Guidelines for the addition of Archaeological Science data to Historic Environment Records

Introduction:

The aim of this document is to enable entry of relevant terms relating to archaeological science data into an Historic Environment Record (HER) in a way that is compatible with other archaeological entries and is searchable. The objective is to help specialists choose the right terms for their data in the first instance and to provide the information in an appropriate form for direct entry to the HER.

As defined by English Heritage, archaeological science includes geophysics, conservation and investigation of artefacts, scientific dating and all aspects of environmental science including geoarchaeology, palaeoecology, human osteology, zooarchaeology and archaeobotany. In addition, many recent developments now routinely form part of archaeological science: ancient biomolecular analysis; stable isotope analysis; residue analysis as well as the use of X-ray Fluorescence spectrometry (XRF), Scanning Electron Microscopy (SEM) and dating techniques such as Optical Stimulated Luminescence (OSL). These types of investigation have become more common in all kinds of interventions including those funded by developers. If this information is not in the HER these data are, in effect, invisible and valuable information will not be available to guide further planning decisions, research or syntheses.

Background:

The archaeological science categories described above are rarely entered on the HER (other than, occasionally, in a 'notes' field) although it has been the intention to make them available for some time. The first attempt was made in the 1990s by Peter Murphy in collaboration with the Lincolnshire curators. However, since the appointment of archaeological science advisors in 1999, to promote the use of archaeological science in all interventions, it has become even more crucial to encourage the input of archaeological science data into the HERs – formerly the Sites and Monuments Records (SMRs). After much debate, a working group was established to further this aim. The group comprised SMR officers, local authority curators and both English Heritage and university staff. This group was kept informed of developments by e-mail and was encouraged to comment as much as possible. Five workshops and one e-conference, held on the Forum on Information Standards in Heritage (FISH) web site, took place between December 2003 and May 2005. The results were presented at the HER Forum in June 2005.

Fields, terms and lists identified for addition to the HER:

It is recommended that archaeological science data are entered as an Event within an HER. This means that some extra fields are required although others may already exist within the Artefact or Ecofact classes – this will very much depend upon the individual HERs. The recommended fields are presented in detail in the Manual and Data Standard for Monument Inventories (MIDAS) documents accessible via the MIDAS heritage home page (* web links noted in the document are provided together at the end of this document) and are summarised below, with examples:

Object Type: Type of remains (item) investigated. This field accommodates all object types including artefacts and ecofacts: e.g. vessel and insect remains (controlled entry). Use the MDA Archaeological Object thesaurus

Material Type: The material of which the item is composed. The distinction of object from material is an important one, e.g. metal, wood, bone (controlled entry). Consult Archaeological Sciences Thesaurus

Modification State: The physical condition of an item, but not its quality. The emphasis is on the state of preservation or the changes which follow its use, e.g. anoxic, charred, mineral replaced (controlled entry). Consult Archaeological Sciences thesaurus

Aspect (feature): A feature of the item**.** There are two types: 1. natural aspect, e.g. pathology and 2. modification by humans, e.g. worked (controlled entry). Consult Archaeological Sciences thesaurus

Investigative Technique: The technique used to investigate the item, e.g. microscopy, tree-ring analysis, stable isotope analysis, x-radiography (controlled entry). Consult Archaeological Sciences thesaurus

Method of Recovery: The technique used to recover material for analysis, e.g. flotation, coarse sieving, specialist sampling (controlled entry). Consult Archaeological Sciences thesaurus

Key assemblage: Is this a significant assemblage (yes/no), justified in the 'potential' field.

Potential: The potential of the assemblage for further research. Free text with date and author for each entry as the potential may change over time. Useful for more specialised research.

Period: Date of the material examined. Use the Royal Commission for Historic Monuments (RCHME) Archaeological Periods List

Reference: bibliographical reference to the report.

Storage location: Where the material archive is kept.

Notes: Free text for anything unusual not accounted for in this list.

As far as possible, terms to be used within the fields have been taken from existing thesauri and lists such as the MDA Archaeological Object thesaurus, the ADS Scientific date wordlist, and the RCHME Archaeological Periods List. Some of these have been used regularly by HER officers for many years and will thus be familiar.

