Heritage Assets in Inland Waters

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Executive Summary

This report addresses the range of heritage assets that may be found under inland waters. The focus is on assets or features that go unnoticed because they are literally 'in' the water, beneath the surface. The report considers the significance of such assets and their archaeological potential.

Heritage assets and their components under inland waters have received relatively little attention in England. This is despite the archaeological potential of waterways being repeatedly demonstrated by stray finds, excavation of former waterway structures on land that is now dry, and underwater investigations elsewhere in the British Isles and further afield.

Even in the case of recognisable significant assets adjacent to or spanning the water, the possible presence and significance of archaeological material below water is sometimes overlooked. For this reason, the report concentrates on designated heritage assets such as scheduled monuments and listed buildings in the first instance. The presence and significance of non-designated assets and hitherto unknown assets are also addressed.

The report considers the threats to heritage assets in inland waters, their management, and the potential for greater awareness and appreciation. Attention is also paid to recent developments in methodologies and techniques through which assets in inland waters can be investigated.

The project focuses on non-tidal waterways, including canals but with an emphasis on navigable rivers. Examples are drawn from across England but especially from a study area comprising the catchment of the rivers Kennet and Bristol Avon, including the Kennet and Avon canal.

Heritage Assets in Inland Waters
an appraisal of their significance and protection

Fjordr 16171 / EH 6670

1. Background

In the decade or so since English Heritage became responsible for the historic environment in territorial waters, there has been a very major improvement in the management of heritage assets under the sea: in the administration of statutory provisions; in provision through marine planning and licensing; and in appreciation of the significance of marine assets and their contribution to understanding England's past. Most importantly, there is now broad acknowledgment in the profession and among the wider public that assets that happen to be below water are not the preserve or concern only of those who happen to be able to go underwater. Apparent invisibility or inaccessibility does not diminish significance, the need for management, or the possible contribution that assets below water can make to society.

However, it seems that this leap in awareness and provision has not encompassed underwater assets that are beneath inland waters. This is paradoxical: in broad terms inland waters have the same status in law, policy and planning as dry land; inland waters are often only a few metres deep; and there are many highly significant assets immediately adjacent to watercourses whose history and character is intrinsically connected to the water and whose components extend beneath. Notwithstanding, there appear to be very few instances in which the underwater components of heritage assets have been addressed explicitly in their protection, management or investigation of those assets. It is highly likely that significant heritage assets, both designated and non-designated, are being damaged or suffering degradation as a result of both natural and humanly-induced processes in inland waters, but such deterioration is unobserved and unremarked.

Although there is considerable recognition of heritage assets relating to inland waters, this recognition usually only extends to the elements of the asset that are above and beside the water. Even where asset boundaries encompass inland waters, it seems that very little explicit attention is given to those parts that are below water. This has damaging consequences for understanding, appreciating and conserving such assets. This project is a first step in seeking to establish the character and scale of this problem.

2. Research Aim and Objectives

The aim of the project is to appraise the protection and significance of designated heritage assets that lie partly or wholly beneath England's inland waters by way of a pilot study.

The proposed objectives of the project are as follows:

- O1 To review the range of designated asset types that may have components under inland waters, and the methodologies and techniques that are enabling their investigation.
- O2 To consider the significance of asset components that are under inland waters both in their own right and in relation to assets as a whole.
- O3 To consider the potential in inland waters for assets / asset components of equivalent significance to designated assets.

O4 To outline possible hazards – both natural and humanly-induced – to heritage assets under inland waters.

O5 To review the provision for assets under inland waters in current statutory and policy frameworks.

O6 To examine the consideration of asset components under inland waters in the management of a selection of designated assets.

O7 To consider the potential for increasing awareness and appreciation of assets under inland waters.

3. Project Scope

Throughout this report, the term 'heritage asset' is used, and whilst recognising that individual artefacts and their findspots are also heritage assets, the focus here is on heritage assets in the form of sites, monuments, features and landscapes. This focus is emphasised by a concentration on designated heritage assets. Individual artefacts are not ignored, as they may indicate the presence of a site or be associated with a site, but they are not the principal concern.

Many heritage assets have a connection to inland waters:

- the location or function of the asset may be dependent on water (e.g. watermills; quays);
- the relationship to water may be fundamental to understanding or appreciating the asset (e.g. designed landscapes that include waterways);
- the structure of the asset may extend over, into or under the water (e.g. bridges; fords);
- structural material and architectural fragments may be located in the water (footings; piers; debris from damage or demolition)
- artefacts associated with the asset may have been deposited or lost in the water;
- waterlogged sediments may contain organic and palaeo-environmental remains relating to the asset and its context.

Of all these connections, three particular themes weave through the narrative:

- The presence of heritage assets in the water;
- The historical relationship between heritage assets and the water;
- The archaeological character of inland waterways themselves as features that have been constructed or heavily modified by human activity.

The relationship between water and heritage assets may have changed since their original construction and use: the boundaries of watercourses can move due to erosion or accretion; watercourses may silt-up entirely and become 'land'; and areas that were once land can become inundated. People have also intervened in these relationships: natural rivers have been intentionally moulded by waterside construction, reclamation, dredging and re-shaping of watercourses for drainage, energy, navigation, defence or aesthetic appreciation, for example; and entirely new watercourse have been created, including canals and docks. A wide range of land management, agricultural and industrial activities can also have unintentional consequences for watercourses.

As the scope of this project is potentially very large it focuses on a sub-set of inland waters, namely canals and rivers, with an emphasis on navigable rivers. Transport connected with inland waters is, therefore, a key focus; but as most waterways have multiple uses, the range of assets that is considered is not limited only to transport.

This is a small project to scope the issues and potential of waterside assets where there is material associated with the asset below water. There appears to be a particular gap in awareness about the role of inland waters in England's past, and probably many assets in which English Heritage has a direct interest that exemplify both potential significance and a hiatus in management. The project provides both a general account plus case studies of different asset types, focussing on listed buildings and scheduled monuments in particular.

In legal terms, 'inland waters' include all waters inshore of the 'baseline', which is the point from which the Territorial Sea and other marine zones are measured outwards. Usually the baseline is low water, but in estuaries and other circumstances the baseline cuts across the water. Water inland of this line is 'inland waters', including both tidal waters (which may stretch far inland) and non-tidal waters.

The legal regimes relevant to managing heritage assets at sea (designation; planning; reporting 'wreck') generally apply to tidal waters, so they overlap with – and cover – extensive areas of inland waters. As it is concerned with land-based management, this project focuses entirely on inland waters that are non-tidal – that is to say, rivers (and canals) upstream of the tidal limit. This also means that the project is concerned with assets in freshwater environments rather than in estuarine or marine environments.

The project encompasses both natural and non-natural inland waters, noting that in many cases apparently natural watercourses have in fact been heavily modified.

The project focuses on flowing watercourses (rivers, streams, canals etc.) rather than enclosed waterbodies (i.e. lakes, ponds, moats, reservoirs). Clearly, there is potentially a great deal of overlap here, and there may be a very close relationship between enclosed and flowing water in some cases. This distinction is not regarded as fundamental; it is only a convenient means of confining the scope of the project in the first instance.

As noted above, the relationship between assets and watercourses may have changed over time. The intention is to draw attention to heritage assets and their components that are overlooked because they are below water, so the project focuses on the current relationship between assets and watercourses. That is to say, the project will not consider heritage assets that were once near or below water but which are now on or under land as a result of accretion, siltation or reclamation. Again, this distinction is not fundamental and is adopted to confine the scope of the project; instances where elements of heritage assets close to water that have become silted-up are flagged, especially where there is potential for material – especially waterlogged material and deposits of palaeo-environmental interest – to have gone directly from being below water to being buried under 'dry' land. Assets that are partly in and partly out of the water are considered in their entirety – i.e. including the parts in or on land as well as those below water.

As well as the underwater elements of assets built on, over or adjacent to water, the project considers assets intended to float on the water but which have now become fixed, i.e. boats

and ships that have been hulked or wrecked in inland waters. Even the remains of historic air crash sites can be found in inland waters[1].

The project considers, at least in outline, all the main forms of land-based designation, i.e. scheduled monuments, listed buildings, registered parks and gardens, registered battlefields and World Heritage Sites. Where appropriate, attention is paid to EH Historic Properties adjacent to watercourse, especially where there may be opportunities to add directly to the public's awareness and understanding of assets under inland waters.

3.1. Study Area

As the project has been framed as an appraisal, the scope has been confined at the points outlined above. Although discrete assets that illustrate the range of asset types, environments, issues and hazards presented by assets under inland waters are picked out from across England, the project focuses on a specific geographical study area: the Kennet / Avon catchment (Figs. 1-3).

This catchment is unified by the Kennet and Avon Canal but it also includes extensive rivers, both navigable and apparently unimproved. The effect of the canal in cutting off 'backwaters' within which evidence of pre-canal activity prior to the Eighteenth Century may be preserved, is a feature of both the Avon and the Kennet. The project encompasses the waterways from the point at which the Kennet joins the Thames at Reading to the locks at the foot of the Floating Dock at Bristol, on the Avon.

The docks at Bristol were tidal until they were turned into inland waters by the permanent flooding of the Floating Harbour, served by a new feeder canal and excavation of an entirely new course for the tidal River Avon from 1809. The River Avon itself was – and remains – navigable up to Bath, at which point the canal leaves the river but runs largely in parallel all the way past Bradford-on-Avon to just north of Trowbridge. Above Trowbridge the Avon continues up to Melksham, Chippenham and Malmesbury. Having departed from the River Avon near Trowbridge, the canal passes through Devizes and Pewsey into the valley of the River Dun to meet with the Kennet at Hungerford. Above Hungerford the River Kennet continues to Ramsbury, Malmesbury and Avebury. Below Hungerford, the canal and river flow in tandem – though with quite separate courses – down to Newbury. Even below Newbury the canal and river sometimes have different routes down past Aldermaston, finally coming together just outside Reading. Through Reading the waterway is much modified, and it meets the Thames just downstream of the city centre.

This complex of waterways has been selected because of its variety in terms of modification through to full canalisation. It includes two major urban areas – Bristol and Reading – as well as rural landscapes. The history of water transport has clearly been important to the development of places along the waterways and many other aspects of water use are reflected in heritage assets that are associated with them. The Post-Medieval and Modern aspects of the waterway are well represented, but there are also Medieval and earlier sites adjacent, and archaeological material stretching back into prehistory can be anticipated. There are numerous listed buildings and scheduled monuments and several registered parks and gardens; there is a registered battlefield adjacent to the Kennet at Newbury; a World Heritage Site astride the Kennet at Avebury; the World Heritage Site at Bath encompasses

[1] E.g. http://www.thewestmorlandgazette.co.uk/news/10141805.Will_Wastwater_give_up_its_watery_secret_of_three_lost_WW2_airmen__Divers_plan_return_to_lake_in_hunt_for_answers_into_aircraft_missing_67_years_/?ref=nt

part of the Avon; and there is a waterfront English Heritage property at Bradford-on-Avon. With such an emphasis on navigation there is very real potential for inland wrecks; and the presence of deposits of palaeo-environmental interest in the vicinity of heritage assets can be reasonably inferred. Whilst there may be water-related aspects of the historic environment and its management that are not represented by the Kennet / Avon catchment, it offers a suitable focus for this pilot.

4. Outline of Methods

The project has comprised three main methods:

- Review of National Heritage List for England;
- Site visits;
- Correspondence and meetings.

4.1. Review of National Heritage List for England

The National Heritage List for England (NHLE) – which is available online at http://www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/ – was reviewed for designated heritage assets in the immediate vicinity of the Kennet and Avon rivers and the Kennet and Avon Canal within the study area. The online Map Search facility was used to look at the relationship between assets and waterways, plus the more detailed online information that is available for specific assets. Brief details of the selected designated heritage assets were recorded in an MS Excel workbook, indexed using the List Entry Number (Appendix 1).

Within the Upper Kennet, individual heritage assets were only selected up to the boundary of the World Heritage Site around Avebury. Within the Avebury WHS boundary, designated assets in proximity to water are very numerous and clearly there are important relationships between prehistoric monuments and water. The waterways within the WHS are quite small, however. Although not wishing to downplay the potential for structural elements of designated assets – including artefacts and palaeo-environmental deposits – within waterways in the WHS, and indeed the potential for undesignated assets and as-yet unknown heritage assets, detailed consideration of the Avebury WHS was felt likely to imbalance the project as a whole.

Water-related assets were selected on the basis of judgement. Where there is a direct physical relationship the asset was always selected; where the asset is close to the river its details were reviewed to establish whether there might be a relationship to the waterway, and if no such relationship was apparent the asset was not selected. The validity of this method of selection is dependent on the information available in the online National Heritage List for England. However, many designated assets have very little or only cursory information available online as yet. Also, even where there appears to be a relationship with the water, this relationship has often received little express attention in the online records. References to material being in the water are very rare.

It should be noted that the approach to designating assets has not always been consistent in terms of assets being designated as a group or individually, hence the quantification of designations does not necessarily equate to numbers of assets.

A total of 302 designated heritage assets was selected which, when split into stretches, gave the following counts:

Waterway	Stretch	Designated Assets	
Avon	Floating Harbour and The Feeder	28	
	Navigable Avon	27	
	Upper Avon	35	
	Sherston Avon	8	
	Tetbury Avon	8	106
Kennet	Lower Kennet	13	
	Mid Kennet	55	
	Upper Kennet	25	93
Kennet and Avon Canal	Hungerford- Savernake	12	
	Savernake - Devizes	37	
	Devizes - Widbrook	10	
	Widbrook - Bathampton	16	
	Bathampton - Bath	28	103
Total		302	

The designated assets were categorised according to broad types and then further grouped into themes, as follows:

			Transport	Trade	Shipbuilding	Mill	Religious	Domestic	Military	WHS
Bridge	105	34.8%	105							
Lock	26	8.6%	26							
Water Management	10	3.3%	10							
Aqueduct	8	2.6%	8							
Tunnel	4	1.3%	4							
Culvert	1	0.3%	1							
Wharf	16	5.3%		16						
Crane	7	2.3%		7						
Boat / Ship Yard	4	1.3%			4					
Mill	26	8.6%				26				
Church	10	3.3%					10			
Monastic	6	2.0%					6			
Barrow	2	0.7%					2			
House	29	9.6%						29		
Farm	6	2.0%						6		
Settlement	9	3.0%						9		
Park	9	3.0%						9		
Inn	7	2.3%						7		
Baths	1	0.3%						1		
Pillbox	8	2.6%							8	
Battle	1	0.3%							1	

			Transport	Trade	Shipbuilding	Mill	Religious	Domestic	Military	WHS
Castle	4	1.3%							4	
Camp	1	0.3%							1	
WHS	2	0.7%								2
Total	**302**	100.0%	154	23	4	26	18	61	14	2
			51.0%	7.6%	1.3%	8.6%	6.0%	20.2%	4.6%	0.7%

Further details of each designated heritage asset were obtained by downloading the designation data available at http://services.english-heritage.org.uk/NMRDataDownload/ . These national datasets were cut to include only those heritage assets that had been selected, and then incorporated into the project GIS using QuantumGIS and OS OpenData map layers.

4.2. Site visits

Site visits were conducted on four occasions, as follows:

Bradford on Avon	8 July 2013
Upper Avon	16 July 2013
Navigable Avon	24 October 2013
Caen Hill Locks	18 November 2013

Planned visits to the Kennet in December 2013 were cancelled due to poor weather.

Site visits comprised visual observation of designated assets picked out in advance from those selected above, plus general observations of the adjacent waterway, the potential for undesignated / unidentified assets, hazards, and management considerations.

4.3. Correspondence and meetings

Fjordr attended the 6th Annual English Heritage – Environment Agency Conference, 'Rivers, People & Places: a heritage perspective on water management planning' (Exeter, 15 October 2013) and gave informal presentations at two further meetings: the North East Maritime Archaeology Forum (NEMAF) on 16 October 2013; and the ALGAO Maritime Committee on 12 November 2013.

Individual meetings were held with Rod Millard (Bath and North East Somerset Council), David Viner (Canal & River Trust) and Claire King (Wiltshire Council).

Email correspondence was carried out with a number of people. The following in particular made available information on a variety of inland waters investigations:

Keith Elliott (Northumberland CC)

John Buglass (John Buglass Archaeological Services)

Nigel Baker (Herefordshire CC)

Alan Stoyel

Gav Robinson (Northern Archaeological Associates)

Keith Falconer

Marcus Jecock (English Heritage)

5. Asset Types in Inland Waters

Objectives:

O1 To review the range of designated asset types that may have components under inland waters …

O2 To consider the significance of asset components that are under inland waters both in their own right and in relation to assets as a whole.

O3 To consider the potential in inland waters for assets / asset components of equivalent significance to designated assets.

5.1. Overview of Designated Heritage Assets in the Study Area

The designated heritage assets in the Study Area can be summarised by the themes outlined in Section 4, as follows:

Transport	154	51.0%
Domestic	61	20.2%
Mill	26	8.6%
Trade	23	7.6%
Religious	18	6.0%
Military	14	4.6%
Shipbuilding	4	1.3%
WHS[2]	2	0.7%
	302	

Designated assets relating to transport account for over half of the total number. Assets categorised as domestic are the second-most numerous, though many of these assets are 'houses' that may have a spatial rather than functional relationship with the nearby waterway. Designated examples of mills, and assets representing trade such as wharves and cranes are present in moderate numbers. All of these categories cover multiple periods, illustrated by the similarly moderate number of designated assets classed as 'military', which ranges from pillboxes to the possible Iron Age hillfort at Tetbury Camp (LEN 1003421). Equally, there is a moderate number of assets grouped as 'religious' that ranges from churches to barrows.

There are four designated assets related to shipbuilding, all within the Floating Dock at Bristol and probably related more to the construction and repair of sea-going ships than vessels intended primarily for inland waters[3]. The apparent absence of designated assets relating to the construction and repair of vessels intended for inland waters underlines two points that have a bearing on all of these categories, and which are worth outlining at this point:

- The assets that have been quantified are only those that have been designated. Their overall numbers and proportions reflect approaches to designation as much as the overall

[2] The two World Heritage Sites (WHS) within the Study Area – Bath and Avebury – have been categorised separately because they are complex heritage assets in their own right as well as comprising large numbers of assets reflecting multiple themes.

[3] Though clearly there is an overlap insofar as many vessels on inland waters were capable of estuarine and coastal seafaring, and sea-going vessels could travel far inland using inland waterways.

population and patterning of heritage assets in the vicinity of waterways across the Study Area.

- For assets to be designated they first have to be known. Again, the number and proportion of assets that are known is driven by approaches to investigation and survey as much as by what may actually be present.

In consequence, the apparent absence of designated examples of – for instance – inland shipbuilding facilities is likely to be a product of such assets not having been looked for or recognised, combined with a lack of designation if such assets are known. For many categories of asset in the Study Area it seems unlikely that there is either an absence of such assets, or an absence of assets that would meet designation criteria. That is to say, the apparent absence reflects two blind spots in archaeological approaches – in the identification of assets and in the implementation of designation – rather than real gaps in the composition and character of the historic environment. Few if any systematic thematic surveys – which would both identify assets and consider if they met selection criteria for designation – appear to have been directed towards inland waters. Notwithstanding, some of the apparent inconsistencies are not attributable only to a gap in consideration for inland waters, but to a more general variability in approaches to identifying and designating heritage assets when viewed at catchment scales. The scope for overall inconsistency needs to be borne in mind when considering each of the types and thematic groups of designated assets considered in the following section.

5.2. Transport

Bridges

Of the transport-related assets, bridges predominate:

Bridge	105	34.8%
Lock	26	8.6%
Water Management	10	3.3%
Aqueduct	8	2.6%
Tunnel	4	1.3%
Culvert	1	0.3%
	154	

From the outset, it should be recognised that the main purpose of bridges is to cross the waterway, hence they are not related functionally to the waterway itself but to whatever is crossing it – be it a footpath, road or railway. Bridges do not necessarily inform an understanding of the waterway as a means of transport, though clearly the parameters of a bridge such as the height of arches or distance between piers will have a bearing on navigability.

Even though bridges are not prompted by water transport as such, in the case of canals the creation of bridges to accommodate existing routes formed an essential element of construction: 44 of the 105 designated bridges in the Study Area are on the Kennet and Avon Canal. The fact that accommodation bridges of various types have a distinctive architectural relationship to the canal with which they were constructed may have encouraged their designation. Notwithstanding the high number of canal-related bridges that are designated, river bridges remain the most common type of designated asset in the Study Area.

Bridges are an important consideration for the archaeology of inland waters despite having only an indirect bearing on inland waters transport because they indicate interaction with the waterway potentially over many centuries, as well as considerable investment in time and resources. Bridges are historic focal points, indicating at the very least that people were present on both sides of the river. Bridges can be a focus for many waterside activities, as well as often indicating a nodal point in navigation. As bridges may constrain navigation, because they limit the width and height of vessels that can pass, so they may be a focus for measures to overcome the constraint: by stepping masts; by enabling vessels to pass in some other way; or by obviating the need to pass by transhipping to another vessel. Bridge sites may have been located originally because of the presence of a feature that also impedes navigation – the lowest practical bridging point perhaps being a shallow area or rock outcrop. As well as forming a node for transport along the waterway, the presence of the land-based transport that gave rise to the bridge also provides a node for loading and unloading to the shore. This underlines the point that although bridges are not water transport facilities, they can be very important places for water transport nonetheless.

Clearly there are many places where bridges are relatively isolated in the landscape, but equally bridges and settlements are often closely linked and combined with industrial, military and religious activities – which may range in scale from a few heritage assets to entire historic cities (such as Bristol, Bath and Reading in the Study Area). This gives rise to the potential for bridges to be a focus for heritage assets largely unrelated to transport along or across the waterway.

Reflecting the complexity that can surround bridges as features of inland waterways, there are multiple facets to what may be present below water in the vicinity of a bridge. These can be split broadly as follows:

- Material relating to transport across the water;
- Material relating to transport along the water;
- Material largely unrelated to transport.

Considering first material relating to transport across the water, in many cases the structure that is designated may be partly below water, typically the abutments and any piers together with their cutwaters. In some instances, the riverbed between the abutments and piers may also include structural material such as foundations, or ‘framing and setting’ to prevent scour near piers and abutments (Harrison 2007, 120). The remains of structures built to facilitate construction – such as timber cofferdams – might also survive. Other disconnected structures directly related to a designated bridge – such as additional piling or the elements of a swing bridge – may also be present in the immediate vicinity, together with structural material that has fallen from the bridge, such as architectural masonry.

Changes through time to across-water transport are a key source of material that may be found below water. As generally recognised (and observed on several bridges in the Study Area e.g. Staverton (LEN 1364101) (Plate 1), older bridges have often been widened either on one side or both as traffic has increased. This may have resulted in a more recent façade, but it is often the case that the original structure of the bridge is still present and can be observed and accessed from the water, as well as extending below the water.

In some cases the modification of a bridge may be even more radical. Near Dauntsey House (LEN 1199975) within the Study Area, for example, what appears to be a Medieval or Post-

medieval bridge has been modified so that its piers now carry a C20th concrete bridge (Plate 2); loose stone in the river may be attributable to the partial demolition of the earlier bridge.

Where bridges have been rebuilt or replaced rather than modified, there is potential for material from the earlier crossing to be present in the vicinity of the later bridge that is the focus of designation. Stone foundations or timber piles may have been observed, for example. The presence of multiple phases of bridge may be attested in cartographic and documentary records (Jecock pers. com.).

It should be borne in mind that a bridge may have gone out of use and collapsed and not been replaced; that is to say the presence of bridges is not confined to places where there are still bridges today. This appears to be the case at Lacock, where field observation – later confirmed by historic map evidence – showed the presence of the remains of a previously unknown bridge (Plates 3 and 4) of Post-medieval or perhaps Medieval date not far from the designated buildings of Lacock Abbey (LEN 1283853) and partly within the designated park and garden (LEN 1001236). It seems at least possible that the piers or foundations of the C14th Old Bridge at Bath – once aligned with the southern end of St. James' Parade / Southgate Street – may still be present below water (Jeremiah 2005, fig. 94–96).

A bridge may indicate the presence of other forms of crossing, such as fords or ferries. These may have preceded the bridge and been superseded; or have continued alongside the bridge in contemporary use. This appears to be the case at Barton Bridge (LEN 1364494; LEN 1005663) in Bradford on Avon, where there is a ford alongside the smaller footbridge on the south east shore. Although the boundary of the scheduled monument includes a section of the river, it does not include the ford. From outside the study area, Marcus Jecock (pers. com.) drew attention to a paved ford close to the designated C19th bridge at Gargrave, North Yorkshire (LEN 1167754), indicated by rippling water.

As well as having the potential to be present in the vicinity of designated bridges, fords and ferries may be present at places where no bridge was ever attempted. Fords require relatively shallow water and might simply be a cheaper alternative to building a bridge, being replaced by a bridge when the investment of effort becomes worthwhile, if ever. Ferries tend to be established where the width and/or depth of water – or the need for unimpeded navigation – make construction of a bridge unviable, though again technical or financial conditions may change such that bridging becomes practical. In the Study Area there are no designated fords or ferry crossings (though, as noted above, there is a ford adjacent to – but outside the designated area of – Barton Bridge). This is surprising because fords and ferries have plainly been present and are attested by placenames and cartographic sources. The lower part of the navigable Avon, for example, is highly likely to have been crossed by ferry at several points, and indeed there are references to multiple ferries in Bath before the bridges were built.

