collected for each monument. When dense tree cover or steep topography precluded the use of the GPS receiver, hand survey was undertaken using tapes. This reduced the accuracy of the survey to within 5m.

3.8 Attributes of each feature were recorded. The central grid reference (northing and easting) were noted using a GPS receiver. Maximum dimensions (length,

width and height/depth) and orientation were typically recorded using hand tapes and a compass.

3.9 An assessment of the preservation and significance of each feature was based on a number of criteria: visibility (high/medium/low), condition (good/medium/poor/uncertain), completeness (as a percentage) and importance. The level of importance of each feature followed a grading system developed for the Weld Estate, Dorset (Keen and Carreck 1987):

- Level I Archaeological and historical features of special (i.e. national/regional) importance which warrant the greatest possible protection
- Level IB Level I monuments which appear to have been badly damaged or destroyed
- Level II Archaeological and historical features of lesser (i.e. local) importance
- Level IIB Level II monuments which appear to have been badly damaged or destroyed
- Level III Former archaeological and historical features of special importance for which there is confidence that no coherent archaeological remains (including buried feature) are recoverable.

An additional star rating (i.e. II* or IIB*) was used to indicate monuments whose nature, function and use could be ascribed with reasonable confidence (although it was not anticipated that Level I and III monuments would be given star ratings).

3.10 A detailed description was complied for each feature, including details on physical characteristics and any relationships with other features. This was often accompanied by a sketch plan of the feature. Current ground cover was noted and an assessment of any risk to the monuments' survival was made. Finally, any recommendations for further survey were given.

3.11 Sarah Whitley and Angela Johnson of The Peak District National Park Authority visited the site on the 18th of June in order to monitor the work in progress.

3.12 Following completion of the archaeological survey, the site archive was prepared in accordance with the specification outlined in the Management of Archaeological Projects, Map 2 (English Heritage 1991). The site archive contains all the information collected during the fieldwork and the records have been checked and indexed as necessary (Appendix III). The paper archive is currently held by Archaeological Services WYAS in appropriate and stable environments.

4. Results

4.1 During the Level 2 survey of the woodland 45 archaeological features or groups of features were recorded. Within Compartment 1, nine monuments or groups of monuments were located, and Compartments 2 and 3 revealed fourteen each. Within Compartment 4 eight monuments or groups of monuments were located. These monuments are summarised by compartment in Tables 1 to 4 (Appendix IV), and their locations are shown in Figure 3.

4.2 The monuments identified within each compartment are discussed below by period and/or feature type. Tables containing a summary of the monuments from each compartment are given in Appendix IV. These list all features in the order of their monument identification number.

Compartment 1

4.3 Within Compartment 1, nine features or groups of features were identified (Table 1; Appendix IV). Of these, no monuments are classified as Level I, i.e. sites of national archaeological importance. All nine monuments are classified as Level II sites i.e. sites of local archaeological importance, with one having suffered recent damage from forestry vehicles (Monument 4) and classified as IIB (Fig. 3).

4.4 The vegetation recorded within Compartment 1 consists largely of dense areas of pine and larch plantation. Several areas of relatively recent felling and subsequent regeneration within the last five or ten years located in the central and north of the compartment were too dense and inaccessible for survey. In total, approximately 13.4 hectares was not surveyed within Compartment 1. From observations elsewhere within the study area, modern felling and timber removal practices cause considerable damage and disturbance due to large vehicles and machinery. It is likely, therefore, that the un-surveyed areas of recent extraction have suffered disturbance and any potential archaeological features may have been lost. Within the steep valley of Holling Dale Brook towards the east of the compartment, there are areas of deciduous trees of predominantly beech with some oak. The west-facing slope of the valley hosts mature beech woodland to the north of Monument 9. The topography of Compartment 1 is variable. The majority of the area falls on the broad south-east facing slope that occupies the majority of the compartment. Sharper slopes occur where the ground drops down to meet Rushy Flat Dike in the west, Brogging Moss Dike in the south, and Holling Dale Brook in the east. The condition of monuments is generally good to medium, with only the stonewall (Monument 9) and the wooden bridge (Monument 5) classed as in poor condition due to collapse and decay. The visibility of monuments encountered was generally high to medium, but this may be biased due to dense areas of woodland yielding negative results, and only the larger scale features being identified. This is reflected in the survey coverage, which was generally medium to poor due to dense areas and thick ground coverage.

4.5 **Monument 8: Cave.** This monument represents a small natural cave set within an outcrop of gritstone in the eastern area of Compartment 1. The cave is west facing and is approximately 3m in length, 4m wide and 1m high at the mouth. It may be that this outcrop was the focus for prehistoric activity when such prominent landscape features were held in importance, although there is no direct evidence to support this here. There is also the possibility that certain deposits may survive within the cave floor deposits. The gritstone boulder strewn outcrop was surveyed for potential prehistoric rock art and prehistoric evidence, but none were identified. The majority of the rock surface is covered in a thick mat of pine needles and undergrowth limiting inspection. The potential for such evidence must not be ruled out, however, as

the protected nature of the outcrop within a coniferous plantation has reduced the affects of erosion and weathering experienced by the majority of moorland outcrops in the area.

4.6 **Monument 2: Ditch system.** An extensive drainage ditch system covering approximately 18ha was located along the northern boundary of Compartment 1 where it borders with Holling Dale and Holling Dale Piece. The ditch system generally consists of a series of parallel ditches orientated approximately north to south, draining to the south into more substantial north-west to south-east orientated ditches. The system appears to incorporate a natural stream running off the moor to the north, and down slope to the south-east where it joins Holling Dale Spring. The smaller north-south orientated ditches are approximately 1m in width and 0.5m in depth. The larger catchment ditches to the south are generally 2 to 3m in width and 0.5 to 0.75m in depth. Where the ditches reach the compartment boundary to the north they appear to cut through, or are more likely contemporary with, the bank, wall and ditch represented by Monument 1. Indeed, several of these have small 'bridges' under the stonewall and continue in part across the moor to the north. The ditch system appears to represent a post-medieval drainage system put in place to control the movement of run off water from the moorland into the plantation, and subsequently to aid the drainage of this area. Holling Dale and Holling Dale Piece lie up slope from the plantation and it is likely that considerable volumes of water move from the moor in times of heavy rain and snow melt. It is likely that this drainage system is contemporary with the conversion of this area from moorland into plantation. The present survey must only be considered as a representation of the true extent of this ditch system due to a poor GPS signal and dense undergrowth in the area.