Environmental aspects were very briefly expressed in some of these lists but needed to be completely overhauled and, indeed, expanded. To that end, the index of the Environmental Archaeology Bibliography (EAB), commissioned by English Heritage in the early 1990s, was used as a base for establishing the range of environmental entries. Following discussion and wide consultation, the ecofacts Class of the MDA Archaeological Object thesaurus has been updated and a new Archaeological Sciences thesaurus created. Users will be able to submit candidate terms to these thesauri in the usual manner.

From the specialist to the HER:

It is fully understood that the additional data entry should not be an excessive burden upon the HER officer and that minimal, if any, extra research should be needed by them to produce the information needed for data entry. To that end a number of steps have been identified that should ensure that an adequate and appropriate summary record is included with the specialist full report and submitted to the HER. This will almost certainly be part of an archaeological contracting unit's report deposited as a result of planning conditions and thus good communication between the Unit and its specialists is crucial:

1. The archaeological curators will need to add an additional requirement to their briefs or specifications. This is in order that the specialists will identify the relevant entries as part of their report right at the start of a project. It is expected that the specialists will know all the fields mentioned above and the thesaurus relevant to their specialism. A proforma will be available to ensure that the correct details are recorded (see below).
2. The contracting unit will make the need for this additional reporting clear to the specialist when subcontracting to them.
3. The specialists will send their report back to the contracting unit with this additional information attached.
4. The site report, including the specialists' reports with the new information, will be sent to the HER.
5. The HER officer will enter the archaeological science data as an Event.

Forms for specialists:

The form for the specialists to complete is available, as either a table or a list, with this document and can be photocopied. It is also available electronically.

Worked example of the new record:

Site Name: *Blagdon Manor Farm*	**Organisation undertaking the work:** *Archaeological Unit X*
Site Code: *BMF08*	
Date of intervention: *November 2008*	
Grid Reference: *NP 6032 5046 or 460320 750460*	*(the latter fully numeric Grid Ref is easier to enter into ArcInfo GIS for example)*

OBJECT TYPE: e.g.vertebrate remains, mammal remains, small mammal remains, bird remains *Vertebrate, mammal remains*

Material Type	**Modification State**	**Aspect**	**Investigative Technique**
(e.g. metal, wood, bone): *bone, tooth*	(anoxic, charred, m replaced): *mineral replaced, altered by animals*	(feature) (e.g. worked**)** *pathology*	**(**e.g. microscopy, x- radiography): *stable isotope analysis*
Method of Recovery: (e.g. flotation, coarse sieving, specialist sampling): *hand retrieval, floatation*			
Key Assemblage: **Yes** *X*			**No**
Potential: *Large assemblage from three well-defined phases of occupation.*			
Period: *Roman*			
References: *Bloggs, G. 2005 Assessment report of the site of Blagdon Manor Farm,Doggerland Unpublished report of Archaeological Unit X.*			
Storage Location: *Museum of Environmental Samples*			
Notes: (PTO if *necessary)*			

Or as a list:

Object Type (artefact/ecofact): vertebrate remains, mammal remains, small mammal remains, bird remains

Material Type (e.g. metal, wood, bone): *bone, tooth*

Modification State (anoxic, charred, mineral replaced): *mineral replaced, altered by animals*

Aspect (feature) (e.g. worked**)** *pathology*

Investigative Technique (e.g. microscopy, x- radiography): *stable isotope analysis*

Method of Recovery (e.g. flotation, coarse sieving, specialist sampling): *hand retrieval, floatation*

Key assemblage: *yes*

Potential: *Large assemblage from three well-defined phases of occupation.*

Period: *Roman*

Reference: *Bloggs, G. 2005 Assessment report of the site of Blagdon Manor Farm, Doggerland, Unpublished report of the Archaeological Unit X.*

Storage location: *Museum of Environmental Samples*

Notes:

Backlog:

The entry of archaeological science data described above can only be expected, at present, for new projects; this is probably realistic if the task is carried out on a regular basis. It is probably not a realistic proposition to deal with the backlog at the same time. Although in many cases the backlog will not be overwhelmingly large (see the Worcestershire case study) this will vary from place to place. In any case, the research needed to ensure entry of the correct terms would probably be too time consuming for the HER officer in post to envisage dealing with the backlog. It is therefore hoped that independent funds for the backlog may be obtained locally as in the three cases below or through HLF funding. There may also be opportunities for individuals with experience in archaeological science to undertake placements in HERs as part of Continuing Professional Development. Another possibility is that information already contained within the Environmental Archaeology Bibliography can be transferred into HERs.

