

## **DELVING IN DEAN: THE DELVES AN AREA OF UNRECORDED EARLY COAL MINING (PART TWO)**

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### **Introduction**

The two Delves Inclosures, No.1 and No.2, lie in the Forest of Dean to the north west of Cinderford and south of the A4136 between the Northern United site and Brierley. An article in the GSIA Journal for 2003 described a preliminary study which had established the presence of hitherto unrecorded early, probably pre-17<sup>th</sup> century, coal extraction sites in the Inclosures (1). This type of site is referred to here as a 'delve'. The article also noted the intention to carry out a GSIA project to record the number of delves and their distribution. The area was surveyed during February, March and April 2005 when teams of members and some non members made several visits to the area. This article describes the techniques used and the results obtained.

### **The Survey**

A Project Plan was first drawn up, see Appendix 1. The aim was to cover the ground systematically by means of a series of walk lines roughly 10 metres apart, on an approximate north-south bearing. The grid reference of each delve was to be determined by use of hand held GPS (Global Positioning System) units, and recorded with approximate diameters and depths. It soon became clear that the marking of each delve (to avoid double and missed counting) with a numbered cane, as originally intended, was impracticable; instead each delve was marked with a numbered length of brightly coloured tape tied to an adjacent tree. The tape had the advantage of high visibility, so that each traverse after the first could be made with the markings of the previous traverse in view. The tapes were removed later. As experience was gained, a team of three (the optimum number) proved capable of recording 40-60 delves in about five hours.

During the survey, four different GPS units were used, three of which agreed quite closely (typically a few metres), whilst the results from the fourth, initially divergent, fell into place once the appropriate correction factors were determined. It is necessary to carry out surveys of this nature during the winter due to the heavily wooded nature of the terrain and so work started in February 2005. The heavy tree cover in the Forest, even in winter, is not ideal for GPS, nevertheless accuracies of around 6-12 metres were achieved, and this has proved to be adequate for plotting. However, because of the close proximity of adjacent delves, this is not accurate enough to revisit a particular delve by GPS alone. A compass was found to be essential in maintaining a consistent traverse line; without it one's sense of direction was quickly lost amid the trees.

In the initial survey session, the diameters of the first few delves were determined by means of measured cords stretched across the depression and depths were measured using canes marked with a suitable scale. Later that session, depths and diameters were estimated using the experience gained. Subsequent sessions used either a surveyor's measuring rod or a laser rangefinder. The latter proved very useful. Each team recorded its results on paper, for subsequent entry into an Excel spreadsheet produced by Penny Fernando. Finally, Jon Hoyle of the Gloucestershire County Council Archaeology Service produced, from the spreadsheet, plots of the results superimposed on one of their computer generated baseline maps, Appendix 2.

## **The Survey Results**

The whole area of the two Delves Inclosures was covered, with the exception of that part of No.2 north of the track, a small area to the extreme west of No.2, and that part of No.1 which is within the Northern United enclosure. No.1 is centred on SO634152 and No.2 on SO627150. The total number of features recorded to date is 346. The workings range from quite shallow circular depressions often surrounded by a low bank, to large workings with a diameter of 10 – 12 metres and up to 3 metres deep. Many of the workings are less than 20 metres apart. Within the Delves the ground, level at the southern boundary and at the eastern end, begins as one travels south west, to slope down northwards into the valley of the Brierley Brook. The workings roughly follow the contours of the slope and form bands separated by areas of little working; quite frequently, three or four workings form a line up and down the slope. However adits or levels penetrating the hill, which might be expected, were not found, probably because they would of necessity follow the downward slope of the seams and thus be impossible to drain with the primitive technology of the times. The larger delves were mostly on the upper part of the slope, following the contour, usually with a spoil heap rim; smaller shallow delves below usually had no spoil rims, apparently having been back filled from above. One or two workings appeared to have been cut horizontally into the slope, quarry-like, rather than downwards. Some of the larger delves, but not all, had drainage channels cut through the lower spoil rim to connect with an adjacent stream. There were also some areas of possible shallow workings which showed as flattish disturbed waterlogged ground, one such being approximately 6 metres by 20 metres. The area is cut by a number of streams running down to the Brierley Brook, not all marked on the current O.S 1:25,000 map. They tend to cut into the slope, are steep sided, and may be artificial drainage channels or deepened natural streams. They come from the area to the south of the Delves, passing under the tramroad and the boundary bank by means of small culverts.