4.7 **Monuments 1: Wall and ditch.** This monument represents the main northern boundary of the plantation to the moorland to the north. It comprises of a low bank approximately 1 to 1.5m in width and 0.4 to 0.5m in height that flanks a substantial stonewall to the north. The wall is approximately 1.3m high, with the largest drop to the north where a substantial ditch is located. This is approximately 2 to 2.5m in width and 1m in depth. The ground surface to the north is at a similar level to the top of the wall, creating a primitive form of 'Ha Ha'. The monument forms an effective boundary to animals when approached from the north, but is relatively easily crossed from the south, as well as allowing the movement of water underneath via small channels or bridges to the drainage system (Monument 2) to the south. This feature stretches for some 470m along the northern compartment boundary and is likely to be post-medieval in date and contemporary with the conversion of the moor into plantation.

4.8 **Monuments 3 and 6: Ditches.** Monument 3 represents an isolated drainage ditch located in the central area of Compartment 1. Orientated north-west to south-east it is approximately 124m in length, 0.75 to 1m in width and 0.3 to 0.5m in depth. It appears to represent a drainage ditch heading down slope to the south-east that may be part of a more extensive system. The feature has been damaged by forestry vehicles but is still in moderately good condition. Monument 6 represents another drainage ditch orientated north-east to south-west heading down slope from a forestry track to the west of Holling Dale

Cottage. It is approximately 75m in length, 0.4 to 0.5m in width and 0.45m in depth, with a slight bank running parallel to the north-west that measures approximately 1m in width and 0.2 to 0.3m in height. The profile of the ditch is squared and it may have been excavated with a machine. Both Monuments 3 and 6 appear to be post-medieval in date, or later post-medieval in the latter case.

4.9 **Monument 7: Pits.** This monument represents two isolated pits located to the north of Monument 8 and to the south-west of Monument 9. They comprise small sub-circular pits 2 to 2.5m in width and 0.75m in depth of unknown function and date. It is possible that they represent small-scale post-medieval quarrying activity.

4.10 **Monument 9: Stonewall.** Monument 9 represents a substantial stonewall orientated south-east, from a forestry track, down-slope to the north-west where it crosses the Holling Dale Brook and continues for *c.*15m. It is approximately 213m in length, and varying in width from approximately 0.4 to 1m, and in height from 0.4 to 1.4m. Where survival is good, the wall construction is of irregular sized sub-rounded gritstone blocks with occasional sub-angular stones protruding on the north-east side to form steps. Due to collapse and neglect this monument is classified Level IIB*. This internal woodland wall has been neglected, but the same form of construction is evident throughout the maintained plantation boundary walls, and may represent a specific style for the Wentworth Estate, or indeed a style solely for this plantation. The wall is later post-medieval in date.

4.11 **Monument 4: Holloway.** Monument 4 represents a possible holloway orientated north-east to south-west running from Holling Dale Piece where there is a gateway to the moor. The feature is approximately 124m in length, 2 to 3m in width and 0.3 to 0.4m in depth. Due to recent disturbance from forestry vehicles this monument has been classified as Level IIB, and may simply represent a forestry track. The presence of a gate in the stone boundary wall to the north-east suggests a later post-medieval date for the holloway.

4.12 **Monument 5: Bridge and track.** Monument 5 represents a modern wooden bridge and track to the north-east heading towards Holling Dale Cottage. The bridge is constructed of sawn timber and is approximately 5m in length, 1.2m wide and 0.75m above Holling Dale Brook. The track approximately 2.5m wide and appears to have been levelled recently, perhaps with a digger. The bridge is in a poor state, and although still functioning, it is unstable and in danger of collapse, and is therefore classified as Level IIB*. A modern date is suggested for both.

Compartment 2

4.13 Within Compartment 2, fourteen features or groups of features were identified (Table 2; Appendix IV). Of these, no monuments are classified as Level I, i.e. sites of national archaeological importance. All fourteen monuments are classified as Level II sites i.e. sites of local archaeological importance, with one having suffered recent damage from forestry vehicles (Monument 12) and classified as IIB (Fig. 3).

4.14 The vegetation recorded within Compartment 2 consists largely of dense areas of pine and larch plantation. No extensive areas of recent felling and subsequent dense re-growth were encountered but extensive dense areas of pine and undergrowth were located in the west, north and south of the area limiting investigation. Towards the lower reaches of Foulstone Dike and Holling Dale Brook nearing Strines Bridge there are more extensive areas of deciduous trees. Surrounding Monuments 18 and 19 is a mature beech wood, while a mixed deciduous woodland, predominantly of oak, is situated on the steep north facing slopes to the north of Strines Inn. Large areas of central Brogging Moss and Fox Carr Hole Plantations have been badly damaged by recent forestry activity and extensive areas of disturbance and rutting have occurred. This may have destroyed or limited the observation of archaeological features. The topography of Compartment 2 is again variable. The majority of the area falls on the broad east sloping plateaus of Brogging Moss Plantation and Fox Hole Carr, surrounding which are the steep sided stream valleys of Brogging Moss Dike and Foulstone Dike. These two streams join just north of Strines Bridge and continue into Strines Reservoir in a very steep sided valley. The southern area of Fox Hole Carr also contains the steep sided valley of Strines Dike. The steep valley slopes were often dangerous and inaccessible and had to be visually inspected for monuments where possible. The condition of monuments is generally medium, with only the holloways (Monuments 17, 18, 20 and 21) in good condition. The visibility of monuments encountered was generally high to medium, but this may be biased due to dense areas of woodland yielding negative results, and only the larger scale features being identified. This is reflected in the survey coverage, which was generally medium to poor due to dense areas and thick ground coverage.

4.15 **Monuments 11, 17, 18, 20 and 21: Holloways.** Within Compartment 2 five holloways were located. Monument 11 represents a main holloway orientated north-east to south-west, continuing out of the study area across the moor to the south-west towards the disused quarry at Foulstone Delf, and running parallel to the present road. In the north-east the holloway turns to the north and joins the present road from Foulstone Delf. There is a small branch of the main holloway towards the south-west, but this may be a later forestry access track. The main holloway is approximately 305m in length with the small branch approximately 62m long. Both are generally 2 to 2.5m in width and 0.4 to 0.6m in depth. The main holloway has a distinct concave profile towards the north-east, and appears to represent a former access route to the house and quarry at Foulstone Delf. This appears to predate the plantation boundary wall that cuts across the holloway at either end, as well as predating two small quarries (Monuments 14 and 16) that visibly cut across it. A medieval date for the holloways cannot be ruled out due to their association with the larger quarry and house, but a post-medieval date is more likely. Monument 17 represents another former variation in the present road to Foulstone Delf. The small length of holloway (approximately 74m) is orientated north to south and is approximately 2.5 to 3m in width and 0.5 to 0.75m in depth with a distinct concave profile. Again, the boundary stonewall adjacent to the west slightly cuts over the holloway suggesting an earlier possibly medieval date. A series of holloways with one route eventually formalised is common, as demonstrated by the extensive holloway system

