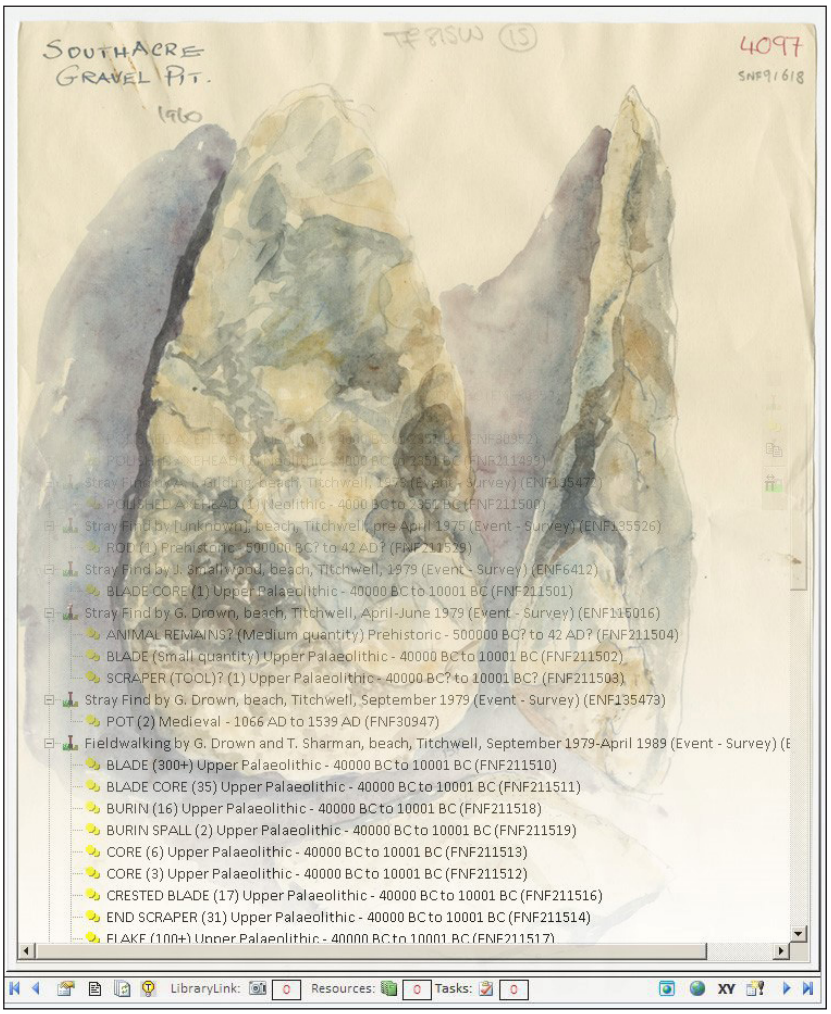
Historic England

A Review of Historic Environment Records Enhancement Projects for the Palaeolithic and Mesolithic

Alice Cattermole

Discovery, Innovation and Science in the Historic Environment



Research Report Series no. 71-2018

Research Report Series 71-2018

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ISSN 2059-4453 (Online)

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EXECUTIVE SUMMARY

This report presents a review of seven Historic Environment Record (HER) enhancement projects funded under the National Heritage Protection Plan (NHPP) between 2013 and 2015 to improve the representation of early prehistoric (Palaeolithic and Mesolithic) archaeology in HERs. The seven HERs which undertook these enhancement projects were:

- South Yorkshire Sites and Monuments Record (HE Project No. 6618)
- West Yorkshire HER (HE Project No. 6619)
- Norfolk HER (HE Project No. 6623)
- Worcestershire HER (HE Project No. 6632)
- West Berkshire HER (HE Project No. 6633)
- Kent HER (HE Project No. 6637)
- Essex HER (HE Project No. 6639)

Each of these projects has been evaluated to determine how successfully it met the stated aim of improving the representation of early prehistoric archaeology within the HER. Although all seven HERs had different starting points and are very diverse in terms of their format, scope and origins, each of the projects achieved significant and positive results within relatively limited timescales and budgets. The open-ended nature of the original call for proposals resulted in a range of different approaches to early prehistoric HER enhancement being developed and trialled, each of which has been tested and from which lessons have been learned. Each of the pilot projects can be deemed successful, and a number of common themes have emerged which will guide future best practice when undertaking HER enhancement of the early prehistoric and other periods.

This report highlights best practice and makes a series of 30 recommendations (see Appendix I) intended to inform the commissioning and delivery of future Historic England-funded early prehistoric HER enhancement projects and provide guidance to local authorities wishing to undertake similar enhancement projects of their own.

Specifically, it is recommended that specialist reviews are conducted into the following subjects and their conclusions acted upon to better enable and facilitate further early prehistoric HER enhancement projects:

- the date range systems currently employed by HERs for recording the early prehistoric period, with a particular focus on the potential use of Marine Isotope Stage dates in HERs;
- the development of a more comprehensive list of lithic terminology and its incorporation into the FISH Object Type Thesaurus;
- HER recording practices for palaeoenvironmental data, to ensure that terminologies and data structures are fit for purpose;
- the systematic trialling and testing of different methodological approaches to deposit and predictive modelling to find the most suitable model for HERS;

- the efficacy of different archaeological mitigation strategies for sites with early prehistoric potential, to better inform development management decisions.

It is also recommended that these reviews be complemented by the following additional measures:

- production of guidance notes on HER enhancement, with a particular emphasis on the early prehistoric period, for Informing the Future of the Past 2;
- production of guidance notes aimed at museum professionals and depositors highlighting the importance of context and locational data for curated artefacts;
- production of guidance notes for the academic sector and funding bodies emphasising the research potential of HER data and the importance of submitting research results and publications to HERs;
- a programme of specialist training to enhance understanding of early prehistory within the HER and development management sectors to improve confidence and inform decision-making;
- the establishment of a national advisory network of early prehistoric specialists to provide advice and guidance to national, regional and local authorities, HERs and other bodies.

It is intended that the results and recommendations presented here will facilitate and inform the development and delivery of future early prehistoric HER enhancement projects across the sector, whether funded by Historic England or undertaken independently, and ensure that the significance of this most important and formative of periods will achieve the recognition, understanding and protection it rightly deserves.

ACKNOWLEDGEMENTS

The author is grateful to the following Project Managers and Project Officers who were involved with the seven HER enhancement projects which form the focus of this report for taking the time to conduct interviews about their projects and for providing additional data and comments on their work: Dinah Saich (South Yorkshire), Jason Dodds and Ian Sanderson (West Yorkshire), Emma Hancox, Nick Daffern, Rob Hedge and Andie Webley (Worcestershire), Paul Cuming (Kent), Teresa O'Connor (Essex), Alex Godden (West Berkshire), Peter Watkins (Norfolk), Dr Francis Wenban-Smith (University of Southampton) and Dr Lawrence Billington (independent researcher). Gratitude is also extended to Petra Wade (Project Assurance Officer, Historic England) and Jonathan Last (Landscape Strategy Manager, Historic England) for their input into and management of the project.