Fairly obviously, fords are likely to be represented by material that is below water – both by structural material that could satisfy the criteria for (the site of) a structure or work for the purposes of scheduling, and potentially by small finds that have been lost while transiting. In cases where fords have been removed to facilitate navigation it is still possible that remains may be present 'in section' at the edge of the river and in riverbanks. Ferries might seem less likely to be represented by material below water because they are intended to float, but some form of structure or work such as staging in stone or on piles is likely, and there is perhaps increased potential for the remains of lost or abandoned ferries to be present in the vicinity.

Material associated with transport along the water in conjunction with bridges is likely to encompass features such as jetties, steps, moorings and wharves – either for loading/unloading to land-based transport, or for transhipment. The steps immediately adjacent to Barton Bridge, for example, may be for the convenience of boat users (18 DSC0492). It is perhaps worth noting at this point that the presence of a bridge may be less of an impedance to navigation than might be assumed, as small craft – still capable of carrying large loads – can pass through even quite small arches.

Material unrelated to transport but associated with bridges can range across all the kinds of material that people may build or use in a settlement in the vicinity of a bridge, or which they might discard or lose when crossing. Bridges (and other forms of crossing) may also be a focus for votive deposits. There is potential for small finds in particular, as a bridge can be a convenient place to quickly get rid of something unwanted: diving investigation of a bridge in Ireland in which the author took part, for example, resulted in the discovery of the heavily corroded remains of a Lee-Enfield rifle and ammunition. The large collection of small finds recovered from the River Wear near the Elvet Bridge in Durham ranges from C12th to C19th[4].

Locks

Locks are the most numerous type of designated asset relating to transport after bridges and are plainly linked to navigation of the waterway. In the Study Area, the locks include those on the canal itself but also locks on the navigable rivers and associated with the Floating Dock at Bristol.

The location of locks is driven by topography and they have a single function. They need not have any connection to activity beyond the immediate vicinity of the waterway and are largely constrained in their extent. Nonetheless, the presence of a single lock or a flight of locks may become a focus for other activities; and where a lock is located near other facilities, the focus may grow. Archaeological material associated with a lock is likely to be limited to the structure of the lock itself; if it is a working lock on a canal then it is probable that the structure has been examined in the course of maintenance when the water level has been reduced or completely drained.

The potential for previously unrecorded structural material to be present below water may be greater in the case of locks on rivers. First, river locks tend to have a longer history and may exhibit more phasing, with previous phases potentially having gone out of use. Second, the scope to examine the structure outside the lock chamber by lowering the water level is much more constrained than in a canal. An example of the former – structural material from an earlier phase being present – was presented at Iffley Lock on the Thames near Oxford, where the inspection of a weir demonstrated the presence of extensive timber remains from a former lock that had been replaced by a new lock on a different alignment (Wessex Archaeology 1999)(Plates 5 and 6).

River locks may form part of quite large and complex structures. This is the case at several of the locks on the navigable Avon. Generally, river locks are accompanied by a weir down which most of the river flows; or the river takes an alternative, unnavigable route. The weir may coincide with a natural impediment to navigation such as a shallow section or outcrop, but on the Avon the weirs are usually associated with mills. That is to say, the weir creates a head of water that is transported by a leat to a mill.

[4] https://www.dur.ac.uk/archaeology/facilities_services/durhamriverwearcollection/

Lock	Mill	List Entry Number
Hanham Lock	Hanham Mills	LEN 1230936 (Cottages)
Keynsham Lock	Old Brass Mill	LEN 1384580
Swineford Lock	Swineford Copper Mills	LEN 1116761
Saltford Lock	Kelston Mills	LENs 1215014; 1288285; 1288317; LEN 1384668 (Jolly Sailor)
Kelston Lock	Saltford Brass Mill	LEN 1004607 (SM); LEN 1384676 (LB)
Weston Lock		LEN 1395660

The combination of weir and lock results in a 'lock island' between the lock and the river overspilling the weir. These lock islands may be a remnant of the natural riverbank but they may also be constructed, and in any case are likely to have required reinforcement against erosion that would prejudice the structural integrity of the lock and/or the weir. The combination of lock, weir, mill, lock island, and associated leats present a complex where the potential for structural material to be present below water appears to be high. As well as material associated directly with these complexes, they may also have formed a focal point for other waterside activity (including inns, stores, boat building etc.).

It should be noted that none of the locks on the Avon Navigation are designated other than Weston Lock, which is in any case the least complex as it effectively lies on a short stretch of conventional canal. Saltford Brass Mill is a scheduled monument, and the scheduled area appears to encompass some of the associated waterways, at least downstream. Otherwise designation is limited to listing of (parts of) the mills or adjacent buildings. The approach to protection of these lock complexes certainly merits review, not least because the improvements to the Avon Navigation date to the 1720s, whereas the Kennet and Avon Canal – which has many designated locks – dates to 1794-1810; and the weirs and leats on the Avon Navigation may be considerably earlier.

One aspect of the river locks that might be worth particular attention is the backwater behind the weir. This is an area that is not suitable for through navigation (as it leads over the weir) but which might be considered suitable for storing or hulking vessels. Vessel remains and other significant material may also find itself in the area immediately upstream of a weir as a result of flood events breaking moorings or demolishing structures. The potential for these backwaters to contain vessel remains could be explored further. Although it was not clear because of the distance, one backwater observed during a field visit contained a submerged section of timber that appeared to be shaped – though it may be a natural log washed downstream in previous flooding (Plate 7).

Although examples here are drawn from the Avon Navigation, similar points apply to the lock complexes of the Kennet river navigation, such as at Blake's Lock, Southcot, Burghfield, Shenfield (where the lock and mill are designated individually), Tylemill and so on.

Water Management

One important characteristic of heritage assets associated with inland waters is that they are multifunctional, so it can be difficult to pin them to a particular theme. The viability of inland waterways as a mode of transport depends utterly on the management of water, to make sure there is sufficient water within the system for boats to stay afloat and for locks to work. However, water management also encompasses drainage and water quality, which may not be central to transport but which are achieved using the same or similar assets. This multiplicity of functions is reflected in the designated assets from the study area that are included here as 'transport' but are somewhat broader in historical relevance.

Ten designated assets in the study area have been categorised as water management, including two main groups: assets associated with Crofton Pumping Station (LENs 1034049; 1300317; 1034022); and assets associated with Blake's Lock sewage pumping station in Reading (LENs 1113618; 1248683; 1321867). Other examples from the Study Area include weirs, pumping stations and engine houses.

The potential for structural material below water relating to water management features of the type designated in the study area is probably limited to the industrial structures themselves, which obviously include elements that are below water, including channels and outlets. There may be particular risks associated with investigating these features because of high water flows and restricted access.

Aqueducts and Tunnels

The aqueducts and tunnels that are designated in the Study Area are all associated with the Kennet and Avon Canal. These are undoubtedly highly significant structures. However, their potential for archaeology below water is probably limited to those elements of their own structure that are beneath the water and which are – as they form part of the canal – capable of being accessed when water levels are reduced or drained entirely for inspection and maintenance.

It is worth noting, perhaps, that only the portals of the Bruce Tunnel, near Savernake, are listed – not the tunnel itself (LENs 1194523; 1035927).

Culverts

In contrast to aqueducts and tunnels, which are striking architecturally but perhaps of moderate interest archaeologically, culverts are practically invisible but potentially of great archaeological interest.

Only one culvert is designated in the Study Area, that over the Holy Brook in Reading (LEN 1321866), which is graded II*. The culvert was surveyed in connection with development-led work in the 1980s. One section of the culvert was thought likely to be of C16th date and is built of re-used C12th and C13th stonework, including both decorated blocks and mason's marks. This stone was thought to have been derived from Reading Abbey following the Dissolution in 1539. It was noted that it was 'impossible' to investigate the floor of the Holy Brook within the culvert, which was below water (Farwell, 'Bridge Street West (W122) in Hawkes and Fasham 1997, 53–55).

Other instances of significant culverts have been highlighted in the course of this project. Specifically, Nigel Baker has drawn attention to his kayak-based investigation of culverts under Bristol, which include the identification of the arches of Medieval bridges that have been 'encapsulated' by construction of the culvert (Baker pers. com.). Claire King drew attention to a desk-based study of a complex of culverts under the Old Abingdon Road in Oxford, with multiple phases dating back to the Medieval period. The report raised the possibility that investigation of the smaller culverts might require inspection by archaeological divers (Jacobs Babtie 2006). The culverts were scheduled in 2012 (LEN 1408790). English Heritage staff have also highlighted the presence of urban culverts, citing an example from Leeds[5] where stonework channels were built in the Nineteenth Century

[5] http://www.secretleeds.com/forum/Messages.aspx?ThreadID=2958

along the routes of earlier becks (streams). Although some of these conduits were subsequently built-over to form buried culverts – incorporating bridges into their structures – other sections of conduit are still open. The network of artificial waterways presents a fascinating insight into the earlier geography of the city and to the complex phases of urban development.

Constructional elements of culverts – which may be of considerable age – will lie below water; they are unlikely to have been observed or recorded previously. There is also potential for material such as small finds to be located within the base of a culvert. If, as Baker suggests, earlier bridges have been incorporated into a culvert then the same comments relating to bridges also apply to culverts.

The National Heritage List returns 61 instances of designated culverts (but not the Holy Brook culvert). Most of the designated examples form part of wider complexes that have been designated and are related to canals, works or ornamental water features, for example. The survival, distribution and significance of culverts warrants further attention, especially where they are – in effect – old waterways that have been covered (especially in urban settings), not simply constructed channels serving other facilities.

5.3. Domestic

The designated assets grouped as 'domestic' are dominated by houses, but these have different relationships to the water. In some cases it is just a matter of proximity. In other cases dwellings have been built to service the waterway, as is the case for lock keepers and lengthsmen. At the other end of the social scale there are several manors and mansions in waterside locations, and farm complexes also. In these instances, there appears to be a history of waterside settlement reflected in the presence of a designated house subsequently, and it is really the history of waterside settlement that is of note rather than the designated building.

The chronological range within the Study Area of designated sites of domestic settlement at waterside locations is broad: as well as Post-medieval inns, cottages and town houses there is a range of medieval settlements, including moated sites. There is a scheduled Early Medieval / Saxon settlement on the Sherston Avon near Cowage Farm (LEN 1018389), which includes 'an earthwork, interpreted as a substantial platform 25m long and 15m wide overlooking the river'. There are three Roman sites that are scheduled: a villa at Littlecote on the Kennet (LEN 1003256); the Black Field site on the Upper Kennet near Mildenhall (LEN 1004726); and the settlement at White Walls Wood where the Fosse Way crosses the Sherston Avon (LEN 1013354). There are no instances of designated prehistoric settlements adjacent to rivers in the Study Area, but it should be recalled that the major area of prehistoric activity around Avebury on the Upper Kennet has not been included here.

The potential for archaeology below water in the vicinity of domestic settlement is probably quite high. Where a dwelling such as a cottage or house has been constructed close to the waterway for purposes connected with the waterway then there may have been access to the water by steps or a jetty for example, which might only be apparent from structural remains now below water. A certain amount of domestic refuse might also be expected. More extensive and significant remains might be present in the vicinity of more extensive waterside settlements indicated by farmsteads and manorial sites for example. The choice of a waterside location is unlikely to be accidental, so evidence of direct means of using the waterway – jetties, minor wharfs – might be expected to be present below water, as well as discarded material and deposits of palaeo-environmental relevance. The potential may be

even greater where there is some degree of integration between the principal waterway and waterways connected to the settlement – as at moated sites. There may also be potential for the remains of watercraft.

In the cases presented by the Early Medieval site near Cowage Farm and the Roman sites at White Walls Wood and Black Field it is difficult to gauge what may be present below water. At White Walls Wood and Cowage Farm the present river actually forms the boundary to the scheduled site, though it is unclear whether this reflects the results of investigation into the extent of significant remains, or relates instead to administration or ownership. It seems unlikely that human activity would have been restricted to just one side of the waterway (indeed the White Walls Wood site is a road crossing); but it is possible (if perhaps unlikely) that subsequent movement of the waterway may have caused erosion up to the line where the river now stands. Understanding the form of the waterway in the period each settlement was occupied is likely to be a key concern in gauging the contemporary relationship with the water and the potential for archaeological material relating to the settlements to be present. It is certainly conceivable that there might be structural, artefactual and palaeo-environmental material present, bearing in mind the favourable preservation environment presented by fresh water. Nor can it be assumed that any material in a waterway will have been washed away: this is a conclusion that can be reached only on the basis of evidence, not conjecture.

At Cowage Farm, White Walls Wood and Black Field the waterways are relatively small. Indeed the point at which the Fosse Way crosses the Avon at White Walls Wood is very shallow and has clearly been 'tidied up' so the relationship between the river and both the Roman road and settlement is obscure. Whether there are remains below the riverbed, on the margins, upstream or downstream is unclear. The waterway at Littlecote is larger, but the waterways in the valley have been heavily modified so it is unclear whether the part of the river on which the villa now stands is contemporary with its use.

The potential for archaeological material in water in the immediate vicinity of settlements indicated by designated assets merits close attention. The relationships between scheduled areas and adjacent rivers – especially where these have been used to form a boundary to the scheduled area – also require careful consideration.

There are nine registered parks and gardens close to the water within the Study Area. The parks may contain evidence relating to the waterway prior to creation of the park, because of their capacity to preserve landscapes relatively unchanged: conversely, creation of the park may have involved extensive modification of the waterway, as well as altering access upstream and downstream. If there was an earlier settlement present – as might be indicated by a surviving country house – than the general points about settlements made above will be pertinent. Where a park includes constructed water features, then elements of these features that lie in the water should also be investigated. Such investigation may reveal details of earlier phases of the park, its means of construction; and any preceding features of the landscape; as demonstrated by the Nautical Archaeology Society's investigations in the Great Lake at Stourhead (McKewan 2006).

There is one instance of a designated baths adjacent to the river: Cleveland Baths near Bathavon (LEN 1396146). This appears to be quite an unusual facility so it may not have many parallels elsewhere. The baths are set back from the river and it is likely that the potential for archaeological material below water is limited to any structures associated with water management for the pool.

5.4. Mills

Twenty six designated assets in the Study Area have been categorised as mills, including instances where the presence of a mill is indicated by the name of a designated site even if there is no mill present. Several comments have already been made about their potential in connection with the lock and weir complexes on the Navigable Avon and Lower Kennet. As the examples from the Avon showed, waterside mills may be industrial in character rather than agricultural, used in the processing of brass, copper, paper and so on as well as grain.

There are many more mill sites in the Study Area indicated by placenames or the general topography shown on modern maps than are represented by designated assets. The very heavy modification of the River Kennet throughout its length and of the Avon at many locations – with numerous leats and channels leaving and rejoining the 'main' river – points to extensive use of both rivers for milling[6]. In terms of the likely presence of material below water, it has to be recognised that the potential for structures (and indeed artefacts and deposits) is not limited to the immediate environs of a mill but extends to all the waterways that would have been used to regulate its flow. The complexity and interconnectedness in some areas is such that the mill sites plainly need to be seen in terms of an overall system, within which the potential for structural and artefactual material below water may be locally high. As noted earlier with reference to locks, there is a very close relationship between mills and weirs, used to create a head of water. Weirs can serve multiple purposes, but where they are integral to the operation of a mill they merit consideration alongside the mill itself. In addition to weirs, the sluices and hatches used to regulate flow and other aspects of milling such as associated wharves, jetties and even boat remains may be illuminated by material under the water.

The designations relating to mills in the Study Area are all listed buildings, except for Saltford Mill – mentioned above – which is also a scheduled monument. The scope for listing to adequately encompass even the features of a mill that are above the water may be questionable; certainly, the potential for material below ground and below water even in the immediate environs may be not be adequately captured by listing. There would seem to be a need, moreover, to be able to capture the leats and water management features that are intrinsic to mills within protection; and to extend this protection to extensive and complex landscapes in some cases. It is understood that these avenues are being explored through other English Heritage projects (EH 6313 Watermill Landscapes: national contextual overview), together with the development of methodologies for enhanced recording of watermills (EH 6153 Pilot Assessment of Watermills and Water Supply Systems (Herefordshire)). It would clearly be advantageous for the below water aspects of mill sites and mill-related features to be considered in these other projects. It has been helpful already for one of these projects to highlight the survival below water of the foundations of mill-related weirs and even the footings of a demolished watermill at Hampton Bishop on the River Ludd (Stoyel pers. com.).

5.5. Trade

Trade has been distinguished here from transport to highlight designated assets relating to the specific activity of exchanging goods. As commented in respect of types of asset, it is perhaps surprising that for a system principally driven by trade – both by canal and by navigable river – relatively few assets are designated. Again, the number of designations is unlikely to reflect the number of surviving assets or their significance in understanding the history of the catchment. The suspicion that the pattern of designation does not reflect

[6] It is evident that modifications for watermeadows and other purposes may account for some of the complexity.

presence or significance is heightened by the very uneven geographical distribution of assets categorised as trade: of 23 designations, 16 relate to wharves and quays in the Floating Harbour at Bristol. The whole of the rest of the system is represented by seven designated assets: including just two cranes, a wharf and an industrial canal-side building on the whole of the Kennet and Avon Canal. Given that the primary purpose of the canal was trade, this is quite staggering.

The range of sites that fall within this 'trade' category is potentially very broad, though this breadth is not reflected by assets designated in the Study Area. The designated quays and wharves of Bristol's Floating Dock are part of the complex associated with the port of Bristol. Other much smaller settlements on the waterway can be expected to have had similar facilities, but on a scale appropriate to their size unless dictated by other circumstances (the need for transhipment at a bridging point, for example). Settlements at a distance from the waterway may have evolved specific wharves as satellites; this is apparent with the introduction of the Kennet and Avon Canal within the Study Area, where a separate node of activity has arisen at Pewsey Wharf, for example. Similar arrangements may have arisen prior to canal building, as a consequence of improving river navigations or more generally as a means of reconciling a settlement with its focus away from the river reconciling itself with the facilities the river presents. In some instances, an opposite tendency may be apparent as the focus of a settlement seems to have migrated away from its waterfront as trade presumably switched from the river to land-based modes of transport. This seems to be the case at Christian Malford, which has a riverside church (LEN 1199647) but where the focus of more recent settlement is away from the river.

Some waterfronts are not associated with a settlement, often reflecting a specific industrial concern as a 'new build'. Designated examples from the Study Area include Avonside Wharf near Keynsham (LEN 1116799) and Murhill Tramway and Wharf near Winsley (LEN 1004693). Assets associated with trade may also be on a much smaller scale, such as wharves and jetties associated with individual farmsteads. Water gates – access points with a specific passage, gate or doorway – such as the designated example at Bradford on Avon (LEN 1300088) might also be regarded as falling in this category.

In terms of archaeology below water, the potential for material to be present at trade sites can be expected to be high. Plainly, wharf structures extend below water: they may have multiple phases and remnants of related structures such as jetties and mooring posts might be anticipated. Perhaps of greatest interest, however, is the likely presence of debris from loading and unloading, which can provide direct insight into the activity and economy these assets represent. The scope for material from below water to inform historical understanding is hinted at by the description of some of the designated assets in Bristol's Floating Harbour:

Quay Walls of Mud Dock	LB II	1202622	'Probably the oldest surviving of the inlet docks of the tidal harbour preceding the Floating Harbour; also known as the Great Dock'
The Grove Wharf Extending approximately 200 metres between Redcliffe Bridge and Mud Dock	LB II	1282053	'An important quay since the C13th'
Welsh Back Wharf Extending approximately 450 metres between Bristol and Redcliffe Bridges	LB II	1202676	'one of the 3 city quays, and an important quay since the C13'

Obviously, the potential for artefactual material – for example – to be present in stratified deposits in the vicinity of these quays will depend on the subsequent history of the waterway, especially of dredging. But numerous instances have shown that even where dredging has taken place it tends to be partial and often leaves some deposits of archaeological interest in place. As with natural erosion, the absence of archaeological deposits has to be demonstrated rather than assumed. Investigations of wharf sites elsewhere have recovered extensive sequences of artefacts indicating the history of trading.

Most investigations of early waterfronts in the UK have been 'dry side' excavations where successive waterfronts have been built forward into the waterway, preserving previous phases within the made up layers of quayside reclamation. Such instances are important for considering the potential of wharves in inland waters. On the one hand, they serve as a reminder that a wharf known from the Post-medieval or Modern period may not reflect the alignment of an earlier wharf, which may in fact be some way back from today's waterfront. Arguably, the scope to build forward on inland waters may be more constrained than in coastal or harbour setting, so phasing might be represented by rebuilding along the same line rather than a parallel succession. Also, investigation of buried waterfronts indicate the potential and significance of waterfront material below water: structural, artefactual and palaeo-environmental. Within the Study Area, the excavations of Reading waterfront (Hawkes and Fasham 1997) underline the fact that highly significant waterfront deposits are not restricted to coastal ports: inland waterfronts deserve equal consideration.

5.6. Religious

The relationship between designated assets categorised as religious and waterways is complicated and difficult to apply consistently. In some cases there is likely to be a functional relationship between the water and a religious site: the six instances of monastic sites near a waterway within the Study Area probably reflect the practical needs of these sites as much as their religiosity. These major sites include Reading Abbey (LEN 1007932), Lacock Abbey (LEN 1001236) and the grange and tithe barn at Barton Farm (LENs 1184239 and 1014813). Examples of smaller waterside monastic sites include Estcourt Grange (LEN 1154751) and Clatford Hall (LEN 1284448).

In other cases, the relationship with water is probably spiritual, at least in part. Ten churches have been flagged as close to the water in the study area, and two barrows (LENs 1012262; 1012294). Even an outline of the place of water in Christian and non-Christian spirituality is well beyond the scope of this report. Hopefully it is sufficient to state that where an asset with a religious or spiritual aspect is located near inland waters, this proximity should be examined expressly: both in terms of understanding the position and use of the asset; and in terms of the potential for material remains – including non-structural remains such as votive deposits – adjacent to and in the water. That is to say the selection of a site for religious purposes may be attributable in part to the specific details of its waterside context, and there may be material attributable to religious practice – offerings, access for baptisms – in the water itself.

Even where a spiritual connection to the waterway might be assumed, practical reasons may also be important in a religious asset. A church may have been established at a settlement that grew up on the waterside or at a crossing point, for example, rather than because of a need to place the church near the water as such. Hence, even if a religious site near the water does not point to a spiritual connection, it may indicate a broader archaeological potential that should be addressed. Particular attention appears to be warranted to the parish churches of riverine settlements on the rivers Kennet and Avon because of the

apparent relationship between the river and the church. Specific examples include Christian Malford (LEN 1199647) and Great Somerford (LEN 1022516) on the Avon, and Mildenhall (LEN 1365445) and Avington (LEN 1365445) on the Kennet.

Although to some degree the existence of a significant relationship between church and river is protected by the designation of these churches as listed buildings, the description accompanying designation is concerned primarily with the architectural significance of the building itself (and – in some cases – adjacent grave markers), not of its location. Other than providing a degree of protection for setting, the listing of churches will not provide any protection for any associated archaeological remains in the vicinity of the river or in the river itself. The relationship between rivers and churches is of concern therefore in terms of management and protection, as well as of seeking a better understanding of the historic environment.

5.7. Military

The identification of a military theme encompasses widely varying types and periods of site. Despite this breadth there is a key commonality, which is that the presence of a river impedes the movement of land-based armies. This impediment can be reinforced – hence rivers have been a focus for adjacent fortification from prehistory to the Modern period. The assets categorised as 'military' include an Iron Age camp at Tetbury (LEN 1003421), four castles, and eight WWII pillboxes. As rivers impede armies, achieving a crossing is important and may be strongly contested, hence rivers may be a focus for engagements – represented in the Study Area by the Battle of Newbury, 1643 (LEN 1000026).

The significance of rivers in strategic terms may be such that the waterway itself is a feature of a broader military landscape. The Study Area encompasses key elements of the General Headquarters (GHQ) line, which was the longest and most important of the 'stop lines' designed to delay any German invasion in 1940-41. Both the River Kennet and the Kennet and Avon Canal formed 'Stopline Blue' from Reading (where it met the Thames – 'Stopline Red') to near Melksham, where it met 'Stopline Green' around Bristol, formed in part by the River Avon up to Chippenham, Malmesbury and Tetbury. By no means all of the remaining pillboxes and associated military features of the stop lines in the study area are designated, nor can it be assumed that waterside pillboxes will automatically meet criteria for designation. Nonetheless, there appear to be some disparities: pillboxes on the River Kennet are well represented by seven designations; but only one of the pillboxes on the Kennet and Avon Canal is designated. None of the pillboxes of Stopline Green on the Avon are designated, though one pillbox appears to fall just outside the boundary of the scheduled monument at Barton Bridge.

Although they were a focus of activity in the early part of the Second World War, the stop lines were never used for their intended purpose (fortunately). The defensive attributes of the waterways – as well as of the pillboxes and other installations – forms part of the story of the defence of Britain in the 1940s and is significant for this reason. However, the potential for any archaeological material associated with this military activity seems likely to be restricted to stray finds at most[7].

[7] I'm not aware of any planned or actual modification of the waterways themselves to add to their attributes as defences. Inland waters were a key element of transport (alongside road, rail and coastwise shipping) during WWII so it seems unlikely that any modification that would compromise navigation would have been put into effect (Savage 1957).

The potential for archaeological material associated with earlier military structures to survive under water is probably greater than for C20th defences. Specifically, the description of the scheduled monument protecting the riverside Motte at Great Somerford (LEN 1013224) notes that 'the importance of the site is enhanced by the likelihood of the survival of below-ground waterlogged and organic remains, as a result of its location on the floodplain of the River Avon'. Although the reference is to remains below-ground, the point about potential also holds for remains 'below-water'. As with other forms of site, the relationship between earlier defended sites and waterways is likely to be multi-layered and complex, taking in aspects of settlement, local administration and the maintenance of boundaries as well as the immediate defensive functionality of the watercourse.