(Monument 44) in Compartment 4. Monument 18 represents a short section of holloway (approximately 90m long) extending from the east side of Strines Bridge in the south, to a small quarry area (Monument 19) in the north. A short branch of the holloway (approximately 10m long) extends from the main route to the north-east to within the quarry area. The holloways are approximately 2 to 2.5m in width and 0.5 to 1.5m in depth, with greater depths observed where they are cut into the steep valley side towards the south. At the junction of the two holloways a small single course of medium sized gritstone boulders have been used to form a small revetment wall on the down-slope sides. The function of the holloways was probably to provide access to this small area of quarry pitting. Monuments 20 and 21 represent two holloways both oriented north-west to south-east, joining Mortimer Road to the north-west either side of Strines Bridge. Monument 21 is the longer at approximately 124m long and Monument 20 the shorter at approximately 75m. Both are between 3 and 4m wide, and 0.75 to 1m in depth where they cut into the valley side. They seem to represent former access routes from the road to the steep slopes of the valley either side of the river. Both holloways seemed to peter out to the south-east and no continuation could be located. No further features were located further down the valley. Due to their association with Mortimer road and Strines Bridge a medieval (or later) date cannot be ruled out.

4.16 **Monuments 13, 14, 15, 16, 19, 22 and 23: Quarries.** A total of twenty quarries of various sizes and forms were located during the survey. These can be divided into three groups for discussion. Monuments 13, 14, 15 and 16 form a line of small quarries orientated broadly north-east to south-west along the north-west side of Holloway 11. Indeed, they appear to be later in date than the holloway as quarries 14 and 16 visibly cut across it. The quarries are generally sub-circular in shape, and between 5 and 8m in length, 4 and 7m in width, and 1.2 to 2m in depth. Monument 15 is the largest and more irregular in shape and orientated east-west, while the remainder are smaller and orientated north-west to south-east. All face down slope to the north-west. The function of the quarries appears to be gritstone extraction and it is possible that they were excavated for the construction of the stonewalls that bound this area of the plantation. Monument 19 represents a discrete area of small scale quarry pitting located to the north-east of Strines Bridge and served by Holloway 18 to the west. Fourteen small quarries were identified covering an area of approximately 2.6ha. They are generally between 4 to 8m in length, 3.5 to 7m in width and 0.5 to 1.2m in depth, and all are orientated north-east to south-west, with the entrances facing towards Holloway 18 to the south-west. The function of the quarries appears to be the small scale extraction of large slabs of gritstone, possibly for the construction of Strines Bridge or stonewalling in the vicinity. With this in mind, the quarries could have a possible medieval origin, but could equally be from the post-medieval period. Monuments 22 and 23 represent an area of extensive quarrying adjacent to the Mortimer Road to the north of Strines Inn. Monument 22 represents a large gritstone quarry approximately 25m in length, 20m in width and 3 to 4m in depth orientated north-west to south-east. The entrance to the quarry towards the north-east is level with the road. Monument 23 represents a less well-defined area of possible gritstone quarrying approximately 20m in length, 4 to 5m in width, 1.5m in depth and orientated south-east to north-west. Rock

faces are visible to the south-west and it seems that large gritstone slabs may have been removed. Perhaps both Monuments 22 and 23 were excavated for the construction of Strines Bridge or Inn, therefore a medieval date cannot be excluded.

4.17 **Monuments 10 and 12: Ditches.** Monument 10 represents an extensive drainage ditch system located in the west and central area of Brogging Moss Plantation in the north-west area of Compartment 2. Similar in form to the drainage system located in Compartment 1 (Monument 2), the Brogging Moss system incorporates a natural stream and channels run off water from the moor located up-slope to the west, via a series of parallel and perpendicular ditches, to the stream system of Foulstone Dike to the south. The ditches are generally between 0.75 to 2.5m in width, 0.3 to 0.6m in depth and cover an area of approximately 38ha. The full extent of the drainage system may not have been located during this study due to very dense pine plantation, dense undergrowth and a poor GPS signal in the area. As with Monument 2, a post-medieval date contemporary with the conversion of the area from moorland to plantation is likely. Monument 12 represents an isolated drainage ditch located in Fox Hole Carr Plantation orientated north-east to south-west and joining the branch of Holloway 11 at the former. It is approximately 49m in length, 0.75m in width and 0.3 to 0.4m in depth. It suggests that small scale drainage has occurred in this area of Fox Hole Carr, and other ditches may exist but are obscured by undergrowth or disturbed. A post-medieval date is likely for this feature.

Compartment 3

4.18 Within Compartment 3, fourteen features or groups of features were identified (Table 3; Appendix IV). Of these, no monuments are classified as Level I, i.e. sites of national archaeological importance. All fourteen monuments are classified as Level II sites i.e. sites of local archaeological importance, with five having suffered recent damage from forestry vehicles (Monuments 26, 29, 32, 34 and 35) and classified as IIB (Fig. 3).

4.19 The vegetation recorded within Compartment 2 consists largely of dense areas of pine and larch plantation. Extensive areas of recent felling and subsequent dense re-growth were encountered towards the south of the compartment as well as in the north, and approximately 8ha was not surveyed due to inaccessibility. Towards the central area of the compartment are more open areas of mature thinned pines with fern and bracken undergrowth. Coo Hill Plantation generally consists of relatively open recently thinned pines, with some denser areas of undergrowth. Large areas of Coo Hill Plantation and some eastern areas of Bole Edge Plantation have been badly damaged by recent forestry activity and extensive areas of disturbance and rutting have occurred, especially in the former. This may potentially have destroyed, or limited the observation of archaeological features. The topography of Compartment 3 is less variable. The majority of the area falls on the broad south-east facing slope of Bole Edge Plantation, that continues in Coo Hill Plantation to the south-east after being dissected by Mortimer Road. This slope generally increases in steepness as it moves south. The visibility of monuments encountered was generally high to medium, but this may be biased

due to dense areas of woodland yielding negative results, and only the larger scale features being identified. Monuments 26 and 35 have a visibility of medium to low due to their ephemeral nature and undergrowth. The survey coverage was generally medium due to some denser areas and thick ground coverage.