Writers on early coal mining describe the technique of bell pits, the sinking of short vertical shafts down to the seam, enabling the coal to be shovelled out so that the cross section of the lower shaft resembled a bell, Figure 1. However close study of the delves showed that most were roughly saucer shaped in section and did not seem to resemble collapsed bell pits, moreover the shallow coal seams (see below) would allow only a small degree of undercutting before the overlying soil collapsed. At the bottom of three of the larger delves could be seen the upper few courses of stone lined shafts, about 1.5 metres in diameter. Two of these were at the centre of No.1 Inclosure, the third at the western end of No. 2 close to the cycle track, Figure 2. Others may exist, hidden beneath accumulated debris in the base of some delves. It has been suggested that these might be the ventilation shafts of later deep collieries situated to the south; this seems unlikely however since the shafts would surely have been continued to the surface, to avoid debris from above falling down the shaft and into the mine.

## **Geology**

The research for this section was carried out by Tony Burton of Nailsworth. The northern boundary of the Supra Pennant group of coal measures, which consist of shales, sandstones and coal seams, trends north-north-westward from the northern end of Cinderford to Steam Mills, from where there is an abrupt change of direction, west-south-west under the Northern United site and the Delves Inclosures, passing south of Brierley then trending south-west to Mirystock. The dip of the slope is to the west and south (2). The Geological Map shows three seams of this group in the vicinity of the Delves – the Churchway High Delf, the No Coal and the Brazilly. The area between Mirystock to the south west and Nailbridge to the north east is marked “numerous old outcrop workings and shallow shafts”. The use of broken lines to mark

the seams indicates that the locations are assumed, not proved, and may not be entirely accurate (3). The record of the upper section of the Northern United shaft, where it penetrates the Supra Pennant measures, shows the Churchway High Delf to be just below the surface, under 3 feet of clay, in three layers totalling only 14 inches separated by two layers of clay totalling 12 inches, Table 1. From Northern United the seam dips to the south west, and the team observed that the delves, shallow at the eastern end, deepen towards the south west. At the Mirystock borehole, approximately 2 -2.5 kilometres away, the Churchway has split into two layers at a depth of 56 to 74 feet (4). This great increase in depth may be mainly due to the presence of a fault between Brierley and Mirystock.

### **The Delves Inclosures**

It seems likely, as noted below, that coal extraction in the Delves had ceased before the beginning of the 17<sup>th</sup> century. Drivers' map of 1787 (5) which includes the collieries working at the time, shows the Delves to be lightly wooded, bisected by trackways originating from marked collieries in Serridge to the south and running northwards to the road, the present A4136. No workings are shown in the Delves however. The area was enclosed around 1810 to facilitate the growing of timber, by excluding the commoners' livestock. There were originally four enclosures, which later became three, then two when No.3 (SO620149) reverted to its original name of Great God Meadow, the western end of which became the site of sidings off the Severn and Wye Railway, built to serve the screens of the Albert and Edward colliery.

### **Early Coal Extraction in Dean**

Sites such as the delves are very difficult to date. Most authorities consider that surface workings of this type are not later than the end of the sixteenth century, after which mining techniques improved. As to the earliest dates, soot found in the flues of Roman villas in Gloucestershire is believed to have come from Forest coal (6).