Case studies:

Some archaeological science data have been entered onto HERs in the last few years supported by local authorities and carried out either in-house or by students. Three such case studies are presented below.

CASE STUDY 1: Worcestershire Historic Environment and Archaeology Service

A model for accessing environmental evidence through Historic Environment Records,

Victoria Bryant HER Manager, Liz Pearson Environmental Archaeologist
Worcestershire County Council

Introduction

Over the last 15 years the Worcestershire HER has been seen primarily as a development control tool. As a result environmental evidence has either not been recorded or has not been recorded in a way that would allow consistent, reliable retrieval of the data.

We believe that this is no longer a sustainable position but to change it we needed to record all environmental data recovered from archaeological activity in Worcestershire. This included antiquarian as well as modern reports. Given the scale of this task we, and we suspect many HERs, could not afford to produce a detailed environmental record for each site. We have aimed instead to provide a general, consistent index. The creation of this index, within the Activities/Events data within the GIS, is the *first* step towards transforming the HER into a useful tool for environmental research. In addition it will inform all management decisions.

A user of the index will not be able to find every site where, for example, a particular type of mollusc has been found but they will be able to discover which sites of a particular period, or in a particular area, or on a particular soil type, have produced molluscs and which of these sites have specialist reports. The majority of these reports are "grey literature" but these can be accessed via our on-line library www.worcestershire.gov.uk/archaeology/library. The combination of even a simple environmental data set with the geological, topographical and archaeological data held within a GIS is a powerful research tool

The present situation

We are adding the information from every new site as it comes in but we have also completed a project to enter "old" data published in grey literature as well as those from journals and monographs. We were allocated an arbitrary sum of £2000 from the Service's small strategic budget to pilot the software and to provide an estimate of the total cost of the project. To our surprise this covered the cost of inputting data from all

the grey literature, the majority of reports within the Transactions of the Worcestershire Archaeological Society and all the major environmental reports for the County. We estimate that the index now holds *at least* 90% of all the environmental data for Worcestershire. The remaining data are from older, smaller sites which are "hidden" in our monument records. We are undertaking a process of cleaning all these records which will, over the next two years, pick up these sites.

Conclusion

This model has been developed jointly by the Environmental team and the HER team of Worcestershire Historic Environment and Archaeology Service. We believe that it is a simple, affordable way of starting the process of developing the HER into a useful research tool. Much more detailed information may be desirable but to acquire the funding it is necessary to demonstrate the need. As we see what demand there is for this information we can assess priorities for enhancing the record. For instance it may be the case that more detailed information on plant remains is often asked for, whereas more detailed information on molluscs is not. The thesaurus of environmental types is in a format which can be extended to be as detailed as necessary and the creation of the simple index allows us to accurately calculate the quantity of reports that would need to be looked at to enhance the data. Thus making an accurate costing of such a project possible for the first time.

For more information on environmental archaeology and research in Worcestershire please contact lpearson@worcestershire.gov.uk

For more details on the structure and function of the database please contact vbryant@worcestershire.gov.uk

CASE STUDY 2: Accessing Environmental Archaeology Data for Research: A Case Study from Surrey

Lucy Farr Department of Geography, Royal Holloway, University of London, Egham, Surrey. TW20 0EX.

Background

The majority of environmental data from excavated sites are currently held as unpublished site reports in county council archives, and it can be difficult for archaeological researchers to know what environmental investigations have been carried out, what data have been collected and where the data are now held. Recently there have been moves to rectify this situation.

Recent PhD research in Surrey has seen a structured program of work beginning with the collection of all environmental archaeology data for the county, and the storage and dissemination of these data using Microsoft Access and GIS. These data have subsequently been used to provide a basis for modelling palaeo-vegetation in the county and identifying areas for future research.

Surrey's Environmental Archaeology Database

The first phase of the PhD program saw the construction of a Microsoft Access database to hold all of the environmental archaeological data for Surrey. The main purpose of the database was to provide a consistent index of all of the archaeological sites in Surrey that had produced environmental archaeology material. The database was constructed to enable links to the SMR records at a later date, and interrogation via ArcGIS 9.