4.20 **Monuments 29, 32, 33, 34, 35, 36 and 37: Holloways.** Seven possible holloways were located within Compartment 3, the majority of which is associated with the eastern boundary of Coo Hill Plantation. The isolated possible holloway located in the north-east area of Bole Edge Plantation, Monument 29, may relate to more recent drainage or felling activity. It is approximately 20m in length orientated north-west to south-east, 1.5 to 2m in width and 0.4 to 0.75m in depth. It runs south-east from a current forestry track, and may relate to drainage or woodland access associated with this and be post-medieval in date. The remaining six holloways in Coo Hill Plantation are likely to be older in date and may have medieval origins. Monuments 36 and 37 seem to provide former access from Mortimer Road in the west to Hallfield, a collection of medieval to post-medieval houses and utility buildings, in the east. Monument 37 is the longest at approximately 127m in length extending from the west where it is cut by the Mortimer Road, into the field and joining the present track to the east (38m lie within the woodland itself). At approximately 10 to 15m wide and 1 to 1.5m deep it is the most sizable example of a holloway encountered during this study, and must have served as a major route. Monument 36 to the south (also broadly orientated east to west) serves a similar function, although smaller in size at 117m in length (approximately 58m within the woodland), 2 to 3m in width and 0.4 to 0.6m in depth. It continues across the arable field as a visible hollow towards Hallfield in the east. Any further continuation to the west within the plantation was not located due to disturbance by forestry vehicles and undergrowth. Monument 35 represents a possible holloway orientated east to west measuring approximately 94m in length, 1.5 to 2m in width and 0.3 to 0.4m in depth. Any continuation west is obscured by vehicle disturbance and it is not visible in the pasture field to the east. Monument 33 represents a curvilinear section of holloway orientated broadly north-east to south-west. It measures approximately 174m in length, 2 to 3m in width, and 0.5 to 1m in depth, with approximately 61m of the length continuing into the pasture field to the south beyond the study area. No continuation was noted in the north where it is cut by a stone boundary wall. Monuments 32 and 34 represent two sections of holloway orientated broadly north to south that may originally have formed the same route. Monument 32 is the more convincing feature at approximately 100m in length (80m within the plantation), 2 to 3m in width and 0.5 to 0.75m in depth, with a possible continuation visible in the pasture field to the south. Monument 34 is less convincing as a feature due to heavy disturbance by forestry vehicles, but at approximately 68m in length, 2 to 3m in width and 0.3 to 0.5m in depth it may form the northern continuation of Monument 32. Monuments 32, 33 and 34 may relate to the disused quarry area indicated on the present OS map (Fig. 2) to the south-west at Brogging.

4.21 **Monument 24: Quarry Area.** Monument 24 represents an extensive area (approximately 19.3 hectares) of small to medium scale gritstone quarrying activity located towards the western boundary of Compartment 3. The present

land-use of this area of Bole Edge Plantation is mature pine plantation with thick to medium ground cover, and the area is currently used as a paint-balling centre. Due to the buildings, netting, facades and barricades associated with this activity it was difficult to fully assess this area, and along with a very poor GPS signal this present summary is limited. Figure 2 shows the main outline of the area of quarrying as well as the main central quarry. Further detail would require a more appropriate survey method. The main large quarries are located adjacent to the paint-ball centre buildings with the largest example measuring approximately 20m in diameter and 2.5m in depth. There appear to be two main quarry foci to the north and south of the paint-ball centre. Generally the smaller examples are approximately 10m in length, 7m in width and 1 to 1.5m in depth. These quarries are difficult to differentiate as the area is extensively exploited and the quarries interlink. They appear to indicate the removal of the weathered top block layer of gritstone. Spoil mounds of various sizes and generally 0.75 to 2m high flank the quarries. Surrounding this main area of quarrying, but generally down-slope to the south-east, is a series of smaller quarry pits that range in size from approximately 3 to 8m in length, 3 to 6m in width and 0.5 to 1.2m in depth. The larger examples of these have entranceways down-slope and again they appear to represent the small-scale extraction of the upper layer of blocky weathered gritstone. The entire area has suffered erosion and damage from paint-balling activity and many smaller quarries have been modified into hideouts or barricades. It is not clear whether some have been recently excavated for this purpose. Dating for these features is difficult as they may have medieval origins, but it seems likely that a post-medieval date is more realistic.

4.22 **Monuments 25 and 31: Quarry Pits.** Monument 25 represents a series of quarry pits located to the north of the quarry area Monument 24 in Bole Edge Plantation, and is probably part of a similar phase of extraction. A total of 14 pits were located during the survey, five of which form a line orientated north-east to south-west towards the north of the quarry area. The remaining pits are located to the south-east towards Monument 24. Due to thick undergrowth and paint-balling equipment this total must not be viewed as absolute, as many smaller pits may be obscured. The area where pits were located is approximately 19.2 hectares. The five pits towards the north are generally slightly larger in size at approximately 5 to 6m in length, 4 to 5m in width and 0.75 to 1.2m in depth, with the largest example to the south-west at approximately 8m in diameter and 1.2m deep. They are all orientated north-west to south-east, with entranceways towards the south-east. The remaining examples to the south-east are more varied in size and shape at approximately 2.5 to 7m in length, 2.5 to 6m in width and 0.4 to 0.7m in depth. Some have small entranceways to the south-east and one example has a small two course high gritstone revetment wall supporting the edge to the north-west. Most of these pits appear to represent small-scale gritstone extraction, but some have a orange sandy clay visible in the weathered sides and a lack of gritstone, perhaps indicating small scale clay extraction. Again, a medieval date for this area of activity cannot be ruled out, but a post-medieval date is more likely. One isolated quarry pit with a spoil mound to the south-east, Monument 31, was located in the southern corner of Coo Hill Plantation. At approximately 6m in length, 5m in width and 1.5m in depth and orientated north to south, it represents a small isolated episode in gritstone extraction, perhaps for

stonewall repairs. A medieval, or more likely, a post-medieval date is probable.

