DESK-BASED HERITAGE ASSESSMENT OF MILL WEIR AND FIVE TUNNELS WEIR, RIVER ARROW, REDDITCH, WORCESTERSHIRE

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Contents

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Summary

A desk-based heritage assessment for the historic environment was undertaken of Mill Weir (NGR SP 05355 68625) and Five Tunnels Weir (NGR SP 05238 68873), River Arrow, Redditch, Worcestershire. It was undertaken on behalf of the Environment Agency, which has identified the weirs as being a barrier to the movement of crayfish and impacting upon morphological processes as well as being obstructive to the passage of fish. They wish to make an informed choice on the solution they propose; to minimise the impact of their scheme to any archaeological or heritage asset in the vicinity.

This report describes and assesses the significance and setting of the heritage assets (and potential heritage assets) that may be affected by the proposals. The potential impact of the application is also assessed.

The River Arrow forms the northern and eastern boundary of the designated area that protects the Scheduled Ancient Monument of Bordesley Abbey, which lies *c* 600m to the west. The course of the Arrow was altered by the Cistercian monks in the 12th century; its current course is a result of these engineering works. The original date of the weirs is uncertain, but Five Tunnels Weir dates back to at least the 16th century, possibly with medieval origins. It has large stones within its construction which may be of medieval date, although these may have been reused from the Abbey, post-Dissolution. Mill Weir lies just to the south of the point where the tail race from the Abbey's 12th century metalworking mill joins the Arrow. The weir does not date from this time, but is rather thought to be related to Redditch's needle working industry; constructed perhaps in the 18th century and associated with further structural remains that may hint at the site of a lost post-medieval mill.

Report

1. Background

1.1 Reasons for the project

A desk-based heritage assessment for the historic environment was undertaken for Mill Weir (NGR SP 05355 68625) and Five Tunnels Weir (NGR SP 05238 68873), River Arrow, Redditch, Worcestershire (Fig 1). It was undertaken on behalf of the Environment Agency, who proposes to undertake alterations to the weirs which have been identified as causing an obstruction to crayfish, affecting morphological processes and fish movement.

The weirs are considered to be, or to contain, potential heritage assets, the significance of which may be affected by the proposals. Both weirs fall within the area protected by the Scheduling of Bordesley Abbey as an Ancient Monument.

The project conforms to the requirements of the Client identified in an email dated 1 June 2012, a generic Worcestershire County Council brief and the project proposal (including detailed specification) prepared by the Service (Worcestershire Archaeology 2012).

The project also conforms to the *Standard and guidance for archaeological desk-based assessment* (IfA 2008), and the *Standards and guidelines for archaeological projects in Worcestershire* (HEAS 2010).

The event reference for this desk-based heritage assessment given by the HER is WSM 46470.

1.2 Aims

The general aims of this desk-based assessment are to:

- describe and assesses the significance of the heritage assets at and around the weirs;
- establish the nature, importance and extent of the heritage assets;
- assess the impact of the application on the heritage assets.

The specific aims of this desk-based assessment are to:

- present information on the significance, condition and extent of the weirs and any potential heritage assets in their direct vicinity that will inform the decision making process regarding the choice of strategy for improvement of fish passage.

1.3 Methods

1.3.1 Documentary research

All relevant information on the history of the site and past land-use was collected and assessed. Records of known archaeological sites and monuments were obtained from Worcestershire Historic Environment Record (HER). Historic maps, published sources and archives were consulted at Worcestershire Archive and Archaeology Service, at The Hive, Worcester, and also at the Forge Mill Needle Museum and Bordesley Abbey Visitor Centre, Redditch. Advice was sought from the West Midlands SPAB Mills Group, and LiDAR data from the Environment Agency was also consulted.

1.3.2 Other methods

A site visit was undertaken on 5 July 2012. The site and surrounding area were inspected on foot in dry, bright weather conditions, however unseasonably high water levels meant that the weirs were somewhat obscured. Digital photographs were taken to inform the compilation of this report, a selection of which are presented as plates, below.

1.4 Results

The results of the HER search are mapped on Figure 2 and the details of individual features of the historic environment are given in Appendix 1. HER references have been used throughout this assessment but during its preparation additional heritage assets have been identified and their details are given in Appendix 2 (reference numbers have the prefix AHA).

2. The application site

2.1 Location

Specific study was made of the weirs in question (Fig 1), however an area extending 500m beyond these features was also investigated to identify further heritage assets within the vicinity and to provide a broader understanding of the local context.

2.2 Topography, geology and soils

The weirs and wider study area are located on the River Arrow and its surrounding floodplain. Gently undulating hills are situated to either side, where Mercian Mudstone outcrops, but within the river valley this is sealed by a thick deposit of alluvium (BGS 2012). As discussed below, the river does not follow its natural course at this point, having been subject to significant engineering works in the 12th century. Nevertheless, the natural state of the river would have been in braided channels, so essentially the river continues within its approximate course. Five Tunnels weir is located where the Dagnell Brook flows into the River Arrow, and Mill Weir is located further downstream, below a raised mill pond to the east. The soils are of reddish brown, clay-rich alluvium.

2.3 Current land-use

The area is owned by Redditch Borough Council and stands as open parkland and cattle pasture; part of the Arrow Valley Park which provides recreational space and preserves access to river walks and to the archaeological remains of Bordesley Abbey and the post-medieval needle industry including Forge Mill Needle Museum. The land has stood as pasture since the dissolution of Bordesley Abbey in 1538, and many earthworks remain extant within the park (Aston 1976).

The 1st edition Ordnance Survey Map of 1886 (Fig 3) shows the Arrow to have been lined with mature trees. Few of these remain (historical maps show their loss between 1886 and 1904), however the area close to Mill Weir preserves several large horse chestnut trees. Although hedgerows criss-cross the surrounding area, they do not extend close enough to the weirs to be impacted upon by the proposals of the Environment Agency. They have therefore not been included for consideration in this report.