The earliest records date from the mid 13th century, when coal was being dug in several of the Forest's bailiwicks. About 1250 the Crown received rents from some ore and coal mines and 1/2d (old halfpenny – 0.2p) for every load carried on the River Severn, while the woodward of Abenhall bailiwick received 1d (old penny – 0.4p) for each horse load of coal. In 1282 coal found in Bearse, Littledean, Mitcheldean and Ruardean (which may have included the area now known as the Delves) belonged to the Crown (7). By 1244 the miners were "free" in the sense that they were allowed to win coal on their own account, and engage in trade, but were subject to regulation by the verderers (later the gaveller) and taxed by the Crown or the forester-of-fee of the bailiwick (8). The sources cited by the Victoria County History authors in reference 7, to establish the earliest date for records of mining in Dean, relate to Forest Proceedings, King's Remembrancer and Exchequer Treasury of Receipt records in the National Archives at Kew. One suspects that study of these would carry the story further, but unfortunately they are accessible only to specialists, being written in heavily abbreviated Latin, modern translations not being available (9).

An early reference to the practice of mining by "free", but taxed, miners occurs in the "Miners' Laws and Privileges", sometimes known as "the Book of Dennis". The earliest known copy dates from 1612, although apparently originating in pre-Reformation times, when according to the Victoria County History "every free miner might with the approval of the king's gaveller dig for iron ore or coal where he pleased.....whether on the royal demesne or on the lands of private persons. In the latter case the lord of the soil as well as the king received a share in the newly opened mine". It was thus necessary for the miners to sell a

quantity of coal, over and above their domestic needs, to pay their dues. To facilitate the trade, “the gaveller ...was also bound to mark out a convenient way ...stretching to the king’s highway”(10). The “Miners’ Laws”, printed in full in Hart’s “Free Miners of the Forest of Dean” also provide that “the Constable shall deliver Tymber to the Miners sufficient to make a lodge upon their pitt to keep and to save the pitt ...[and] that noe man shall come within so much space that ye Miner may stand and cast redding [spoil] and stoness soe farr from him”(11).

The quantity of coal raised in Dean from the 13<sup>th</sup> to the end of the 16<sup>th</sup> century is difficult to determine. Hart, in his *Industrial History of Dean*, considers that the tonnage was small, perhaps not more than 3,000 tons annually during 1551-60 (12). He believes that bell pit digging at the Delves began about 1550, continuing until the area was worked out; the area was planted with timber 1650 -1662. Between 1550 and 1560 our area would have been covered with holes. He believes that as many as 300 free miners had a gale in the Delves. The Deputy Gaveller would grant a gale allowing say 10 yards across, the free miner would dig a hole say 3 yards across down to the coal, then dig out sideways to form a bell pit, held up by timber, of which the miners had free use. Records exist of disputes caused by one miner breaking into another’s gale (13).

Nevertheless the density and extent of the workings in the Delves, which originally stretched at least from Great God Meadow (which adjoins Mirystock in the west) to Nailbridge in the east, and the similar known sites in the Forest, suggest a not inconsiderable output. The trade in coal, established in the 13<sup>th</sup> century, continued to grow, and by 1608 three grades of coal were being sold, for fuel in houses, forges and limekilns, grading being carried out at Mitcheldean, Newnham and Tidenham (14). “The demand for Forest coal grew to the point when in 1687 the residents of the hundred could not buy enough for their household needs. Merchants and agents from Monmouth and Hereford removed large amounts” (15). Some of this trade would have been carried on the Wye, probably from Lydbrook, the natural outlet for coal from the northern field, which includes the Delves. In the 18<sup>th</sup> century “much coal continued to be delivered to various wharves on the Wye, particularly at Lydbrook .....carried up the river to Herefordshire, or down to Monmouth, Redbrook and Chepstow” (16). The trade was probably established much earlier, but documentary evidence is lacking.