4.23 **Monuments 26, 27 and 30: Ditches.** Two ditches were located in the eastern area of Bole Hill Plantation associated with a pond, Monument 28. Monument 26 is approximately 105m in length, 1 to 2.5m in width and 0.3 to 0.75m in depth, generally increasing in size as it moves north. Orientated north-west to south-east it runs to the west of another ditch, Monument 27, but does not appear to have any physical relationship. Monument 26 has suffered recent damage by heavy forestry vehicles, and in at least four places total destruction has occurred. It appears to represent a drainage ditch, but with the association with a pond, it could the modification of a natural waterway. Monument 27 is an 'L' shaped ditch with the longer section orientated north-west to south-east. It runs from a pond, Monument 28, in the east for approximately 60m and turns at a right angle to the north for a short distance of 14m when it reaches Monument 26. It is generally 2 to 3m in width and 1 to 1.2m in depth, and at the northern end broadens into a pit like hollow approximately 4m in length, 3.5m in width and 1.5m in depth. The ditch is flanked to the south and west by a shallow bank approximately 1.5 to 2m in width and 0.75 to 1m in height. Although currently dry, the ditch and pit-like end may represent some form of soak away or drainage system likely to be post-medieval in date. Monument 30 represents an extensive small-scale drainage ditch system in Coo Hill Plantation. These divide into three main systems described here as one feature as they essentially form the same function and are similar in character. The south-west system covers an area of approximately 14.6 hectares and consists of one main ditch orientated north-east to south-west that has five smaller 'tributaries' joining from the north-east. The central system covers and area of some 13.7 hectares and has one main ditch running from the north-west to south-east with three 'tributaries' joining from the north-west. The main ditch runs down slope from this in the base of a small natural valley towards the pasture fields and Monument 33. The north-east system has one main ditch orientated south-west to north-east that runs down-slope towards the arable field that contains part of Monument 36 where another ditch (and tributary) join. Towards the south-east end of the system is a network of smaller interlinking ditches that form a squared pattern. Generally all the ditches are 0.75 to 1.5m in width and 0.3 to 0.5m in depth, with the main catchment ditches on the larger end of the scale. The function of these ditch systems appears to be the drainage of the slight plateau area that traps run off water towards the north-west of the plantation. Many areas of this plateau remain boggy under foot. The system as a whole has suffered greatly from extensive damage from forestry vehicles, with rutting and disturbance visible throughout. This, along with low-lying thick ground vegetation on the plateau, limited the identification of a more extensive ditch system. It is likely that this drainage system is post-medieval in date and contemporary with the conversion of this area into plantation.

4.24 **Monument 28: Pond.** Monument 28 represents a small artificial pond located adjacent to the eastern boundary of Bole Edge Plantation and at the east end of Ditch 27. It is irregular in shape, orientated north to south and measures approximately 18m in length, 10m in width and more than 1m in depth. A small dam holds the water to the south-east. The pond may have

functioned as a watering hole for cattle or sheep, perhaps when driven along Mortimer Road. The pond is identified on the modern OS map (Fig. 2), but is not present on the 1st Edition OS map (Fig. 5), suggesting a later post-medieval date.

Compartment 4

4.25 Within Compartment 4, eight features or groups of features were identified (Table 4; Appendix IV). Of these, no monuments are classified as Level I, i.e. sites of national archaeological importance. All eight monuments are classified as Level II sites i.e. sites of local archaeological importance, with none having suffered serious damage and classified as IIB (Fig. 3).

4.26 The vegetation recorded within Compartment 4 consists largely of moderately dense areas of pine and larch plantation. Little recent felling with subsequent re-growth has occurred in this compartment, and only approximately 3.4ha were not surveyed due to inaccessibility. Denser areas were encountered towards the middle and north-east of the compartment where denser pine areas and the cutting back of rhododendrons has occurred, and the identification of features may have been biased in this area. An open area of heath and scrub (largely juniper) was located in the north-west corner of the compartment over the quarry area Monument 40. Ground cover under the trees generally consists of ferns, bracken and grass that is dense enough in the majority of the compartment to hinder the identification of features. This is also made difficult towards the centre due to large overgrown gritstone boulders. Some damage from forestry vehicles and activity caused by recent thinning was evident in the central block to the east of Holling Dale Cottage and towards the north-east corner. The topography of the area is again generally of a broad slope down to the south-east with a slight ridge running from Holling Dale Cottage to Monument 40. Beyond this to the north-west, the ground drops off steeply down to the Holling Dale Brook valley and Holling Dale Piece. The visibility of monuments encountered was generally high to medium, but this may be biased due to dense areas of woodland yielding negative results, and only the larger scale features being identified. Monuments 41, 43 and 45 have a visibility of medium to low due to their ephemeral nature and undergrowth. The survey coverage was generally medium due to some denser areas and thick ground coverage.

4.27 **Monuments 38, 43, 44 and 45: Holloways.** One isolated holloway and three holloway systems were located in Compartment 4. Monument 38 represents the isolated example located to the north-west of Holling Dale Cottage, running down-slope towards Holling Dale Piece for approximately 93m and orientated broadly north to south. At approximately 1.5 to 2m in width and 0.3 to 0.5m in depth it is cut into the west-facing slope as it traverses down. It is cut by a stonewall to the south, and therefore predating it, but no continuation was evident further south, or at the base of the slope to the north where it peters out. Associated with the cottage, it is likely that this monument represents a former post-medieval access to the area to the north, but an earlier medieval date cannot be excluded. Monument 43 represents two interlinking and one isolated holloway orientated north-west to south-east from the present forestry track towards Thornseat Moor. The more northern holloway is

approximately 207m in length and the southern example is approximately 142m, although the continuation of this to the north-west is likely to be obscured by dense undergrowth. Both monuments are between 2 and 2.5m in width, and 0.3 to 0.5m in depth, and appear to form part of a major holloway system between Mortimer Road and the Thornseat Moor quarries, of which Monument 40 is one example within the study area. Monument 43 represents the more ephemeral examples of the major holloway system of Monument 44.

4.28 Monument 44 represents the most extensive feature located within this investigation. It consists of two main holloways that leave Mortimer Road in the far eastern corner of Compartment 4 (centred on SK 23576 91899), and continue to the west as very deep and substantial hollows to a major junction (centred on SK 23154 91947), where they split into six main smaller holloways and turn towards the north-west. At this junction there are several interlinking, crossing and partly surviving minor routes, as well as a branch towards the west and Monument 43. The six main routes continue to the north-west where they are cut by the main plantation stone boundary wall. The holloways continue from here across an improved pasture field towards the quarry at Thornseat Moor and buildings at Thornseat Delf. Although outside the study area, this area of crossing and interlinking holloways was also surveyed to determine the extent of this feature. The total length of this holloway system is approximately 900m, and a maximum of 57m in width. The total area is approximately 43 hectares, with 34 hectares within the study area and 9 hectares in the field to the north-west. The six main holloways towards the north-west within the study area are relatively consistent in size with 'U' shaped and more flat based profiles at approximately 2 to 2.5m in width and 0.3 to 0.6m in depth. The larger two 'U' shaped main holloways to the east of the main junction are far greater in size with the north-east example measuring approximately 3 to 3.5m in width and 1.5 to 1.7m in depth, and the south-west example at 4 to 4.5m in width and 2m in depth. These are both disturbed to the east by a modern forestry track and an area of recent levelling. Apart from this all the holloways are generally in good condition and have been well preserved within the plantation. It appears they have been avoided by vehicles due to their size and there has been little modern forestry activity in this area. Despite some areas of thicker undergrowth limiting access, the present survey of this monument must be viewed as fairly comprehensive. Dense vegetation towards the east may have hindered identification, but it appears the holloway system is limited to the two deep main routes in this area towards Mortimer Road and the branching only seems to occur further up-slope to the west. The curvilinear forestry trackway that forms the southern delimitation of the holloway system appears to be the last vestige of the former route to be in use at present. It has been recently levelled and firmed up with stony material, but still forms a distinct holloway. This, as well as the two main holloways from Mortimer Road, a branch at the main junction and a route from this to the north-west are depicted on the 1st Edition OS map of 1855 (Fig. 5). This indicates their antiquity and former importance and certainly suggests a post-medieval date, although earlier medieval origins cannot be ruled out.