3. Archaeological and architectural interest in the site

3.1 Terms and definitions

The term 'heritage asset' is applied to elements of the historic environment that have significance because of their historic, archaeological, architectural or artistic merit. Heritage assets include designated assets such as Scheduled Ancient Monuments and Listed Buildings, and undesignated assets that may be of equal significance. The term 'potential heritage asset' is used to denote undesignated assets that may exist in the form of archaeological deposits.

3.2 Designated heritage assets

The weirs fall within the protected areas of a Scheduled Ancient Monument and the vicinity of two Grade II listed buildings. It should be noted that although Beoley Medieval Deer Park is recorded as being a Historic Park or Garden, it is not designated as such by English Heritage.

3.2.1 Bordesley Abbey

General Background

Bordesley Abbey is designated as a Scheduled Ancient Monument (List no. 1005304). The northern and eastern boundaries of the Scheduled area are defined by the River Arrow; the far bank of the river being included within the designation; thus incorporating Five Tunnels Weir and Mill Weir (the weir from the Dagnell Brook to Five Tunnels Weir is not within the Scheduled area). Most of the undesignated entries on the HER represent elements associated with the Abbey, such as fishponds. These will not be discussed beyond the general outline of the Abbey given below, but Appendix 1 lists the various entries as shown in Figure2.

Bordesley was the first Cistercian Abbey to be founded in the West Midlands; dating from the mid 12th century (Price 1971). It grew to support up to 60 monks by the mid 14th century, with many granges across north Worcestershire and Warwickshire. Remnants of standing masonry were preserved after the Dissolution in 1538. These, and parts of the wider Abbey precinct, have been the subject of extensive archaeological excavations from 1969 to 1991 (Rahtz and Hirst 1976; Hirst, Walsh and Wright 1983; Astill 1993). The remains now stand within the Arrow Valley Park as a visitor attraction with a museum.

Excavations

The results of the archaeological excavations are widely available, including via *The Bordesley Abbey Project* at www.reading.ac.uk/bordesley. These document the excavations of the Abbey church, graveyards and fishponds, but of most relevance to this study are the findings of the 1980-1991 excavations which focused on the industrial complex to the east of the Abbey precinct (Figs 4 and 5, after Astill 1993). The excavations concluded that this part of the valley was cleared and drained shortly after the construction of the Abbey in the mid 12th century. The Arrow was diverted from its original course into a man-made channel further north and east (Fig 5) of the current course of the river. Towards the end of the 12th century, a triangular pond (WSM 03889) was constructed with a leat containing the head race, wheel pit, and tail race of a vertically wheeled undershot water mill (WSM 03890). The mill was positioned on a platform to the north of the leat (WSM 03888), where the bellows and hammers of a metalworking workshop were powered (Astill 1993). Textile working, leatherworking and ceramic making were also seen within the precinct, but it is the tail race of the mill that is most relevant to this study as it flowed away from the industrial complex and east towards Mill Weir on the River Arrow (just off the right hand side of Fig 5).

Waterworks and milling

Close to the medieval metalworking mill, the tail race was lined with timber forming a square sectioned channel more than 1m deep and wide. This part of the tail race saw three separate phases of rebuilding but by the late 14th or early 15th century the mill was no longer used. The tail race remained visible as an earthwork extending eastwards; the governing factor in locating a trench that was later excavated close to the Arrow (Trench 'BAJ', Fig 4). Here, no timber lining was found, but the initial cut for the ditch was seen 1.3m below the current ground level, cutting a further 1.2m to a flat base. The ditch silted and the alluvium through which it cut continued to form. The re-cut of this ditch and depth of accumulated material show this area to have silted by *c* 0.8m from the 12th to late 14th centuries; a scenario which would reduce the fall and flow of the water and was the probable reason for the disuse of the mill at this time.

Mill Weir is not thought to have been contemporary with the Abbey (discussed below), but it is possible that Five Tunnels Weir has medieval origins, which would in effect make it a part of the Scheduled Ancient Monument rather than something incidentally protected by the Abbey's designation. It will be discussed in 'Potential heritage assets', below.

The only other archaeological features associated with Bordesley Abbey that one might expect to encounter close to the river (apart from the river itself) is the ridge and furrow system (WSM 03891) known to have extended beyond the Abbey precinct and to the river Arrow. Mill Weir is not thought to have medieval origins, but the original date of Five Tunnels Weir is open to discussion, below, and may well have medieval origins.

3.2.2 **Beoley Paper Mill and Papermill Barn**

Beoley Paper Mill (WSM 00041), is listed as Grade II. The list description (ref. 1099992) describes the building to be 'Tudor on medieval foundations', although without any mention of medieval building fabric. The dating appears to stem from the Victoria County History (VCH IV, 13) which records that land and mills in Beoley were granted by Guy Beauchamp, who held the manor (he died in 1315). It is likely that at least one of these mills became Beoley [Paper] Mill, which was held by the manor in 1650 when three water powered corn mills operated under one roof. The earliest recorded fabric from the building is 16th century, but it saw repeated rebuilds during the Georgian and Victorian periods when its new role as a paper mill found an increasingly strong market in Redditch. For example, it made acid free (rust resistant) paper for packing the needles of Redditch's booming needle industry.

Rollins (1970) addresses the origins of the needle making industry in Redditch. He notes that the scouring process was introduced by a Cistercian monk in *c* 1375, and that 'although there is a lack of direct evidence for Redditch's needle making industry beginning with the monks of Bordesley Abbey… the number of watermills known to be in operation along the River Arrow far exceeded the corn-milling requirements of the whole district'. His implication is tacit, and he would no doubt have been interested by the 1970s excavations of the industrial area of the abbey precinct, including a metalworking mill. These excavations did not, however, give evidence for early needle-working, and the initial use of the Paper Mill is documented as having been a corn mill until the late 17th century.

Papermill Barn (WSM 31696), is listed as Grade II (ref. 1296830). It is central to a post-medieval farm complex where all the surrounding buildings are of 18th and 19th century date, but the barn is of 17th century construction; built in timber and brick.