## **Discussion**

The project team’s work has resulted in the recording and mapping of 346 extractive pits, previously unrecorded, in a small area of the Forest. The spreadsheet has yet to be fully analysed, but has already yielded a mapped plot showing the extent and distribution of the workings, Appendix 2. It is known that the trade in Forest coal dates back to the 13<sup>th</sup> century, if not earlier; research at the National Archives at Kew may provide more detail. It has not been possible to establish precise dates for the Delves workings, although they are clearly early, some perhaps very early. There appears to be a progression from the areas of shallow worked ground, reminiscent of the “gruffy ground” of early Mendip lead extraction, through the smaller delves to the largest pits, some of which feature stone lined shafts of unknown depth. Not all workings had associated spoil heaps; this may be due to later back filling, or to the area being partly flattened before tree planting (17). The team did not find conclusive evidence to show that the workings were collapsed bell pits, perhaps because we were unsure what such a feature would look like. Nevertheless the practicality of the working, by undercutting, of thin coal seams lying under a few feet of clay seems questionable, even using timber supports. Figure 1 shows a miner cutting a bell wholly within a thick coal seam, a proceeding impossible in the Delves. It may be that the Delves are in fact what they appear to

be, the result of early small scale open cast working. Bearing in mind the once much larger extent of the Delves Inclosures, and the number of similar workings known to exist in the Forest, it seems likely that the extent of the late medieval and early modern coal trade was greater than is generally supposed; certainly it was great enough for 13<sup>th</sup> century and later kings to levy taxes on it.

### Acknowledgements

The team consisted of GSIA members Penny Fernando, Frank Colls and the author. Valuable help in the survey was given by Ray Wilson, Nick Peters, David and Farida Jarvis, Ruth Elsdale, Charles Carson, and Tony Burton who also spent time and resources researching the geology of the area. Penny Fernando compiled the spread sheet from the hundreds of records produced, and made important contributions to this report. The team's thanks are due to Jon Hoyle of the Gloucestershire County Council Archaeology Service for his advice and support during the project and for plotting the spreadsheet data on to a computer produced map, and to Dr. Cyril Hart for a number of helpful suggestions and references.

### References

- 1 Youles, Tony, *GSIA Journal for 2003* p.31
- 2 *Geology of the Forest of Dean Coal and Iron Ore Field*. HMSO 1942 p.50
- 3 *Geological Survey Map of Great Britain*. Ordnance Survey 6 inch SO61 NW and SO61 SW. The area around the Delves is shown on a separate sheet at a larger scale.
- 4 HMSO 1942 pp.82-3.
- 5 *Drivers' Survey of the Forest of Dean*, map (a photocopy of the original in the National Archives, Gloucester Record Office D3921/iv/8, also a contemporary copy by R. Gray, an original and cleaner than the above, with ms. book of "Particulars" which includes observations on the Delves, GRO D9096, F16/47 (map) and GRO D9096, F16/31 (Particulars).
- 6 Forestry Commission Guide *Dean Forest and Wye Valley* HMSO 1974 p.28
- 7 *Victoria County History of Gloucestershire (V.C.H.)* vol. 5 p.326, and vol.2 p.218.
- 8 Hart, Dr. Cyril, *Industrial History of Dean* David and Charles 1971 p.253.
- 9 Reader Information Services Dept., National Archives, Kew, via email.
- 10 *V.C.H.* vol.2 p.221.
- 11 Hart, Dr. Cyril, "*The Free Miners of the Forest of Dean*" 2<sup>nd</sup> ed. 2002 p.40.
- 12 Hart, *Ind.His.*, p.254, quoting Nef, J.U. *The Rise of the British Coal Industry* 1930 1,20.
- 13 Hart, Dr. Cyril, *personal communication*.
- 14 *V.C.H.* vol.5 p.328, referencing Smith, *Men and Armour* 1608 pp.33,48,51. The latter work lists, under place names, the names and occupations of armour bearers. Under the place names referenced, but apparently not elsewhere, occurs the occupation of "seivger", three at Mitcheldean, one each at Newnham and Tidenham. Presumably these are "graders" or "sieves".
- 15 *V.C.H.* vol.5 p.329
- 16 Anon, *Observations on the River Wye* 1770, quoted in Hart, *Ind. His.*, p.265.
- 17 Colborne G.N. *Soil Survey no. 70: Soils in Gloucestershire no.3, Sheet SO61 (Cinderford)* p.178. Gloucestershire Collection, Gloucester Library.