4.29 Monument 45 consists of four shorter sections of possible holloways to the south-east of Monument 44. The longer section of holloway, at approximately

166m, is orientated north to south and cuts across the path of the three remaining holloways that are orientated north-west to south-east, the longest of which is approximately 88m in length. All four are consistent in size at approximately 1 to 2m in width and 0.3 to 0.5m in depth, but the three to the east are more ephemeral in nature and are disturbed by forestry vehicles to the south towards the road. Continuation to the north for all routes is unclear and obscured by undergrowth. These features appear to represent more minor routes from the south towards the main holloway system Monument 44. They are likely to be similar in date, probably of post-medieval origin.

4.30 **Monuments 39 and 40: Quarry areas.** Two discrete quarry areas were identified within Compartment 4. Monument 39 is located in the western area of the compartment to the north-east of Holling Dale Cottage. It consists of a series of three larger and ten smaller quarries or quarry pits and approximately fourteen associated spoil mounds. A possible small access channel is also associated with the northern-most larger quarry. The larger quarries are generally orientated north-west to south-east with access points to the south-east. The larger and smaller quarries are difficult to differentiate in places as they all interlink and are irregular in shape. The larger quarries are approximately 6 to 20m in diameter and 1.5 to 2.5m in depth, and the smaller examples are approximately 3 to 6m in diameter and 1 to 1.5m in depth. The spoil mounds are also irregular in shape and their interlinking limited their accurate survey. The points depicted in Figure 2 are the tops of the main mounds, which are *c*.4 to 10m in diameter, 1 to 2m in height and generally oval in shape. The function of this area of quarrying appears to be the removal of sandstone blocks as surviving rock faces are visible in the larger quarries. While a medieval date for the commencing of quarrying in this area cannot be ruled out, a post-medieval date is more convincing.

4.31 Monument 40 is located to the north of Monument 39 in the far north-west corner of Compartment 4, and consists of another series of quarry pits and spoil mounds although of a different character to the latter. This feature comprises one large sandstone quarry located to the north and outside the study area, and seven smaller possible quarry pits and fifteen associated spoil mounds to the south. The main large quarry is approximately 60m in length, 38m in width and 3 to 4m in depth. The possible quarry pits to the south are approximately 3 to 5m in diameter and 1 to 1.5m in depth, and the mounds are 4 to 15m in diameter and 1 to 2m in height. Only the predominant pits and mounds of this southern area have been plotted as the area is a mass of interlinking features. The large quarry to the north seems to be the focus for this area of extraction and the irregular pits and mounds may simply be the spoil area for this. They could also represent later exploitation where the spoil is used for activities such as stonewall construction. Monument 40 is depicted on the modern O. map as a disused quarry (Fig. 2), and is also shown on the 1st Edition OS as a sandstone quarry (Fig. 5). This probably points to a post-medieval date for this feature, but an earlier medieval date cannot be ruled out.

4.32 **Monument 41: Ditches.** Monument 41 consists of five ditches located in the north-west area of Compartment 4 between quarry areas Monuments 39 and 40 and holloway system Monument 44. The northern lengths of Monument 41 cut across Monument 43 and are not likely to be contemporary. The ditches are generally orientated north to south, with one longer example running east

to west from the quarry area Monument 39 towards the holloway/forestry track associated with Monuments 43 and 44. The ditch system covers an area of approximately 27.5 hectares, and they generally measure 0.75 to 1m in width and 0.4 to 0.5m in depth. While there are obvious comparisons with the other drainage ditch systems located in Compartments 1, 2 and 3, it is possible that the ditch orientated east to west represents a small holloway linking Monument 39 to the main holloway systems to the east. Due to its small size and its similarity to the other ditches in this feature, however, it seems more likely that they all performed a drainage function. It also seems likely that they cut the holloways of Monument 43 rather than vice versa, suggesting a post-medieval date.

4.33 **Monument 42: Inscribed stones.** Two inscribed stones were located in the north-west area of Compartment 4, both set in the ground on the corner of the plantation boundary wall to the north-east of Holling Dale Cottage. They appear to be marker stones and are similar to grave head stones in appearance. Both are set directly against the wall, one facing south-east and the other south south-west, with the same carved inscription of '*AEH*' in bold italic capitals towards the top. The former stone is the larger at 0.45m high, 0.4m wide and 0.07m thick, and the latter the smaller at 0.3m high, 0.4m wide and 0.07m thick. It is possible that they represent some form of landowners marker, stonewaller's mark or estate sign. It may be due to the change in landuse for this area evident from the different boundaries present on the 1st Edition OS map and the modern map (Figs 2 and 5). The 1st Edition OS map shows the boundary for this area of the plantation to stretch from just south-east of quarry area Monument 40 north-east to Thornseat House. The present boundary, while following a similar alignment, is some 95 to 140m further south-east. It may be that this area of land was designated for pasture and these marker stones delimited the area within the plantation for the construction of the stonewall. This suggests a post-medieval date.

5. Discussion

5.1 The topographical survey of Bole Edge Plantation and associated plantations aimed to record all visible archaeological features and locate them using a GPS receiver. The low-lying nature of some of the earthworks made their identification difficult and following their course problematic (e.g. Holloway 43 and 45, and Quarry pits 25). Areas of dense and impenetrable vegetation mainly as a result of recent forestry activity obscured monuments further, although the limits of these areas were plotted. These poorly surveyed areas should be considered during the subsequent management of the woodlands. Should the vegetation in these areas alter, additional survey would be valuable. In addition, the general ground cover of ferns, bracken and undergrowth within the more open areas of the plantations was not ideal for the location of more ephemeral monuments and the timing of the investigation which coincided with the dense summer vegetation may have obscured features further. Due to these difficulties, the results of this survey should not be treated as an absolute representation of the underlying archaeology.