ABBREVIATIONS

ADS	Archaeology Data Service
AHOB	Ancient Human Occupation of Britain
ALGAO	Association of Local Government Archaeological Officers
ALSF	Aggregates Levy Sustainability Fund
CBA	Council for British Archaeology
CIFA	Chartered Institute for Archaeologists
EngLaId	English Landscapes and Identities project
ERT	Electrical Resistivity Tomography
FISH	Forum on Information Standards in Heritage
GPR	Ground-penetrating Radar
HE	Historic England
HEAP	Historic England Action Plan
HER	Historic Environment Records
IFP2	Informing the Future of the Past 2
NHPP	National Heritage Protection Plan
PaMeLA	Palaeolithic and Mesolithic Lithic Artefact database
PAS	Portable Antiquities Scheme
SMA	Society for Museum Archaeology
SMR	Sites and Monuments Record
TERPS	The English Rivers Palaeolithic project

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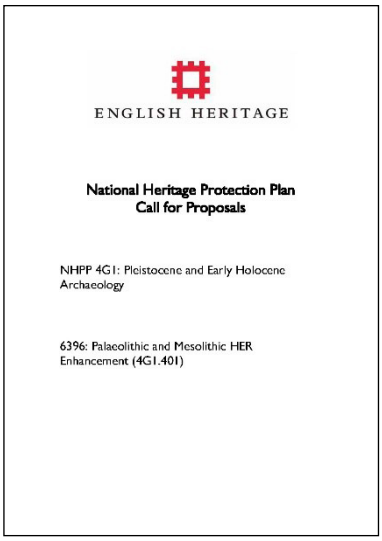
1 INTRODUCTION

This report presents a review of seven Historic Environment Record (HER) enhancement projects funded under the National Heritage Protection Plan (NHPP) between 2013 and 2015 to improve the representation of early prehistoric (Palaeolithic and Mesolithic) archaeology in HERs. Each of these projects has been evaluated to determine how successfully it met the stated aim of improving the representation of early prehistoric archaeology, and this report highlights best practice to guide future work in this area. With a further round of Historic England funding anticipated, this review is intended to inform the commissioning of future projects, and will also provide guidance to local authorities wishing to undertake similar HER enhancement projects.

The HER Enhancement Projects

In 2012, English Heritage (now Historic England) issued a call for proposals under NHPP heading 4G1.401 inviting proposals for projects to improve the representation of early prehistoric (i.e. Palaeolithic and Mesolithic) archaeology in HERs (English Heritage 2012a). These projects were to be undertaken with the aim of ensuring better consideration of these periods within the archaeological planning process, thereby enhancing their protection. The original call for proposals was not prescriptive in terms of methodology, but instead gave HERs the opportunity to devise their own approaches to addressing specific objectives relating to their datasets. It was suggested that the proposed enhancement work should include some or all of the following elements:


ENGLISH HERITAGE

National Heritage Protection Plan
Call for Proposals

NHPP 4G1: Pleistocene and Early Holocene Archaeology

6396: Palaeolithic and Mesolithic HER Enhancement (4G1.401)

Figure 1 The original Call for Proposals (English Heritage 2012)

- Deposit mapping and modelling;
- Checking and enhancing existing records;
- Digitising relevant data-sets;
- Incorporating relevant data from other sources;
- Improving access to information about sites and collections;
- Additional outputs, such as planning guidance, protocols or outreach.

In total, seven HER enhancement projects were commissioned and undertaken between 2013 and 2015. These projects were carried out in different geographical areas, with different early prehistoric datasets and different HER infrastructures, meaning that a diverse range of methodologies was able to be trialled during the

course of the work. The approaches and outcomes of each of these projects are described in more detail below and are summarised in Table 8.

For the purposes of this review, the projects are referred to as Projects I–VII and they are listed here along with their Historic England project numbers, the names of the HER enhanced, and the working title of the project. In two cases, the HER enhancement projects formed part of wider projects which were already taking place.

- **Project I** (HE Project No. 6618): South Yorkshire Sites and Monuments Record (SMR), working title *Enhancing the Palaeolithic and Mesolithic Records of the South Yorkshire SMR*.

- **Project II** (HE Project No. 6619): West Yorkshire HER, working title *West Yorkshire Palaeolithic and Mesolithic HER Enhancement Project*.

- **Project III** (HE Project No. 6623): Norfolk HER, working title *Enhancement of early prehistoric information within the Norfolk HER*.

- **Project IV** (HE Project No. 6632): Worcestershire HER, working title *Putting the Palaeolithic into Worcestershire's HER: creating an evidence base and toolkit*.

- **Project V** (HE Project No. 6633): West Berkshire HER, undertaken as part of the *Tracing their Steps [Middle Kennet Valley] Project*.

- **Project VI** (HE Project No. 6637): Kent HER, undertaken as part of *The Stour Basin Palaeolithic Project*.

- **Project VII** (HE Project No. 6639): Essex HER, working title *Managing the Essex Pleistocene*.

The Current Project

With the seven HER enhancement projects completed or nearing completion, in late 2015 Historic England issued a brief for a follow-on project to appraise the different approaches taken across the initial enhancement projects and set out what the sector considers to be best practice for this kind of work (Historic England 2015). A second round of Historic England-funded HER enhancement projects is anticipated, and the purpose of this review is to inform the commissioning of future projects to ensure that funding is used most appropriately and effectively. As funding by Historic England will be limited, this project also provides guidance and advice for local authorities seeking to undertake HER enhancement work using other sources of funding, without direct input from Historic England.

The results of the individual enhancement projects and this review enable Historic England to continue to address key issues highlighted in the *Research*

and Conservation Framework for the British Palaeolithic (Pettitt et al 2008), including the need to continue to inform decision-makers within local authorities of the potential of deposits that are often regarded as sterile, and the need highlighted by the Mesolithic Research and Conservation Framework (Blinkhorn and Milner 2013) to ensure that the Mesolithic is properly represented by undertaking standardised quality audits and enhancements, especially in HERs.

Methodology

This project has reviewed the methods and outcomes of the seven HER enhancement projects, in order to assess their overall effectiveness and to highlight best practice. All of the available project reports and other written outputs have been used to provide an overview of each of the projects and their wider context. An attempt has been made to understand the different starting points of each project, acknowledging that the seven HERs are diverse in terms of their format, scope and origins and that therefore the potential of the pre-existing resources was different for each project.

All of the HERs were asked to supply copies of the monument, event, source and find records that were part of their HER enhancement project, along with any associated GIS data. Most HERs were willing to provide this data free of charge. The new and enhanced HER database records were qualitatively assessed to see whether they complied with the two main standards used for records: MIDAS Heritage, a content standard which defines the units of information that should be included in a standardised record (English Heritage 2012b), and the Forum on Information Standards in Heritage (FISH) Vocabularies, a collection of wordlists and thesauri recommended for use in conjunction with MIDAS units of information. In addition, where possible, enhanced records were compared with sample data from each HER from before the enhancement projects took place, so that the true extent of the enhancement work could be assessed. It was originally intended that the GIS data provided by the HERs would be assessed. In particular, it was hoped that it would be possible to examine 'before' and 'after' datasets to help measure the impact of the enhancement work, using factors such as the geographical density of the records (i.e. records per square kilometre). However, this was not possible for all projects, since many were not able to supply pre-enhancement datasets.

For each project, the HER source records have been considered to establish which sources proved most valuable. This has been complemented by feedback from project staff about which sources were the most reliable, quickest and easiest to use, and about any sources which were not included. As a result, it has been possible to identify key sources for HERs to use when undertaking any enhancement of early prehistoric records, in order to help focus future enhancement work to maximise its benefits.