3.3 Undesignated heritage assets

There are several undesignated heritage assets identified within the study area by the HER search, but the majority of these form part of the wider picture of Bordesley Abbey and have been covered already.

Medieval Deer Park

The Deer Park (WSM 41573) was formed in 1248-9 when the Bishop of Worcester agreed to the enclosure (VCH IV, 14). Held by the manor, it extended west to the River Arrow. Beoley Mill appears to have belonged to the manor, on the edge of the manor's deer park, and taken the name of the parish. This evidence of the deer park would seem to support the idea that Beoley Mill, and its associated mill pond, may have medieval origins.

Origin and development of Beoley Mill, the mill pond and Five Tunnels Weir

The mill complex at Beoley Paper Mill eventually included a large mill, steam powered pump house, mill ponds, leats, sluices and Papermill Farm. The majority of these features are not specifically noted on the HER, but are covered by the listed status of the Paper Mill and Papermill Barn. Prior to the expansion associated with the needle indusrty, however, the mill would have probably existed with little more than the mill pond that feeds it. If the mill dates from the medieval period, so too must the mill pond. The mill pond is actually fed by the Dagnell Brook and other subsidiary springs rather than the Arrow. Five Tunnels Weir acted to control flood waters so that the mill pond did not over-fill but drained into the Arrow instead. The Five Tunnels from which the Weir takes its name are of 19th century brick construction (Plate 1), and to either side were two sluice gates to further control the water flow (pers comm Patrick Chester). Floodgate Cottage, marked on the 1st edition OS Map (Fig 3) was occupied by someone who worked these sluices in times of flood.

The low crest of Five Tunnels Weir is of 19th engineering brick to the east, re-built at least three times in the last twenty years, with stones pitching in concrete against it (Plate 2; pers comm Giles Matthews). To the west, the timber cill of the old sluice gate can still be seen, and peering through the fast flowing water, it would appear that the crest is formed of large sandstone blocks (Plate 3). It is perhaps tempting to suggest that this is evidence for an original medieval phase of construction, but building stone from the Abbey was used widely elsewhere after the Dissolution, so it could well be medieval stone reused and therefore not in

its primary context. The piers of the sluice gate on the west are encased in 19th century brickwork, but they are in a poor state of repair (Plate 4) and one can see that the core of the brickwork is earlier. Here, the bricks are 55mm thick, and perhaps date from the 16th century, again supporting an earlier origin for the mill pond and mill at Beoley [Paper] Mill.

A small watching brief (WSM 30772) was conducted in 2001 during installation of the stone pitching to the eroding bank immediately downstream of Five Tunnels Weir, but no deposits of archaeological significance were encountered (pers comm Giles Matthews).

Origins of Mill Weir

The original date of Mill Weir is also undocumented. In its current form, it is built of brick which appears to be 18th or 19th century in date (Plate 5), with a bowl downstream of the weir to the east, lined in brick (Plate 6). There remains the question of whether it may have earlier origins. It is not thought to be of medieval foundation for two principal reasons. The weir is downstream of the aforementioned tail race – when engineering for the metalworking mill, the Cistercians would have wanted the tail race to drain into the lower section of water for greater flow and efficiency (J. Bedington, SPAB Mills Group, pers comm). Furthermore, the crest of the weir is *c* 0.8m below ground level – assuming a consistent ground level with Trench 'BAJ' (Fig 2), this puts the weir some 1.7m higher than the original base of the tail race from the medieval mill.

It is therefore thought that the Mill Weir is possibly 18th century in date, but its function remains questionable. Currently, the fall at the weir is only 0.15-0.20m. There is not the head of water to power a mill here, but interestingly it coincides not only with the wider part of the mill pond clearly evident above it (Fig 2; which does hold a considerable head of water), but there are also the remains of 18th – 19th century brickwork between the weir and the millpond above (Plate 7). These appear to have held a sluice gate for the channel which can be identified on the 1st edition OS Map (Fig 3) between the River Arrow and the Mill Pond. This is now fully silted and overgrown. The purpose of this leat is uncertain, and it would benefit from further research to see if perhaps the central wide part of the mill pond once fed down and west, powering a mill which has since been lost, and hence why the weir is called Mill Weir. A weir would be beneficial in such a situation as it would lower the level of the water downstream to give a greater fall to a tail race.

Neither Mill Weir nor Five Tunnels Weir are recorded as heritage assets in the Historic Environment Record, however both are associated with the post-medieval needle industry of Redditch. Five Tunnels Weir is thought to potentially have medieval origins, and Mill Weir may mark the site of a lost post-medieval mill.

3.4 Potential heritage assets

The Arrow Valley has thick deposits of alluvium (WSM 37587) which are known to have good potential for environmental archaeology. The excavations of the mill at Bordesley Abbey attest to the good preservation of organic artefacts, but there may also be deeper sequences such as peat that hold valuable palaeo-environmental material.

The above discussions have highlighted that there is the potential for below ground archaeology in the direct vicinity of the weirs. This is particularly the case at Mill Weir, where the tail race of the medieval mill is known to feed into the Arrow. The ridge and furrow system is also likely to be preserved. During the excavations of the 1980s, this was found to pre-date the construction of the precinct boundary, so although ridge and furrow might not usually seem so significant, it would be of research interest if it were possible to find a sequence between the ridge and furrow and the diversion of the Arrow from its original to its present course.

There are no specific records on the HER for finds dating from periods other than the medieval and post-medieval, but the excavations at Bordesley Abbey did recover prehistoric worked flints and Roman pottery, in particular a near complete Roman pot. Although the site is thought to have been covered with braided channels during prehistoric times, these had largely silted up by the time the Abbey was built, and Astill (1993) suggests that it might have been similar during the Roman period, with the area used as pasture. This would be unlikely to yield significant Roman remains, but the HER does record WSM 34296; a field to

the north of the study area called Blackstitch Field – suggestive of having once been a [putatively Roman] occupation site.