The database was formed adhering, as closely as possible, to the English Heritage guidelines for database construction, outlined in the MIDAS–*(A manual and data standard for monument inventories)* document:
(http://www.jiscmail.ac.uk/files/FISH/web_midasintro.htm).
The data structure of the database is shown below in Figure 1.

Preliminary results of data collection

The results of the data collection and GIS mapping exercise have provided the following insights into Surrey's environmental archaeology resource:

1. Sites that have produced environmental archaeology data are not evenly distributed across the county.
2. The distributions of sites that have produced environmental archaeology data are determined by hydrological and geological factors as well as reflecting areas of development.
3. There is a lack of environmental data for the chalk downs and clay areas.
4. There is a very pronounced paucity of environmental data for the Palaeolithic/Mesolithic periods in Surrey.

Identifying sites for research

These results informed the decision to concentrate further fieldwork and data collection in three main areas. Their location is shown in Figure 2. These areas were chosen to provide new environmental data for Surrey where temporal and spatial deficits were evident in the existing EAR record. Furthermore, the combination of the EAR and SMR data sets identified areas that have evidence of a high level of human activity in the Upper Palaeolithic/Mesolithic period, but have a lack of supporting environmental data.

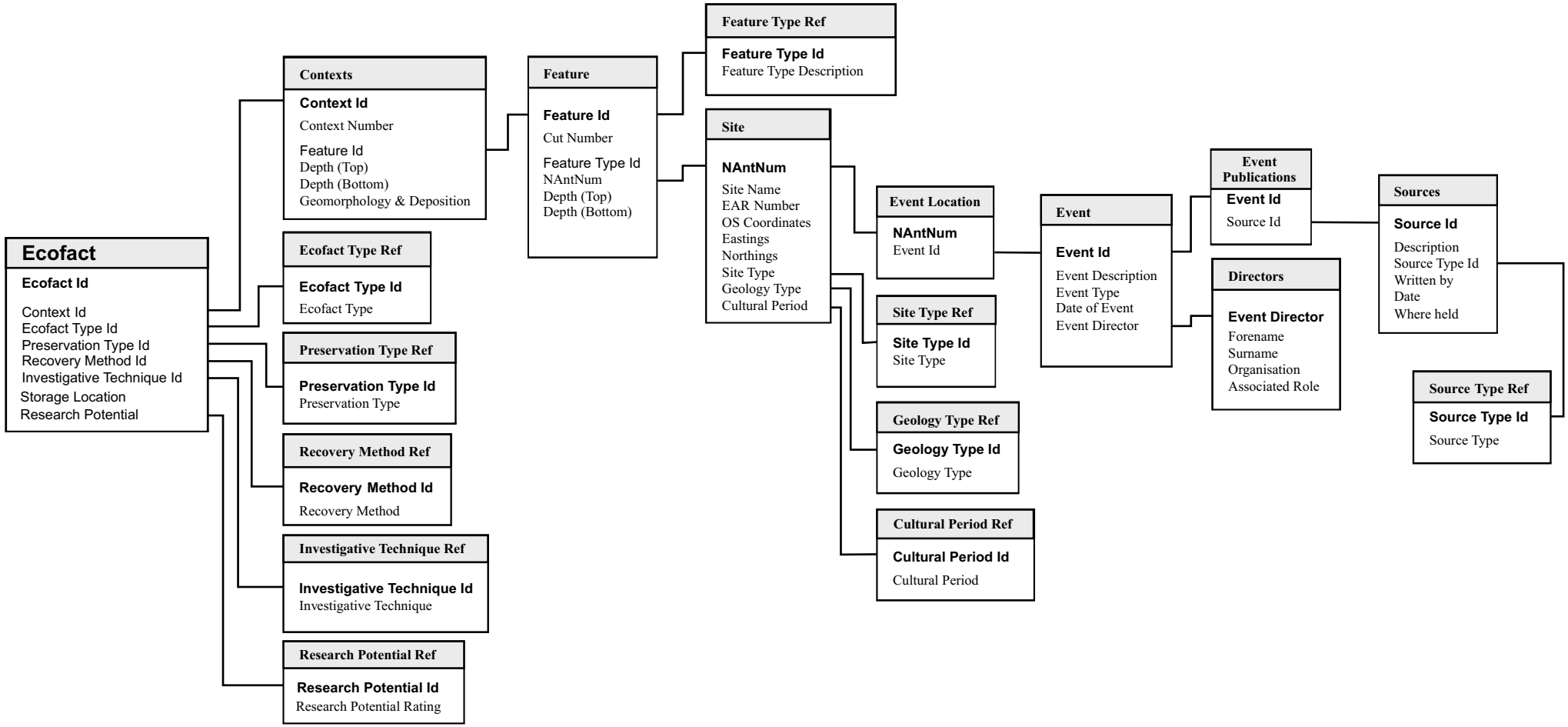

Figure 1: diagrammatic plan of Surrey's Environmental Archaeology Resource (EAR) database

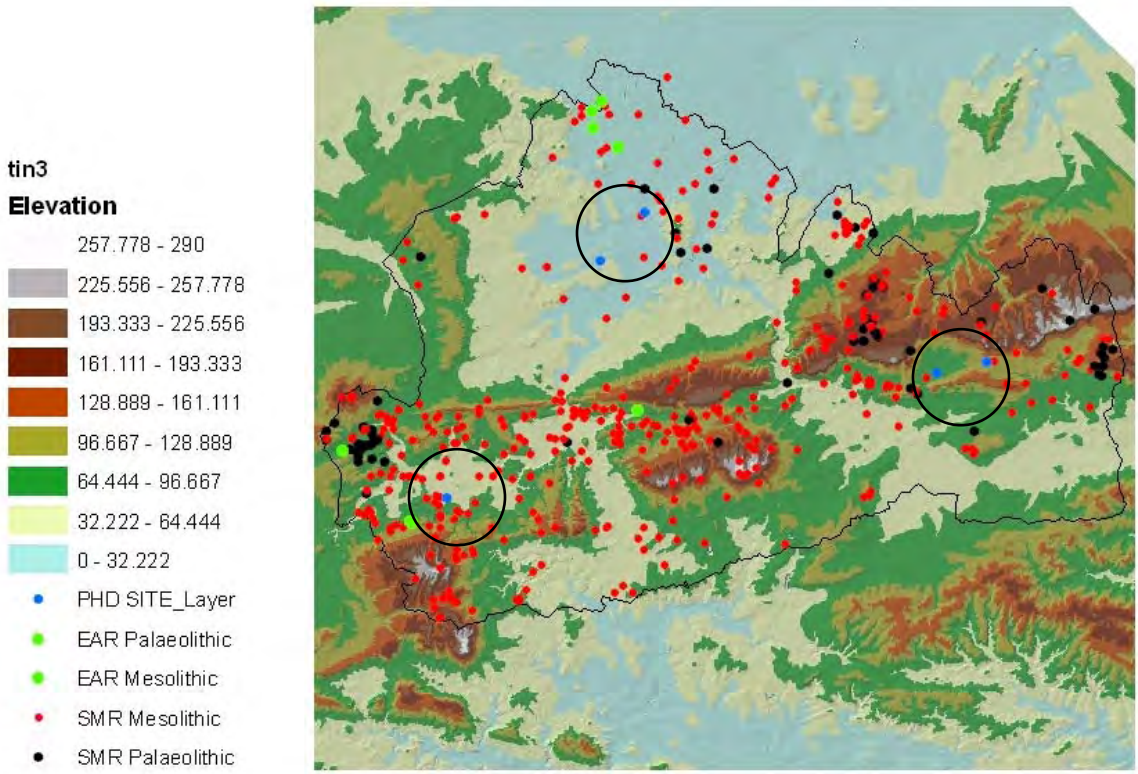

Figure 2. The location of new sites for research

Summary
The formation of Surrey's environmental archaeology database, together with the application of a GIS interface, provides an important means of accessing environmental archaeology data in the county. It is now possible to access these data alongside the HER to inform interested parties about where environmental data are located, what they consist of and to which cultural periods or timeframes they are related. This has established a valuable tool for researchers, heritage management organisations and archaeological agencies working in Surrey.

CASE STUDY 3: Archaeological science and the Greater London Sites and Monuments Record.