Although structural remains are unlikely, it is possible that artefactual material may have been deposited in the River Kennet in the course of the Battle of Newbury. The main part of the registered battlefield (LEN 1000026) lies to the south of the river.

5.8. Shipbuilding

As noted above, the building and repair of boats and ships is poorly represented in the Study Area. All four designated assets in this category are within the Floating Dock at Bristol, and are associated with sea-going ships: the building and repair of inland waterway vessels is unrepresented.

It is also worth noting that all four designated assets associated with shipbuilding are situated on Spike Island, which is the 'island' formed in the early C19th between the Floating Harbour and the New Cut up to Bathurst Basin. The bank of the Avon that became Spike Island was largely undeveloped before the Floating Harbour was constructed, so the potential for archaeological material below water associated with the shipbuilding sites is limited to the Modern period. Nonetheless, some elements of the designated assets are situated below water. A brief archaeological diving inspection in the vicinity of Great Western Dock (LEN 1025026), which was built expressly for the building of the SS Great Britain, enabled observations to be made of the structure of the mouth of the dock. The diving inspection also locating timber piles that appeared to predate the dock, and brick wasters that were presumably associated with an earlier brickworks at the site (Wessex Archaeology 1998).

It is clearly not the case that there are no significant sites associated with the building and repair of boats and ships on the rivers Kennet and Avon, or on the Kennet and Avon Canal. For example, historic photographs show the boatbuilding sheds at Honeystreet wharf, where the Harriett – now a scheduled monument at Purton (LEN 1021451 – see below) – was built (Berry 2009, fig. 88–91). Where such sites survive, they are highly likely to have structural elements – as well as artefacts and perhaps deposits of palaeo-environmental interest – that are below water. As well as sites directly concerned with building and repair, ancillary facilities such as timber yards and ropewalks might be anticipated, and these too may have associated material that is below water.

5.9. Heritage Assets not represented by Designations in the Study Area

There is a series of asset types that might be reasonably be expected to be associated with inland waters but which are not represented by designations in the Study Area. Echoing points made earlier, these absences may be attributable to approaches to designation, approaches to site identification, or to genuine absence amongst heritage assets that have survived in the Study Area.

Vessels

There are no instances of vessel remains being designated in the Study Area. Indeed, there are very few instances where the remains of vessels in inland waters have been designated across the whole of England[8]. This is surprising given that waterways within the Study Area – and throughout England – were clearly navigated by a great variety of inland craft (Paget-Tomlinson 2006, 217–278), and inland craft would be highly significant to understanding the history of transport, trade, communication and so on in multiple periods.

Vessels that would have been used on inland waters are quite numerous in the National Register of Historic Vessels (NRHV), including its core collection, known as the National Historic Fleet. Smaller vessels that would have been used on inland waters can be found in the National Small Boat Register. Vessels in preservation are predominantly of relatively recent date: none of the cargo vessels in the NRHV date earlier than 1850. Many of the vessels in the NRHV are narrowboats and barges, including some types that were distinct to a region or particular waterway. Of particular interest to the Study Area is the Harriett, which is a Kennet Canal Broad Beam Barge built in 1905[9], but which has been hulked at Purton on the River Severn, where it became a scheduled monument (LEN 1021451). Emphasising the earlier point about shipbuilding in the Study Area, the Harriett was built by Robbins, Lane and Pinnegar of Honeystreet, Pewsey.

Although vessels in preservation clearly provide insight into the history of inland waterways, it should be borne in mind that their age range is relatively constrained and – having continued in use – their character is not necessarily that of their original usage. Aspects of a vessel in an archaeological context – such as the presence of cargo, small finds contemporary with the vessels use, and deposits of palaeo-environmental interest – are all absent in the case of vessels in preservation. The lack of designated examples of vessels used in inland waters is therefore a major gap in the representation of England's historic environment.

Vessels used in inland water have certainly been found in the UK: sometime in an estuarine / intertidal context; sometimes within reclaimed ground; but also submerged and/or buried in inland waters. The date range for such vessels is very broad: many of the prehistoric, Roman and Medieval watercraft discovered in the UK have been found in inland contexts[10] or would have been suitable for navigating inland waters. There is no reason to conclude that inland watercraft are absent as a type of heritage asset from under England's inland waters.

Instances where vessels are situated or have been found underwater in England include the remains of barges and wherries in the Norfolk Broads[11] and 'an ungainly log-jam of 21 barges and narrow boats … exposed after drainage work on a 200-year-old tipping basin at

[8] A search of the National Heritage List for 'wreck' or 'watercraft' other than designated wrecks gives just three returns: the unexcavated remains of the Roman vessel at New Guys House (LEN 1001979); Abbeydale Works (1004822), for which the reason for being returned by the query is unclear; and the Harriett, discussed later in the text.

[9] http://www.nationalhistoricships.org.uk/register/2347/harriett

[10] For a recent example see http://www.bbc.co.uk/news/uk-england-norfolk-23526192

[11] Some of which seem to have sunk after having been used as anti-invasion defences to prevent German seaplanes from land in WWII – see http://the-norfolk-broads.co.uk/viewmessages.cfm?Forum=22&Topic=16262.

Worsley, near Manchester'[12]. Vessels are likely to be found below water either because they have been lost accidentally by some form of 'wrecking' incident, or because they have been discarded or 'hulked' in the water. Noting that many vessels have actually been found in the ground in areas that have been reclaimed or silted up, it is also possible that vessel remains might be found in a riverbank or river bed as a result of erosion, having originally being lost through some other circumstance. Where they have been hulked, vessels may occur singly or in large groups as an assemblage. A few instances of hulk assemblages in inland waters were recorded as part of EH 5919 Hulk Assemblages projects: assessing the national context (Davies 2011; Pett 2013). Although many of the assemblages are far from the sea[13], they are in fact in tidal water and therefore beyond the scope of this project. Some of the inland assemblages appear to be in waterways that have since been filled-in (e.g. Old Port Basin, Chester[14]) but Sutton Locks on the River Weaver near Runcorn clearly contains some vessels that are still below water[15].

The potential for remains to be found under inland waters would appear to be quite high, the lack of examples reflecting only that they have not been a focus of investigation or survey. The possible location of vessels lost accidentally may be difficult to predict, but the evident propensity to hulk inland craft indicated by the few examples above might suggest that unnavigable waterways that are close to navigable waterways might have been an attractive place to dispose of (or at least store) unwanted vessels. It is this possibility that prompted the observations about the potential of backwaters behind weirs, discussed above. In addition to disused locks and weirs – illustrated by Sutton Locks – attention could be directed to meanders cut from the waterway by river improvements. These have the additional advantage that once removed from the navigable waterway, such meanders are unlikely to have been navigated and therefore unlikely to have been dredged or to have 'wrecks' removed. Their potential for the presence of surviving vessel remains might be higher as a result.

A scenario along these lines is suggested by the St.Aidan's assemblage of up to eight vessels found in the River Aire near Methley, Castleton (Buglass n.d.). The River Aire is accompanied by the Aire and Calder Navigation Canal. In this section the river had been improved by a section of canal known as the Methley Cut. The banks of the River Aire failed in 1988, causing the immediately adjacent open cast mine to flood. When the banks of the Aire failed it had the effect of draining the river, revealing the remains of various boats. It took a decade to bring the coal mine back into production, which involved building a new waterway that incorporated the old river into the canal. Fieldwork was carried out in the late 1990s to record the boat remains prior to the line of the old river being incorporated into the open cast mine.

Most of the vessels appeared to have been abandoned, as their fittings had been removed; they could be disposed of in the river because navigation now followed the Methley Cut. One boat may have been lost by accident, as it contained a cargo of coal and domestic artefacts

[12] 'Basin yields scuttled riches'. The Guardian, 3 May 1991 reprinted in Nautical Archaeology Society Newsletter 1991 (2): 4. NB. This may be the Boothstown assemblage noted in EH 5919 in the following text.

[13] Clearly, many of the assemblages contain the hulks of vessels that would have been used in inland waterways, even if they were disposed of in tidal waters.

[14] And see http://www.chesterwalls.info/towerwharf.html regarding excavation of 10 buried vessels in North Basin, Tower Wharf Chester in winter 1998.

[15] https://maps.google.co.uk/maps?q=sutton+level+locks,+cheshire&hl=en&ll=53.300848,-2.688534&spn=0.001502,0.00394&sll=53.301986,-2.591916&sspn=0.768967,2.017365&t=h&hq=sutton+level+locks,&hnear=Cheshire&z=19

likely to have been used by the crew, though some aspects of the site were such that intentional abandonment could not be ruled out. Most of the vessel remains were boats of about 55 x 12 ft, intended to fit the locks on the navigation. They appeared to date to the period 1750-1820 and were clinker-built in the lower portion of the hull and carvel from just above the turn of the bilge to the gunwale. The boats may have been moored close to a nearby drydock before sinking. In addition, a large intact rudder was found from a coasting vessel of 120-150 ft in length.

Interestingly, some of the remains had been impacted by previous work in the river (Buglass n.d.):

> At some time the river had been dredged and widen [sic] by the use of a long reach excavator which had encountered the remains of at least four vessels lying just down stream of the lock …. The machine, in trying to carry out the work on the river, had broken up the boats and attempted to pile the remains up, still in the river but out of the way. This resulted in a 3m high, 10m long mound of boat fragments ranging from almost complete sides to individual planks that had acted as a debris trap for years of sediment and rubbish washing down stream.

This example might suggest that even where a waterway is known to have been dredged, it need not preclude the continued presence of significant archaeological material; it may have simply have been dragged out of the way of the channel whilst staying underwater.

Aircraft

It is worth noting briefly that the remains of air crash sites may be found in inland waters. Large sections of aircraft wreckage have been found in waterbodies such as lakes in England (as noted in the Introduction[16]). It is conceivable that substantial sections might also survive in the larger rivers. However, it seems more likely that aircraft remains below water will generally be limited to smaller items from the debris field where an aircraft has crashed on the river bank or close by. Instances of aircraft crashing actually within a waterway are known from tidal rivers and from rivers outside England, but the instances from England appear to be mostly air crash sites situated close to rivers, with which riverborne debris might be associated. For example, a Beaufighter crashed close to the river at Edenbridge in Kent in 1940[17]; a Wellington crashed into a river (possibly the Avon?) at Wellesbourne Mountesford near Warwick in 1942[18]; and a Whitley struck a cable across the River Ure at Givendale, Ripon, crashing in a field next to the river[19].

Fishing

An activity intimately related to water but for which there are no designated remains in the Study Area is fishing. Again, this reflects an apparently low level of designation for assets associated with river fishing nationally. A search of the National Heritage List against the Monument Type 'Fish Trap' provides only one return: the salmon coops on the River Eden near Carlisle, which are a listed building (LEN 1087677). 'Fish Lock' also returns just one asset, on the River Tees at Low Dinsdale, near Darlington, which is also a listed building (LENs 1185926, 1190641 (duplicate list entries)). 'Fish Weir' returns five assets, but these

16 http://www.thewestmorlandgazette.co.uk/news/10141805.Will_Wastwater_give_up_its_watery_secret_of_three_lost_WW2_airmen__Divers_plan_return_to_lake_in_hunt_for_answers_into_aircraft_missing_67_years_/?ref=nt

17 http://www.edenbridgetown.com/in_the_past/beaufighter_story/

18 http://www.aviationarchaeology.org.uk/marg/crashes1942.htm

19 The field in which the aircraft crashed is thought to have been removed by gravel extraction, but any remains in the river may still survive – see http://www.yorkshire-aircraft.co.uk/aircraft/yorkshire/york41/z9145.html

are all coastal, as are most of the assets returned by searching against 'Fish House'. There are, however, a few assets classed as fish houses that relate to river fishing: two on the River Severn connected with salmon fishing at Minsterworth (LEN 1091352) and Elmore (LEN 1393691)[20]; and the C17th house of Charles Cotton – friend of Izaak Walton – on the River Dove in the Peak District (LEN 1188084), which underlines the point that angling has a material heritage also. In addition, there is a C18th weir and salmon ladder near Linton-on-Ouse, Yorkshire, which is a Grade II* listed building (LEN 1293712).

Undoubtedly there are many more fishing-related heritage assets in inland waters (leaving aside enclosed water such as fish ponds) than evident in the National Heritage List. Even examples that are designated – such as the salmon coops on the Eden, the fish lock on the Tees and the weir and salmon ladder on the Ouse – plainly have elements that are below water. Other examples that are of sufficient significance to warrant designation seem likely to be present; and it is to be expected that some examples may survive only as the remains of structures that are largely or entirely below water.

The examples above are all stone-built, but wood and other materials will have been used in riverine fishing – especially timber. English Heritage's Introduction to Heritage Assets on River Fisheries and Coastal Fish Weirs (English Heritage 2011a) is concerned with 'passive' fishing (using various forms of trap) rather than active fishing where the fisherman has to be present all the time, and most of the examples are drawn from the coast or tidal rivers. However, reference is also made to river weirs and to various forms of baskets and barriers. The Introduction to Heritage Assets notes that the archaeological evidence for some riverine fishing may be 'circumstantial and open to alternate interpretation, consisting perhaps of no more than a single pole or a suggestive arrangement of pegs or stone weights'. In other cases, riverine fish traps may comprise much more substantial timber remains. For instance, Baker has photographed the fish weir on the River Severn at Preston Boats, near Shrewsbury, which includes mid-channel structures that are only accessible by water. His photographs show large timbers (as well as smaller wooden elements) together with stonework. He notes that the weir survived until about 1914 but dates back to the Medieval period (Baker pers. com.).

The Introduction to Heritage Assets notes that fish traps may have been in use in England from the Mesolithic onwards, with the remains of estuarine traps having been found on the Isle of Wight and in the Humber from the early 4th to 2nd millennia BC. Evidence of prehistoric and Roman fishing have been found at other locations; and striking Medieval examples have been excavated from the former channels of the River Trent at Hemington (Cooper 2003).

It is worth noting that assets representing fishing activity may survive in a degraded state in rivers because of actions taken to remove them to enable navigation. The potential conflict between people operating fixed fishing-related structures and people engaged in transport is widely recognised and gave rise to extensive documentary evidence relating to legal cases. Where navigation prevailed and a fishing-related structure was removed, it is likely that only sufficient was removed to enable boats to pass: remains are likely to survive at and below bed level, and on the margins of the channel. Echoing a point about the effect of navigation improvements cutting across the natural course of rivers, the scope for fishing related structures to survive in relatively complete condition within backwaters would seem to be quite high.

[20] Though strictly, these relate to lave-fishing which is a tidal method and therefore outside the scope of this study.

The scope for riverine fishing-related assets that are associated with monastic sites probably warrants specific attention.

Drainage

The presence of designated heritage assets in the Study Area that are associated with water management has been touched on in relation to transport, above. The principle examples were pumping stations associated with maintaining water in the navigable system, and water quality. There appear to be no designated assets associated with facilitating and manipulating drainage in the Study Area. Again, this may reflect an overall paucity of designation of these types of assets nationally – though the plethora of terms under which drainage-related assets might be classified is so wide as to make comprehensive searching difficult.

Examples nationally of designated drainage-related assets include two sets of hatches (to control the flooding of water meadows) on the River Avon near Amesbury, which are listed buildings (LENs 1131066; 1182695). The water meadow near the Thames at Oaksey is a scheduled monument (LEN 1019729). Water management features associated with water meadows are also included within the scheduled monument at Little Carlton medieval village in Nottinghamshire (LEN 1019870), and within several other scheduled monuments (e.g. LENs 1019411; 1019410; 1019393) but these are principally earthwork remnants of water meadow features and do not necessarily include drainage-related structures in extant watercourses.

A search of the National Heritage List against the type 'weir' returns 147 designated assets. Some of these might be regarded as having a role in the management of drainage, but weirs can serve many (and multiple) purposes – hence the examples already referred to which provide a head of water to mills and/or an overflow for locks. Many of the designated weirs have a decorative or designed landscape function, or are associated with canals. Examples whose principle purpose appears to be to manage downstream drainage (rather than creating a head of water for a mill etc.) include Kirkthorpe Weir and Sluice Gates on the River Calder (LEN 1200709) and Stony Weir on the River Frome near Wool (LEN 1304599). Further consideration of weirs in the context of designation is certainly merited, taking into account their variety of functions and the apparent under-representation of weirs as elements of mill sites.

A similar search against the type 'sluice' returns an even higher number: 228 designated assets, though with considerable overlap with the assets returned by the search on 'weir'. Again, features associated with creating a head of water for mills etc. predominate, but there are also examples where managing water downstream appears to be the main driver (e.g. the sluice house and eel trap near Salisbury (LEN 1334951)).

As with many of the assets discussed in this report, some of the structural elements of water management features are below water level. Other structures, artefacts and deposits that are associated with drainage-related assets may be found below water. An example is the sluice investigated by Wessex Archaeology at Langport, Somerset (Wessex Archaeology 2006)[21]. It should be noted that an individual drainage-related asset may not seem especially important in itself, but it could have a role in a wider system that is considered to be significant historically.

[21] http://www.flickr.com/photos/wessexarchaeology/tags/langport/

The apparently low level of designated assets relating to drainage and the management of watercourses (other than for transport, mills or designed landscapes) is again surprising[22]. It seems unlikely to reflect an absence of such structures in England, or a lack of significance. With the interest in removing features that may obstruct drainage or the movement of fauna, drainage related assets might be considered to be at particular risk.

Waterways

As noted previously in respect of mills, in many case the whole pattern of watercourses has been heavily modified by human activity. This is self-evident in the case of canals: they are artefacts built by people. The same is also true of many of the improvements to river navigations, which are effectively just short canals constructed to cut out meanders. Substantive modification of river channels is much more widespread than river improvements in the C17th and later, however, and Rhodes suggests that 'we should be very cautious of characterizing the pattern of channels in any British river as "natural"' (Rhodes 2007, 140) (emphasis added). Whilst the effects on rivers of sediment inputs attributable to farming since the Neolithic can be set aside as 'unintended', in most other respects human interventions with respect to watercourses are intentional. That is to say, in many cases – even perhaps most cases – watercourse in England have been constructed. Watercourses themselves ought to be regarded as heritage assets.

It is notable that although many of the features in the Study Area that are associated with the Kennet and Avon Canal are designated, no section of the canal itself is designated despite its self-evident significance as a built feature. Even if a highly selective approach were to be taken, only picking out sections of the canal itself that retained special features or a high level of integrity in terms of its original construction, specific recognition of the significance of the canal in heritage terms would be worthwhile.

The same observation applies in respect of constructed sections of river. Consideration should be given to formally recognising the significance of whole sections of rivers and watercourses that have been constructed, contributing to a greater awareness that rivers in England cannot be assumed to be natural.

Where a canal, river or other watercourse has been constructed it is likely that some elements of its structure such as lining material or campshedding may survive below water. Investigation of the underwater sections of rivers and canals may help establish the character and chronology of human intervention, especially for watercourses modified in the C17th and earlier.

[22] See (English Heritage 2011b) for introduction to river flood defences, though these are predominantly on land near rivers rather than within rivers.

6. Investigative Methodologies and Techniques

O1 To review … the methodologies and techniques that are enabling [the] investigation [of designated assets under inland waters].

6.1. Overview of Investigative Methodologies and Techniques

This section will concentrate on field techniques, which can be divided between direct observation and remote sensing. Underpinning both, however, are desk-based techniques that make the best of existing data whether it is held online, in archaeological records, in public archives or in private collections.

Desk-based approaches to inland waters are not fundamentally different from other historic environment topics, beyond underlining the point that there is a great deal of data that can be mobilised and that some of the main sources may be unfamiliar. The capacity to discover, access and manipulate such data is being revolutionised by information technology and communications, so an appropriate level of desk-based study should always be undertaken before committing resources in the field.

The other avenue of investigation that has to be borne in mind prior to considering archaeological fieldwork is the facility with which discoveries of archaeological material can be reported. There is a long tradition of significant archaeological material being found in inland watercourses that continues to the present[23]. In some cases the material may be a 'stray' find; in other cases it might be an indication of the presence of a coherent asset. Increasing the flow of new information about the presence of archaeological material in inland waters to archaeologists is an essential step given the relatively low level of knowledge about this aspect of the historic environment.

As with desk-based methods, reporting from inland waters is not fundamentally different from reporting on land: there is statutory provision for reporting 'treasure'; and the non-statutory Portable Antiquities Scheme (PAS) for all forms of discovery. Both frameworks apply to inland waters. However, some additional points are worth bearing in mind:

First, it may be worthwhile directing particular attention and supporting materials on archaeological material in inland waters to the groups of people most likely to make discoveries. This might include people that use the water recreationally, such as anglers or canoeists, and local societies with particular links to waterways. It might also include members of the public who work on or near rivers, to raise awareness of existing mechanisms of reporting and to encourage support for 'best practice' from their employers. Tailoring encouragement to the specific circumstances in which material may be discovered, and explaining why the material and its discovery are important, are likely to increase the level of reporting.

Second, attention may need to be directed to the archaeologists who implement the existing frameworks, so that they respond positively to reports and are able to deal with them appropriately. As archaeological material from inland waters has a relatively low profile in England, the significance and implications of a discovery may not be fully recognised. Watercourses are dynamic environments so discoveries might result from processes – such as erosion – which may damage any further material, so awareness may be needed of the priority to be given to passing-on information about discoveries from inland waters.

[23] http://www.theguardian.com/uk-news/2013/aug/30/neolithic-skull-fragment-avon-river-pershore

Third, in order to monitor reporting from inland waters and identify any trends, it may be necessary to make minor amendments to reporting systems so that discoveries are 'tagged' as being from inland waters. The PAS database does not appear to be searchable on the basis of the geographical context in which discoveries are made, for example, other than by 'elevation'. However, the controlled vocabulary for Landuse includes Open Fresh Water, which in turn includes Running Water[24]. Quite how this can be used in searching the database is unclear.

6.2. Direct Observation

Methods based on direct observation are those where an archaeologist is immediately present to record and interpret the asset, including by excavating and handling archaeological material, recovering artefacts, taking samples and so on. The range of archaeological techniques used in respect of inland waters is little different from on land, but there may be a difference in how access to assets is achieved in order to carry out those techniques. Four modes of access are relevant: by foot; by wading; by boat; and by diving.

Irrespective of the mode of access, there will be common concerns that will need to be addressed, notably legal rights of access, and health and safety. These are not archaeological issues as such and will not be examined here, other than to draw attention to the fact that there is a considerably body of law relating to inland watercourses – some of which is contentious – and that watercourses present specific hazards in respect of drowning, obstructions, water flow and contamination, among others. Each mode of access may have different implications in terms of access rights, and in terms of the health and safety considerations that need to be addressed.

This section focusses on waterways that are relatively accessible in physical terms. Waterways such as culverts and conduits in urban environments may present additional difficulties because of their physical size or the requirements of working in confined spaces. Whilst some such waterways can be investigated – with appropriate precautions – using the direct observation methods discussed here, in other cases a remote solution such as geophysics or video inspection comparable to those discussed in the following section may be necessary.

Access by foot to waterways is a reasonably straightforward means of making direct observations from the drier parts of a river corridor. It is low cost, relatively rapid and often provides a good vantage point for looking down on assets in the water, and for considering their wider setting. Access by foot may make it difficult to see features in the nearside bank of a watercourse, and if there is no bridge then access is limited to one side or the other. In rare circumstances, access on foot might be possible to areas that are normally below water: in the case of St. Aidan's, discussed above, Buglass describes their methods as 'field walking a river bed', and conventional land techniques were used to excavate and record the once sunken vessels. A similar effect can be achieved intentionally if there is scope to control the water level, make use of seasonal low-water conditions, or by making a temporary cofferdam from which the water is pumped to expose the asset to 'dry' access.

Wading – in boots or in a wetsuit or drysuit – gives a greater range of access to the water itself, potentially encompassing the whole watercourse if it is sufficiently shallow. It can provide good access to the banks and to structures and artefacts in shallow water, including structural elements of assets that are at or immediately below water level or are otherwise

[24] http://finds.org.uk/database/terminology/landuse/id/3

hidden from observation such as the underside of bridges. A degree of below water capacity can be obtained by using an underwater viewer or bathyscope[25]. The perspective from the water may provide insights and enable identification of assets that might be missed from walking 'above' the river. Wading is generally slower than walking and requires a point of access; it is likely to be 'out-and-back' rather than linear.

Boat access is necessary for deeper water, and offers advantages in terms of coverage but also perspective (Baker pers. com.). Boat access can be by small craft such as kayaks, as demonstrated by Baker, or by larger vessels. Small craft offer distinct advantages in terms of being able to approach assets in very shallow water, or in areas that are otherwise confined (such as culverts), and in being able to get out of the boat if necessary. In the course of kayak surveys, Baker has identified palaeo-environmental deposits dating to the Bronze Age, Roman pottery linked to a potential production site, former bridge piers, architectural masonry, Medieval waterfronts and a Medieval riverbank quarry, as well as the fish weir and culverts mentioned elsewhere in this report (Baker pers. com.). Larger boats may have the advantage of being powered and 'drier' for survey equipment. Larger boats may be necessary on more open waterways and if there are other large vessels in the vicinity.