Throughout the assessment phase an open dialogue has been maintained with all key project partners, in particular the Project Managers and other staff

involved in the seven projects, to ensure that all projects are fairly and thoroughly evaluated, and that the resultant assessment is an accurate and realistic reflection of the work carried out. Telephone interviews were conducted with the managers of each project and also with additional members of the project teams where they were available. Their opinions on the positive and negative aspects of their own projects, along with their thoughts on what they would do differently if the exercise were to be repeated, have proved invaluable to the assessment of the projects.

This report presents the results of the HER data assessment and highlights the key findings of the project. It is hoped that the recommendations made in this report will assist Historic England in the commissioning of further HER enhancement work, with particular emphasis on enhancement of early prehistoric data. It also includes recommendations relevant to the Forum for Information Standards in Heritage (FISH) about issues relating to HER enhancement in general, as well as highlighting key issues specifically relating to the recording of early prehistory. Ultimately, it attempts to identify best practice based on the assessment of the seven HER enhancement projects.

It is intended that the results of the project will be summarised for inclusion in the *Informing the Future of the Past* HER Guidance wiki website, and the key findings were presented by the Project Officer at the Summer 2017 HER Forum meeting. This report will also act as an early prehistoric HER enhancement toolkit, which will be able to guide HERs with limited resources to direct and optimise the impact of any HER enhancement work that they are able to undertake.

2 THE HER ENHANCEMENT PROJECTS

Seven enhancement projects were commissioned as a result of Historic England's 2012 call for proposals under heading 4G1.401 of the NHPP inviting projects to improve the representation of Palaeolithic and Mesolithic archaeology in HERs (English Heritage 2012a). The original call for proposals was not prescriptive in terms of methodological approach, but instead gave HERs the opportunity to devise their own approaches to addressing specific objectives relating to their datasets.

This section summarises and reviews the approaches and methodologies applied in each of the seven projects and presents quantitative analyses of their results. Qualitative assessments are also presented for each project, and these are informed by the project reports, as well as telephone interviews and email correspondence with key members of staff from the respective project teams. Full details of each project can be found in the end-of-project reports referenced in each section.

Project I: South Yorkshire SMR (HE Project No. 6618)

The enhancement of the Palaeolithic and Mesolithic records in the South Yorkshire SMR was undertaken by Archaeological Services WYAS with the aim of furthering the development of appropriate mitigation strategies within the planning process. The project comprised a three-staged approach: 1) the checking and collating of existing data, 2) the updating and creation of SMR records, and 3) the assessment and analysis of the updated dataset (see Grassam and Weston 2014).

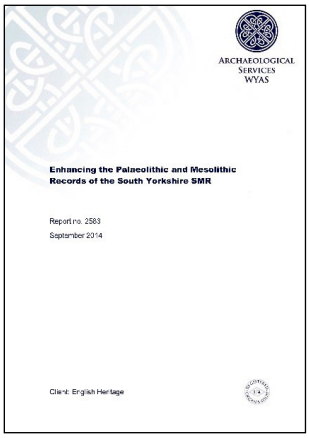


Figure 2 Project 6618 Final Report (Grassam and Weston 2014)

A number of key sources were consulted during the enhancement phase of the project, including the PastScape database and the *Palaeolithic and Mesolithic Lithic Artefact* (PaMELA) database, the *Portable Antiquities Scheme* (PAS) database, Wymer and Bonsall's *Gazetteer of Mesolithic and Palaeolithic Sites* (1977), local journals and doctoral research. Use was also made of data compiled for Paul Preston's doctoral thesis concerning Mesolithic artefacts from the central Pennines (Preston 2012), and Dr Ed Blinkhorn's assessment of PPG16-derived evidence for Late Pleistocene/Mesolithic activity in England (2012). Blinkhorn also produced a review of the grey literature held by the South Yorkshire SMR (Blinkhorn 2013), which enabled the project to quickly identify new sources of information to be integrated into the SMR.

Museums were asked for information on Palaeolithic and Mesolithic material from their collections databases. The response from museums was very positive, but the amount of new information provided was very limited. Collections

databases tended to lack sufficient information to inform SMR enhancement in their own right, and time and resources required to do this this prevented a thorough search of their holdings being undertaken as part of this project, but it is clear that there are large quantities of flint held in museum collections that have never been dated or analysed.

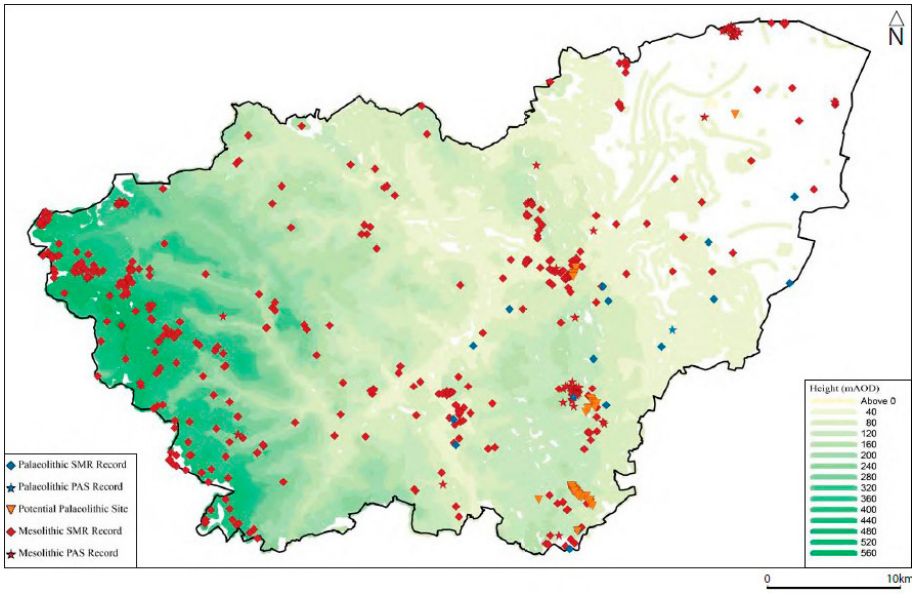


Figure 3 The South Yorkshire study area showing post-enhancement records plotted against relief (from Grassam and Weston 2014)

At the start of the enhancement process, the SMR contained 229 Palaeolithic and Mesolithic monument records, and at the end of the project this figure had increased to 467, with an additional 140 records being enhanced. The increase in records was far more significant for the Mesolithic than the Palaeolithic: there were only 11 Palaeolithic monument records at the start of the project, with seven new records created based on flint scatters and findspots and 70 potential rock shelter sites added during the survey (these being recorded as 'Environment (non-archaeological site)'). The number of Mesolithic records almost doubled from 218 at the start of the project to 431 by the end, with a further 59 records relating to PAS data still to be integrated.

By far the best source for creating new records was the PaMeLA database, which provided 80 new records. Wymer and Bonsall's gazetteer provided details of 37 new sites, but these were all also recorded in PaMeLA or PastScape. The Humberhead levels survey resulted in 11 new Mesolithic sites, notably in areas where no evidence for activity of this date had previously been recorded, and museums provided details that allowed 17 new records to be created.