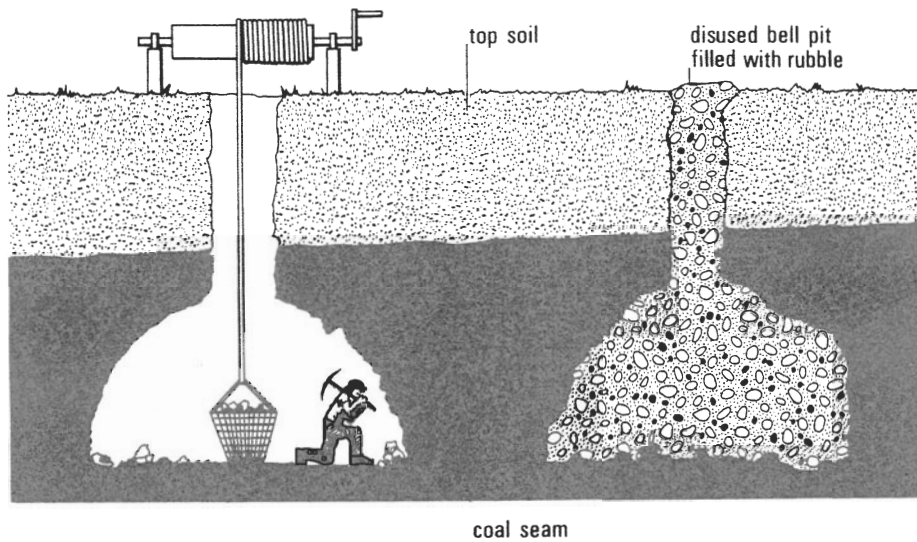


Figure 1. Bell Pit  
 (from *Technological Essay: Coal*. Open University Press 1983)

Note. This is a fenced off "Delve", adjacent to tramroad line. Irregular profile with sloping sides down to what seems to be a stone structure forming a kind of shaft top.

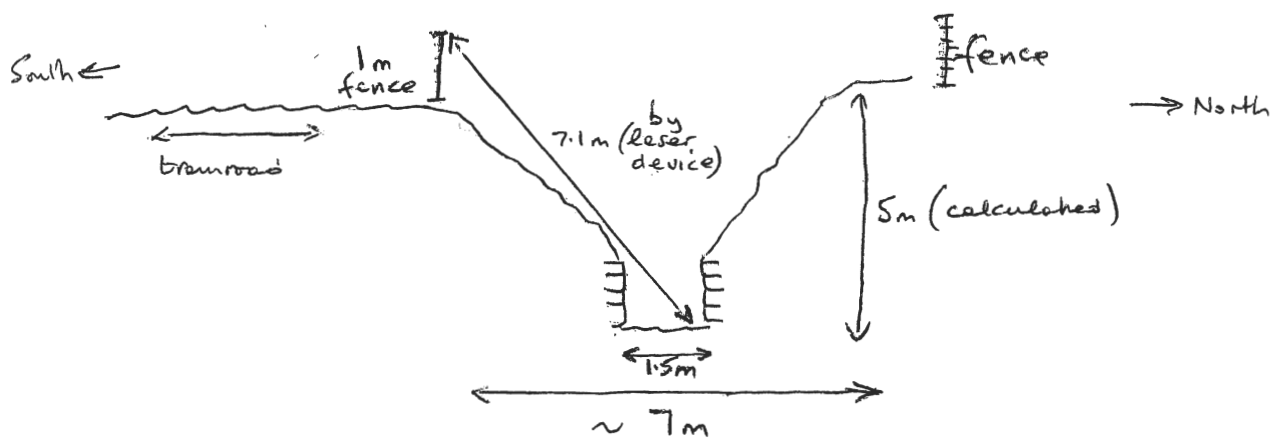


Figure 2. Delve with shaft, sketch by Frank Colls

### Northern United Shaft

Site, 1,150 yds. S.W. of the cross-roads in Nailbridge. Six-inch map Gloucester 31 N.E.  
 Latitude 51° 50' 14". Longitude 2° 31' 38". Height above O.D. 581 ft. Communicated  
 by Henry Crawshaw and Co. Ltd.