Only diving offers the ability for archaeologists to make direct observations of archaeological material that is under the water. Snorkel diving may be appropriate if the water is relatively shallow and clear, but otherwise either scuba or surface-supplied diving equipment will be necessary. Diving introduces an additional degree of concern about health and safety, including all the specialist equipment and the need for a point of access (which may be a boat). However, the character of inland waters is such that diving is much less constrained than in the sea, enabling far greater time to be spent in the water. Specifically, rivers and canals are much shallower than the sea, so there is unlikely to be a time limit imposed by the need to avoid decompression sickness. Although there may be a current flowing, rivers and canals are not tidal so diving is not constrained to a short period of 'slack' water. Also, rivers and canals generally only have a short 'fetch', so diving operations are unlikely to be constrained by weather. As a result, diving in inland waters can be expected to have a cost-effectiveness that is many times that of diving in the sea.

Archaeologists accessing heritage assets in inland waters by foot, wading and boat can expect to use the same range of tools as archaeologists on land, with a general caveat over the need to take care with instruments that ought not to be dropped in the water. Diving can also make use of many standard tools such as measuring tapes, drawing boards and trowels, and adaptations are well-established for excavation tools such as water dredges. Position-fixing may require careful consideration. Tools such as Total Stations and precision GPS can be used with appropriate care, even with the prism or antenna being deployed by wading or by boat. Total Station surveys have also been achieved by diving in some cases, given a sufficiently long staff (Henderson and Burgess 1996). Clearly, tools such as Total Stations need a stable platform, so they are not suitable for being boat-based. Handheld GPS – integrated with tablets and other systems and suitably waterproof and ruggedized – provides a straightforward means of recording assets on foot, by wading and by boat, as repeatedly demonstrated by the RCZAS programme over the last decade or so. The same level of provision is not yet available for diving, though a similar effect can be achieved through both low tech and high tech methods. Diving-based fieldwork has benefitted in particular in the last decade from the revolution in digital still and video photography, there now being a wide range of cameras and casings that can be used very effectively underwater.

[25] E.g. http://www.nhbs.com/title.php?bkfno=199105&ad_id=1495&gclid=CITA8cvRg7wCFRMQtAodEVwATw

Archaeological investigations based on direct observation and specifically targeted at archaeological material under inland waters seem to be rare in England. Examples include:

On foot	Nutwith Cote, River Ure Recording Project	Excavation and recording of large worked timber >7.6m long and faunal remains in bank of River Ure (Buglass 2006)
	Thornton le Street, Thirsk	Recording of large worked timber in riverbank (Buglass pers.com)
Wading	Lake House, Wiltshire	Excavation of waterlogged C5th-C6th inhumation adjacent to the Hampshire Avon (McKinley 2003)
Boat-based	Kayak surveys, Severn and Bristol	Baker pers. com.
Diver-based	Iffley Lock, Oxford	Recording of lock reused as weir in the Thames at Oxford (Wessex Archaeology 1999)
	Langport, Somerset	Recording of Early C19th timber weir at Langport, Somerset, removed to alleviate flood risk[26]
	Bishop's Gate Bridge, Norwich	Recording of bridge piers (Bird and Jallands 1991)
	Stourhead Lake (enclosed water)	Excavation and recording of designed landscape features (McKewan 2006)
	River Tees, Middleton One Row	Investigation of possible Roman crossing; survey of bank revetment (Buglass 1999)
	Barrowburn Fulling Mill, River Coquet	Coquetdale Community Archaeology[27]
	Corbridge, River Tyne (1980s-90s)	Investigation of Roman bridge site, including recovery of artefacts (Elliott pers. com.)
	Hart Burn, Morpeth (early 1990s)	Investigation of Roman crossing points (Elliott pers. com.)
	Dere Street, River Derwent (2013)	Investigation of Roman crossing point (Elliott pers. com.)

Some other investigations seem to have been proposed in the past but it is not clear whether fieldwork was carried out:

- Nautical Archaeology Society (NAS) River Project – first season of work proposed at Henley Bridge and Bray Ferry on the Thames in April-May 1989. Nautical Archaeology Society Newsletter Spring 1989: 9.
- Henley Bridge. NAS member invited to carry out a survey by Oxford Archaeology Unit in 1986: '21 timber piles were located from a structure South of the present 18th century bridge. Collapsed stone structure has also been found'. Nautical Archaeology Society Newsletter Spring 1989: 10.

Investigations in inland waters have been much more extensive elsewhere in the British Isles, i.e. in Wales (e.g. survey and excavation of Llangorse Crannog, Powys (Redknap and

[26] http://www.flickr.com/photos/wessexarchaeology/tags/langport/
[27] http://www.bbc.co.uk/news/uk-england-tyne-13749247

Lane 1994)), Scotland (long history of crannog investigations[28]), and Northern Ireland (McNeary 2011). Equally, the investigation of inland waters – including rivers – is firmly established in Continental Europe. A recent edition of *Dossiers d'Archeologie* on freshwater archaeology included papers from France, Switzerland, Belgium, Germany, Hungary, Slovenia, Poland, Croatia, Italy, Spain and Portugal, most of which included sites investigated by diving. A paper from England clearly articulated the importance and potential of riverine archaeology, but the examples of fieldwork were all based on land-based investigation of former channels (Brown 2009).

6.3. Remote Sensing

In remote sensing, archaeologists observe data acquired from the environment in order to draw archaeological inferences. Although archaeological observations are indirect, mediated by data, remote sensing enables archaeologists to obtain perspectives that otherwise would not be possible because of accessibility, scale or resolution, for example. Remote sensing also offers the advantage that data can be manipulated and combined in ways that are not available by direct observation.

The forms of remote sensing relevant to archaeological investigation in inland waters are based mostly on the measurement of light or sound; they can be divided into methods of surveying above water and surveying below water, with a small degree of overlap.

This report is concerned primarily with the investigation of archaeological material that is below water, hence remote sensing above water might appear to be beyond its scope. However, features above water can be a good guide to what is below water: either very directly, where a structure such as a bridge or wharf has elements that go below water; or more indirectly, where there are features at the side of the river that might imply the presence of material below water, or the overall topography indicates archaeological potential. Remote sensing above water – which is generally easier, cheaper and more precise than remote sensing below – may be an important precursor to surveys (either by direct observation or remote methods) under the water.

The above-water remote sensing methods that are increasingly applied in land archaeology are clearly relevant to investigating inland waters also. Subject to scale and suitable access, laser scanning can be used for assets on the bank or spanning the water, including their topographic surroundings. Laser scanning may be able to capture data from features over a reasonably large distance, so might be suitable for surveying assets in mid-channel without physical access, for example.

LiDAR may also offer advantages to inland water investigations, especially if there are suitable datasets already available. As LiDAR is especially suited to topographic survey, it may be particularly useful in picking out low relief features adjacent to watercourses. These may be silted-up channels, or slight hollow ways indicating a river crossing, for example. In some cases, LiDAR has been able to achieve a degree of penetration of shallow water, especially if it is reasonably clear: this raises the possibility of LiDAR serving as a means of below-water remote sensing too, though the turbidity of some English rivers may limit its effectiveness.

[28] Investigations may have also been carried out in rivers through the proposed Stirling Bridge Project: '... upstream of the Medieval bridge of 1450, the remains of the piers of the ancient bridge, thought likely to be connected with Wallace and the battle of Stirling Bridge of 1297, were still visible under suitable conditions from boats ... and could be examined by sub-aqua divers ... A first season of field work is planned for this summer ...). Nautical Archaeology Society Newsletter Spring 1989: 11.

There may be instances where land based geophysics such as gradiometry can be deployed adjacent to watercourses to help localise assets that have components below water, such as a river crossing indicated by routes approaching the water. For example, a Roman Road approaching the River Avon at Newton St. Loe has been observed in geophysical results (Millard pers. com.). However, land-based geophysical survey may be regarded as a fairly intensive method of prospecting for below water assets, unless a survey of waterside assets is itself the key objective. For example, an Electromagnetic conductivity (EM) and Ground Penetrating Radar (GPR) survey were conducted adjacent to the River Severn near Worcester to try to locate a buried trow. Although there appeared to be no trace of the trow, various anomalies indicated possible buried objects, former buildings and the structure of a now-buried lock (Elks and Stowe 2006).

Photogrammetry is an increasingly important form of above-water remote sensing, which can be deployed much more readily than LiDAR. Photogrammetric images can be obtained from towers or poles, but an interesting development recently is the use of Small Unmanned Aircraft (SUAs) (aka Remotely Piloted Aircraft (RPA)). The 'system' of aircraft and controls is referred to as an Unmanned Aircraft System (UAS). SUAs can be fixed wing or have rotors, and can be piloted manually or autonomously to follow a pre-set flight plan. Their use for aerial photogrammetry of heritage assets is already being developed[29]. The advantage of SUAs/RPAs with respect to inland waters is their ability to overcome problems associated with physical accessibility over water, though their use is subject to permission from the Civil Aviation Authority (CAA). Fixed wing SUAs may be appropriate for surveying river corridors, whereas rotor SUAs may be more appropriate for surveying individual assets, especially if they are in mid-channel or have high elevations over water.

The main forms of below-water remote sensing relevant to heritage assets in inland waters are multibeam echosounders and sidescan sonars. Both are in regular use by specialist companies offering river surveys. Magnetometers and sub-bottom profilers could also be used in inland waters, but the types of features they are most appropriate for investigating are probably of less concern in inland waters than at sea, and they may generate issues over deployment and interference.

Multibeam echosounders and sidescan sonars both create topographic data, though in different ways. Sidescan sonar typically has an advantage in resolving small features, which is important when trying to discover ephemeral archaeological features. Multibeam has the advantage of producing real world x,y,z data that can be integrated with topographic data from LiDAR or laser scanning, for example. Both multibeam and sidescan are available in models attuned to working in shallow water, intended specifically for work in harbours for example. The key constraint on their use is the vessel required to mount and operate the survey equipment, but again there is a demand for surveying in shallow and/or confined water so installations in small craft are routine.

Other forms of below-water remote sensing are possible, using sector scanning sonar and underwater lasers, for example. Their use for surveying heritage assets underwater is not as developed as the methods already referred to, and they are not as commonly available. However, the high density of points that can be generated by sector scanning sonar, for example, means that the potential application of such methods warrants further consideration, especially as deployment of fixed (rather than towed) instruments is likely to be easier in inland waters than in the sea.

[29] http://www.photogrammetric-vision.com/uploads/8/7/4/5/8745932/erasmus_uav_archeological.pdf

A further means of below-water remote sensing that may have application to heritage assets in inland water is the use of Remote Operated Vehicles (ROVs). Survey ROVs generally carry video and stills cameras and can be used for visual inspections. They offer particular advantages where the use of a diver is not practical, where access to the surface is restricted or there are other hazards, for example. There are some small and easily-deployed ROV systems available which may be suitable for slow flowing water where control of position can be achieved visually (in a linear culvert, for example). However, if the water is more open, then the ROV will need to be capable of mounting position-fixing equipment, and bigger motors may be necessary to cope with stronger water flows.

Autonomous Underwater Vehicles (AUVs) are similar in principle to ROVs in that they carry a range of sensors down to the seabed, but they are untethered and follow a pre-set survey plan rather than being piloted. AUVs can carry echosounders and sidescans. As they are not towed they are relatively easy to deploy. However, they are complex and generally costly forms of equipment, mostly used in research, defence and high-value commercial surveys. Lower cost AUVs are becoming available and may become an option for surveying inland waters in due course.

A less costly option than either ROVs or AUVs is the use of a drop camera, which is simply a waterproof video camera that is lowered to the bed. Drop cameras are easy to deploy but can only be used if you are directly above the feature that is to be inspected. They have only a limited capacity for being directed around a feature, and are generally used for obtaining sample photographs of extensive areas (e.g. habitats) rather than discrete structures. Nonetheless, they can offer a relatively straightforward means of imaging the bed of a river or canal.

As on land, photogrammetry is also showing significant potential as a means of underwater survey where there is a reasonable degree of through-water visibility. Photogrammetry can be carried out using cameras deployed by divers or mounted on ROVs/AUVs. Data derived from multiple photographs can be used to build a 3-dimensional model that can be used by itself or integrated with the images. Underwater photogrammetry offers a relatively quick way of surveying complex structures that would be very time-consuming to achieve using conventional diver-based methods. Although very high-resolution photogrammetric surveys can be carried out they are likely to require considerable resources for processing. Lower cost approaches are being trialled[30].

With all these remote sensing methods, as already indicated, attention to the quality of position-fixing is essential, as are sufficient storage capacity, data management procedures, software, and time to make the most of the data through processing and interpretation. Merging data from different sensors is becoming routine. In many instances, the right solution will not be to find a form of remote sensing that offers a silver bullet, but to deploy multiple sensors in a thoroughly integrated manner.

[30] E.g. Wessex Archaeology http://www.youtube.com/watch?v=-_aYb0bOp28.

7. Hazards: sources, pathways and receptors

O4 To outline possible hazards – both natural and humanly-induced – to heritage assets under inland waters.

In considering the hazards to heritage assets in inland waters, the first point to note is that the assets themselves represent earlier interventions in watercourses, and indeed the whole of the watercourse may itself be a fabrication. Also, watercourses are a focus for natural processes – especially waterflow but also other physical, chemical and biological processes – that will have been affected by the introduction of features now regarded as heritage assets, and which will in turn have effects on the asset. Both natural and humanly-induced processes are especially closely entwined in watercourses. Given that so many watercourses are heavily modified, unpicking the relationship between the natural and humanly-induced components of a hazard will be difficult: human impacts will often take effect through natural processes such as erosion; the effect of a natural impact will depend on how the watercourse has been modified.

As the relationship between natural and humanly-induced processes in watercourses is complex, it is helpful to distinguish between sources, pathways and receptors. In this case, heritage assets are the principal receptors, and their characteristics as receptors will be driven largely by the form they take and the materials they comprise, rather than monument type. In terms of form, assets may be wholly or largely buried, partly buried, or largely upstanding; where they are not wholly buried their upstanding elements may be entirely in the water, or partly below water and partly above water. As shown above, assets can range from built structures such as bridges to palaeo-environmental deposits of archaeological interest. They may be situated immediately onshore, in the bank, in the bed or midstream. They may also be related to other features up or downstream that may make their management complicated because of hydrodynamics.

Pathways can be described as direct or indirect. Direct pathways are those where the effect of an impact on an asset is unmediated by another process. For example, mechanical excavation will itself cause archaeological material to be removed and damaged. Indirect pathways are those where the impact changes a process and the process then has an effect on the heritage asset, such as excavation upriver mobilising a greater amount of sediment into the water, which is subsequently deposited around the remains of a heritage asset downstream.

Sources	Pathways		Receptors			
Construction	Direct:	Indirect:	Consolidated structure	Largely buried	Onshore	Stone
Excavation	Physical damage	Erosion	Partly buried	In the bank	Timber	
Dredging	Physical removal	Accretion	Unconsolidated structure	Largely upstanding	In the bed	Brick
Piling	Physical dispersal	Biological degradation	Disarticulated structure	below water	Midstream	Earth
Regrading	Harm to setting	Chemical degradation	Artefact spread	Largely upstanding		Ceramic
Widening		Root growth	Isolated artefact	above water		
Intrusive access		Flooding	Deposit			
Changes to hydrography		Dessication				
Changes to vegetation						
Changes to access						

Five activities are regarded as warranting particular attention because of the risks they pose to the historic environment in inland waters:

- River restoration, flood risk management, and the removal of structures;

- Waterways management;
- Development;
- Small-scale hydro;
- Erosion;
- Flooding.

These hazards give rise to various sources of harm to heritage assets, by a variety of different pathways, affecting historic assets according to their characteristics as receptors. It is not the intention to detail all the pathways through which significant effects might arise, however. Rather, the identification of different sources, pathways and receptors is intended to enable causal links to be identified and demonstrated rather than assumed, providing a much firmer basis for effective mitigation and monitoring.

7.1. River restoration, flood risk management, and the removal of structures

Two pressures are combining which may have significant implications for heritage assets in inland water. First, major instances of flooding due to rainfall in recent years mean that there is continuing pressure to carry out flood schemes. These can involve building up the height of defences against flooding but also removing features that restrict drainage. However, there is also interest in 'natural flood methods' intended to slow down drainage especially in the upper sections of river catchments, which may involve local construction of features within the river corridor, and 're-meandering' to make the pattern of drainage more sinuous. The second pressure is to improve water quality by improving ecology through implementation of the Water Framework Directive. There is a particular interest in increasing diversity of habitats and facilitating the movement of species along river catchments. Such improvements are carried out under the heading of 'river restoration', which can involve a wide variety of groundworks, excavation, construction of features such as deflectors, and modification or removal of existing structures. Taken together, flood schemes and river restoration give rise to many sources of potential effects on the historic environment.

Restoration is being supported by Defra's Catchment Restoration Fund, which is administered by the Environment Agency. Support is also being provided by the Love Your River campaign (http://www.defra.gov.uk/loveyourriver/) and by individual river trusts, represented nationally by The River Trusts.

Although 'restoration' is an appealing term the point has been made that human intervention in rivers in England is endemic and may go back millennia (Rhodes 2007). Whilst river restoration is often framed as returning rivers to a natural state, it is important to recognise that 'restoration' is in fact simply the most recent episode of human intervention. The re-excavation of an earlier meander is not restoration of that meander; it is re-excavation, which may be a source of harm for any heritage assets that were within the meander before it silted up[31]. This is not to say that restoration is undesirable; only that it should be seen in its historical context and its implications for the historic environment properly considered. More broadly – and returning to a point made previously – watercourses are often heritage assets in themselves, forming part of wider riverine landscapes that have value within the historic environment. Sections that warrant restoration may not be of great historical significance, but this ought to be assessed rather than assumed. Considering watercourses in

[31] Four Early Medieval burials have recently been found in the excavation of a 'new' backwater being excavated to create habitat: http://www.bbc.co.uk/news/uk-england-northamptonshire-25774172

their historical context may also make a positive contribution to options for restoration, and also create opportunities for engaging the public about both the past and the future of their water environment.

There is already a certain degree of awareness about historic environment issues arising from flood schemes and river restoration. Major archaeological investigations have accompanied some flood schemes and the Environment Agency's *Fluvial Design Guide* includes a specific chapter on Landscape and Heritage[32]. Similarly, the River Restoration Centre's *Manual of River Restoration Techniques* includes examples where historic environment concerns have been addressed. For example, the removal of Kentchurch Weir was preceded by a heritage study and the appointment of an archaeologist to record historic features in the course of the works[33]. Earlier guidance on river weirs also discusses their value in terms of heritage and archaeology, and provides case studies where archaeological concerns have been taken into account (Rickard, Day, and Purseglove 2003).

Although there is awareness of historic environment issues in general, there seems to be little consideration of the potential for material of archaeological interest to be actually in the water, or for waterways themselves to have the character of heritage assets. There also seems to be little recognition that waterside structures – including elements that are below water – may be of historic interest. By way of example, the EA's *Fluvial Design Guide*, although having a section on heritage, makes virtually no reference to historic or archaeological character in its chapter on structures. There appears to be no reference to the possibility that structures may be designated under heritage legislation, and that specific consents may be required for engineering works[34].

7.2. Watercourse Management

In addition to works that are designed to change watercourses and their operation, some consideration needs to be given to the potential for damage to the historic environment arising from routine works that are intended to keep watercourses operational. Some watercourse management activities can be expected to have very little effect on the historic environment, but others such as inspection, maintenance and rebuilding could have implications for designated assets and other heritage assets that have not been recognised. Maintenance dredging and the removal of silt from watercourse might not be regarded as hazardous to the historic environment, because the activity is – in principle – confined to horizons that have been laid down only recently. However, maintenance dredging on the margins of watercourses may encroach on deposits that have not been dredged previously. Even in canals and other maintained waterways, dredging in recent years – intended to maintain navigation for relatively shallow recreational craft – may have left deeper horizons undisturbed for many decades (Viner pers. com.). This may lead to impacts if the full depth is dredged once more.

Large organisations such as the Canal & River Trust, which have thousands of assets to maintain including designated examples, have established procedures and specialist staff to ensure that statutory requirements are met and that historic environment considerations are taken properly into account (Viner pers. com.). It is currently developing a national Listed Building Consent Order (LBCO) in partnership with English Heritage[35]. The Canal & River

[32] http://evidence.environment-agency.gov.uk/FCERM/en/FluvialDesignGuide.aspx

[33] http://therrc.co.uk/MOT/Final_Versions_(Secure)/12.3_Monnow.pdf

[34] http://evidence.environment-agency.gov.uk/FCERM/en/FluvialDesignGuide/Chapter11.aspx?pagenum=3

[35] http://canalrivertrust.org.uk/about-us/heritage/national-listed-building-consent-order

Trust – and its predecessor British Waterways – has a track record of commissioning archaeological investigations in connection with repair works (Cook 2010; Cook 2012) and also makes provision for the reporting to its archaeological advisors of finds during dredging (Viner pers. com.).

Smaller organisations may not have such formal mechanisms and specialist staff, but still have the responsibility to keep their watercourse operating smoothly and to deal with assets accordingly. Where an asset is still operational, its historic character may not be recognised; and there is still a general concern that – even where there is provision for the historic environment – the scope of 'historic environment' is not regarded as including things which may be below water.

7.3. Development

As well as activities specific to watercourses, risks also arise from general pressures, such as development. Places close to the water are often favoured for development because of the demand for waterfront property or because previous industrial sites that were once reliant on water transport have been released as 'brown field' sites. Such development may be confined to the water's edge and may not encroach on the bank or bed of a river. However, related works – for access, to relocate services, or to augment flood protection measures – could result in works that impinge on the river. Some developments, however, may have a direct impact on the riverbed, such as the construction of inland marinas and related works (e.g. piled jetties and pontoons), and the restoration of former canals. Again, it is important to recognise that whereas land-elements of a waterside development may be given careful consideration in respect of the historic environment – in accordance with applicable guidance – there may be little awareness of the potential implications for archaeological material below water even amongst the heritage professionals responsible for curatorial advice or on the developer's own team.

7.4. Small-scale Hydropower

Rivers are a focus for renewable energy using small-scale hydropower, sometimes making use of historic features such as old mills and leats. Small scale hydropower is being encouraged by Government because it can make a 'modest but useful' contribution to UK targets for renewable energy[36]. Hydropower is eligible for Feed in Tariff (FIT) payments and for support from the Rural Community Energy Fund (RCEF), which provides grants to assist with feasibility studies and with project costs such as planning and consenting[37].

Where historic features are re-used there is plainly a potential impact on the historic environment; but even if small-scale hydropower is being proposed as an entirely new-build, there is of course potential that archaeological material below water may be affected.

Proposed developments are subject to planning consent, which is subject to national and local planning policies relating to the historic environment. Consent is also required from the Environment Agency, in the form of an environmental permit. The pre-application checklist that the Environment Agency provides for potential hydropower developers requires applicants to indicate whether the scheme is likely to affect any heritage features, noting

[36] https://www.gov.uk/harnessing-hydroelectric-power .

[37] https://www.gov.uk/government/news/15m-fund-for-rural-energy-projects-opens-to-applications

that structures such as weirs may be listed buildings and that consent may be required[38]. Further advice, to the effect that the Environment Agency must determine if developments within or close to heritage sites could result in harm, is provided in accompanying guidance[39].

Although there is provision to consider the historic environment implications of hydropower both through the planning system and the requirement for an environmental permit, concern for heritage assets is likely to be directed primarily towards built and visible structures, rather than elements that are below water.

7.5. Erosion

As noted above, erosion is best seen as a pathway for indirect impacts on the historic environment, which can have a complex source that combines both human-induced and natural origins. However, erosion manifests itself as an immediate cause of damage to heritage assets, evident to the public as well as heritage professionals, so it is worth considering as a 'proxy' source. That is to say, there may be no need or not time to unpick the complex sources of erosion if damage to a heritage asset is imminent or already occurring.

Erosion is usually most visible when it is affecting a river bank in which archaeological material may be situated; but it can also occur to the bed of a river and to the foundations of existing monuments as 'scour'. In respect of archaeological material below water, it is the prospect of erosion of the riverbed and of scour around the foundations of designated assets that gives rise to most concern. However, even erosion of the riverbank may undermine waterside structures, or cause archaeological material to be washed out of sections and lost downstream.

Erosion may be regarded as a positive characteristic of rivers regaining more natural dynamics following restoration, cutting down the gradient to a 'natural' profile following the removal of a weir, for example. As well as reinstating the process of creating meanders, bankside erosion might be regarded as introducing greater diversity of habitat, as the low cliffs caused by erosion provide nesting opportunities to birds and insects.

Erosion can reveal material that was otherwise buried, but once exposed it is likely to degrade from a variety of processes. Erosion can also have a catastrophic effect on heritage assets. For example, a Medieval – Post-medieval bridge on the Avon adjacent to Lacock Abbey was visible during a site visit because a fairly extensive length of riverbank had been pulled away by a tree falling; this erosion threatened to allow water behind such stonework as had survived, and could lead to further instability and collapse. The causal relationship between tree fall and bank erosion was unclear – erosion could have undermined the tree, or the tree could have fallen in a high wind, ripping the ground away – but whatever its source, subsequent erosion had obvious potential to do substantial damage to the asset.

Actions to mitigate erosion – by installing bank stabilisation structures – can cause further damage if the presence or extent of archaeological material is not recognised. This may be

[38] Form WR325: Environmental site audit checklist for hydropower schemes. http://www.environment-agency.gov.uk/business/topics/water/126571.aspx

[39] Guidance for Run-of-River Hydropower: Water Framework Directive, nature conservation and heritage (December 2013). http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/LIT_8848_c3f345.pdf

particularly the case if the stabilisation involves driving piles or stakes into the water to act as toe protection[40].

7.6. Flooding

Like erosion, flooding is better seen as a pathway for indirect impacts than as a source, but the complexity of the natural and humanly-induced origins that gives rise to flooding – and the immediacy of the risks to heritage assets that accompany flooding – are such that flooding itself is worth specific attention.