4. Summary of significance

4.1 Assessment of significance

The desk-based assessment has provided new evidence about the weirs which have to date received no archaeologically guided research. They both stand as heritage assets with archaeological interest in their own right; as a part of a wider industrial landscape which is a significant part of the heritage of Redditch. Furthermore, Five Tunnels Weir may date from the medieval period, although it is not possible to substantiate this without further investigative (or indeed intrusive) work, and Mill Weir may be the site of a lost post-medieval mill. An assessment of the significance of the weirs, and their setting, which may be impacted upon by the proposed work of the Environment Agency, can be broadly made in terms of the nature, importance and extent of the archaeological interest.

Nature of the archaeological interest in the site

Extensive excavations have been undertaken in the area, focussing on the medieval Abbey of Bordesley. The nature of the archaeology was broad, with elements of the Abbey still standing, and cemeteries excavated. Nevertheless, it is the waterlogged excavations towards the Arrow that are most relevant to consideration of the weir sites. Organic preservation was excellent. The area is known to preserve complicated earthworks, but these do thin-out towards the Arrow and it is clear that activity in this area was not as concentrated. Indeed, the area in question was beyond the Abbey precinct and is known to preserve ridge and furrow.

The other major consideration is the sites association with the post-medieval needle making industry of Redditch. Two post-medieval mills survive in the vicinity; Beoley Paper Mill which is now a private residence, and Forge Mill Needle Museum, which now holds the local museum and visitor centre. The industrial heritage preserved in the standing buildings is complimented by a preserved network of mill ponds, weirs and sluices; all an intrinsic part of the post-medieval industrial landscape of the area. The weirs form part of this built heritage, and Mill Weir is also closely associated with further brick-built structural remains which have seen no previous archaeological consideration.

Relative importance of the archaeological interest in the site

Bordesley Abbey, as a well preserved and complete example of the earliest Cistercian foundation in the West Midlands, is very significant archaeologically. The River Arrow on which these two weirs are located is itself a construct of the 12th century when the monks diverted the course of the river. Specific and isolated areas of this engineering works are possibly of less relative importance as it is the wider landscape that brings the context and research interest to this element of the sites history, plus it has been researched in-depth by Aston (1976) and Astill (1993).

The weirs themselves present a far greater potential for research. The 18th and 19th century brickwork which might be easily 'written-off' is part of the industrial heritage of Redditch, and as discussed above, there remain questions about the original date of these features, and also the function of Mill Weir and whether it may have once been associated with a lost mill.

Physical extent of the archaeological interest in the site

The extent of the medieval landscape is far reaching, but it is only the aspects close to the proposed works at the weirs that are of direct relevance here. The discussion above noted the depths at which the medieval archaeology associated with Bordesley Abbey were found. The earlier medieval ground level, contemporary with the 12th century mill, was 1.3m below current ground level, and the tail race cut a further 1.2m. The water that flowed from this channel, 2.5m below ground level, must have drained into a very much lower River Arrow than the silted version we see today, *c* 0.80m below ground level. The medieval deposits, however, were thick, and one might expect to find preserved late medieval deposits 0.50m below the current ground surface. If significant archaeological features were dug here, it is likely that they will have survived well in the waterlogged conditions, but this area is without

the Abbey precinct, so beyond the known tail race, significant medieval archaeological deposits either side of the weirs are thought to be unlikely.

The key factor for consideration is the structure of the weirs themselves. As discussed, Five Tunnels Weir is largely a 19th century structure relating to the working of the Beoley Paper Mill. Nevertheless, it is possible to see that the core of the structure (in one part at least) is probably of 16th century date, and there may be earlier elements preserved within the structure. Unfortunately it is only possible to see the 16th century core because of the extremely poor state of repair that Five Tunnels Weir is in. The central part with the tunnels appears sound, but particularly the sides of the western sluice are literally falling apart.

Similarly, Mill Weir is in a very poor condition, with many bricks lost and others looking like they are about to be washed away (Plate 8). The structural brickwork that is preserved just to the east of Mill Weir is largely in better condition, although one of the large trees is doing significant damage to the structure (Plate 9). It is worth noting that the trees on both banks of the river local to these weirs are protected within Borough Of Redditch New Town Tree Preservation Order (23) (G Boyes, Senior Tree Officer, pers comm).

5. The potential impact of the proposed works

5.1 General background

The form and extent of the proposed works is at present in discussion. The following comments can be made to inform the works. The historic environment is a non-renewable resource and therefore cannot be directly replaced. However mitigation through recording and investigation also produces an important research dividend that can be used for the better understanding of the county's history and contribute to local and regional research agendas.

Any site investigation works or watching briefs required would be concluded by production of an archaeological report (and appropriate publication) to be deposited with Worcestershire Historic Environment Record (HER) and the project archive with Museums Worcestershire.

It has established that both weirs are heritage assets. The present form of the Dagnell Brook, Arrow River and mill pond clearly demonstrate the engineered nature of this confluence.

5.2 Mill Weir

To the east of the weir lie the extant structural remains of a leat and sluice gate, and to the west there is a strong likelihood of encountering the end of the tail race from the medieval mill.

5.3 Five Tunnels Weir

At Five Tunnels Weir, the water has eroded the very easternmost mud-bank of the river (Plate 10). The existing crest is of 19th century brick, rebuilt in the last twenty years. No historic structure has been identified here and the likelihood of significant archaeological deposits is thought to be low. The current gap is *c* 0.6m.

On the west side of the weir the structure of the sluice gate at this point appears to contain 16th century brickwork. The fall here is only *c* 0.25-0.3m, although high water levels might make this appear less than is generally the case.

5.4 Modern Weir

There is a further, steeper, weir between the Dagnell Brook and the River Arrow, which was not named in the commissioning of this report. It is within 10m of Five Tunnels Weir, to the east, and built of sloping concrete in the 20th century (shown on Fig 1), with a fall of c 1m. For the mill pond to have maintained its raised level throughout the post-medieval period, and perhaps also the medieval period, it is conjectured that there may have been some sort of weir or sluice here in the past. The 1st edition OS map does mark 'sluice' in this location, although this appears to relate to Five Tunnels Weir. It is thought unlikely that evidence for the original weir or sluice is preserved within or behind the current structure.