[*Coal Measures : Supra-Pennant*] :—

	Thickness		Depth	
	ft.	in.	ft.	in.
Clay	3	0	3	0
Coal	0	10	3	10
Clay	0	4	4	2
Coal	0	2	4	4
Clay	0	8	5	0
Coal	0	2	5	2
Clay	1	0	6	2
Blue shale with ironstone balls	9	10	16	0
Soft grey rock, clay joints and black partings	6	0	22	0
Blue shale	14	0	36	0
Coal, No COAL	1	2	37	2
Clod fireclay	11	10	49	0
Soft blue shale	10	0	59	0
Blue rock	22	0	81	0
Grey bind, shale	5	0	86	0
Dark shale	2	0	88	0
Coal, BRAZILLY	1	6	89	6

Table 1. Record of Northern United shaft in the Supra-Pennant.

From the Brazilly seam, the shaft entered the Pennant, descending to the Coleford High Delf at a depth of 700ft. (from *Geology of the Forest of Dean Coal and Iron Ore Field*. HMSO 1942 p.83)

## **Appendix 1. THE DELVES SURVEY PROJECT**

### **1. Survey Area**

The Survey will include the areas marked as “The Delves Inclosure No. 1” and “The Delves Inclosure No. 2” on the current O.S. map OL 14, at SO 6215. Both areas are bounded to the south by the track of the 1810 Churchway to Mirystock tramroad, to the north by the A 4136, and are divided by the old boundary ditch and bank which runs NNW from the tramroad to the point on the A 4136 marked “152” on the O.S. map. In practice it may be expedient to use the clear track which runs parallel, a few metres to the E.

### **2. Aims of the Survey**

To provide information on the distribution and character of the numerous pits or depressions (“delves”) which are believed to be sites of pre- 17 century coal extraction. Features closely associated with a delve, such as spoil heaps, should be noted. Other features such as banks and ditches may be recorded.

### **3. Proposed Survey Techniques**

Both Inclosures are transected by clear tracks which divide the area into subdivisions. The aim is to walk each subdivision systematically, with surveyors having sight of 100 % of the ground. It is anticipated that walk lines will run on a consistent bearing (say NNW) from the tramroad, although the wooded nature of the terrain may prevent even coverage using this method. Where this is the case, every effort should be made to search the area in as consistent a manner as possible. Each delve will be identified by means of a handheld GPS reading taken from the south rim, since descending into the delve could militate against accurate GPS readings and might just conceivably be hazardous. If GPS readings are nevertheless not possible, other manual location methods should be used, including:-

Compass bearing to fixed points.

Pacing to fixed points.

Sketch mapping to fixed points.

Each identified delve or other feature will be assigned an individual number and recorded on a pro forma to be prepared. To avoid duplication, it may be expedient to mark each recorded point, say with numbered sticks or canes.

Discrete features will be recorded as points, unless larger than say 15m across. For features larger than this, or of unusual shape or form, approximate dimensions should be recorded and a sketch map prepared if deemed appropriate.