Flooding is likely to be accompanied by erosion and all its implications for the historic environment. Flooding also gives rise to further hazards, including:

- the force of water on the structure of a heritage asset;
- direct damage to heritage assets from debris propelled by the water;
- blockages to structures such as bridge arches that increase forces on other parts of the structure; and
- artefacts becoming entrained in the increased flow of water and lost downstream.

This report focuses on archaeological material underwater that is – almost by definition – not susceptible to damage simply from being immersed. However, it must also be acknowledged that increased water levels from flooding can cause tremendous damage to elements of heritage assets that are normally 'dry', affecting structures, materials and contents.

As discussed above, measures intended to manage flood risk – such as the removal of historic constrictions, dredging, the raising of river defences and other thresholds, and wholesale manipulation of upland areas of catchment – may present as great a threat to heritage assets as flooding itself, unless accompanied by comprehensive provision for assessing and mitigating their likely archaeological effects.

[40] http://evidence.environment-agency.gov.uk/FCERM/en/SC060065/MeasuresList/M5/M5T6.aspx?pagenum=2

8. Statutory and policy frameworks

O5 To review the provision for assets under inland waters in current statutory and policy frameworks.

O6 To examine the consideration of asset components under inland waters in the management of a selection of designated assets.

The principal statutory and policy frameworks relating to heritage assets in inland waters are as follows:

Statutory designation:

- Scheduled Monuments
- Listed Buildings

Non-statutory designation:

- Registered Parks and Gardens
- Registered Battlefields
- World Heritage Sites

Planning

- National Planning Policy Framework

There are examples of each form of designation in the Study Area, including two World Heritage Sites and one registered battlefield:

Scheduled Monument	SM	35	35	12%
Listed Building Grade I	LB I	12		
Listed Building Grade II	LB II	211		
Listed Building Grade II*	LB II*	31	254	84%
Park and Garden Grade II	RHPG II	9		
Park and Garden Grade II*	RHPG II*	1	10	3%
Registered Historic Battlefield	RHB	1	1	0%
World Heritage Site	WHS	2	2	1%
		302		

8.1. Scheduled Monuments

Scheduled monuments are designated under the Ancient Monuments and Archaeological Areas Act 1979 (AMAA 1979). The AMAA 1979 provides that the Secretary of State can include in the Schedule of Monuments any monument that is of national importance. The site of a monument includes not only the land on or in which the monument is scheduled, but any land comprising or adjoining it that appears to be necessary to the monument's support and preservation (s. 61(9)). In English law, land includes land covered by water. No reference is made to any form of watercourse in the AMAA 1979 (except the Territorial Sea), so it is simply the case that the presence of a watercourse makes no difference to the application of the Act. Any part of a scheduled monument that is within a watercourse has exactly the same status as those parts that are not in the water.

The only specific reference to water with respect to scheduled monuments (other than in the Territorial Sea) is that 'flooding' on land in, on or under which is a scheduled monument is regarded as works for which Scheduled Monument Consent is required.

Having noted that land under water has equal status to land above water as far as the AMAA 1979 is concerned, it is also worth noting that the boundaries of many of the scheduled monuments selected in the Study Area include elements of watercourses within their areas. This is clearly necessary where the monument itself extends under the watercourse – as is the case with locks. There are at least some examples where the extent of the land that is scheduled extends beyond the asset to include adjoining land that is below water. The two scheduled bridges in Bradford-on-Avon – Barton Bridge (LEN 1005663) and Bradford-on Avon Bridge (aka Town Bridge – LEN 1005659) – illustrate the questions that scheduled monument boundaries raise in respect of inland waters[41].

At Barton Bridge the scheduled area encompasses the bridge and an area of watercourse to the north, encompassing the main river and a subsidiary channel crossed by a footbridge. The choice of the boundary is unclear: it seems sensible to include within the scheduled area a part of the watercourse beyond the monument itself, including part of the river and the channel; but there is no inclusion of the river or the channel to the south. The scheduled area effectively excludes a ford that is closely associated with the bridge. There is also a pillbox just outside the scheduled area. It is worth noting that there is a separate scheduled area around Barton Farm, a little over 20m away.

On map evidence alone, a more appropriate boundary might encompass the whole of the structural material of the bridge including the structural remains of the associated ford (though given the likely association between Barton Farm and Barton Bridge a single encompassing boundary might be even more appropriate). The inclusion within the scheduled monument of watercourses might simply be regarded as a buffer, in which case an even buffer covering both sides of the bridge would be warranted. If the watercourses are included because there is a perceived potential for archaeological material to be present, or the channel feature is regarded as integral to the asset, then again the boundary might be expected to reflect more closely the layout of the asset, encompassing the river and channel to the south of the bridge as well as to the north. The area of the ford includes isolated stonework and eroding sections within which structural archaeological material may be present (Plate 8).

At Bradford-on-Avon Bridge, the scheduled area again extends to the watercourse, this time on both sides and appearing as a buffer. The scheduled area does not appear to cover the south end of the bridge, though this may be an offset or mapping error. It seems clear that the scheduled area does not include the bridge approaches, including an area to the west where there is a distinct 'embayment' with a low quay and steps; this may be the south end of the ford recorded as being in use until the C19th, though with Roman origins. As above, the justification for the boundaries is unclear; the scheduled monument may provide some incidental protection to part of the ford site, though this appears to be unintentional.

[41] It should be noted that there appears to be an offset in boundaries of the scheduled monuments in the map data available via the National Heritage List site. The same offset is apparent both in the online mapping and the pdf maps. This possible distortion, which is probably due to differences in the scale of maps used for digitisation (see http://www.english-heritage.org.uk/content/imported-docs/a-e/eh-data-download-faqs.pdf) does not detract from the observations about boundaries that are made in this section of the report.

The Early Medieval settlement near Cowage Farm (LEN 1018389) illustrates a different approach to boundaries in relation to water, as the boundary carefully follows the edge of the river. In this case, the present day bank of the river appears to have been used as a simple line to follow. The settlement is clearly located on the river and some of the earthworks are described as referencing ('overlook') it. It is not clear whether any account has been taken of the potential for archaeological material to be within or on the other side of the river. It seems unlikely that the current river bank used as a boundary reflects the Early Medieval riverbank. Unlike the two bridges discusses above, there appears to be no 'buffer' – intentional or otherwise – that might protect material within or related to the river.

8.2. Listed Buildings

Listed buildings are designated under the Planning (Listed Building and Conservation Areas) Act 1990. Designation applies to the building, any structure or object fixed to the building, and any structure or object that is not fixed to the building but is within the curtilage forming part of the land since before 1948 (s. 1(5)). There is no reference to watercourses in the legislation.

Designated assets that are listed buildings do not have boundaries in the National Heritage List or in the designation data available at http://services.english-heritage.org.uk/NMRDataDownload/. However, it seems reasonable to conclude that as the whole of a building is protected by designation, any parts that are below low water would be protected equally – such as the piers and abutments of a bridge or the base of a quay wall. Attached objects and structures would also be included, even if they are below water. Unattached objects and structures would be included if within the pre-1948 curtilage.

However, it is not clear whether 'curtilage' can encompass a watercourse. Riparian ownership generally includes the bed of a non-tidal watercourse to the median line, but curtilage does not necessarily extend to the limit of ownership. In the case of a building on a tidal river, the tidal water and the land below it are excluded from its curtilage (Mynors 2006); whether curtilage includes the bed of a non-tidal watercourse may depend if the river is subject to other rights such as fishing or navigation. Consequently, an unattached object or structure in a watercourse may prove not to be listed, unless it has specifically been included in the description of the listed building.

There is a variety of circumstances where objects or structures in the water are not attached to the buildings that are described but are considered to contribute to the special architectural or historic interest of a listed building. These non-attached structures may not be protected by designation because the curtilage does not encompass the bed of the watercourse. Effective protection may require either that the extent of the curtilage with respect to the watercourse is established, or that the description of the building makes express reference to unattached objects and structures in the water.

The Canal & Rivers Trust is developing a national Listed Building Consent Order in partnership with English Heritage[42].

8.3. Parks, Gardens and Battlefields

Registered parks and gardens and registered battlefields are non-statutory designations that are given effect through the planning process. The National Planning Policy Framework

[42] http://canalrivertrust.org.uk/about-us/heritage/national-listed-building-consent-order

(NPPF)(Department for Communities and Local Government 2012) regards registered battlefields and Grade I and Grade II* registered parks and gardens as being designated assets of the highest significance. The NPPF states that substantial harm or loss should be wholly exceptional. Where a proposed development will lead to substantial harm to or total loss of significance, local planning authorities are required to refuse consent unless outweighed by substantial public benefits or other specified circumstances apply. If lesser harm or loss is proposed then this has to be weighed against public benefits (Department for Communities and Local Government 2012, para. 132–134).

It should be noted that the protection offered to registered parks, gardens and battlefields applies only to activities that are subject to planning consent, i.e. development. Registration clearly underlines the significance of parks, gardens and battlefields that have been designated, which may also be important in respect of non-planning activities depending on the obligations and practices of the institutions carrying out the activity.

There appears to be no specific reference to the management of watercourses in the UK policy or guidance relating to registered parks, gardens and battlefields.

Although there are 10 registered parks and gardens in the Study Area, only one is Grade II* (Kelston Park – LEN 1000536) and the rest are Grade II. Only Kelston Park has, therefore, the high level of protection afforded by the NPPF para. 132.

Watercourses are a common feature of registered parks and gardens. The park or garden may include or abut a watercourse, and watercourses may form part of the boundary. Where the watercourse forms part of the boundary this is likely to be because the watercourse played a role in the design. Where watercourses have been modified and/or features have been added to the watercourse as part of the design then plainly the watercourse is likely to have a direct role in contributing to the significance of the designated asset. Modifications and /or features could have components that are below water which ought to be regarded as integral to the designation. In some cases a Registered Park or Garden may include earlier watercourse-related features. These may not necessarily contribute to the significance that is reflected in designation, so these earlier features may not benefit from the same degree of protection.

There is only one registered battlefield in the Study Area, the site of the Battle of Newbury 1643 (LEN 1000026). The River Kennet forms the boundary along two lengths at the north of the battlefield. The river appears to have formed an actual boundary to the battle, forming the extreme northern flank that both armies used in forming up[43]. It is conceivable that some debris, spent ordnance and so on could have made it into the river.

8.4. World Heritage Sites

World Heritage Sites are protected under the World Heritage Convention 1972. Communities and Local Government Circular 07/2009 emphasises the weight to be given to the outstanding universal value of World Heritage Sites (Department for Communities and Local Government and Department for Culture Media and Sport 2009, para. 8):

> The outstanding universal value of a World Heritage Site indicates its importance as a key material consideration to be taken into account by the relevant authorities in determining planning and related applications and by the Secretary of State in determining cases on appeal

[43] See sketch map at http://www.hungerfordvirtualmuseum.co.uk/Events/Civil_War_1642-51/1st_Battle_of_Newbury.jpg

> or following call in. It is therefore essential that policy frameworks at all levels recognise the need to protect the outstanding universal value of World Heritage Sites. The main objective should be the protection of each World Heritage Site through conservation and preservation of its outstanding universal value.

As with registered parks, gardens and battlefields, the main mechanism for implementing the protection of World Heritage Sites is the planning process, and the NPPF includes specific sections on how this is to occur. World Heritage Sites are included amongst the 'designated heritage assets of the highest significance' referred to in NPPF para. 132. Local planning authorities are, however, encouraged by para. 137 to 'look for opportunities for new development to enhance or better reveal their significance' whilst noting in para. 138 that 'not all elements of a World Heritage Site … will necessarily contribute to its significance'. Further guidance is provided in English Heritage's *Guidance Note to Circular for England on the Protection of World Heritage Sites* (English Heritage 2009).

The emphasis on the planning system for giving effect to the World Heritage Convention 1972 means that there may be gaps for potentially harmful activities that are not 'development'. However, para. 8 of Communities and Local Government Circular 07/2009, quoted above, also refers to 'related applications' and 'policy frameworks at all levels'. Hence, a general policy to protect the outstanding universal value of World Heritage Sites might be expected towards the management of other forms of activity associated with watercourses in World Heritage Sites.

There appears to be no specific reference to the management of watercourses in the UK policy or guidance provided in respect of World Heritage Sites.

There are two World Heritage Sites in the Study Area: City of Bath (LEN 1000103) and the Avebury part of Stonehenge/Avebury (LEN 1000097).

The City of Bath World Heritage Site Management Plan (Bath and North East Somerset Council 2010) makes numerous references to the River Avon, and to the Kennet and Avon Canal, in its discussion of the history and character of the city, and pressures such as redevelopment of Bath Western Riverside and flooding. For example, paragraph 2.3.35 notes:

> The natural crossing points of the River Avon in Bath were used by the Romans, and as ferries were replaced by bridges have continually influenced the city's development. The river, together with associated water meadows and gravel terraces, is an important landscape element and wildlife corridor cutting through the heart of the city.

Issue 28 of the Management Plan notes that:

> There is a need to promote understanding that the River Avon and Kennet and Avon Canal are integral to the Site's landscape setting and a need to ensure they are managed appropriately.

The Avebury World Heritage Site Management Plan (English Heritage 2005) notes:

> The River Kennet, which flows through the WHS, has species-rich and diverse flora and abundant aquatic invertebrates. The river also has important historic, visual, and landscape characteristics and was clearly significant for the location of several of the key Neolithic monuments in the area.

Although the prehistoric significance of the river is noted here, most references are to the ecology of the river and its water meadows. The management objectives and strategy, for

example, note only that the Avebury WHS Steering Committee 'should also support the work of conservation agencies and groups seeking to improve and monitor the flows of the River Kennet' (p. 126). Archaeological questions relating to watercourses do feature, however, in the *Stonehenge, Avebury and Associated Sites World Heritage Site Revised Archaeological Research Framework* (Wessex Archaeology 2013).

9. Potential for increased awareness and appreciation

O7 To consider the potential for increasing awareness and appreciation of assets under inland waters.

It is easy to conclude that there is a great deal of potential for increasing awareness and appreciation of assets under inland waters because the current baseline, in England, is so low. Other than an apparently small number of archaeologists with specific interests in this area, awareness appears to be low amongst archaeologists and other heritage professionals, amongst water managers, amongst water users, and amongst the public at large.

The low level of awareness of assets under inland waters can be contrasted with the high profile of heritage assets above water. That is to say, there is a very high level of appreciation of the historic character of canals generally, and of waterfronts, bridges and other structures generally. This is evidenced to the degree to which 'heritage' is often incorporated actively into the character of places that have waterways running through them.

As well as the lack of awareness of assets that may be below water in all forms of inland watercourse, there also appears to be a lower awareness generally of the above and below water historic aspects of non-canal watercourses, both navigable and non-navigable. Rural watercourses can appear to be natural and it is their 'natural' aspect, ecology and 'quiet, unspoilt enjoyment' that are brought to the fore. The fact that rural watercourses may have been improved or entirely fabricated, and are likely to have witnessed all sorts of activity in the past, is obscure. This may be a particular issue in watercourses that are not navigated today; particularly the smaller watercourses in the upper reaches of rivers. The impression they provide may be entirely misleading as to their role historically. This may also be the case on navigable watercourses when perhaps only the occasional locks are regarded as 'historic'; and even in some urban contexts where the character of the river as a 'wildlife corridor', as noted in the quote from the WHS management plan for the City of Bath, is emphasised.

Some watercourses seem almost invisible. They do not fall into the categories of canal, historic urban waterway, or rural river. In these places, which might be urban, suburban or rural, historical context could make a significant difference to appreciation of the waterway and its role. It ought not be assumed that a waterway has not had a significant history, or that there is no potential for the presence of assets below water, just because it appears non-descript today.

Noting these broad differences between watercourses, it may be worth developing a formal categorisation of watercourses in terms of their historic character. This in itself may do a great deal to raise awareness amongst heritage professionals and water managers. In Historic Landscape Characterisation, which is necessarily broad in scale, all watercourses are subsumed within the type 'water', which also includes enclosed bodies of water such as lakes, ponds and reservoirs. The scale of HLC is such that many watercourses do not appear in the characterisation because they lack area, though of course their character may be recognisable to some degree in the landscape type of the surrounding land.

In view of the degree to which watercourses have been modified, and their role in historical development, then a finer-grained characterisations focussing on the watercourses themselves would seem to be warranted. Although the articulation between watercourses and their surrounding landscapes in the present – the 'riverscape' – should be considered, in view of the points above about potential mismatches between current appearance and

historical development, then the initial focus ought to be on characterising the watercourse itself.

Lack of awareness of heritage assets below water in inland waters is probably a result of so few examples being presented. Even the below-water extents of significant heritage assets above water are virtually absent as a corpus of material upon which awareness can be based. One of the most straightforward means of increasing awareness across all sectors would be to assemble such evidence that has been found and present it. This has been pursued to some degree during the course of this project, which has collated some otherwise diffuse examples, but a broader systematic exercise to gather examples of archaeological events and details of assets might be warranted. It is, however, possible that there are not many other examples of existing work to uncover; a prudent first stage might therefore be to bring together the small number of people with interests in this area to gauge the extent of the likely resource of previous or existing work.

At some stage a formal standalone event might be worthwhile, such as the International Conference on Fresh Water and River Archaeology that took place in Bangor in June 1994 (but unfortunately without proceedings). In the interim, papers or sessions at events hosted by organisations with general interests (Institute for Archaeologists; Council for British Archaeology) or related interests (Nautical Archaeology Society; Wetland Archaeology Research Project) could help to raise awareness. Presentations to water managers at events such as the English Heritage Environment Agency Annual Conference would undoubtedly be helpful in this respect.

Initiating new investigations to generate information about heritage assets in inland water would be a further way of increasing awareness amongst archaeologists, water managers, users and the wider public. New work could be desk-based or seek to apply some of the methodologies described previously. Demonstrating the presence and significance of features below water – either in connection with known/designated assets, or discovering previously unknown assets – would help break the cycle of there being little evidence because no one is looking, and no one looking because there is little evidence.

Despite the low awareness of assets below water, and of the historical character of some waterways, the high level of awareness of the historical character of some waterways provides a very sound platform on which to build. A high level of archaeological awareness is apparent in key organisations such as the Environment Agency and the Canal & River Trust, and these organisations have clear obligations and/or objectives with respect to conserving and enhancing the heritage of inland waters. Local authorities have archaeological advice available to them, and English Heritage itself has a key role with respect to designated assets. Lack of attention to those elements of the historic environment that are below the water rather than above is not attributable to an absence of expertise or advice. Substantially improving awareness and appreciation across the management of watercourses and heritage assets could be achieved quite readily: there is suitable infrastructure already in place, though this infrastructure is already under immense pressure without the additional task of looking into an environment that has mostly been ignored.

The organisations already cited – Environment Agency, Canal & River Trust, local authorities and English Heritage – also make a major contribution to heritage awareness and appreciation among the public at large. That is to say, the infrastructure for increasing awareness amongst water users and the wider public is also already in place for many of England's waterways. Greater public awareness and appreciation of heritage assets under inland waters is helped by a number of other factors:

- Everyone is close to a watercourse. Irrespective of where people live and work, the history of inland waters is local history, to which they can make a connection through their everyday places.
- There is good access to many watercourses. Navigable waterways usually have a publicly-accessible towpath; many rivers have public rights of way to them or along them; and highways – as bridges – can provide a degree of access also. Where there is public navigation there is a high degree of access from a viewpoint that is especially suited to exploring the earlier use of waterways.
- There is a good infrastructure of user-groups for inland waters, operating both nationally – through national recreational bodies – and locally, through clubs and societies. These are supported through media such as specialist magazines, web-sites, online fora, meetings and events. There are, therefore, mechanism for raising the historic environment as a subject with large numbers of people who routinely spend time around inland waters.
- As well as people who have an abiding interest, inland waters host many occasional visitors – to inland water based activities or holidays, for example, or simply to 'places of interest'. There is an overlap here with the organisations that specifically promote and cater for visits to inland water heritage (e.g. canal museums; watermills) or is simply situated on a watercourse. English Heritage also falls in this category, as many of its properties are on watercourses. Within the Study Area, Bradford-on-Avon Tithe Barn[44] is a good example, as the complex is located close to the River Avon next to Barton Bridge, whilst the Kennet & Avon Canal is built on an embankment immediately behind the barn. The property provides a number of opportunities for raising awareness of the river and bridge, and of the changes wrought by building the canal (018 DSC 0618). Other major heritage organisations, notably the National Trust, could also benefit from drawing their visitors' attention to inland water heritage.
- Waterways often form a component of 'open space' such as public parks and recreation grounds. Areas of water such as rivers and canals fall within the scope of open space in the NPPF (Department for Communities and Local Government 2012, 54), affording a degree of protection from development. Policies in the NPPF with respect to Green Belts, which require local authorities to plan positively to enhance the beneficial use of Green Belt (Department for Communities and Local Government 2012, para. 81), could also be mobilised in increasing public awareness of the historical role of watercourses.

These advantages in terms of the potential of public awareness, and the need expressed above for new investigations to draw attention to heritage assets under inland waters, present an opportunity. There is a clear case for promoting community-based projects focussing on inland waters as a means of simultaneously generating new information about heritage assets, and raising public awareness through active participation in desk-based research and field investigations. As with all community-based archaeology projects, a certain degree of support will be required to assist, provide tools, keep safe, help direct, and facilitate recording and reporting; but there is considerable potential to make major gains in both historic environment data and public awareness through accessible, non-intrusive investigations of local watercourses.

A further means of raising awareness by actively engaging the public with respect to heritage assets in inland waters is to take steps to encourage greater reporting from this environment by the public through the Portable Antiquities Scheme. As noted above, many

[44] http://www.english-heritage.org.uk/daysout/properties/bradford-on-avon-tithe-barn/

important artefacts have been found in watercourse in the past; in many cases these may be relatively isolated losses or depositions, but in some cases they may indicate the presence of a site or structural remains. The PAS could be a source of previous information relating to discoveries in rivers, but it also has potential as a partner in seeking to increase awareness about what might come to light through greater attention to watercourses[45].

[45] NB Many finds recorded through PAS are made by metal detectorists. Metal detector finds in the vicinity of existing or relict watercourses may have a bearing on previous watercourse use. However, metal detecting on the bed of shallow watercourses should probably not be encouraged because of the difficulty of making observations through the water if a contact is made, and because of the potential for environmentally-rich waterlogged deposits to be disturbed even by shallow digging.

10. Conclusions

There are many designated heritage assets in close proximity to non-tidal inland waters. These are mostly listed buildings – especially bridges – but also scheduled monuments, registered parks and gardens, registered battlefields and World Heritage Sites. Designated assets in the vicinity of watercourses reflect a variety of themes: transport – both across the waterway and along it; trade; milling; military; religious and domestic. In the Study Area, shipbuilding was hardly represented by designated assets, and there are no designated assets representing the vessels themselves, or fishing, or drainage. It seems unlikely that this lack of representation is caused by a real absence in the Study Area of heritage assets that would meet selection criteria for designation relating to these themes. Rather, it appears that these themes are poorly represented by the designation of heritage assets nationally.

Few investigations appear to have been undertaken in inland waters in England. There is not, therefore, a proven toolbox of methodologies and techniques to hand. Nonetheless, desk-based and 'on foot' methodologies could be adapted quickly from existing practice, as could – to some extent – 'wading' methodologies in the light of RCZAS experience. Boat based methodologies – especially the use of kayaks as developed by Nigel Baker – seems a very productive avenue to develop, subject to the requirements of health and safety, and agreeing access. Diving in inland waters has produced good results on several occasions and could be used more widely; diving in inland waters is much more cost-effective than at sea due to several environmental factors.

Remote sensing techniques have great potential in inland waters but appear to be little used. Sidescan, multibeam and other techniques directed at underwater topography and riverbed features could be adapted from their use at sea, where they have radically changed archaeologists' capacity to prospect for and record underwater sites. Techniques such as LiDAR and photogrammetry that can be applied 'in air' to the topography immediately surrounding waterways, and to features that are above water, could also be used to better understand the context of and potential for assets in the water.

Many designated assets have elements that are below the water. However, the significance of these elements in their own right, or in their contribution to the significance of the asset as a whole, is largely unexplored. In the Study Area, few of the asset descriptions available through the National Heritage List mention the below-water elements of the sites to which they refer. On the basis of the few comments picked out, map evidence and observations during site visits, it can be concluded that the underwater elements of designated assets could prove to be very significant in terms of understanding the assets and their histories. Some of the designated assets have potential for as-yet unknown assets to be situated below water in their vicinity.

Although the evidence is limited, the small number of investigations that have addressed heritage assets in or close to the water have demonstrated the presence of material that has otherwise been unknown, unrecorded or unremarked. These few examples show that significant archaeological material can survive in inland waters. It seems highly likely that there are many more examples of as-yet unknown assets that are significant in themselves, and which could have an important role in illuminating the wider history of watercourses in the development of England.

The main hazards identified by this project are the modification of watercourses and their structures for the purposes of 'restoration' and/or flood risk management; and general development. Watercourse management and small-scale hydro may present a hazard but there is already a degree of awareness of heritage issues in these sectors, though this may

be focussed more on above-water elements than below water. Erosion and flooding howsoever caused, are also key pathways through which damage can occur.