The enhancement phase was not without its difficulties, most of which concerned time and resources. Although Stages 1 (data collation) and 2 (data entry) were planned as two separate exercises, it quickly became apparent that the two stages needed to happen simultaneously to prove most efficient, with project staff working straight into the live SMR database. Similarly, the scale of new material was too great to be readily accommodated within the project. For

example, although data was obtained from the PAS there was not time for it to be integrated, and a only a rapid survey of grey literature was undertaken, focussed on areas considered to have greatest potential.

Once the enhancement phases were completed, the SMR was analysed to identify areas with known or high potential for Palaeolithic/Mesolithic evidence, areas where high concentrations can be seen to be caused by collection biases, areas where there are genuine gaps in the record, but where there is potential for surviving evidence, and areas with limited potential for Palaeolithic/Mesolithic evidence. This analysis also considered data held in the West Yorkshire HER, which was enhanced as part of Project II (see below), allowing for a comparison of the datasets based on similar areas of geology, topography and land-use across the two adjacent counties.

The new data and analyses highlighted the potential for all areas of the county that remain unaffected by urbanisation and extraction to contain early prehistoric remains. Moreover, where potential exists for early prehistoric deposits to have been sealed by alluvium or peat, well preserved nationally significant sites may yet survive. Comparison of the pre-enhancement and post-enhancement SMR monument record distributions indicate that, while findspots have increased in areas where flint has previously been discovered, finds have also been recovered for parts of South Yorkshire that previously had no finds. Analysis of the discovery of early prehistoric sites demonstrates that flint collection is by far the biggest contributor to the sum total of early prehistoric records, while very few records are derived from developer-funded archaeological investigations (just 16 records, four of which are from a single site). This is thought to reflect the shortcomings of the archaeological mitigation strategies that have been employed previously, and new mitigation guidelines have been developed as part of the project which are already proving useful to development management in the county when placing, justifying and enforcing archaeological planning conditions.

Project Name	Enhancing the Palaeolithic & Mesolithic Records of the South Yorkshire SMR			
Project Number	6618			
Periods	Palaeolithic & Mesolithic		**Project Area**	1,552 sq km
HER	South Yorkshire SMR		**HER Platform**	HBSMR
Enhancement	***Before***	***Record Density***	***After***	***Record Density***
Monuments	229	0.15 per sq km	467	0.30 per sq km
Predictive Model	N/A			
Other Resources	Highlighted areas of high/limited archaeological potential Archaeological planning advice			
Key Sources	PaMeLA; PAS; Wymer and Bonsall (1977); Blinkhorn (2012); Preston (2012)			

Table 1. Key facts for the South Yorkshire SMR enhancement project (HE Project 6618)

Project II: West Yorkshire HER (HE Project No. 6619)

The enhancement of the West Yorkshire HER was undertaken by its curators, the West Yorkshire Archaeology Advisory Service, and focussed on the examination and recording of selected local museum holdings of Mesolithic and possible Palaeolithic material. The project mirrored the three-stage approach taken in neighbouring South Yorkshire: data collation and checking, updating the HER, and analysing the updated dataset (see Dodds 2015).


West Yorkshire Archaeology Advisory Service

Report on the Enhancement of the West Yorkshire Historic Environment Record for the Palaeolithic and Mesolithic Periods

December 2015

HISTORIC ENGLAND PROJECT 6619 MAIN

EH National Heritage Protection Plan reference NHPP 4G1: Pleistocene and Early Holocene Archaeology - 6SNE: Palaeolithic and Mesolithic HER Enhancement (4G1.401)

Figure 4 Project 6619 Final Report (Dodds 2015)

The existing HER records were initially examined and checked for the adequacy of the description, location, and referencing contained within them, and they were used to identify collections of lithic material held in local museums which were to be examined as part of the project. The PAS records for West Yorkshire were also obtained and checked to establish whether there was any material to add to the HER, but, unlike South Yorkshire, other databases such as PaMeLA and other published gazetteers were not consulted, the project team preferring to focus on examining material in museum collections themselves. In this regard the enhancement work benefitted enormously from the Project Officer's expertise in the identification of early prehistoric worked flints.

Searches were undertaken at seven local museums to extract useful information from their archives, including collectors' notebooks and other information relating to the museums' collections of worked lithics. Elements of this data already formed part of the existing HER records, but the material needed systematic enhancement and re-casting to meet modern standards and to improve accuracy and adequacy. The museum visits included examination of all previously identified Palaeolithic material, and where possible the material was digitally photographed and discussed with relevant specialists to refine the dates ascribed to it. This reassessment of material from museum collections resulted in the reclassification of a lot of material previously recorded as Palaeolithic as being of early Mesolithic date. Select Mesolithic material was also examined to attempt to refine the dating of Mesolithic records for particular sites and to confirm the identification and quantities of particular tool types.

All the information collected in the museums was entered directly into the West Yorkshire HER database and the GIS was updated. The record enhancement process was comprehensive, with monument, event, source and find records being enhanced in tandem, and this was considered the most thorough and efficient approach. New GIS polygons were scaled to reflect the level of accuracy of the grid references, for example a six-figure NGR would result in a polygon 100m in diameter, and paper file information was created for all of the new and enhanced monument records.

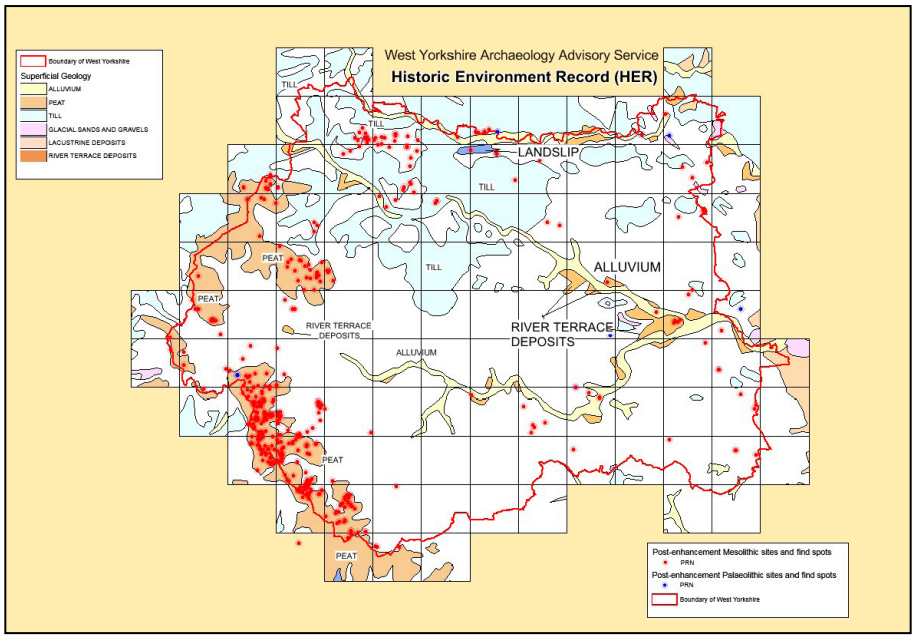


Figure 5 The West Yorkshire study area showing post-enhancement records plotted against geology (from Dodds 2015)

At the start of the project there were 684 Palaeolithic and Mesolithic records in the HER, with 671 records pertaining to the Mesolithic period and 13 records relating to Palaeolithic findspots. During the project two new Palaeolithic records were created and six were amended as they were found upon detailed examination to relate to Mesolithic rather than Palaeolithic material, so in total at the end of the project there were only nine Palaeolithic records. An additional 596 Mesolithic records were created, including 283 derived from artefacts in the PAS database and ten new palaeo-environmental records (the first to be recorded in the HER), bringing the total number of Mesolithic records to 1,267. In total, 267 new records were created from data gathered from museum collections, and an additional 223 existing HER records were amended and updated. As was also the case in South Yorkshire, a substantial proportion of these amendments were made using improved locational data collected from Preston's doctoral research (2012). Additionally, the boundaries of the glacial Lake Humber, which had not previously been recorded on the HER, were identified and mapped based upon the work of the BRITICE Glacial Mapping Project carried out by the University of Sheffield, which produced GIS maps of glacial landforms and features related to the last British Ice Sheet (https://www.sheffield.ac.uk/geography/staff/clark_chris/britice_v2/about).