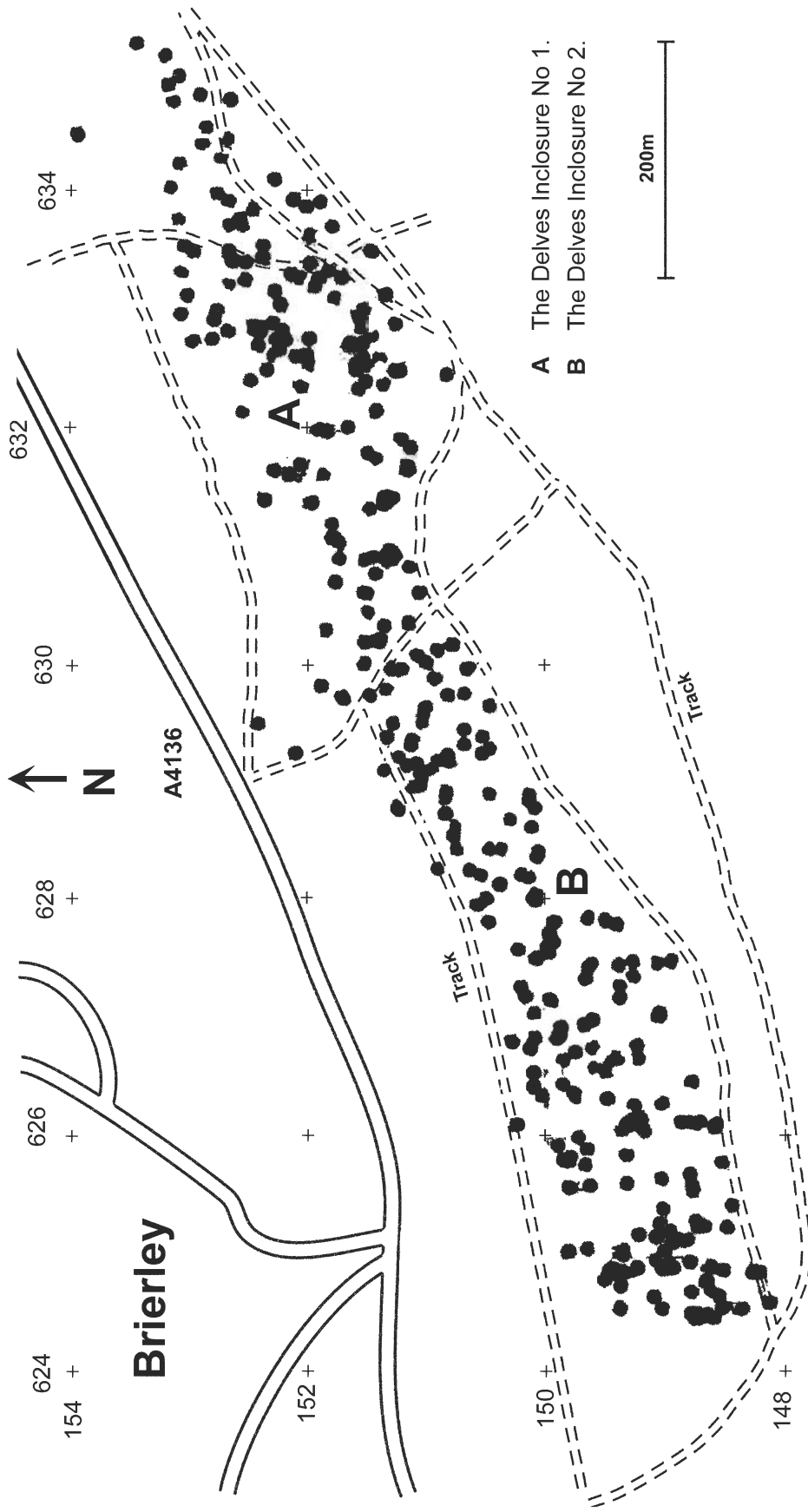
The primary aim of the survey being to record numbers and distribution, pinpoint accuracy is not required, nevertheless it is proposed to record full GPS readings together with indicated tolerances.

The basic information will be entered into an Excel table. Jon Hoyle of the Gloucestershire Archaeology Dept. has kindly undertaken to plot the results on to one of their computer maps.

### **4. Copyright**

It is intended to publish the results of the Survey in the GSIA Journal, the authors to retain copyright of all published written, drawn and photographic material.





A The Delves Inclosure No 1.  
 B The Delves Inclosure No 2.

Distribution of the Delves Recorded in the Survey

Appendix 2