6. References

Cartographic sources

- Beighton's Map 1, 1722. Held by Forge Mill Museum
- 1st edition, 1886, Ordnance Survey, 25":1 mile
- 1904, Ordnance Survey, 25":1 mile
- 1927, Ordnance Survey, 25":1 mile
- 1938, Ordnance Survey, 25":1 mile
- 2011, Ordnance Survey Superplan

Aerial photographs

- Several aerial photographs are included in the excavation reports from work on Bordesley Abbey showing the extensive earthworks on the site. These were studied but their HER references are unrecorded.
- LiDAR imagery was also consulted, and the tail race from the medieval mill to the River Arrow was seen to be very clear.

Documentary sources

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- VCH IV, Page, W and Willis Bund, J W, (ed), 1924 *Victoria History of the County of Worcestershire*, **IV**

The following sources have also been cited in this assessment.

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- DCLG/DCMS/EH 2010 *PPS5 Planning for the historic environment: historic environment planning practice guide,* Department for Communities and Local Government/Department for Culture, Media and Sport/English Heritage

- HEAS 2010 *Standards and guidelines for archaeological projects in Worcestershire*, Planning Advisory Section, Historic Environment and Archaeology Service, Worcestershire County Council unpublished report **604**, revised December 2010
- Worcestershire Archaeology, 2012 *Proposal for a desk-based heritage assessment of Mill Weir and Five Tunnels Weir, River Arrow, Worcestershire,* Worcestershire Archaeology, Worcestershire County Council, unpublished document dated 11 June 2012, **P3884**
- IfA 2008 *Standard and guidance for archaeological desk-based assessment*, Institute for Archaeologists

7. Publication summary

The Service has a professional obligation to publish the results of archaeological projects within a reasonable period of time. To this end, the Service intends to use this summary as the basis for publication through local or regional journals. The client is requested to consider the content of this section as being acceptable for such publication.

A desk-based heritage assessment for the historic environment was undertaken on behalf of the Environment Agency of Mill Weir (NGR SP 05355 68625) and Five Tunnels Weir (NGR SP 05238 68873)*, River Arrow, Redditch, Worcestershire (HER ref WSM 46479). Works are proposed at the weirs to enable better passage for fish. The River Arrow forms the northern and eastern boundary of the designated area that protects the Scheduled Ancient Monument of Bordesley Abbey which lies c 600m to the west. The course of the Arrow was altered by the Cistercian monks in the 12th century; its current course is a result of these engineering works. The original date of the weirs is uncertain, but Five Tunnels Weir dates back to at least the 16th century, possibly with medieval origins. It has large stones within its construction which may be of medieval date, although these may have been reused from the Abbey, post-Dissolution. Mill Weir lies just to the south of the point where the tail race from the Abbey's 12th century metalworking mill joins the Arrow. The weir does not date from this time, but is rather thought to be related to Redditch's needle working industry; constructed perhaps in the 18th century and associated with further structural remains that may hint at the site of a lost post-medieval mill.*

8. Acknowledgements

The Service would like to thank the following for their kind assistance in the successful conclusion of this project, Giles Matthews (Biodiversity Officer, Environment Agency), Ed Wilson (Senior Archaeologist, Environment Agency), Tony Green (Redditch Local History Society), Jo-Ann Gloger, Gillian Crawley and Patrick Chester (Forge Mill Museum, Redditch), and John Bedington (Secretary, SPAB Mills West Midlands Group).

9. Personnel

The assessment was undertaken by Fiona Keith-Lucas. The project manager responsible for the quality of the project was Tom Vaughan. Illustrations were prepared by Carolyn Hunt.

Appendix 1
Heritage assets registered with the Historic Environment Record

Monuments

HER number, & legal status	Site name	NGR (SP)	Record type	Date	Description
WSM 00010	Bordesley Abbey	0464 6874	Monument	1140-1538 AD	Abbey
WSM 00810	Fishponds, Bordesley Abbey	0475 6882	Monument	1066-1539 AD	North of Abbey
WSM 03887	Southern Fishpond, Bordesley Abbey	0470 6864	Monument	1066-1539 AD	
WSM 03888	Leats East of Bordesley Abbey	0489 6869	Monument	1066-1539 AD	
WSM 03889	Triangular Mill pond	0498 6864	Monument	1066-1539 AD	
WSM 03890	Watermill	0506 6864	Monument	1066-1539 AD	
	Watermill			1301-1400AD	
WSM 03891	Ridge and Furrow	0506 6875	Monument	1066-1539 AD	East of Abbey
WSM 07247	Industrial area of Bordesley Abbey	0508 6865	Monument	1066-1539 AD	Bloomery
				1066-1539 AD	Surface
				1066-1539 AD	Tile Kiln
WSM 24913	Papermill Meadow, Beoley	0529 6853	Monument	1540-1900 AD	Paper Mill
WSM 00041	Beoley Paper Mill	0540 6843	Building	1501-1600 AD	Watermill
			Building	1540-1900 AD	Corn mill
			Building	1540-1900 AD	Paper Mill
			Building	1601-2000 AD	Mill
			Building	1650-2000 AD	Timber-Frame
WSM 31696	Papermill Barn, Beoley	0548 6847	Building	1601-2000 AD	Barn
			Building	1601-2000 AD	Stable
			Building	1601-2000 AD	Timber-Frame
WSM 43046 LB 1296830	Papermill Farmhouse	0549 6844	Building	1850-2000 AD	Dwelling

			Building	1850-2000 AD	Farmhouse

Events

HER number, & legal status	Site name	NGR (SP)	Record type	Date of work	Description
WSM 27757	Papermill Barn	0548 6847	Survey	1999	
WSM 30772	Five Tunnels Weir	0521 6885	Intervention	2001	
WSM 32810	Fishponds, Bordesley Abbey	0475 6882	Intervention (Photograph)	1958	Pre-dates dredging
WSM 42989	Industrial area, Bordesley Abbey	0508 6864	Intervention (Excavation)	1968-1989	Excavations 1968-1989
WSM 45784	Church Hill, Redditch	0647 6865	Desk Based Assessment	ongoing	