The analytical objectives of the project were similar to those pursued in South Yorkshire, with the enhanced HER data being used to characterise areas with known high potential for Palaeolithic/Mesolithic evidence, areas where there are gaps in the record with potential for surviving evidence, and areas with limited potential for Palaeolithic/Mesolithic evidence. Following the HER enhancement work, this project also devised mitigation strategies for developer-funded work which drew heavily on the approaches adopted in South Yorkshire. Specific alert layers have not been developed, but in-house training has been delivered

highlighting key areas with high potential for the recovery of early prehistoric material, for example on the peat and on the margins of glacial Lake Humber.

The project took longer and cost more than had been planned, as there was more work involved in completing the project than had previously been anticipated. This was largely because of the time required to read and locate documentary information associated with museum collections, the quality of which was found to be highly variable. Similarly, the extracted PAS data was converted into a GIS layer with hotlinks back to the individual database records, as there was not sufficient time to fully integrate all of the PAS data into the HER database.

The enhanced HER dataset is being well-used and has been routinely sent out to archaeological contractors. The enhanced dataset has been particularly useful on large-scale developments such as road schemes and major new housing development. For example, the results of the project have been used to justify additional sieving work on a site near to the margins of glacial Lake Humber, while on some other sites contractors are no longer routinely machining off topsoil on sites where it is considered likely that significant material may be recovered from the topsoil.

Project Name	Enhancement of the West Yorkshire HER for the Palaeolithic & Mesolithic Periods			
Project Number	6619			
Periods	Palaeolithic & Mesolithic		**Project Area**	2,029 sq km
HER	West Yorkshire HER		**HER Platform**	Bespoke
Enhancement	***Before***	***Record Density***	***After***	***Record Density***
Monuments	684	0.34 per sq km	1,276	0.63 per sq km
Palaeolithic	13	0.006 per sq km	9	0.004 per sq km
Mesolithic	671	0.33 per sq km	1,267	0.62 per sq km
Predictive Model	N/A			
Other Resources	Highlighted areas of high/limited archaeological potential			
Key Sources	PAS; Preston (2012); BRITICE; Museum collections			

Table 2. Key facts for West Yorkshire HER enhancement project (HE Project 6619)

Project III: Norfolk HER (HE Project No. 6623)

This enhancement project was undertaken by Norfolk County Council's Historic Environment Service and focussed on the enhancement of all Palaeolithic and Mesolithic records in the Norfolk HER. The enhancement placed particular emphasis on the integration of new information from museum collections, digital archives and sources not previously included on the HER, as well as delivering a limited programme of outreach and engagement (see Cattermole and Watkins 2014).

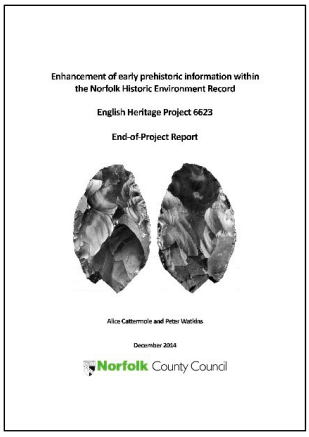


Figure 6 Project 6623 Final Report (Cattermole and Watkins 2014)

The first stage of the project comprised the enhancement of all existing HER records, including refining the chronological range of every find, ensuring each object had been assigned the appropriate term in the object thesaurus (many were indexed under broad terms such as 'lithic implement'), inputting object descriptions for each find or group of finds and updating related monument descriptions and summaries. As part of the enhancement process, all of the existing finds illustrations and photographs held by the Norfolk HER were digitised and indexed, and any detailed intra-site finds distributions were plotted in GIS. All of this information was linked to relevant records within the HER database.

The second stage of the enhancement comprised the addition of new information from museum collections, and from digital archives including the Wymer and Jacobi archives. The quality of museum records varied considerably, although in many cases they were sufficiently detailed to allow integration of new information into the HER and occasionally these records contained important information that was not recorded by any other available sources. Some of the information from museum records was straightforward to integrate, particularly where related HER numbers had been listed, but in many cases it was necessary to rely on grid references, site names and parishes in order to establish the location of particular discoveries. Several hundred objects from museum collections were photographed and/or illustrated in the course of this phase of the work.

At the start of the project, the Norfolk HER held over 2,250 records relating to Palaeolithic and Mesolithic monuments and findspots. At the end of the project there were over 4,700 early prehistoric finds records in the Norfolk HER, of which 4,400 have a detailed description. During the project 2,218 monument records were enhanced, with early prehistoric evidence being added to 333 monument records where none was recorded previously. Additionally 2,320 existing event records were modified, and a further 1,343 new event records were added; 6,166 new source references were added from 1,301 unique sources, of which 895 were entirely new. This represents a huge undertaking, and is far in excess of what was anticipated by the project team at the project development stage.

Prior to starting the HER enhancement work it was necessary to give careful thought to how future researchers engage with the county's Palaeolithic and Mesolithic resource. The key issue was that these periods are principally represented by artefactual evidence, much of which is recorded in large, complex multi-period HER monument records that often primarily deal with evidence associated with much later periods of activity. In order to fully appraise the early prehistoric material it was therefore decided to place particular emphasis on adding detailed information to the finds records rather than putting this detail in the monument description field. As the Norfolk HER already contained detailed finds records imported from the PAS, this was not a radical departure, but rather an attempt to raise the Palaeolithic and Mesolithic finds records up to an equivalent standard.