The current statutory and policy frameworks for designated heritage assets encompass assets under inland waters in the sense that they make no explicit reference to them; it has to be assumed, therefore, that the regimes apply equally irrespective of the environment in which the asset (or its components) lies. Lack of reference to the specifics of assets in inland waters does not equate to comprehensive or integrated provision, however. Even if no reference is made in primary legislation, some form of elucidation in accompanying guidance, for example, would be useful. As well as addressing a general absence of guidance on what designation means in respect of assets that are (partly) below water, some specific queries warrant consideration. In particular, the application of 'curtilage' to non-tidal waters ought to be addressed to better understand the status of unattached objects or structures below water in the vicinity of listed buildings. Moreover, the application of designated asset boundaries in relation to water seems to merit further attention. It is not always clear whether watercourses are used simply as a convenient line to follow, or whether inclusion/exclusion is based on the historical contribution of the watercourse itself or the potential for significant material to be present.

Other than comments about boundaries in respect of individual assets, there is little evidence of material below water having played a role in management decisions about designated assets. Practice on this topic may be non-existent.

There is great potential for increasing awareness and appreciation of assets under inland waters because the current baseline of awareness is so low. Relatively low awareness of assets under inland waters applies to archaeologists and heritage professionals, to water managers, to user-groups and the wider public. This may be partly attributable to a tendency to regard many rivers as 'natural', rather than as having been modified and/or being a focus of human activity in the past. Developing a means of characterising different watercourses might help to address this misconception. Assembling and presenting a corpus of information from previous investigations of inland waters could alleviate lack of awareness, though it is possible that there is in any case very little material to compile. New investigations directed at inland waters would be another good way of building awareness. Local availability and existing public access to inland waters add to the scope for generating public awareness of assets in inland waters. Community-based projects may provide opportunities to achieve greater public engagement whilst increasing the flow of archaeological data about rivers.

11. Recommendations

In terms of specific recommendations, the emphasis here is on actions that will raise awareness and prompt engagement by other stakeholders. No specific actions are proposed in respect of awareness-raising, as each of the actions itself is intended to promote greater awareness.

The following actions are put forward for consideration:

<u>Range/potential of asset types and their significance</u>

- Brief national reviews could be undertaken of the designation of specific monument types in inland waters to clarify the extent of existing designations, the historical significance of

monument types, and strategies for greater protection. Particular attention could be directed to the following types of heritage asset:

Inland watercraft

Shipbuilding

Trade (inland ports, wharves and quays)

Fishing (to complement IHA on Fish Weirs)

Ferry sites

Lock complexes on river navigations

Mill weirs

Culverts

Drainage / water management

Domestic sites and churches in vicinity of rivers

- A programme-based approach, akin to the RCZAS programme, could be taken to better understanding the historic environment of inland water environments.
- Model desk-based assessments of inland waterways could be carried out, drawing upon HER and NRHE data as well as designated assets, and cartographic/documentary sources. Evidence for changes to the watercourse, and for historical usage of the watercourse, ought to be a particular focus.
- A formal categorisation of watercourses in terms of their historic character would be very helpful, drawing on the approach and conclusions with respect to 'water' in completed HLCs but focussing on the identification of different 'types' of watercourse based on their historical development.

Methodologies and techniques

- A limited-numbers meeting or workshop could be organised for people already engaged in archaeology of inland waters to share experience, to identify other examples of investigations, and to discuss potential application of methodologies and techniques.
- A comprehensive data-gathering exercise on previous investigations in inland waters could augment the information provided in this report as a basis for increasing awareness of investigative methods.
- Selective trials are warranted of investigative methods such as: boat-based survey; diving; multibeam/sidescan/sector scan survey; LiDAR; photogrammetry; and the application of SUAs.
- The development of an outline research agenda for inland waters would help frame investigations.
- Practical approaches could be developed to promote and assist community-based archaeology projects focussing on inland waters, by preparing – for example – model work programmes, 'toolbox' guides to desk and field-based investigation, templates for recording and reporting, exemplar material etc.

Law, policy and management

- Specific guidance on the implications of river restoration for the historic environment could be developed to support the Manual on River Restoration.

- Additional information on the contribution of designated assets below water to the historic environment could be offered for inclusion in the EA Fluvial Design Manual.
- The implications for heritage assets of different approaches to flood risk management interventions ought to be reviewed to inform current debates about responses to flooding.
- Greater engagement with the EA about watercourses as heritage assets in their own right, and about assets below water, would help to raise awareness amongst water managers.
- Information on designated assets below water could be incorporated into Canal & River Trust guidance for safeguarding the special significance of historic locks and bridges, in conjunction with Listed Building Consent Order[46]
- There could be greater engagement with WHS Management Plans where reference is made to watercourses (e.g. City of Bath WHS Management Plan, Item 28).
- Better consideration of watercourses could be sought in the WHS Management Plan for Avebury.
- The approach to protecting artificial and heavily modified watercourses warrants development, noting that statutory designation may be appropriate in some but not all cases.
- Guidance ought to be developed on the management of designated heritage assets in inland waters, addressing significance, boundaries, extent of designation (with reference to curtilage), hazards, and approaches to investigation.
- Baseline understanding of heritage assets in inland waters could be augmented by work with PAS on encouraging reports of discoveries from watercourses.
- Greater reference to the history of watercourses and to assets below water is warranted in English Heritage material directed to the public.

[46] http://canalrivertrust.org.uk/about-us/heritage/national-listed-building-consent-order/the-project

12. References

Bath and North East Somerset Council. 2010. “City of Bath World Heritage Site: Management Plan 2010-2016.”

Berry, Warren. 2009. *The Kennet and Avon Navigation: A History*. Chichester: Phillimore.

Bird, P., and S. Jallands. 1991. “An Underwater Survey of Bishop’s Gate Bridge, Norwich: Extract from Project Report.” *Nautical Archaeology Society Newsletter* 1991 (3): 6–8.

Brown, Tony. 2009. “L’archeologie Fluviale En Angleterre.” *Dossiers d’Archeologie* 331 (Archaeologie Fluviale en Europe): 82–87.

Buglass, John. n.d. “Boats in a Coal Mine”. Unpublished typescript.

———. 1999. “River Tees Survey near Midlleton One Row, Teeside”. Unpublished report.

———. 2006. “River Ure Recording Project. Field Barn, Nutwith Cote Farm, North Yorkshire. Survey and Archaeological Interpretation”. Unpubished report.

Cook, Martin. 2010. “Building Recording at Locks 29, 30, 31, 32 and 34, Kennet and Avon Canal, Devizes, Wiltshire”. Unpublished report for British Waterways.

———. 2012. “Watching Brief at Dreweat’s Weir, Kennet and Avon Canal, West Berkshire”. Unpublished report for Canal & River Trust.

Cooper, L.P. 2003. “Hemington Quarry, Castle Donington, Leicestershire, UK: A Decade beneath the Alluvium of the Confluence Zone.” In *Alluvial Archaeology in Europe*.

Davies, Louise. 2011. “Hulk Assemblages: Assessing the National Context”. Unpublished report.

Department for Communities and Local Government. 2012. “National Planning Policy Framework.”

Department for Communities and Local Government, and Department for Culture Media and Sport. 2009. “Circular on the Protection of World Heritage Sites”. Communities and Local Government Circular 07/2009.

Elks, David, and Simon Stowe. 2006. “Geophysical Survey Report: Droitwich Canal - Hawford Lock”. Stratascan: Unpublished report for Droitwich Canals Trust, ref. J 2134.

English Heritage. 2005. *Avebury World Heritage Site Management Plan (English Heritage 2005)*. London: English Heritage.

———. 2009. “The Protection & Management of World Heritage Sites in England: English Heritage Guidance Note to Circular for England on the Protection of World Heritage Sites.”

———. 2011a. *River Fisheries and Coastal Fish Weirs*. Introductions to Heritage Assets. English Heritage.

———. 2011b. *Roman and Medieval Sea and River Defences*. Introductions to Heritage Assets. English Heritage.

Harrison, David Featherstone. 2007. *The Bridges of Medieval England Transport and Society, 400-1800*. Oxford: Clarendon Press.

Hawkes, John W, and P. J Fasham. 1997. *Excavations on Reading Waterfront Sites, 1979-1988*. Salisbury, England: Wessex Archaeology.

Henderson, J.C., and C. Burgess. 1996. “Close Contour Survey of Submerged Sites to Create Data Terrain Models.” *International Journal of Nautical Archaeology* 25 (3): 25–256.

Jacobs Babtie. 2006. “Old Abingdon Road, Oxford: Archaeological Desk Based Assessment”. Unpublished report.

Jeremiah, Josephine. 2005. *The Bristol Avon: A Pictorial History: From Source to Avonmouth*. Chichester, West Sussex: Phillimore.

McKewan, Colin, ed. 2006. “Stourhead Lake Project 2005: Survey and Excavation of the Lakes at Stourhead House”. Nautical Archaeology Society.

McKinley, J. 2003. “A Wiltshire ‘Bog Body’? Discussion of a Fifth/Sixth Century Burial in the Woodford Valley.” *Wiltshire Archaeological and Natural History Magazine* 96: 7–18.

McNeary, Rory. 2011. “Riverine Archaeology in Northern Ireland: An Evaluation.” *International Journal of Nautical Archaeology* 40 (1): 162–70.

Mynors, Charles. 2006. “Legal Briefing: The Extent of Listing (3).” *Context*, no. 97.

Paget-Tomlinson, E. W. 2006. *The Illustrated History of Canal & River Navigations*. Ashbourne: Landmark.

Pett, Leonie. 2013. “Hulk Assemblages: Asssessing the National Context (Part Two)”. Unpublished report.

Redknap, Mark, and A. Lane. 1994. “The Early Medieval Crannog at Llangorse, Powys: An Interim Statement on the 1989–1993 Seasons.” *International Journal of Nautical Archaeology* 23 (3): 189–206.

Rhodes, Ed. 2007. “Identifying Human Modification of River Channels.” In *Waterways and Canal-Building in Medieval England*.

Rickard, Charles, Rodney Day, and Jeremy Purseglove. 2003. “River Weirs – Good Practice Guide Guide - Section A”. Unpublished report for Environment Agency.

Savage, C.I. 1957. *Inland Transport*. History of the Second World War: United Kingdom Civil Series. London: HMSO.

Wessex Archaeology. 1998. “SS Great Britain Project. Great Western Dry Dock and Quayside. Archaeological Appraisal”. Unpublished report ref: 44626.02.

———. 1999. “Iffley Lock, Oxford: Archaeological Recording”. Unpublished report ref: 45611.03.

———. 2006. “Langport Sluice Gates, Somerset. Archaeological Recording. Technical Report”. Unpublished report ref: 62110.01.

———. 2013. “Stonehenge, Avebury and Associated Sites World Heritage Site Revised Archaeological Research Framework”. Unpublished report.

Appendix I: Designated Assets in the Study Area

ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1001	Avon	Floating Harbour and The Feeder	Bridge	Swing Bridge over North Entrance Lock	LB II*	1202186	
1002	Avon	Floating Harbour and The Feeder	Lock	Brunel's South Entrance Lock	LB II*	1207824	
1003	Avon	Floating Harbour and The Feeder	Bridge	Swing Bridge over Brunel's South Entrance Lock	LB II*	1207851	
1004	Avon	Floating Harbour and The Feeder	Wharf	Quay Walls and Boards around Cumberland Basin	LB II	1202185	
1005	Avon	Floating Harbour and The Feeder	Lock	South Junction Lock	LB II	1207842	NB. Lock Cottages LBs adjacent.
1006	Avon	Floating Harbour and The Feeder	Boat / Ship Yard	Patent Slip and Quay Walls	LB II	1218703	
1007	Avon	Floating Harbour and The Feeder	Boat / Ship Yard	Underfall Yard	SM	1005419	NB Other LBs in association
1008	Avon	Floating Harbour and The Feeder	Boat / Ship Yard	Albert Dock	LB II	1025026	
1009	Avon	Floating Harbour and The Feeder	Boat / Ship Yard	Great Western Dock	LB II	1025026	NB Other LB (office) associated
1010	Avon	Floating Harbour and The Feeder	Crane	Fairbairn Crane	LB II*	1202666	
1011	Avon	Floating Harbour and The Feeder	Crane	Fairbairn Crane	SM	1005418	
1012	Avon	Floating Harbour and The Feeder	Wharf	Princes Wharf and Wapping Wharf, Quays and Bollards	LB II	1279514	
1013	Avon	Floating Harbour and The Feeder	Crane	Crane Base	LB II	1204766	
1014	Avon	Floating Harbour and The Feeder	Wharf	Floating harbour quay wall and bollards extending for approximately 900 metres	LB II	1202530	
1015	Avon	Floating Harbour and The Feeder	Wharf	Quay wall and bollards to narrow quay	LB II	1202380	
1016	Avon	Floating Harbour and The Feeder	Bridge	Prince Street Bridge	LB II	1209521	NB Other LB (engine house) associated
1017	Avon	Floating Harbour and The Feeder	Crane	Hand crane at mud dock	LB II	1209534	
1018	Avon	Floating Harbour and The Feeder	Wharf	Quay Walls of Mud Dock	LB II	1202622	'Probably the oldest surviving of the inlet docks of the tidal harbour preceding the Floating Harbour; also known as the Great Dock'
1019	Avon	Floating Harbour and The Feeder	Wharf	Quay Wall of Bathurst Wharf	LB II	1219079	
1020	Avon	Floating Harbour and The Feeder	Wharf	The Grove Wharf Extending approximately 200 metres between Redcliffe Bridge and Mud Dock	LB II	1282053	'An important quay since the C13th'

ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1021	Avon	Floating Harbour and The Feeder	Wharf	Walls, Quays and Bollards to Bathurst Basin	LB II	1204010	
1022	Avon	Floating Harbour and The Feeder	Crane	Hand Crane on Redcliffe Wharf	LB II	1025029	
1023	Avon	Floating Harbour and The Feeder	Wharf	Redcliffe Wharf Quays and Bollards, Extending approximately 250 metres south of Redcliffe Bridge	LB II	1218800	
1024	Avon	Floating Harbour and The Feeder	Wharf	Welsh Back Wharf Extending approximately 450 metres between Bristol and Redcliffe Bridges	LB II	1202676	'one of the 3 city quays, and an important quay since the C13'
1025	Avon	Floating Harbour and The Feeder	Wharf	Buchanans Wharf	LB II	1202484	
1026	Avon	Floating Harbour and The Feeder	Bridge	Bedminster Bridge	LB II	1201994	
1027	Avon	Floating Harbour and The Feeder	Lock	Netham Locks, including remains of Bridge	LB II	1025059	
1028	Avon	Floating Harbour and The Feeder	House	Lock Keeper's House at Netham Locks Lock Keeper's toll House at Netham Locks	LB II	1282061	
1029	Avon	Navigable Avon	House	Picnic House	LB II	1116829	'Built in connection with Avon Navigation Scheme' NB other LB (cottages) associated but Hanham Lock not designated
1030	Avon	Navigable Avon	Bridge	Bridge over Siston Brook and approx 100 yards of Wharf Retaining Wall and Steps immediately south of Bridge at Londonderry Wharf	LB II	1116824	NB other LB (weigh house) associated
1031	Avon	Navigable Avon	Bridge	Causeway and Lock Bridge north east of Ile D'avon	LB II	1116825	NB other LB associated
1032	Avon	Navigable Avon	Mill	Old Brass Mill	LB II	1384580	'the section of the River Avon near Saltford is one of the most important areas, nationally, for the brass industry and its archaeological remains'. NB Other LBs associated. Keynsham Abbey (SM) nearby on R. Chew
1033	Avon	Navigable Avon	Wharf	approximately 63 yards of Retaining Wall to Wharf and Steps at Avonside Wharf	LB II	1116799	
1034	Avon	Navigable Avon	Mill	Swineford Copper Mills including Waterwheels and Machinery	LB II	1116761	
1035	Avon	Navigable Avon	Inn	Jolly Sailor Inn	LB II	1384668	
1036	Avon	Navigable Avon	Mill	Annealing Ovens, Kelston Mills	LB II	1215014	NB Adjacent brassworkers' cottages listed also
1037	Avon	Navigable Avon	Mill	Annealing Ovens, Kelston Mills	LB II	1288285	
1038	Avon	Navigable Avon	Mill	Annealing Ovens, Kelston Mills	LB II	1288317	
1039	Avon	Navigable Avon	Mill	Saltford Brass Battery Mill	SM	1004607	
1040	Avon	Navigable Avon	Mill	Old Brass Mill	LB II*	1384676	
1041	Avon	Navigable Avon	Park	Kelston Park	RHPG II*	1000536	
1042	Avon	Navigable Avon	WHS	Bath	WHS	1000103	[K&A within Bath WHS at bridge between Bathwick and Bathampton]
1043	Avon	Navigable Avon	Bridge	Newbridge	LB II	1365664	

ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1044	Avon	Navigable Avon	Bridge	Newbridge or New town Bridge	LB II*	1395726	
1045	Avon	Navigable Avon	Lock	Weston Lock	LB II	1395660	
1046	Avon	Navigable Avon	Bridge	Bridge, Lockswood Cut / weston Cut	LB II	1395658	
1047	Avon	Navigable Avon	Bridge	Victoria Bridge	LB II*	1395490	
1048	Avon	Navigable Avon	Mill	Camden Mill, Bath	LB II	1395124	
1049	Avon	Navigable Avon	Mill	Camden Malthouse and Silo	LB II	1395115	
1050	Avon	Navigable Avon	Bridge	Skew Bridge	LB II	1395344	
1051	Avon	Navigable Avon	Bridge	Halfpenny Bridge and Lodge House	LB II	1394582	
1052	Avon	Navigable Avon	Bridge	St James Railway Bridge	LB II	1395151	
1053	Avon	Navigable Avon	Bridge	North Parade Bridge	LB II	1395800	
1054	Avon	Navigable Avon	Bridge	Pulteney Bridge	LB II	1394514	(?SM also)
1055	Avon	Navigable Avon	Park	Parade Gardens	RHPG II	1001630	NB Monk's Mill at N end of enclosure
1056	Avon	Upper Avon	Bridge	Cleveland Bridge	LB II*	1394634	NB 'It stands near the likely site of the city's Roman bridge'
1057	Avon	Upper Avon	Baths	Cleveland Baths	LB II*	1396146	
1058	Avon	Upper Avon	Mill	Bathampton Mill	LB II	1115200	
1059	Avon	Upper Avon	Bridge	Bathampton toll Bridge	LB II	1320555	NB Other LB (toll House) associated
1060	Avon	Upper Avon	Bridge	Limpley Stoke Bridge (or Stokeford Bridge)	SM	1005641	
1061	Avon	Upper Avon	Bridge	Barton Bridge	SM	1005663	NB Barton Farm SM adjacent, incl. Tithe Barn
1062	Avon	Upper Avon	Bridge	Barton Bridge	LB II*	1364494	
1063	Avon	Upper Avon	Mill	Main Block of Abbey Mills	LB II*	1200197	
1064	Avon	Upper Avon	Wharf	Water Gate to north of Westbury House	LB II	1300088	***
1065	Avon	Upper Avon	Bridge	Town Bridge and Chapel	LB I	1036011	
1066	Avon	Upper Avon	Bridge	Bradford-on-Avon Bridge	SM	1005659	
1067	Avon	Upper Avon	Mill	Lamb Building (Building 70), Kingston Mills	LB II	1036136	
1068	Avon	Upper Avon	Bridge	Road Bridge over River Avon, Staverton	LB II	1364101	'two arches possibly C15'. Adjacent to Nestle Condensed Milk Works: http://www.britainfromabove.org.uk/image/epw041325
1069	Avon	Upper Avon	Bridge	Packhorse Bridge, Melksham Road	LB II	1251182	
1070	Avon	Upper Avon	Bridge	Bridge over River Avon, Melksham	LB II	1364161	
1071	Avon	Upper Avon	Bridge	Lacock Bridge	SM	1018383	
1072	Avon	Upper Avon	Bridge	Lacock Bridge	LB II*	1022127	
1073	Avon	Upper Avon	Bridge	Bridge 170m west of Lacock Methodist Chapel	SM	1018382	
1074	Avon	Upper Avon	Monastic	Lacock Abbey	RHPG II	1001236	NB Lacock Abbey adjacent – with ponds; extends north again to river and weir
1075	Avon	Upper Avon	Bridge	Rey Bridge	LB II	1022190	NB Ray Mill upstream; no [NB Odd channels on headland]
1076	Avon	Upper Avon	Settlement	Moated site and fishponds south east of Rowden Farm	SM	1013876	
1077	Avon	Upper Avon	Bridge	Avon Bridge House, Bath Road	LB II	1268166	
1078	Avon	Upper Avon	Bridge	Maud Heath's Causeway	LB II*	1022351	'Maud Heath gave land and property in 1474 for the construction and maintenance of a raised path'

ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1079	Avon	Upper Avon	Mill	Kellaways Mill	LB II	1022355	
1080	Avon	Upper Avon	Bridge	River Avon Viaduct (MLN19078)	LB II	1409160	
1081	Avon	Upper Avon	Church	Church of All Saints, Christian Malford	LB I	1199647	'C12 origins, c1300, C15 with C18 west tower' NB Other LBs associated. NB ?Ford name.
1082	Avon	Upper Avon	Water Management	Avon Weir	LB II	1199629	'Marked as Christian Malford Mill on andrews and Drury 1773 map'
1083	Avon	Upper Avon	Church	Church of St. James, Dauntsey	LB I	1199909	'C12 origins'
1084	Avon	Upper Avon	House	Dauntsey House	LB II*	1199975	'C14 core'
1085	Avon	Upper Avon	Church	Church of St Peter and Paul	LB I	1022516	'C14, C15'
1086	Avon	Upper Avon	Castle	Motte castle 20m west of Great Somerford Church	SM	1013224	'The importance of the site is enhanced by the likelihood of the survival of below-ground waterlogged and organic remains, as a result of its location on the floodplain of the River Avon'
1087	Avon	Upper Avon	Mill	Kingsmead Mill	LB II	1363757	
1088	Avon	Upper Avon	Settlement	Ringwork on Cam's Hill, 500m north east of Lawn Farm	SM	1021288	NB at a distance from river, on hill
1089	Avon	Sherston Avon	Mill	Avon Mills, Inner Buildings	LB II	1269278	
1090	Avon	Sherston Avon	Bridge	St Johns Bridge and attached Walls	LB II	1269281	'on site of earlier bridge, also known as Mill or town Bridge'
1091	Avon	Sherston Avon	Settlement	Early medieval settlement, palace, church and Bronze Age ring ditches 340m east of Cowage Farm	SM	1018389	'towards the flood plain of the river, where the field is under pasture there is a further feature visible as an earthwork, interpreted as a substantial platform 25m long and 15m wide overlooking the river'
1092	Avon	Sherston Avon	Mill	Bremilham Mill House	LB II	1363876	
1093	Avon	Sherston Avon	Settlement	Medieval moated site and Romano-British settlement at White Walls Wood	SM	1013354	
1094	Avon	Sherston Avon	Bridge	Bridge over River Avon	LB II	1356034	
1095	Avon	Sherston Avon	House	Bridge House	LB II	1198718	
1096	Avon	Sherston Avon	Settlement	Earthwork 200yds (180m) W of parish church, Sherston	SM	1004703	
1097	Avon	Tetbury Avon	Bridge	Baskerville Bridge	LB II	1269250	
1098	Avon	Tetbury Avon	Bridge	Abbey Bridge	LB II	1269294	
1099	Avon	Tetbury Avon	Park	Estcourt Park	RHPG II	1001437	NB Shipton Mill
1100	Avon	Tetbury Avon	Monastic	Estcourt Grange	LB II	1154751	This is the site of a Cistercian Priory, established c1140
1101	Avon	Tetbury Avon	House	Summerhouse in woods about 90 metres due south of centre of Wiltshire Bridge	LB II	1089688	
1102	Avon	Tetbury Avon	Camp	Tetbury Camp	SM	1003421	
1103	Avon	Tetbury Avon	Bridge	Wiltshire Bridge	LB II	1227608	Duplicate
1104	Avon	Tetbury Avon	Bridge	Wiltshire Bridge	LB II	1089645	Duplicate
1105	Kennet	Lower Kennet	Bridge	Railway Bridge and attached Accommodation Bridge over River Kennet	LB II	1113621	

ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1106	Kennet	Lower Kennet	Water Management	The Screens House	LB II	1113618	
1107	Kennet	Lower Kennet	Water Management	The Engine House	LB II	1248683	
1108	Kennet	Lower Kennet	House	47-48, Kenavon Drive	LB II	1248695	NB Houses face the river
1109	Kennet	Lower Kennet	Water Management	The Pump and Turbine House	LB II	1321867	
1110	Kennet	Lower Kennet	Mill	Abbey Mill Ruins	LB II	1113390	
1111	Kennet	Lower Kennet	Monastic	Reading Abbey: a Cluniac and Benedictine monastery and Civil War earthwork.	SM	1007932	
1112	Kennet	Lower Kennet	Bridge	High Bridge	LB II	1321938	
1113	Kennet	Lower Kennet	Bridge	High Bridge	SM	1005388	
1114	Kennet	Lower Kennet	Culvert	Culvert on Holy Brook running south westwards From Su71441/73234 to 71327/73133	LB II*	1321866	***
1115	Kennet	Lower Kennet	Wharf	Building now part of Courage's Brewery	LB II	1113473	
1116	Kennet	Lower Kennet	Bridge	West Bridge over the Holy Brook at Coleypark Farm	LB II	1113608	
1117	Kennet	Lower Kennet	Bridge	East Bridge over the Holy Brook at Coleypark Farm	LB II	1321899	
1118	Kennet	Mid Kennet	Bridge	Burghfield Bridge	LB II	1313029	
1119	Kennet	Mid Kennet	House	Holybrook Cottage	LB II*	1215618	NB Other LB (Old Mill House) associated
1120	Kennet	Mid Kennet	Lock	Garston Lock	LB II*	1117125	
1121	Kennet	Mid Kennet	Pillbox	Pillbox at south east Corner of Garston Lock	LB II	1117126	
1122	Kennet	Mid Kennet	Pillbox	Pillbox at north west Corner of Garston Lock	LB II	1135986	
1123	Kennet	Mid Kennet	Lock	Sheffield Lock	LB II	1319599	
1124	Kennet	Mid Kennet	Lock	Sheffield (or Shenfield) Lock	SM	1006972	
1125	Kennet	Mid Kennet	Mill	Shenfield Millhouse	LB II	1117139	
1126	Kennet	Mid Kennet	House	Canal Cottage and Outbuilding	LB II	1393107	
1127	Kennet	Mid Kennet	Lock	Aldermaston Lock	LB II	1319515	
1128	Kennet	Mid Kennet	Lock	Aldermaston Lock	SM	1006970	
1129	Kennet	Mid Kennet	Mill	Old Mill House	LB II	1154855	
1130	Kennet	Mid Kennet	House	Bridge Cottage	LB II	1303078	'This is one of the few remaining minor industrial buildings associated with the Kennet Navigation'
1131	Kennet	Mid Kennet	Settlement	Medieval field system W of Woolhampton	SM	1006969	
1132	Kennet	Mid Kennet	Church	Chapel approximately 10 metres to east of Manor Farmhouse	LB II*	1303413	
1133	Kennet	Mid Kennet	Farm	Manor Farmhouse	LB II	1117304	
1134	Kennet	Mid Kennet	Church	Chapel of St Leonard, Manor Farm	SM	1005378	
1135	Kennet	Mid Kennet	Mill	Brimpton Mill	LB II	1303401	
1136	Kennet	Mid Kennet	Settlement	Moated manorial site 200m north-west of East Field Copse	SM	1013188	
1137	Kennet	Mid Kennet	Lock	Monkey Marsh Lock, Kennet and Avon Canal	SM	1006971	
1138	Kennet	Mid Kennet	Farm	Chamberhouse Farmhouse	LB II	1117294	NB Other LB associated (cottage)
1139	Kennet	Mid Kennet	Farm	Hambridge Farm House	LB II	1221044	NB Other LB associated (barn)

ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1140	Kennet	Mid Kennet	Mill	Stowers - Mill House	LB II	1290644	
1141	Kennet	Mid Kennet	Bridge	Bridge over River Kennet	LB II*	1290920	'replacing an earlier wooden bridge of 1726' NB Other LBs associated with bridge head
1142	Kennet	Mid Kennet	Lock	Newbury Lock	LB II	1211989	
1143	Kennet	Mid Kennet	Bridge	Enborne Bridge over Kennet and Avon Canal	LB II	1220347	
1144	Kennet	Mid Kennet	Bridge	Guyers Bridge and Lock	LB II	1221070	
1145	Kennet	Mid Kennet	Battle	Battle of Newbury 1643	RHB	1000026	
1146	Kennet	Mid Kennet	Bridge	Benham Bridge on Kennet and Avon Canal	LB II	1220893	
1147	Kennet	Mid Kennet	Pillbox	Pillbox immediately east of Benham Bridge	LB II	1221049	
1148	Kennet	Mid Kennet	Pillbox	Pillbox immediately west of Benham Bridge	LB II	1290705	
1149	Kennet	Mid Kennet	Park	Benham Park	RHPG II	1000173	
1150	Kennet	Mid Kennet	Castle	Motte in Hamstead Marshall Park, 340m NE of The Dower House	SM	1007925	
1151	Kennet	Mid Kennet	Park	Park Pale in Hamstead Marshall Park	SM	1015953	
1152	Kennet	Mid Kennet	Mill	Mill House	LB II	1136077	
1153	Kennet	Mid Kennet	Bridge	Hamstead Bridge and Hamstead Lock	LB II	1136141	
1154	Kennet	Mid Kennet	Pillbox	Pillbox at north west Corner of Hamstead Bridge	LB II	1221114	
1155	Kennet	Mid Kennet	Pillbox	Pillbox at north east Corner of Hamstead Bridge	LB II	1221117	
1156	Kennet	Mid Kennet	Park	Hamstead Marshall Park	RHPG II	1000525	
1157	Kennet	Mid Kennet	Castle	Motte and bailey castles, fishponds, deserted medieval village and manor site NE of St Mary's Church	SM	1007924	
1158	Kennet	Mid Kennet	Pillbox	Pillbox at 65 metres east of Dreweatts Bridge and Lock	LB II	1136148	
1159	Kennet	Mid Kennet	Bridge	Dreweatts Bridge and Lock	LB II	1117230	
1160	Kennet	Mid Kennet	Inn	Dundas Arms Inn	LB II	1117250	
1161	Kennet	Mid Kennet	Bridge	Bridge to south of Dundas Arms	LB II	1313116	
1162	Kennet	Mid Kennet	Bridge	Bridge over Mill Race	LB II	1319544	
1163	Kennet	Mid Kennet	Bridge	Canal Bridge	LB II	1117245	
1164	Kennet	Mid Kennet	Bridge	Kennet and Avon Canal, Orchard Meadow Bridge	LB II	1117212	
1165	Kennet	Mid Kennet	Bridge	Kennet and Avon Canal, Brunsdon Bridge and Brunsdon Lock	LB II	1319566	
1166	Kennet	Mid Kennet	Church	Church of St Mark and St Luke	LB I	1319539	'CII'
1167	Kennet	Mid Kennet	House	The Manor House	LB II	1117237	
1168	Kennet	Mid Kennet	House	Garden House and Part of Garden Walls 50 metres south west of The Manor House	LB II	1135733	
1169	Kennet	Mid Kennet	Bridge	Kennet and Avon Canal, Wire Bridge and Wire Lock	LB II	1117211	
1170	Kennet	Mid Kennet	Bridge	Bridge over River Kennet at Dun Mill	LB II	1210533	
1171	Kennet	Mid Kennet	Lock	Kennet and Avon Canal Dun Mill Lock	LB II	1212487	
1172	Kennet	Mid Kennet	Bridge	Bridge over Canal at Dun Mill	LB II	1210532	
1173	Kennet	Upper Kennet	Bridge	Bridge over River Kennet	LB II	1210246	
1174	Kennet	Upper Kennet	Mill	Eddington Mill (Mill House and Mill)	LB II	1289506	
1175	Kennet	Upper Kennet	House	Pavilion on River Kennet	LB II	1212052	
1176	Kennet	Upper Kennet	Mill	The Mill House	LB II	1300620	

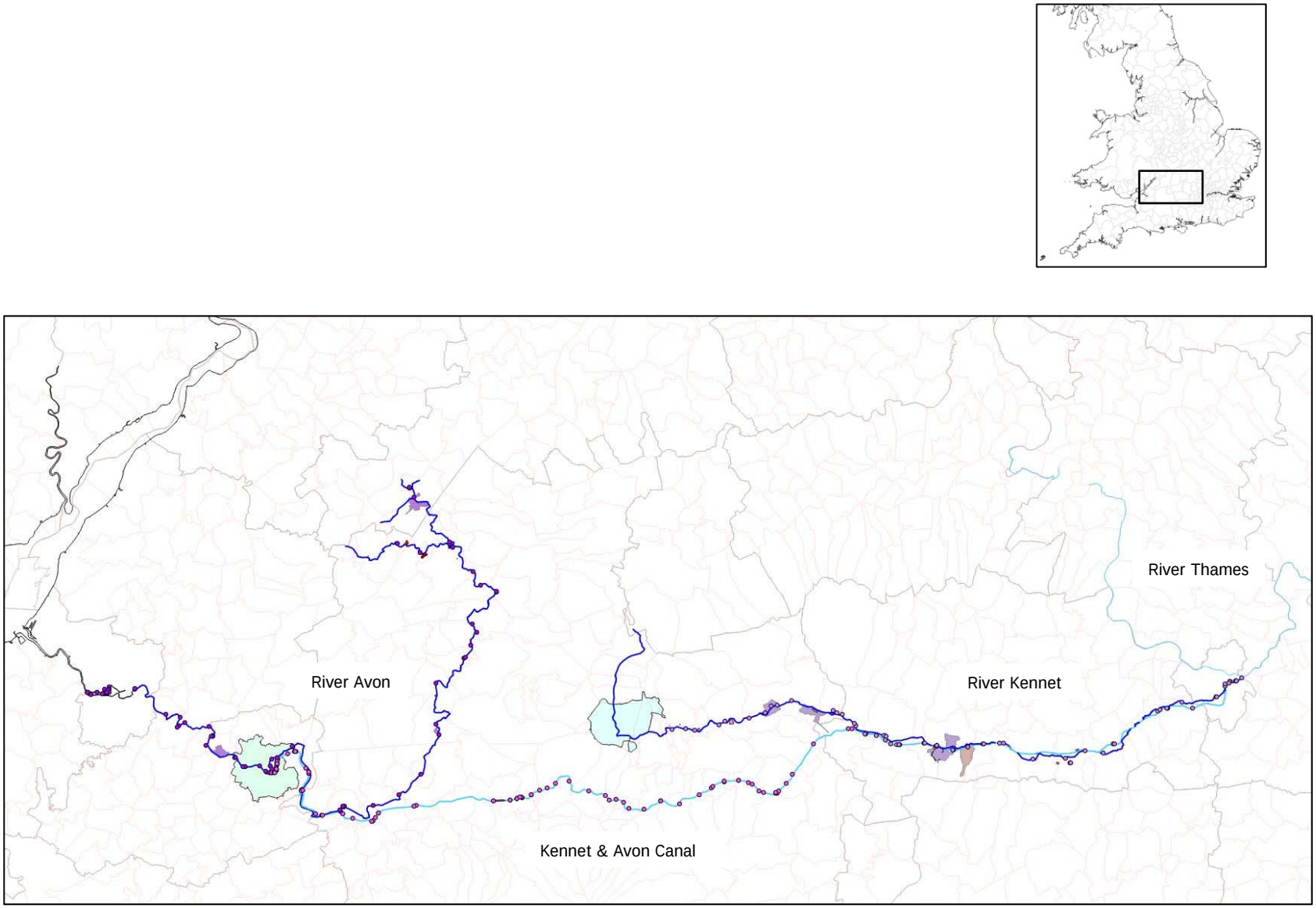
ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1177	Kennet	Upper Kennet	Church	Church of St Mary	LB II*	1034139	c1300, early C14
1178	Kennet	Upper Kennet	Settlement	Roman villa at Littlecote	SM	1003256	
1179	Kennet	Upper Kennet	Park	Littlecote House	RHPG II	1000479	'During the medieval period there was a manor at Littlecote, which was owned by the Durnford family in the C12. The manor came in the ownership of the Darell family c 1415 ... In 1730, the then owner of Littlecote House, Sir Francis Popham, discovered the remains of a Roman villa in the park with a rare decorative floor mosaic
1180	Kennet	Upper Kennet	Mill	The Old Mill	LB II	1183958	NB extensive river works; many properties have rear river frontage
1181	Kennet	Upper Kennet	Bridge	Bridge and Weir on River Kennet	LB II	1184067	
1182	Kennet	Upper Kennet	House	Ramsbury Manor	LB I	1184029	'on site of house of the Earl of Pembroke c1560 replacing a palace of the Bishops of Salisbury'
1183	Kennet	Upper Kennet	Park	Ramsbury Manor	RHPG II	1001242	
1184	Kennet	Upper Kennet	Farm	Axford Farmhouse	LB I	1300471	'House, medieval, C17 and C19, incorporating chapel of c1250 - 1300.'
1185	Kennet	Upper Kennet	Farm	Great Barn, 20 metres north west of Axford Farmhouse	LB II	1034124	
1186	Kennet	Upper Kennet	Bridge	Bridge over River Kennet	LB II	1300350	
1187	Kennet	Upper Kennet	Settlement	Black Field Roman site	SM	1004726	
1188	Kennet	Upper Kennet	Church	Church of St John The Baptist	LB I	1365445	'c10, c1200' – site close to river
1189	Kennet	Upper Kennet	Mill	Elcot Mill House	LB II	1243209	Not a mill, but possibly the site of a mill?
1190	Kennet	Upper Kennet	House	Marlborough College	RHPG II	1001239	
1191	Kennet	Upper Kennet	Castle	Castle mound	SM	1005634	
1192	Kennet	Upper Kennet	Church	Church of St George	LB II*	1243100	Preshute lies c. 1 mile west of Marlborough. The name, meaning `priest's cell', is first recorded in 1186. The church had the dedication of St George by 1232, although it may be of Saxon foundation.
1193	Kennet	Upper Kennet	House	Mill Cottages, Manton	LB II	1365433	
1194	Kennet	Upper Kennet	Barrow	Bowl barrow 50m north of Barrow Farm	SM	1012262	
1195	Kennet	Upper Kennet	Monastic	Clatford Hall	LB II*	1284448	The house probably occupies the site of a cell of the alien priory of St Victoire en Caux
1196	Kennet	Upper Kennet	Barrow	Bowl barrow 300m east of Ivy House Farm	SM	1012294	
1197	Kennet	Upper Kennet	WHS	Stonehenge, Avebury and Associated Site	WHS	1000097	Kennet is in WHS above George Bridge: numerous designated assets
1198	K&AC	K&AC – HD-SE	Bridge	Canal Bridge	LB II	1290527	
1199	K&AC	K&AC – HD-SE	Church	Church of St Lawrence	LB II*	1289541	NB Date given is 1816 though references to earlier monuments. Presumably built on site of earlier church; site may have been cut by canal construction

ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1200	K&AC	K&AC – HD-SE	Lock	Oakhill Down Lock and Bridge	LB II	1183543	
1201	K&AC	K&AC – HD-SE	Lock	Church Lock and Accommodation Bridge	LB II	1034040	
1202	K&AC	K&AC – HD-SE	Lock	Beech Grove Lock, Accommodation Bridge, and Apron Weir	LB II	1034051	
1203	K&AC	K&AC – HD-SE	Lock	Crofton Crossing Lock No 61 and Accommodation Bridge	LB II	1034084	
1204	K&AC	K&AC – HD-SE	Water Management	Reservoir Outfall and Sluices to Wilton Reservoir Wilton Reservoir Outfall and Canal Crossing Lock	LB II	1034022	
1205	K&AC	K&AC – HD-SE	Water Management	Crofton Pumping Station	LB I	1034049	
1206	K&AC	K&AC – HD-SE	Water Management	Flue to Crofton Pumping Station	LB II*	1300317	
1207	K&AC	K&AC – HD-SE	Bridge	Wolfhall Fields Bridge and Crofton top Lock	LB II	1365509	
1208	K&AC	K&AC – HD-SE	Bridge	Wolfhall Bridge	LB II	1263645	
1209	K&AC	K&AC – HD-SE	Tunnel	Bruce Tunnel, east Portal	LB II	1194523	NB Tunnel itself not designated
1210	K&AC	K&AC – SE-DS	Tunnel	Bruce Tunnel, west Tunnel	LB II	1035927	
1211	K&AC	K&AC – SE-DS	House	Wharf House	LB II	1035906	
1212	K&AC	K&AC – SE-DS	Crane	Crane on Burbage Wharf	LB II	1035907	
1213	K&AC	K&AC – SE-DS	Farm	Brimslade Farmhouse	LB II*	1035724	
1214	K&AC	K&AC – SE-DS	Lock	Brimslade and Cadley Locks, Bridges and Short Pound	LB II	1286307	
1215	K&AC	K&AC – SE-DS	Lock	Wootton Rivers Lock and Road Bridge	LB II	1035769	
1216	K&AC	K&AC – SE-DS	Bridge	Canal Bridge 200 metres west of Road Bridge	LB II	1035765	
1217	K&AC	K&AC – SE-DS	Bridge	New Mill Bridge	LB II	1272689	
1218	K&AC	K&AC – SE-DS	Bridge	Pains Bridge	LB II	1243859	
1219	K&AC	K&AC – SE-DS	Bridge	Suspension Bridge by Cannings Cottage	LB II	1193314	
1220	K&AC	K&AC – SE-DS	House	Cannings Cottage	LB II	1364669	
1221	K&AC	K&AC – SE-DS	Bridge	Ladies Bridge	LB II	1366119	
1222	K&AC	K&AC – SE-DS	Bridge	Woodborough Fields Bridge	LB II	1272677	
1223	K&AC	K&AC – SE-DS	Bridge	Accommodation Bridge on Kennet and Avon Canal, 500 metres east of Honey Street	LB II	1035672	
1224	K&AC	K&AC – SE-DS	Inn	Barge Inn	LB II	1365969	
1225	K&AC	K&AC – SE-DS	Bridge	Kennet and Avon Canal, Stanton Bridge	LB II	1033722	
1226	K&AC	K&AC – SE-DS	Bridge	Kennet and Avon Canal, England's Bridge	LB II	1365967	
1227	K&AC	K&AC – SE-DS	Bridge	Bridge on Kennet and Avon Canal, north of townend	LB II	1033771	
1228	K&AC	K&AC – SE-DS	Bridge	Kennet and Avon Canal, Horton Chain Bridge	LB II	1033746	
1229	K&AC	K&AC – SE-DS	Bridge	Kennet and Avon Canal, Canal Bridge at The Bridge Inn	LB II	1365980	
1230	K&AC	K&AC – SE-DS	Bridge	Kennet and Avon Canal, Laywood Bridge and Blockhouse	LB II	1033730	
1231	K&AC	K&AC – SE-DS	inn	Bridge Inn	LB II	1286187	NB ?wrongly positioned – should be adjacent to 1365980
1232	K&AC	K&AC – SE-DS	Bridge	Brickham Bridge	LB II	1244050	NB Duplicate
1233	K&AC	K&AC – SE-DS	Bridge	Kennet and Avon Canal Brickham Bridge	LB II	1262287	NB Duplicate

ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1234	K&AC	K&AC – SE-DS	Bridge	Park Bridge	LB II	1249363	
1235	K&AC	K&AC – SE-DS	Bridge	Wharf Bridge	LB II	1263776	
1236	K&AC	K&AC – SE-DS	Pillbox	Pill Box, by the Kennet and Avon Canal	LB II	1393864	
1237	K&AC	K&AC – SE-DS	House	27 and 27a, Northgate Street	LB II	1262653	
1238	K&AC	K&AC – SE-DS	House	Boundary Walls, Gates and Gate Piers of Numbers 27 and 27a	LB II	1251685	
1239	K&AC	K&AC – SE-DS	House	Besborough Lodge	LB II	1251687	
1240	K&AC	K&AC – SE-DS	Lock	Kennet and Avon Canal, Kennet Lock, immediately north of Town Bridge, The Nursery	LB II	1252431	
1241	K&AC	K&AC – SE-DS	Bridge	The Town Bridge	LB II	1262655	
1242	K&AC	K&AC – SE-DS	House	Bridge House Durleston	LB II	1249415	
1243	K&AC	K&AC – SE-DS	Bridge	Prison Bridge	LB II	1249416	
1244	K&AC	K&AC – SE-DS	Bridge	Marsh Lane Bridge	LB II	1243579	
1245	K&AC	K&AC – SE-DS	House	Foxhanger House	LB II	1272869	
1246	K&AC	K&AC – SE-DS	Lock	Caen Hill Locks	SM	1004694	
1247	K&AC	K&AC – DS-WK	House	Wharf Cottage	LB II	1021763	
1248	K&AC	K&AC – DS-WK	Aqueduct	Semington Aqueduct	LB II	1021749	NB Duplicate though details differ
1249	K&AC	K&AC – DS-WK	Aqueduct	Semington Aqueduct	LB II	1252241	
1250	K&AC	K&AC – DS-WK	House	4, Marsh Road	LB II	1021624	
1251	K&AC	K&AC – DS-WK	Bridge	Kennet and Avon Canal, Canal Bridge at Staverton	LB II	1021873	NB Duplicate
1252	K&AC	K&AC – DS-WK	Bridge	Kennet and Avon Canal, Accommodation Bridge over Canal	LB II	1285421	NB Duplicate
1253	K&AC	K&AC – DS-WK	Bridge	Bridge approximately 500 yards north east of Bridge to east of Aqueduct over Railway	LB II	1364208	
1254	K&AC	K&AC – DS-WK	Bridge	Bridge to east of Aqueduct over Railway	LB II	1021621	
1255	K&AC	K&AC – DS-WK	Aqueduct	Aqueduct over Railway	LB II	1021620	
1256	K&AC	K&AC – DS-WK	Aqueduct	Aqueduct over River Biss	LB II	1364207	
1257	K&AC	K&AC – WK-BN	Bridge	Widbrook Bridge Trowbridge Road	LB II	1261986	
1258	K&AC	K&AC – WK-BN	Inn	The Barge Inn	LB II	1200524	
1259	Avon	Upper Avon	Monastic	Tithe Barn at Barton Farm	LB I	1184239	
1260	Avon	Upper Avon	Monastic	Monastic Grange at Barton Farm	SM	1014813	NB Other LBs associated
1261	K&AC	K&AC – WK-BN	Inn	The Cross Guns Inn	LB II	1021877	
1262	K&AC	K&AC – WK-BN	Aqueduct	Avoncliff Aqueduct	LB II*	1021876	
1263	K&AC	K&AC – WK-BN	Bridge	Kennet and Avon Canal, Winsley Canal Bridge	LB II	1181033	
1264	K&AC	K&AC – WK-BN	Wharf	Murhill tramway and wharf	SM	1004693	
1265	K&AC	K&AC – WK-BN	Aqueduct	Dundas Aqueduct	LB I	1215193	NB Duplicate?
1266	K&AC	K&AC – WK-BN	Aqueduct	Dundas Aqueduct	LB I	1364071	NB Duplicate?
1267	K&AC	K&AC – WK-BN	Aqueduct	Dundas Aqueduct	SM	1005631	
1268	K&AC	K&AC – WK-BN	Crane	Crane at Dundas Wharf	LB II	1215194	
1269	K&AC	K&AC – WK-BN	Bridge	Dundas Horse Bridge	LB II	1232772	

ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1270	K&AC	K&AC – WK-BN	Lock	Lock Walls and Basin Wall at Entrance of Somersetshire Coal Canal south of Basin at west of Dundas Aqueduct	LB II	1276919	
1271	K&AC	K&AC – WK-BN	Bridge	Bridge over Kennet and Avon Canal	LB II	1214606	
1272	K&AC	K&AC – WK-BN	Water Management	Claverton Pumping Station	LB II	1214608	
1273	K&AC	K&AC – WK-BN	Bridge	Bridge over a Leat to south of Claverton Pumping Station	LB II	1288490	
1274	K&AC	K&AC – WK-BN	Bridge	Bridge over Kennet and Avon Canal	LB II	1214605	
1275	K&AC	K&AC – BN-BH	Bridge	Kennet and Avon Canal Bridge, 100 yards to east of George Inn	LB II	1115195	
1276	K&AC	K&AC – BN-BH	Inn	The George Inn Public House	LB II	1312465	
1277	K&AC	K&AC – BN-BH	House	1-6, Canal Terrace	LB II	1136975	
1278	K&AC	K&AC – BN-BH	Bridge	Bridge over The Kennet and Avon Canal	LB II	1137009	
1279	K&AC	K&AC – BN-BH	Bridge	Retaining Wall of Canal above Railway to east of Bridge	LB II	1394480	'This carefully detailed length of masonry construction indicates the lengths the Great western Railway went to in order to accommodate the existing canal, on its entry into Bath.' [Included as equivalent to bridge as relates to accommodation of other transport]
1280	K&AC	K&AC – BN-BH	House	2, Kennet and Avon Canal	LB II	1395941	'built as a lengthman's cottage to supervise the pound up to the next length the cottage for which is just beyond Bathampton'
1281	K&AC	K&AC – BN-BH	Tunnel	Kennet and Avon Canal Tunnel (Under Beckford Road)	LB II*	1395965	
1282	K&AC	K&AC – BN-BH	Park	Sydney Gardens	RHPG II	1001258	'at the time the introduction of the Canal was seen as a novelty, adding to the 'Picturesque Beauties' for which the Gardens were known'
1283	K&AC	K&AC – BN-BH	Bridge	Bridge in Sydney Gardens	LB II*	1395952	'The bridge is a good example of an iron bridge by the renowned Coalbrookdale Foundry at Ironbridge, and was the earliest use of a pioneering method of creating skewed crossings'
1284	K&AC	K&AC – BN-BH	Bridge	Footbridge over Canal in Sydney Gardens	LB II*	1395961	'The bridge, dating from 1800, is a good example of an iron bridge by the renowned Coalbrookdale Foundry at Ironbridge, and is one of two in the Gardens which mark Coalbrookdale's return to bridge making'
1285	K&AC	K&AC – BN-BH	House	Cleveland House	LB II*	1395310	
1286	K&AC	K&AC – BN-BH	House	Plinth, Gates, Railings and overthrows to Cleveland House	LB II	1395312	
1287	K&AC	K&AC – BN-BH	Lock	Lower Lock	LB II	1395962	NB – query position – should be adjacent to 1395950