Other

HER number, & legal status	Site name	NGR (SP)	Record type	Date	Description
WSM 34296	Field named Blackstitch, Redditch	0509 6911	Occupation site	43-401 AD	Suggested Roman occupation site
WSM 41573	Beoley Medieval Deer Park	0647 6938	Deer Park	1066-1540 AD	
WSM 37587	Alluvial deposits	0726 6543	Environmental deposit	10000BC – 1500 AD	

Appendix 2
Additional heritage assets identified by the desk-based assessment

Additional heritage asset	Site name	Grid reference	Source	Date	Description
AHA 001	Five Tunnels Weir	SP 05238 68873	Site visit	16th century?	See text above
AHA 002	Mill Weir	SP 05355 68625	Site visit	18th century?	See text above

Plates

Plate 1 Five Tunnels Weir from the south-west

Plate 2 The east side of Five Tunnels Weir, from the south-west

Plate 3 The housing for the old sluice, western side of Five Tunnels Weir, from the west

Plate 4 The western side of Five Tunnels Weir, in poor repair, from south-east

Plate 5 Mill Weir, from the south-east

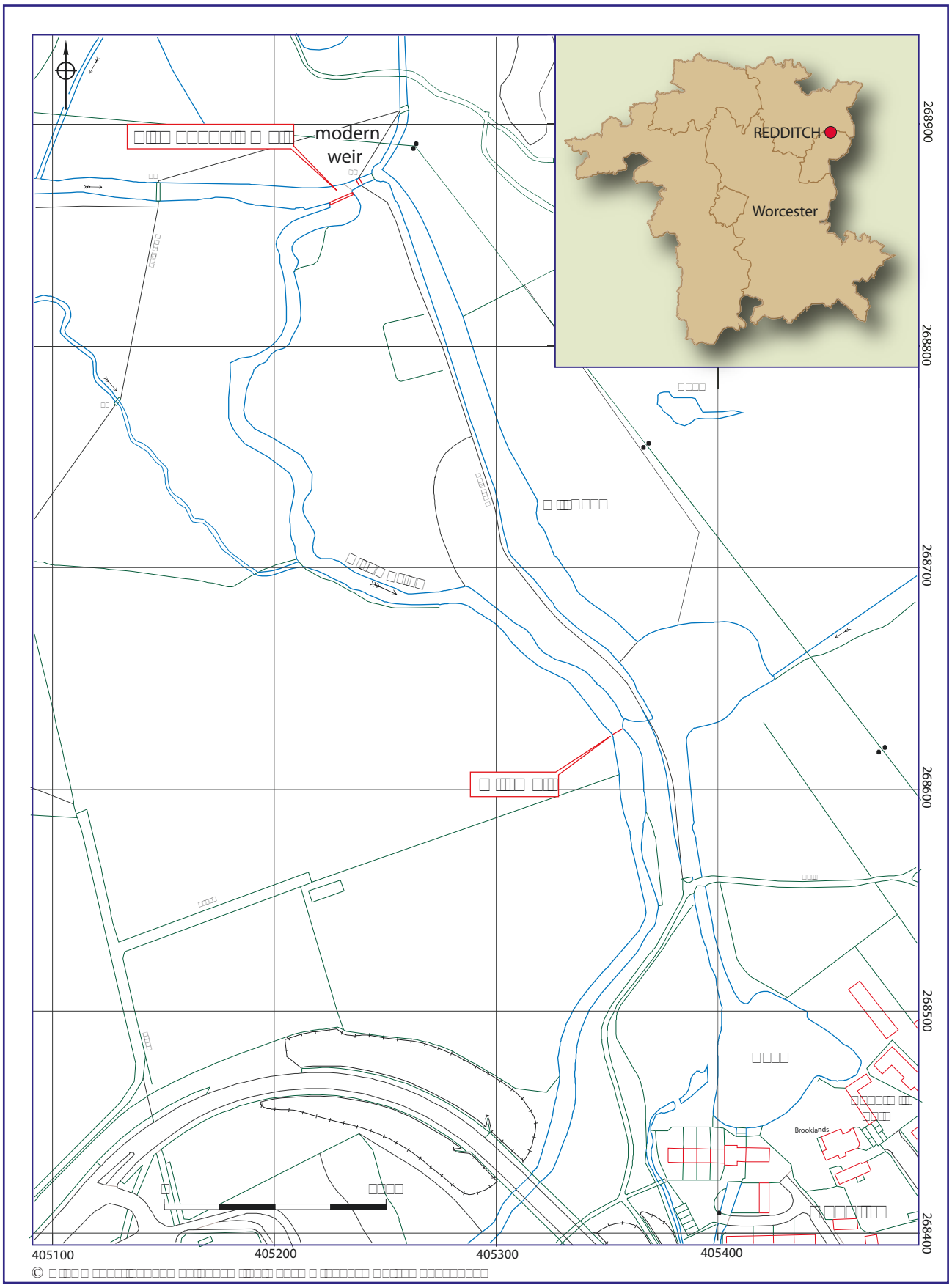
Plate 6 The bowl below Mill Weir, looking south