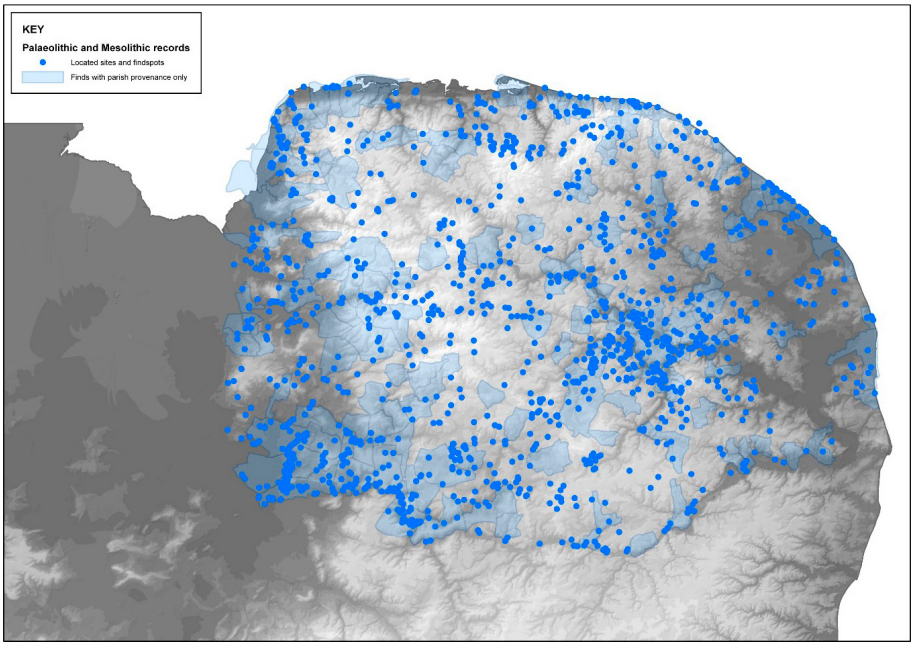


Figure 7. The Norfolk study area showing post-enhancement records plotted against topography (from Watkins with Cattermole 2014)

Once the enhancement of existing HER records and the addition of new material to the HER was complete, the early prehistoric resource was assessed using GIS and the findings of the resource assessment were summarised in an extensive report (Watkins with Cattermole 2014). The main difficulty encountered in preparing this document was the quantity and complexity of the sources that the project team needed to refer to in order to ensure that the report took account of the latest advances in research into early prehistory. This was essential to provide the context for discussion of the key themes identified during the HER enhancement process and to ensure the academic credibility of the report. It is undoubtedly the case that this project would have benefited from having specialist input during the report-writing process.

The new HER data was complemented by a Planning Guidance Document designed in consultation with and for use by development management colleagues, which was produced with a view to maximising the opportunities within the planning process for conserving and, where appropriate, investigating

deposits with the potential for survival of significant early prehistoric remains. The contents of this planning guidance, and the wider results of the project have been, and will continue to be, promoted and consolidated amongst Norfolk County Council staff.

The overall results of the project have also been the focus of a programme of engagement and outreach in order to raise public awareness and recognition of Palaeolithic and Mesolithic artefacts and ensure their timely reporting to the relevant archaeological authorities. As a large rural county in which development is primarily focused in and around urban centres, Norfolk has always been dependent upon amateur fieldworkers and finders of artefacts reporting their discoveries and has cultivated relationships with such groups and individuals over a long period. Informal reporting of this kind is undoubtedly invaluable, but more valuable still, especially in rapidly changing coastal environments, is regular monitoring undertaken by a body of trained volunteers who are able to recognise early prehistoric artefacts for what they are, accurately record their findings and refer them to the relevant archaeological authorities.

Project Name	Enhancement of early prehistoric information within the Norfolk HER			
Project Number	6623			
Periods	Palaeolithic & Mesolithic		**Project Area**	5,371 sq km
HER	Norfolk HER		**HER Platform**	HBSMR
Enhancement	***Before***	***Record Density***	***After***	***Record Density***
Monuments	1,800	0.34 per sq km	2,218	0.41 per sq km
Predictive Model	N/A			
Other Resources	Resource Assessment report Archaeological planning advice Flint identification and recording toolkit Outreach and engagement programme			
Key Sources	PAS; John Wymer archive; Roger Jacobi archive; Museum collections			

Table 3. Key facts for the Norfolk HER enhancement project (HE Project 6623)

Project IV: Worcestershire HER (HE Project No. 6632)

The enhancement of the Worcestershire HER was undertaken by Worcestershire County Council Archive and Archaeology Service and the project primarily focussed on the integration into the HER of Palaeolithic data gathered by Quaternary scientists and archaeologists pertaining to the county. A specific aim of the project was the integration of data collected during the Shotton Project, a one-year project funded by English Heritage in 2003 to raise the profile of the Palaeolithic in the Midlands amongst the public, curators and academics (see Russell and Daffern 2014).

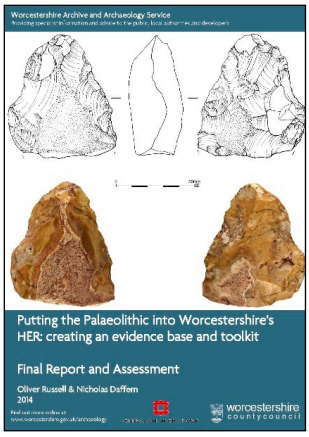


Figure 8 Project 6632 Final Report (Russell and Daffern 2014)

A comprehensive literature review was carried out as part of the HER enhancement phase, focussing in particular on Quaternary science and geological journals, as these are often overlooked by archaeologists and the datasets and information therein are rarely deposited with or integrated into HERs. The second strand of the enhancement comprised the assessment by a specialist of artefactual material held in the Whitehead Collection at the British Museum. Just over 250 objects were assessed, 229 of which were identified as being of Palaeolithic date. A further 53 objects in local collections were also assessed, 12 of which were believed to date to the Palaeolithic. Five objects were selected to be illustrated as part of this project. Neither the artefactual assessment or the literature review would have been able to have been successfully undertaken without the input of a Quaternary specialist as part of the project team.

An unexpected addition was the discovery of over 2,000 records of Palaeolithic faunal remains which were also held in the in the Whitehead Collection. A variation was requested in order to digitise and map the complete catalogue of these faunal remains and incorporate this information into the HER, although it was not possible to fully achieve this even with this variation and this work is still ongoing.

Prior to the project there were approximately 30 Palaeolithic monument records within the HER, including some loosely dated objects which had been assigned a broad prehistoric date range rather than being assigned specifically to the Palaeolithic. The record count at the end of the project stood at 157 Palaeolithic monument records, which incorporated multiple finds records and related events.

A lot of the material coming in to HERs relating to the Palaeolithic period is from non-archaeological disciplines who use Marine Isotope Stages (MIS) as their main dating framework and for this reason the project team used MIS for records generated by this project. In order to do this a series of drop-down date ranges were created in the HER database and linked to detailed scope notes which contain descriptions of national and regional conditions at that time. This chronological framework was adopted in order to add clarity and to

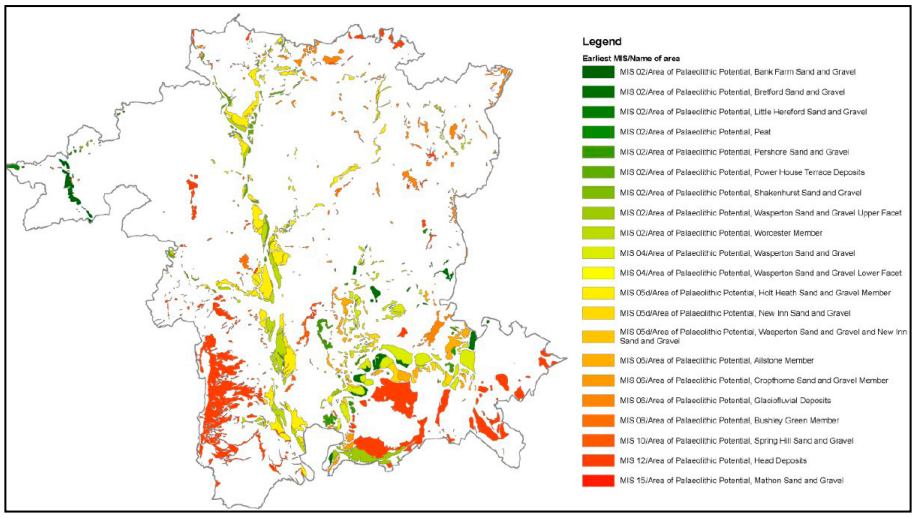


Figure 9 The Worcestershire study area showing the identified Areas of Palaeolithic Potential (from Russell and Daffern 2014)

'future-proof' the HER records. However, most records were ultimately assigned MIS ranges which broadly equate to the more traditional tripartite (i.e. Upper, Middle and Lower Palaeolithic) dating scheme for the period.