5.2 During the survey it was noted that modern forestry activity has caused considerable damage to the archaeological potential of the area. Large wheel ruts, disturbed areas and thick mats of discarded branches litter the forest floor

potentially destroying and/or hiding archaeological features. The potential for chemical contamination is also evident from discarded fuel, oil and grease canisters throughout much of the area.

5.3 No direct evidence of prehistoric activity was located during the Level 2 survey. A potential focus for later prehistoric activity has been suggested for the gritstone cave Monument 8, but no direct evidence can be presented to support this idea. More ephemeral features such as field lynchets, boundaries or even clearance cairns may have been obscured by the current ground vegetation, limited to sub-surface features or destroyed by modern forestry activity, but again no conclusive evidence was found. Nevertheless, prehistoric activity was certainly evident in the surrounding area as indicated by artefact scatters (Section 2.1).

5.4 The current survey provided no evidence for Roman or early medieval activity in the study area.

5.5 The earliest tangible evidence for the exploitation of this landscape is in the medieval period. It is probable that many holloways located during the Level 2 survey find their origins in this period. These facilitated movement into and through the area and were essential for the removal of raw materials beyond the immediate environment. Such features, however, are notoriously difficult to date and even when they are clearly associated with a group of quarry pits (e.g. Holloway 18 and the group of quarry pits Monument 19), they may represent the re-use of earlier routes. An earlier date, however, seems plausible for the holloways in Coo Hill Plantation in Compartment 3, as they appear to represent former access routes to and around Hallfield. This substantial estate building and utility structures may also originate in this period. Similarly, Holloway 11, a former access route to the gritstone quarry at Foulstone Delf, and a series of four small quarries (Monuments 13 to 16), two of which cut the holloway, represent various phases of activity. While these probably indicate at least two phases of activity in the post-medieval period, it is also possible that Holloway 11 represents an earlier phase of extraction activity that was later expanded. Again, the large holloway systems in Compartment 4 (Monuments 43, 44 and 45) may have originated in the medieval period providing access to the quarries on Thornseat Moor, and were later expanded and diversified in the post-medieval period.

5.6 A majority of features identified during the survey represents post-medieval activity, including quarries, quarry pits, holloways, drainage ditches and a pond. Access around this area during the post-medieval period is indicated by Jefferys Map of 1775 which shows Mortimer Road as a bridle way, with Hallfield and Lane Head to the south-east and a crossing point over the river further down stream towards the present day Strines Reservoir (Fig. 3). No evidence of this crossing was located during the survey and it may have been a ford. The valley sides are very steep at this point and the crossing point may have been further upstream. This suggests that the present location of Strines Bridge is later post-medieval in date. Further post-medieval activity includes the transformation of ‘Hallfield Moor’ (depicted as open moorland on Jefferys’ 1775 map) into the series of plantations evident on the 1st Edition OS map of 1855 (Fig. 4). This fundamental change in landuse is likely to have occurred under the management of the Wentworth Estate. As the plantation is depicted

as 'managed plantations/woodland' on the Bradfield Parliamentary Enclosure Map of 1826 (Section 2.2), the transition from moorland to plantation occurred sometime between 1775 and 1826. A detailed study of the Wentworth estate archives may help clarify the date of this landscape change.

5.7 Of interest is the relationship between the quarry areas and the planting of trees in the late 18th to early 19th century. Many mature pines have been planted over and among the quarries and it is likely that quarrying had ceased when the plantation was established. The presence of some 150+ year old beeches associated with Quarry 19 suggests that quarrying activities may have been earlier post-medieval rather than later. This is supported by the fact that some of the holloways (Monuments 11 and 44) that are associated with quarry areas are overlain and blocked by the stone boundary wall of the plantation. A similar relationship was also observed for the isolated holloways in Compartment 3. As a result, many of the holloways, and some of the quarries, are likely to be earlier post-medieval in date or even medieval in origin.

5.8 Through the 19th century the study area was a managed forest associated with the series of forestry tracks still in use today, and the drainage ditch systems (Monuments 2, 10, 30 and 41). Unfortunately, evidence of potential sawpits, charcoal burning sites, plant nurseries and other activity areas was not found, although this may be due to the dense vegetation cover at the time of survey or disturbance caused by modern forestry activity. There was some suggestion that areas were deep ploughed or ridged before the planting of trees. This is a well known technique in modern forestry and serves to improve drainage and maintain tree health (Edlin 1948). Possible evidence of this was noted in the central area of Compartment 1, although it proved too enigmatic to survey. Conversely, other areas e.g. Compartment 3 are strewn with large gritstone boulders and ploughing is unlikely to have been practical.

6. Recommendations

6.1 A Level 2 survey of the Bole Edge Plantation and associated plantations recognised 45 monuments or groups of monuments, of which only two were highlighted for a more extensive survey (Table 5; Appendix IV). These include Quarry area 24 that has been modified into a paint-balling centre and was difficult to investigate within the remit of this study, and the extensive, well preserved holloway system (Monument 44) that would benefit from further investigation.

6.2 A more immediate concern, however, is the continued damage being caused to some of the archaeological monuments, ironically by the factors that have originally preserved them. Modern forestry techniques involve the use of large wheeled and tracked machines for cutting and removing timber and these create heavily rutted tracks. Some felled areas also appear to have been bulldozed to create banks of small timber and waste (e.g. the un-surveyed area in the north-west of Compartment 3). This has created large areas of heavily disturbed ground interlinked by access tracks. This was evident throughout the plantations and many archaeological features have been visibly damaged (Table 6; Appendix IV) and others may have been destroyed. Of immediate concern is that the same techniques will be employed to convert much of the evergreen plantation back into moorland with the loss of further

archaeological monuments. In addition, at least some of the apparently blank zones within the study area reflect areas of dense vegetation cover and may prove to contain as yet unidentified archaeology. This possibility should be considered in future management plans. In addition, the paint-balling centre focused around Monuments 24 and 25 continues to cause erosion and contamination of the quarry area. The impact from footpath erosion, however, is minimal as the plantations occupy private land and access is very limited. There is one concessionary footpath along the eastern side of Bole Edge Plantation but it appears to be rarely used and its impact is low.

6.3 During the Level 2 survey it was difficult to assess the damage caused by vegetation, although some monuments were affected by root systems. Such damage can only be accurately assessed with exploratory excavation. Excavation would also be necessary to provide dating evidence for features that are presumed rather than demonstrated to be medieval or post-medieval in date and to establish stratigraphic/physical relationships between routeways, and quarry areas.