Plate 7 Remains of sluice gate to east of Mill Weir, looking north

Plate 8 The western side of Mill Weir, in poor repair, from the east

Plate 9 Tree root damage to the sluice remains by Mill Weir, looking south-east

Plate 10 Erosion beyond the eastern edge of Five Tunnels Weir, looking north

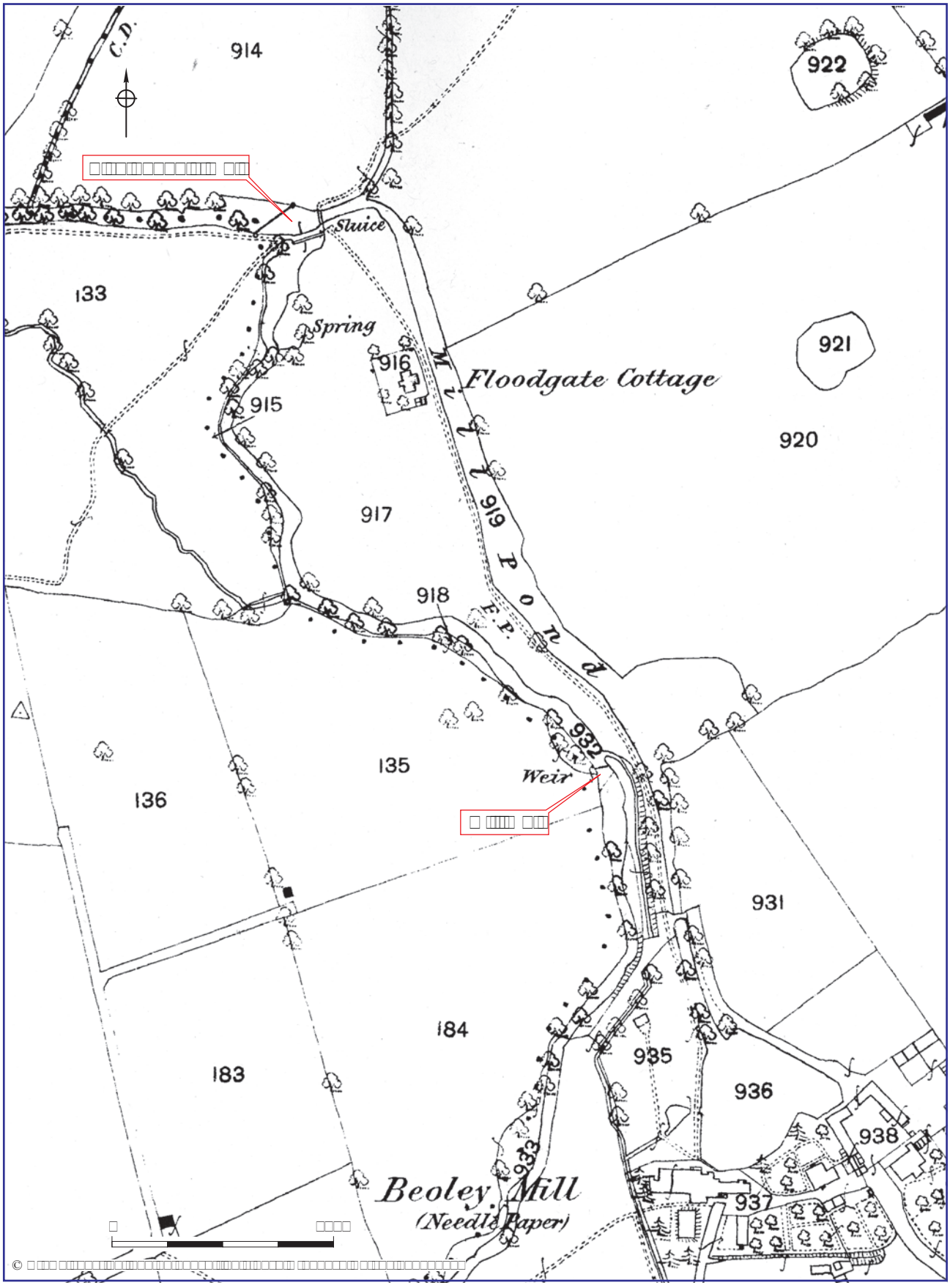

modern
weir
REDDITCH
Worcester
Brooklands
405100
405200
405300
405400
268900
268800
268700
268600
268500
268400