Following the enhancement of the HER, the project created and mapped a series of areas of Palaeolithic potential which can be used to simplify the complex datasets and ensure that Palaeolithic potential was recognised within the development control system. Mapped areas of this kind were considered to be necessary in order to ensure that the knowledge and understanding of Worcestershire's Palaeolithic is retained within the host organisation beyond the lifespan of the project, so that decisions could be made based upon the evidence gathered by the project even if key staff had moved on. These areas of potential were created and characterised using British Geological Survey (BGS) data overlaid with the enhanced HER entries and merged into one polygon per member/deposit. This resulted in the creation of 21 separate areas of Palaeolithic potential, each of which now has an entry within the HER's 'Geology' layer and is accompanied by a full description. These areas of potential were not scored relative to one another, as there is still too much uncertainty within the data, but it is recognised that an assessment of significance is desirable and the Worcestershire County Council Archive and Archaeology Service are hopeful that scoring will be introduced as more data becomes available.

Ultimately, the MIS descriptions written for the HER, the mapped areas of Palaeolithic potential and additional advisory information were collated into a toolkit, which is intended to inform future planning policies across the county and to better inform professionals working within the highlighted areas of potential. The enhanced HER data is being regularly supplied to archaeological contractors via the established HER enquiry procedures.

In terms of actually using these areas of Palaeolithic potential for development control, Worcestershire County Council staff involved in this process reported that in most cases these areas are not yet defined clearly enough to be of great

relevance to day-to-day development control work, but are likely to be of much greater use in large-scale infrastructure projects and minerals extraction. There has already been one high-profile case of a quarry where enhanced HER data was used to alert the contractor to the potential for recovery of Palaeolithic remains, and where mammoth remains were subsequently found.

Public-facing outreach and engagement formed a significant part of the project, and the team contributed text, images and artefacts to several exhibitions in the county during the project. The project has prompted the local museum service to re-evaluate its geological and Palaeolithic collections, which has led to a successful joint Heritage Lottery Fund application for a Palaeolithic/Pleistocene exhibition in the summer of 2018, with a linked programme of engagement.

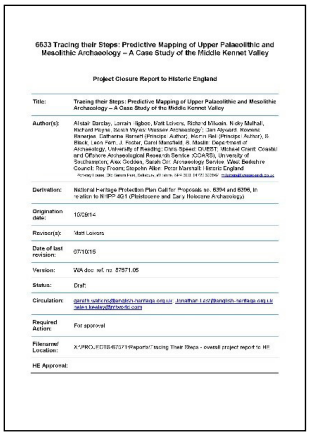
While the Worcestershire HER has been substantially enhanced, there are large areas of the county where the nature and extent of the Palaeolithic resource is still unknown. The archaeological curators feel that it is unlikely that significant new information will be revealed in these areas through the development management process, and therefore new approaches will be required in these areas to better understand the Palaeolithic resource and its potential. It is encouraging to note that other follow-on projects based upon the conclusions and recommendations of the HER enhancement project are currently being explored by Worcestershire County Council.

Project Name	Putting the Palaeolithic into Worcestershire's HER			
Project Number	6632			
Periods	Palaeolithic		**Project Area**	1,741 sq km
HER	Worcestershire HER		**HER Platform**	HBSMR
Enhancement	Before	Record Density	After	Record Density
Monuments	30	0.02 per sq km	157	0.9 per sq km
Predictive Model	21 Areas of Palaeolithic Potential			
Other Resources	Online toolkit / archaeological planning advice Outreach and engagement programme			
Key Sources	Whitehead Collection; Shotton Project archive;			

Table 4. Key facts for the Worcestershire HER enhancement project (HE Project 6632)

Project V: West Berkshire HER (HE Project No. 6633)

This project was a collaboration between West Berkshire Council, Wessex Archaeology and the University of Reading which focused on the creation of a predictive sedimentary and archaeological model to help manage the Palaeolithic and Mesolithic resource in the Middle Kennet Valley. At the time of evaluating the projects (March 2017) the project report had not been completed, although a partial draft was made available (see Wessex Archaeology, in prep.).



6633 Tracing their Steps: Predictive Mapping of Upper Palaeolithic and Mesolithic Archaeology – A Case Study of the Middle Kennet Valley

Project Closure Report to Historic England

Title:	Tracing their Steps: Predictive Mapping of Upper Palaeolithic and Mesolithic Archaeology – A Case Study of the Middle Kennet Valley
Author(s):	Alistair Barclay, Lorrain Higbee, Matt Leivers, Richard Mikulski, Nicky Mulhall, Richard Rhynes, Sarah Wyles Wessex Archaeology; Jan Apsimon, Vivienne Banerjee, Catherine Barnett (Principle Author), Kerrin Pelt (Principle Author), S Black, Laura Kerr, J. Foster, Carol Marchant, R. Mudd, Department of Archaeology, University of Reading; Chris Speed, QUEST, Michael Grant Oswald and Offshore Archaeological Research Service (OCARS), University of Southampton, Alex Geddes, Sarah Orr, Archaeology Service, West Berkshire Council; Tony Pearce, Graeme Allen, Pete Marshall Historic England
Derivation:	National Heritage Protection Plan Call for Proposals ref. 6894 and 6896, in relation to NHPP 4G1 (Prehistoric and Early Holocene Archaeology)
Origination date:	10/2014
Revisor(s):	Matt Leivers
Date of last revision:	07/10/16
Version:	WA doc. ref. no. 87871.05
Status:	Draft
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Required Action:	For approval
Filename/ Location:	X:\PROJECTS\87871\Reports\Tracing Their Steps - overall project report to HE
HE Approval:	

Figure 10 Project 6633 Draft Final Report (Wessex Archaeology in prep)

This project covers a 30km length of the Kennet Valley. This area was deliberately restricted in order to achieve the level of specificity required to model and predict the occurrence of deeply buried and waterlogged sites and sequences, often to be found 2m or more below the ground surface. Prior to the project starting, this area was known to contain one of the greatest concentrations of Final Upper Palaeolithic and Early Mesolithic hunter-gatherer sites in Britain, and a high quality palaeo-environmental record for the period 9,700–7,500 cal. BC. The area has been subject to comprehensive fieldwalking and lithic distribution studies, so that gaps in the distribution of findspots tend to be real, due to removal of deposits or deep burial, or representing genuine gaps in activity during these periods.