ID	Water-course	Stretch	Asset Type	Name	Desig-nation	List Entry Number	Notes
1288	K&AC	K&AC – BN-BH	Tunnel	Kennet and Avon Canal Tunnel (Under Cleveland House and Sydney Road)	LB II*	1395966	
1289	K&AC	K&AC – BN-BH	Bridge	Wall to Kennet and Avon Canal on west side of Lane	LB II	1394911	[Included as equivalent to bridge as relates to accommodation of other transport]
1290	K&AC	K&AC – BN-BH	Bridge	Canal Bridge	LB II	1394244	'The construction of this bridge was a pre-requisite for the development of the hillside'
1291	K&AC	K&AC – BN-BH	Wharf	23a, Sydney Buildings	LB II	1395243	'Industrial canal side building (possibly warehouse)'
1292	K&AC	K&AC – BN-BH	House	Top Lock Cottage	LB II	1395954	
1293	K&AC	K&AC – BN-BH	Bridge	Footbridge adjoining Top Lock	LB II	1395957	
1294	K&AC	K&AC – BN-BH	Lock	Top Lock	LB II	1395964	
1295	K&AC	K&AC – BN-BH	Lock	Second Lock	LB II	1395963	
1296	K&AC	K&AC – BN-BH	Lock	Abbey View Lock	LB II	1395943	
1297	K&AC	K&AC – BN-BH	Bridge	Canal Bridge adjoining Abbey View Lock	LB II	1395953	
1298	K&AC	K&AC – BN-BH	Water Management	Chimney approx. 23 metres north of Pulteney Gardens Bridge	LB II	1395956	
1299	K&AC	K&AC – BN-BH	Lock	Wash House Lock	LB II	1395967	
1300	K&AC	K&AC – BN-BH	Bridge	Footbridge adjoining Wash House Lock	LB II	1395959	
1301	K&AC	K&AC – BN-BH	Water Management	Garage (Former Engine House)	LB II	1395945	
1302	K&AC	K&AC – BN-BH	Bridge	Bridge adjoining Lower Lock	LB II	1395950	



Key

Listed Buildings
- Avon
- K&AC
- Kennet

Scheduled Monuments
- Avon
- K&AC
- Kennet

Watercourses
- Kennet & Avon Canal
- River Avon
- River Kennet
- River Thames

Registered Parks and Gardens
- Avon
- K&AC
- Kennet

Registered Battlefield
- Kennet

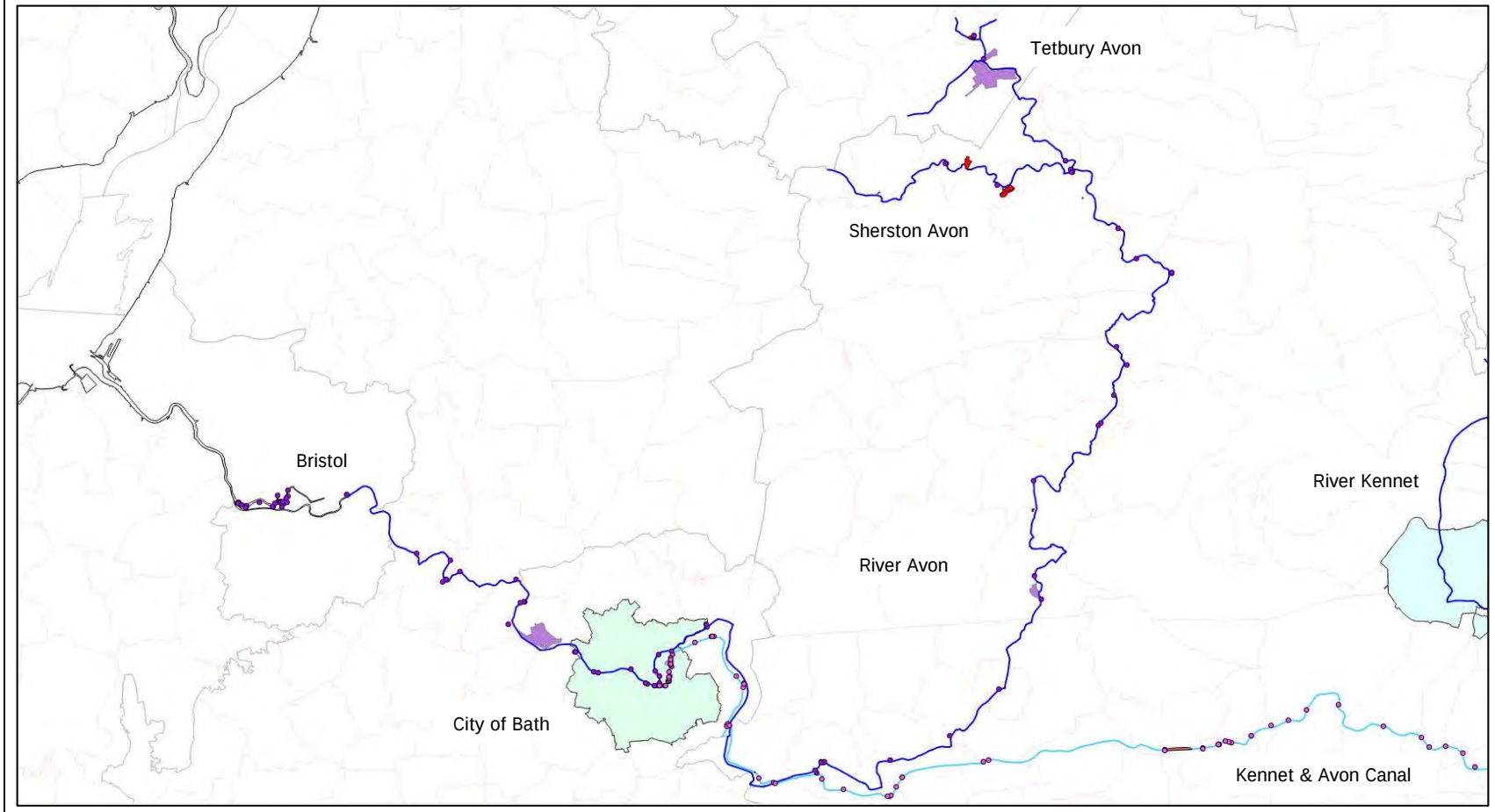
World Heritage Sites
- Avon
- Kennet

Local Authority Boundaries

Parish Boundaries

Designated Assets in the Study Area

Figure 1



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- K&AC
- Kennet

Registered Battlefield
- Kennet

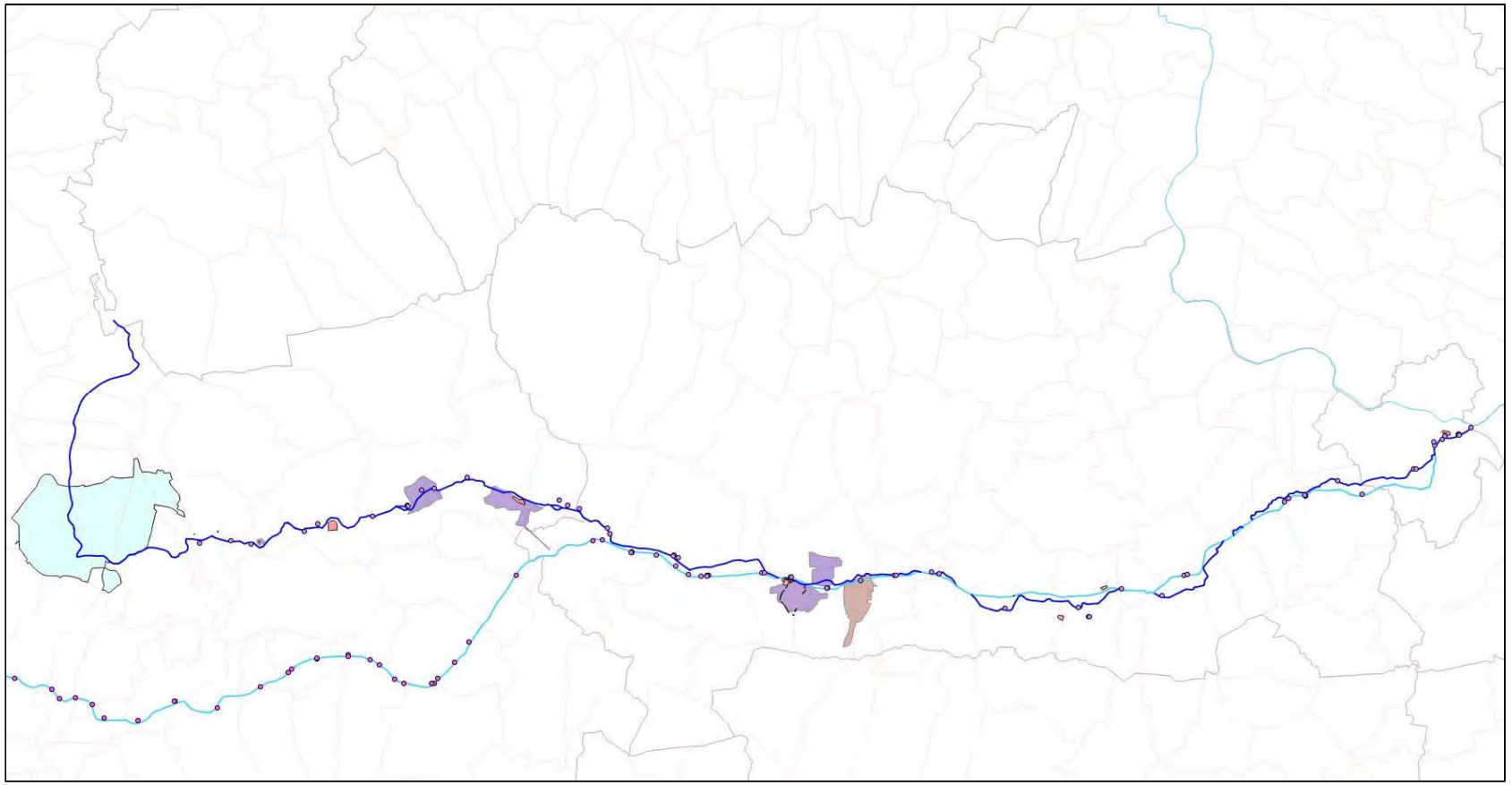
World Heritage Sites
- Avon
- Kennet

Local Authority Boundaries

Parish Boundaries

Designated Assets in the Study Area: West

Figure 2



Key

Listed Buildings
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- K&AC
- Kennet

Scheduled Monuments
- Avon
- K&AC
- Kennet

Watercourses
- Kennet & Avon Canal
- River Avon
- River Kennet
- River Thames

Registered Parks and Gardens
- Avon
- K&AC
- Kennet

Registered Battlefield
- Kennet

World Heritage Sites
- Avon
- Kennet

Local Authority Boundaries

Parish Boundaries

Designated Assets in the Study Area: East

Figure 3

Plate 1: Ribbed arches beneath one side of Staverton Bridge, River Avon (© Antony Firth/Fjordr)

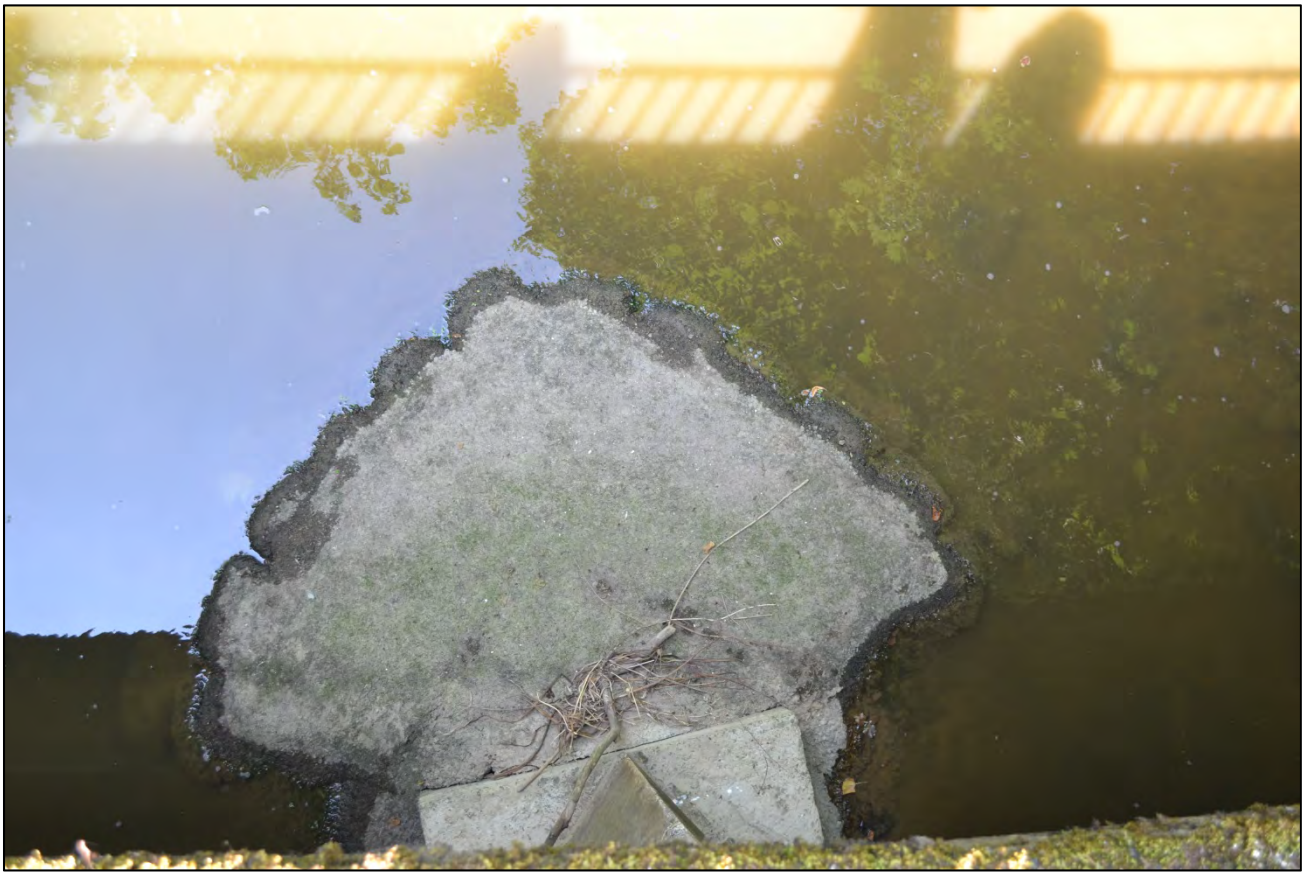

Plate 2: Modern bridge support apparently on much earlier pier, now covered in concrete and concrete bags, Dauntsey, River Avon (© Antony Firth/Fjordr)

Plate 3: Lower courses of former bridge, Lacock, River Avon (© Antony Firth/Fjordr)

Plate 4: Remains of former bridge in riverbank, Lacock, River Avon (© Antony Firth/Fjordr)

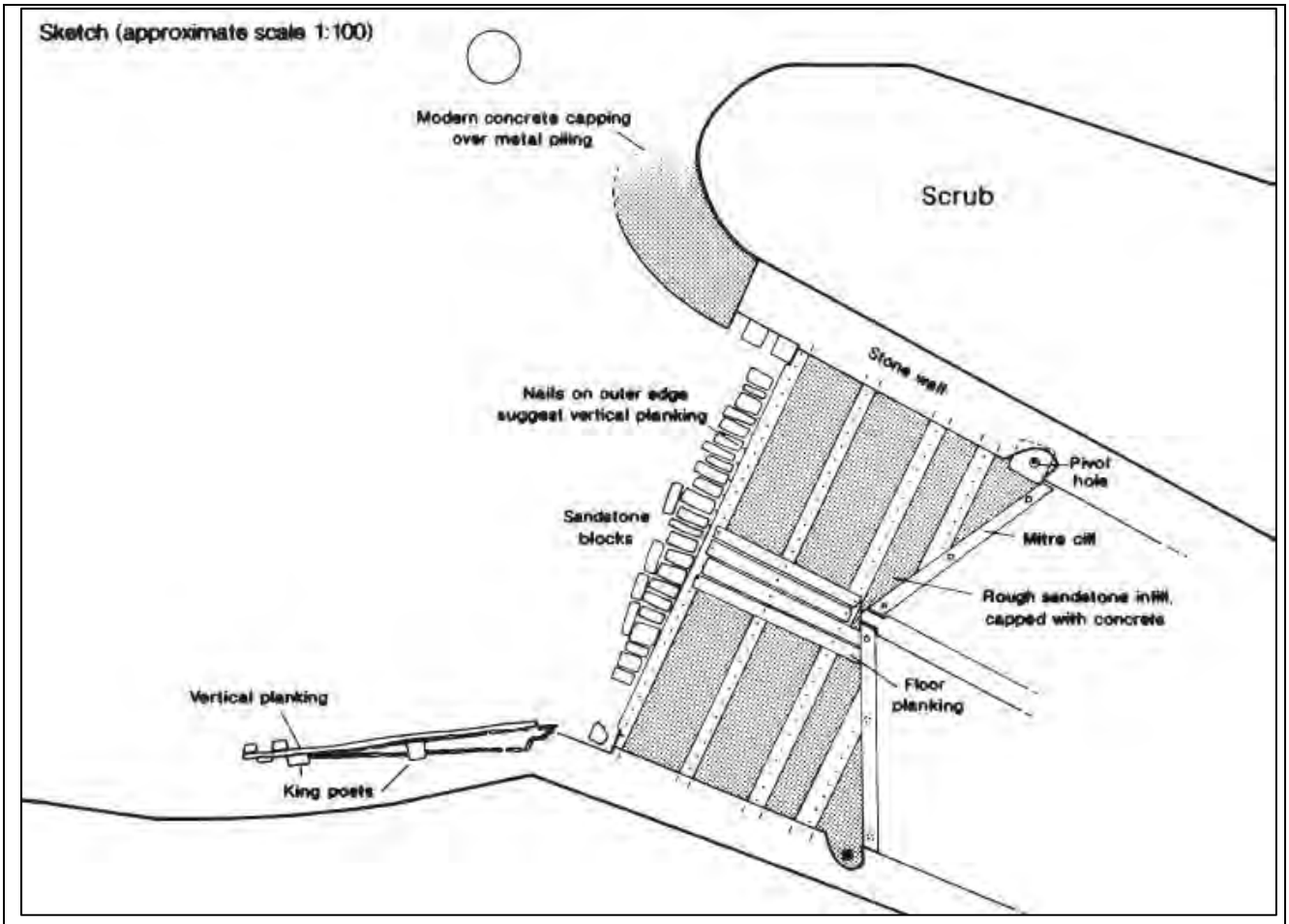

Plate 5: Structure of former lock in base of weir, Iffley (Inset Fig 2 © Wessex Archaeology 1999)

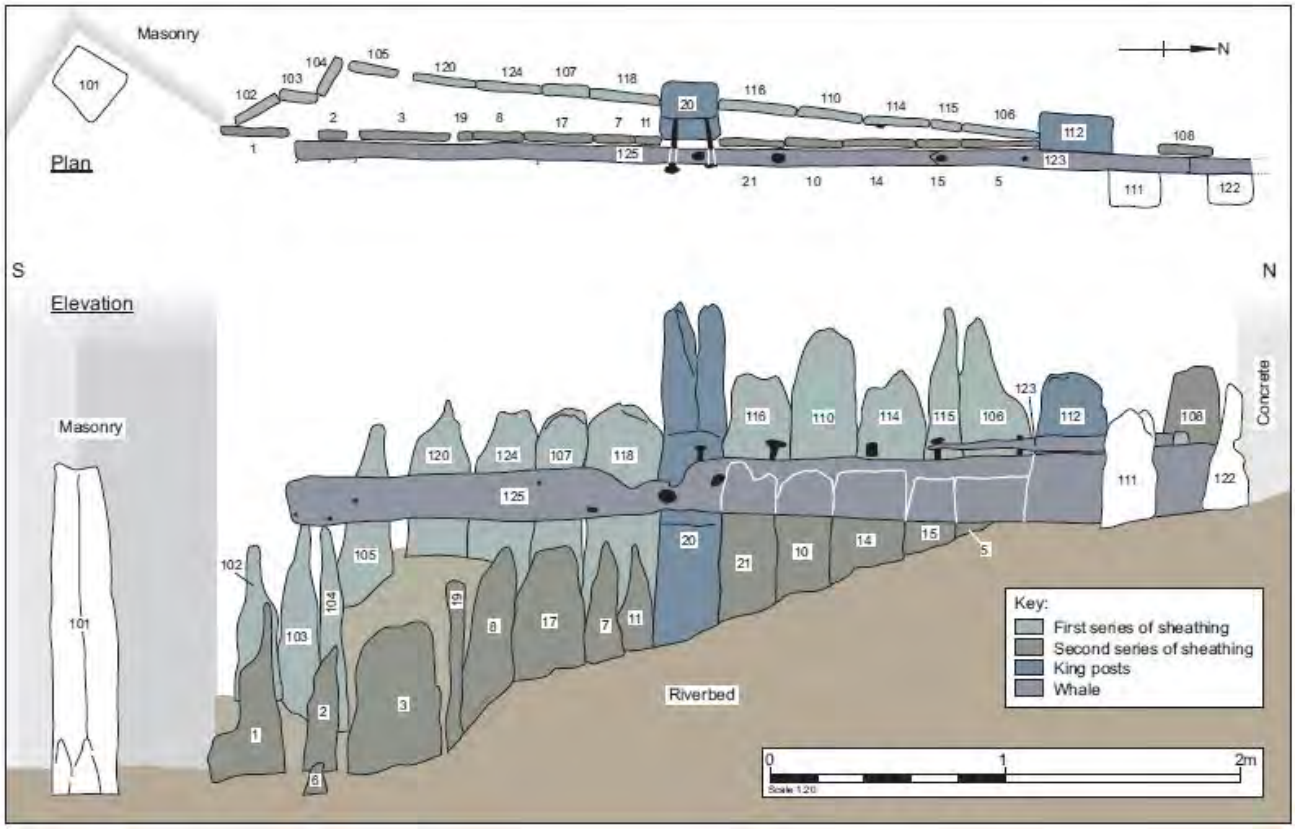

Plate 6: Section of vertical planking (campshedding), Iffley (Fig 3 © Wessex Archaeology 1999)

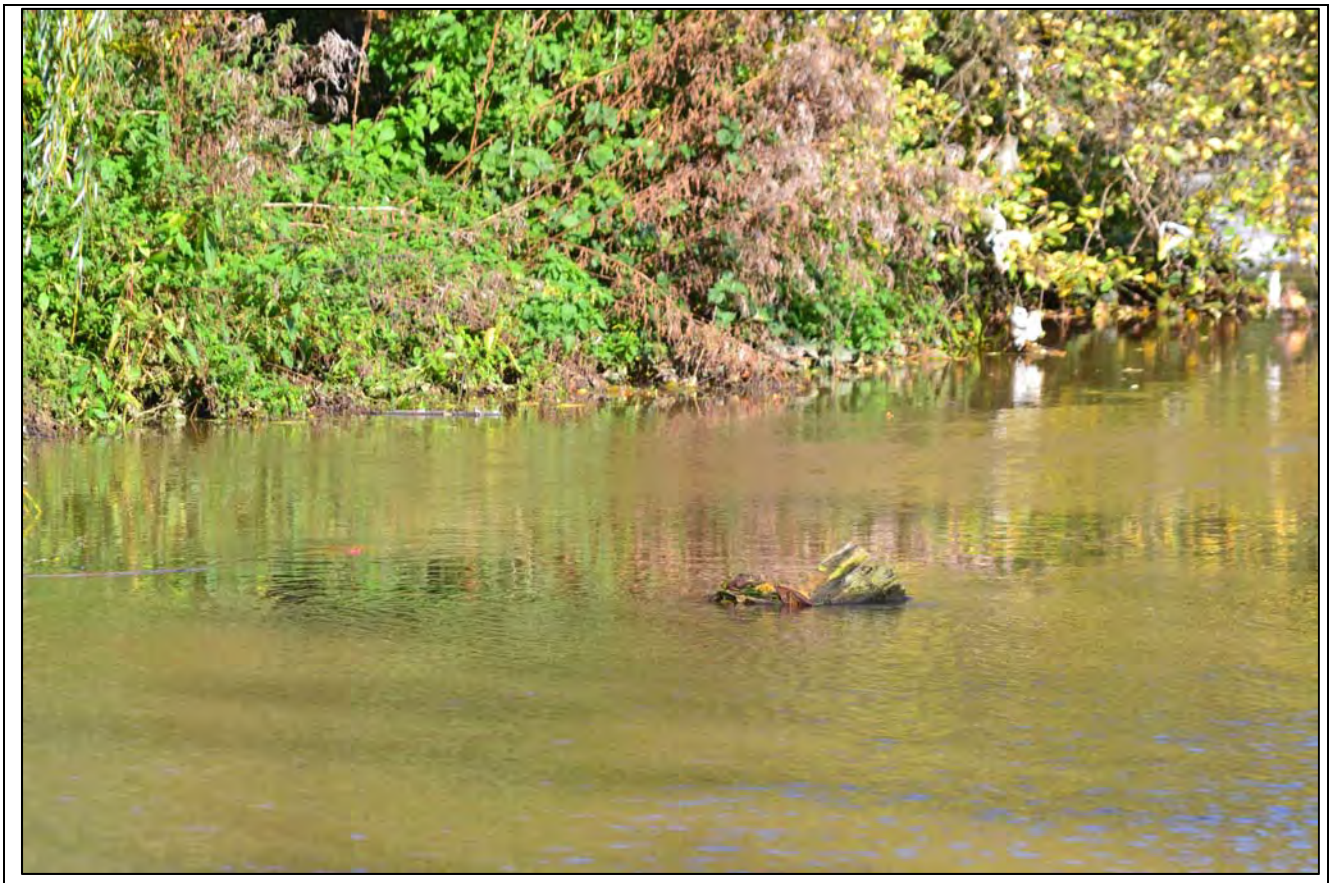

Plate 7: Apparently worked timber in backwater behind weir, River Avon (© Antony Firth/Fjordr)

Plate 8: Eroding stonework at ford just outside scheduled area, Barton Bridge, Bradford-on-Avon (© Antony Firth/Fjordr)

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