Jane Sidell, English Heritage, London Region

The Greater London Sites and Monuments Record has been collecting data from archaeological interventions in London for more than twenty years. During this time, archaeological fieldwork in London has been taking place, largely driven by commercial and housing development alongside infrastructure associated with road, rail and air travel. Considerable scientific research has been undertaken during this time, but

generally suffers the usual indignity of languishing in the corpus of grey literature. In fact, the majority of scientific reports are only summarised for the overall site report, so rarely does any detail make it into local libraries or the GLSMR itself.

Nevertheless, such a corpus of scientific data has the potential to act as a powerful research tool. Therefore, several enhancement projects have been devised and are being developed at the GLSMR. The first of these is a database of all absolute dates collected from London. This is drawing together over a thousand radiocarbon, archaeomagnetic and optically stimulated luminescence dates with background data, such as date of fieldwork and any published references as well as more crucial data such as the lab number, material dated, grid reference and calibration, meaning that any researcher will have enough detail to work with in the future. The aim is that the database will be housed at the GLSMR and eventually be available on-line for researchers to search for key dates, but also thematic research, such as looking at all known dated human remains, or dates associated with prehistoric pottery. It will also be supported by a published commentary. The project has been undertaken by John Meadows with funding from English Heritage.

The second project is a database of all pollen samples examined in Greater London. A significant amount of pollen analysis has been done over the last thirty years, but particularly since the advent of PPG16, which has expanded the area routinely examined archaeologically into some of the wetter and more organic parts of London. Sadly, much of the work in these areas has not been published and may never be so as it largely based on evaluations of peatland sites with little physical archaeology. Pollen records were obtained from the key pollen analysts, Rob Scaife and Nick Branch, whilst others were tracked down through the grey literature and some published works. 165 reports have been found, and added to a new database on the GLSMR. They can be examined by querying the database, or through the GIS. The records include the usual location and dating information, but also the nature of the environments represented by period, with key species per vegetation type and also key events, such as the elm decline and the rise of cereals, have been noted. Again, it is hoped that this will eventually be available on-line. The project was undertaken by Yvonne Edwards for an MA dissertation, with no funding required!

We now face the additional task of updating these datasets. However, the initial work has been done to create the databases, and the potential has been demonstrated, therefore, there is great goodwill from HER staff and also contracting units and specialists to let their data be used to benefit future research in the region. It is to be hoped that it can be disseminated more widely in time, and may be an initiative that other regions may also take forward.

Appendix 1 – web links

Useful web links to documents and thesauri noted in the text by (*) – all accessed 7th October 2009

MIDAS heritage home page: http://www.english-heritage.org.uk/server/show/nav.19938

List of all thesauri from the NMR:
http://thesaurus.english-heritage.org.uk/frequentuser.htm

Archaeological Science thesaurus:
http://thesaurus.english-heritage.org.uk/thesaurus.asp?thes_no=560

Environmental Archaeology Bibliography database – home page from which queries can be generated:
http://ads.ahds.ac.uk/catalogue/specColl/eab_eh_2004/index.cfm?CFID=3118735&CFTOKEN=97026259

Form to be completed by the specialist and included with report for submission to HER

Site Name:	Organisation undertaking the work:
Site Code:	
Date of intervention:	
Grid Reference:	

OBJECT TYPE: e.g.vertebrate remains, mammal remains, small mammal remains, bird remains

Material Type	Modification State	Aspect	Investigative Technique
(e.g. metal, wood, bone):	(anoxic, charred, mineral replaced):	(feature) (e.g. worked)	(e.g. microscopy, x-radiography):
Method of Recovery: (e.g. flotation, coarse sieving, specialist sampling):			
Key Assemblage: Yes No			
Potential:			
Period:			
References:			
Storage Location:			
Notes: (PTO if necessary)			

Or as a list:

Object Type (artefact/ecofact):

Material Type (e.g. metal, wood, bone):

Modification State (anoxic, charred, mineral replaced):

Aspect (feature) (e.g. worked**)**

Investigative Technique (e.g. microscopy, x- radiography):

Method of Recovery (e.g. flotation, coarse sieving, specialist sampling):

Key assemblage:

Potential:

Period:

Reference:

Storage location:

Notes:

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