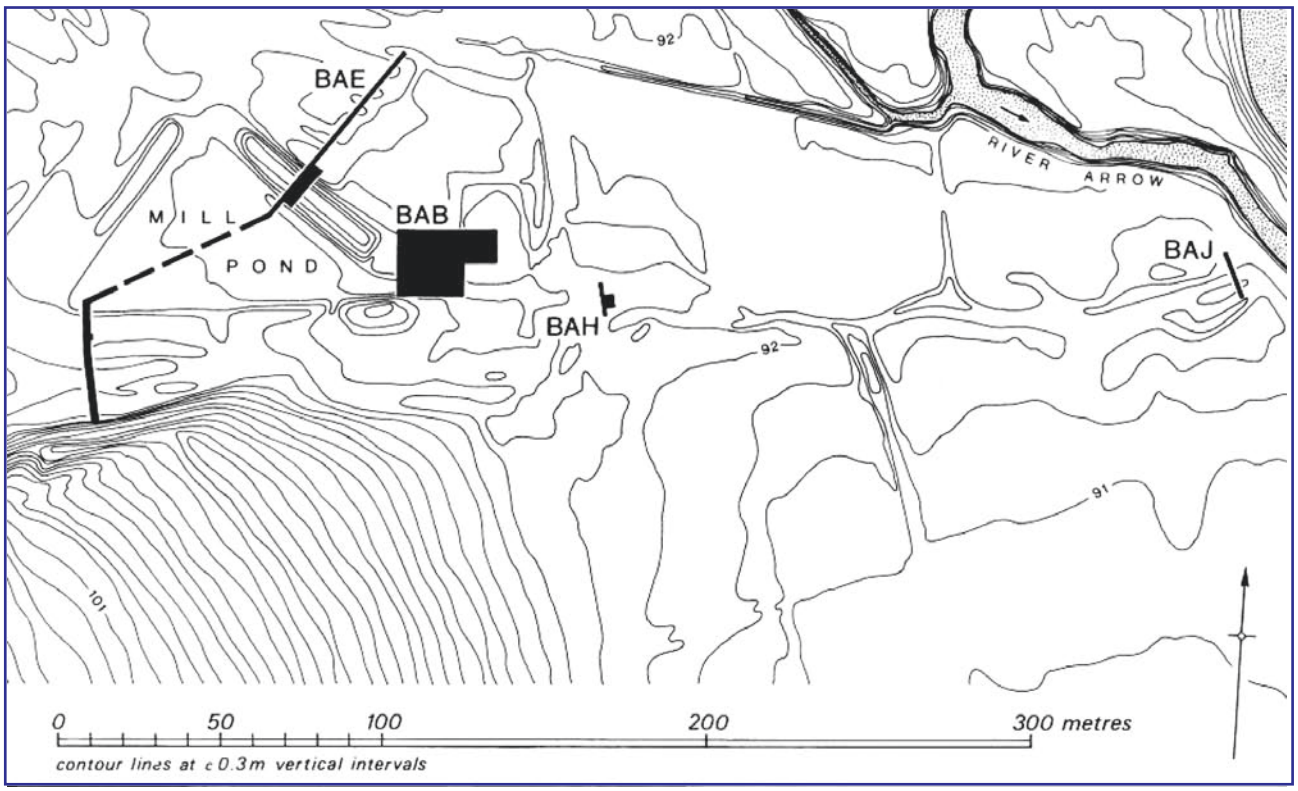
Trench

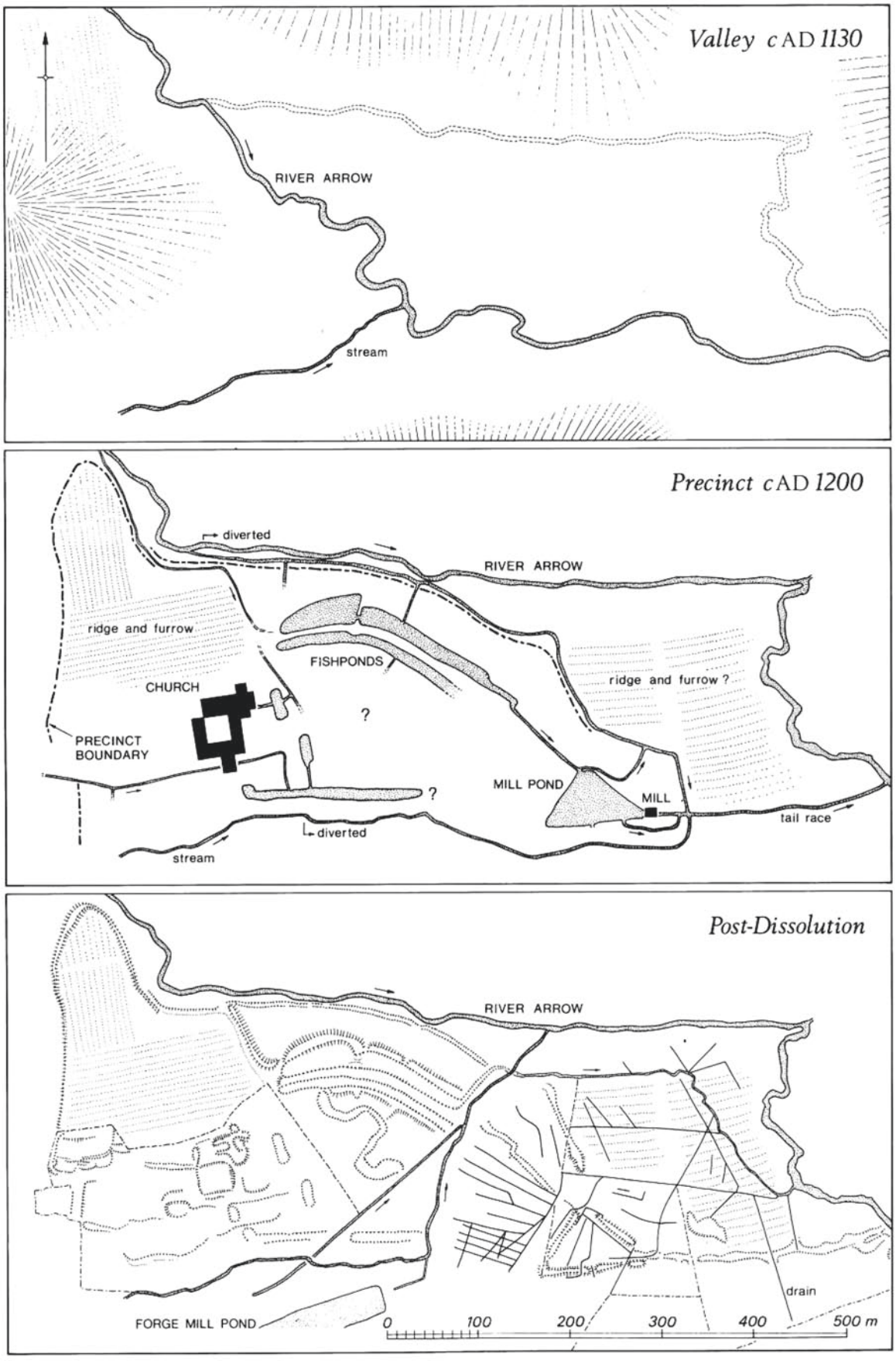
BAB

BAH

BAJ


C.D.
914
922
Sluice
133
Spring
916
915
Floodgate Cottage
921
920
917
Mill Pond
918
F.P.
932
135
Weir
136
931
184
935
183
936
938
933
937
Beoley Mill
(Needle Paper)


BAE
MILL
POND
BAB
BAH
BAJ
RIVER ARROW
92
92
91
101
0
50
100
200
300 metres
contour lines at c 0.3m vertical intervals


Valley c AD 1130
RIVER ARROW
stream
Precinct c AD 1200
diverted
RIVER ARROW
ridge and furrow
FISHPONDS
ridge and furrow ?
CHURCH
?
PRECINCT BOUNDARY
?
MILL POND
MILL
tail race
diverted
stream
Post-Dissolution
RIVER ARROW
drain
FORGE MILL POND
0
100
200
300
400
500 m