6.4 To avoid further destruction to the archaeological monuments as known, the following recommendations are made:

- Currently, forestry activity represents the single greatest threat to the survival of archaeological remains. While it is unrealistic to exclude such activity, future management decisions should take account of the distribution of archaeological features as identified in this survey, while bearing in mind that additional archaeology may have been masked by the dense vegetation. With regard to the proposed felling of large areas of woodland, it may be necessary to target certain areas for more sensitive clearance. Within any management plan, key archaeological features, such as Monuments 11, 18, 19, 24 to 28, 32 to 40, and especially Monuments 43 to 45 should be considered. The removal of vegetation from these zones many be more destructive than leaving the trees in place.
- Although damage to archaeological monuments by tree roots was noted occasionally, this could not be clearly assessed during the survey. Exploratory excavation would be required to determine if sub-surface disruption to any archaeological features is occurring.
- If effective management of the woodland and proposed moorland reinstatement is unable to reduce the damage to the archaeological monuments, excavation should be considered. The aim would be to collect sufficient data to determine the extent, condition, character, importance and date of the archaeological remains. As a destructive medium in itself, however, excavation should be seen as a last resort.

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Fieldwork
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Appendix I

Brief for archaeological walk-over survey and impact assessment

Appendix II

Project design for an archaeological walk-over survey

Appendix III

Inventory of primary archive

File no.	Description	Quantity
1	Compartment summary sheet	4
1	Monument record sheet	51

Appendix IV

Tables

Table 1. Archaeological features within Compartment 1

ID no.	Grid ref.	Type	Period	Level
1	SK 21911 92029	Wall & ditch	Post-med	II*
2	SK 21834 92081	Ditch system	Post-med	II*
3	SK 21881 91707	Ditch	Post-med	II*
4	SK 22268 91895	?Holloway	Post-med	IIB
5	SK 22507 91819	Bridge & Track	Late Post-med	II*
6	SK 22556 91804	Ditch	Late Post-med	II*
7	SK 22360 91459	Pits (x2)	Post-med?	II
8	SK 22366 91432	Cave	Prehistoric?	II?
9	SK 22299 91494	Stonewall	Post-med	IIB*

Table 2. Archaeological features within Compartment 2

ID no.	Grid ref.	Type	Period	Level
10	SK 21508 91295	Ditch system	Post-med	II*
11	SK 21668 91069	Holloways	Med- Post-med	II*
12	SK 21628 91028	Ditch	Post-med	IIB*
13	SK 21599 91059	Quarry pit	Med- Post-med	II*
14	SK 21650 91069	Quarry pit	Med- Post-med	II*
15	SK 21704 91090	Quarry pit	Med- Post-med	II*
16	SK 21768 91110	Quarry pit	Med- Post-med	II*
17	SK 22012 91071	Holloway	Med- Post-med	II*
18	SK 22164 90967	Holloways	Med- Post-med	II*
19	SK 22187 90960	Quarry pits	Med- Post-med	II*
20	SK 22086 90855	Holloways	Med- Post-med	II*
21	SK 22351 90803	Holloways	Med- Post-med	II*
22	SK 22217 90734	Quarry	Med- Post-med	II*
23	SK 22258 90707	Quarry?	Med- Post-med	II

Table 3. Archaeological features within Compartment 3

ID no.	Grid ref.	Type	Period	Level
24	SK 22371 91158	Quarry area	Post-med?	IIB*
25	SK 22438 91329	Quarry pits	Post-med?	II*
26	SK 22842 91153	Ditch	Post-med	IIB*
27	SK 22854 91187	Ditch	Post-med	II
28	SK 22899 91175	Pond	Post-med	II*
29	SK 23020 91458	Holloway?	Post-med	IIB
30	SK 23081 91110	Ditch system	Post-med	II*
31	SK 22841 90805	Quarry pit	Post-med	II*
32	SK 23069 90939	Holloway	Med- Post-med	IIB
33	SK 23127 90978	Holloway	Med- Post-med	II*
34	SK 23107 91159	Holloway	Med- Post-med	IIB
35	SK 23183 91084	Holloway	Med- Post-med	IIB
36	SK 23266 91369	Holloway	Med- Post-med	II*
37	SK 23250 91471	Holloway	Med- Post-med	II*

Table 4. Archaeological features within Compartment 4

ID no.	Grid ref.	Type	Period	Level
38	SK 22632 91886	Holloway	Med/Post-med?	II*
39	SK 22776 91930	Quarry area	Med/Post-med?	II*
40	SK 22778 92151	Quarry area	Med/Post-med?	II*
41	SK 22920 92016	Ditch system	Post-med	II
42	SK 22974 92105	Inscribed stones	Post-med	II*
43	SK 23016 92023	Holloways	Med/Post-med?	II*
44	SK 23128 91993	Holloway system	Med/Post-med?	II*
45	SK 23336 91755	Holloway system	Med/Post-med?	II*

Table 5. Archaeological features recommended for further survey

Plantation	Compartment	ID no.	Grid ref.	Type	Period
Bole Edge	3	24	SK 22371 91158	Quarry area	Med/post-med
Bole Edge	4	44	SK 23128 91993	Holloway system	Med/post-med

Table 6. Archaeological features under high risk of damage/destruction

Plantation	Compartment	ID no.	Grid ref.	Type	Level	Threat
Holling Dale	1	3	SK 21911 92029	Ditch	II*	Vehicles
Holling Dale	1	4	SK 22268 91895	?Holloway	IIB	Vehicles
Holling Dale	1	5	SK 22507 91891	Bridge	IIB*	Collapse
Bole Edge	1	9	SK 22299 91494	Stonewall	IIB*	Collapse
Brogging	2	10	SK 21508 91295	Ditch system	II*	Vehicles
Fox Hole	2	12	SK 21628 91028	Ditch	IIB*	Ephemeral
Bole Edge	3	24	SK 22371 91158	Quarry area	IIB*	Paintball
Bole Edge	3	26	SK 22842 91153	Ditch	IIB*	Vehicles
Coo Hill	3	29	SK 23020 91458	?Holloway	IIB	Disturbed
Coo Hill	3	30	SK 23081 91110	Ditch system	II*	Vehicles
Coo Hill	3	32	SK 23069 90939	Holloway	IIB	Ephemeral
Coo Hill	3	34	SK 23107 91159	Holloway	IIB	Vehicles
Coo Hill	3	35	SK 23183 91084	Holloway	IIB	Vehicles
Coo Hill	3	36	SK 23266 91369	Holloway	II*	Vehicles
Bole Edge	4	45	SK 23336 91755	Holloways	II*	Vehicles