The predictive model developed uses GIS processing to model layers indicating areas of 'High' and 'Highest' archaeological potential for Upper Palaeolithic and Mesolithic archaeological remains within the study area, thus providing a dataset which can highlight areas in which well-preserved deposits may exist. These areas are calculated algorithmically based upon key factors identified by specialist members of the project team, specifically stratigraphic surfaces and unit thicknesses, lithology type, distribution and thickness, hydrological and topographic modelling of the study area, and spatial analysis of the HER data against the above datasets. This model is therefore readily able to be updated and refined as new archaeological data emerge.

With this in mind, targeted fieldwork was undertaken to test and enhance the predictive model, including electrical resistivity tomography (ERT) and ground-penetrating radar (GPR) with ground-truthing of these techniques by coring, geoarchaeological description and trial excavations. The findings have been refined using radiocarbon dating and evaluation of the palaeoenvironmental remains. This fieldwork fell outside the scope of the HER enhancement project, but the results will be passed to the West Berkshire HER and integrated in the usual fashion.

The creation of the deposit model resulted in the production of several vector and raster datasets to ensure compatibility with the West Berkshire HER. These were transferred to the HER and integrated into their GIS in order to inform

the planning process. During the process of building the predictive model, gaps in finds and sequences within the West Berkshire HER were identified, which allowed some HER enhancement to be undertaken, particularly to source and event records, although the precise extent and nature of this enhancement has not been recorded and is therefore unable to be quantified.

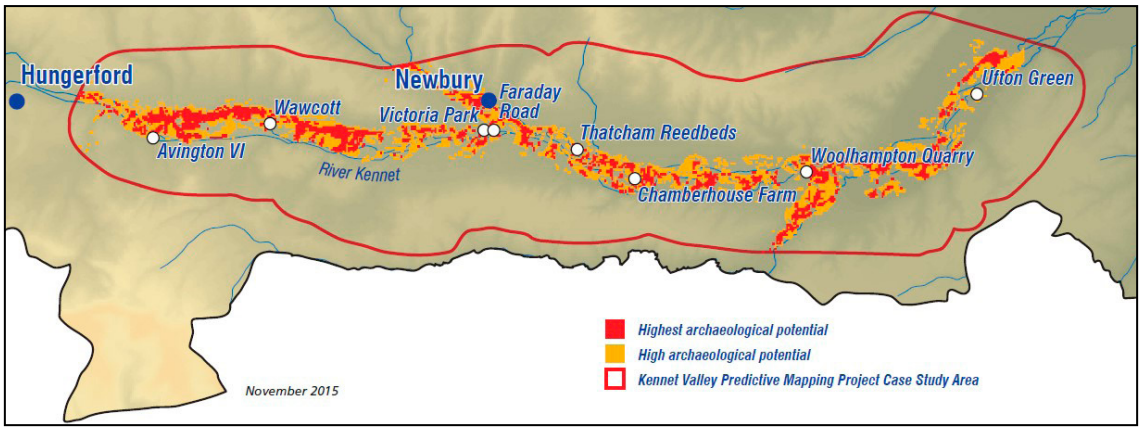


Figure 11 The Middle Kennet Valley study area showing areas of 'Highest archaeological potential' and 'High archaeological potential' plotted against topography (from West Berkshire Council Archaeology Service 2015)

The GIS layer has been used by West Berkshire development management officers when assessing whether Holocene archaeology or palaeoenvironmental potential need to be considered in archaeological planning recommendations. The model has been referenced directly in archaeological conditions, and the techniques employed in subsequent investigations have been tailored accordingly.

A best practice note was produced in the form of a short leaflet aimed at aggregate extractors and developers working in the project area. This has been circulated within the authority and more widely, but has yet to have a major impact. This is thought to reflect the fact that although development sites have been allocated, the practical elements of larger-scale development and mineral extraction projects to which the guidance would be most applicable have yet to begin in earnest.

Overall, the project demonstrated the benefits of bringing together specialist expertise and opening dialogue between the contracting, academic and curatorial sectors. The

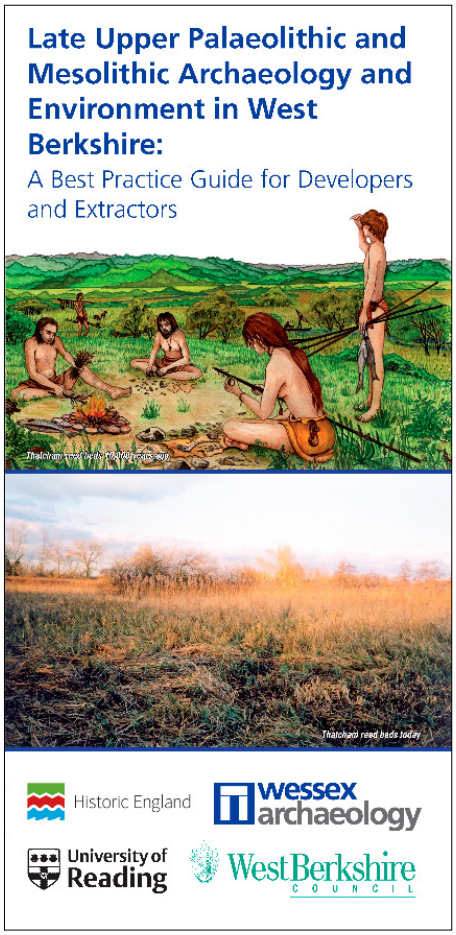


Figure 12 The cover of the best practice leaflet

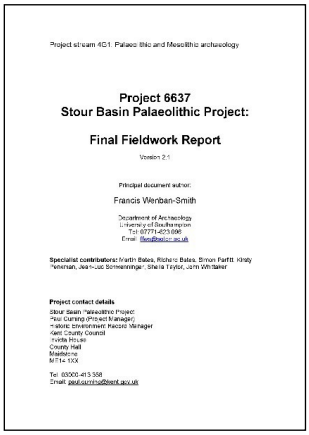
predictive model of archaeological potential would have been impossible for the local authority archaeological service to create on its own, and the project team are keen to highlight the importance of bringing environmental and geoarchaeological research to the attention of HERs so that it can be incorporated into conservation and management.

Project Name	Tracing their Steps: Predictive Mapping of Upper Palaeolithic and Mesolithic Archaeology – A Case Study of the Middle Kennet Valley			
Project Number	6633			
Periods	Palaeolithic & Mesolithic		**Project Area**	240 sq km
HER	West Berkshire HER		**HER Platform**	HBSMR
Enhancement	***Before***	***Record Density***	***After***	***Record Density***
Monuments	Unknown	Unknown	Unknown	Unknown
Predictive Model	GIS-derived layers indicating areas of 'High' and 'Highest' Palaeolithic and Mesolithic potential			
Other Resources	Archaeological planning advice leaflet Fieldwork reports			
Key Sources	Kennet Valley Fieldwalking Survey			

Table 5. Key facts for the West Berkshire HER enhancement project (HE Project 6633)

Project VI: Kent HER (HE Project No. 6637)

This project focussed on the enhancement of the Palaeolithic records held in the Kent HER and the creation of a broad-brush predictive model which identified and characterised areas of Palaeolithic potential. A number of complementary fieldwork projects were undertaken in parallel to this work, the results of which fed into the HER enhancement process (Wenban-Smith and Cuming 2015).


Project stream 4D1: Palaeolithic and Mesolithic archaeology

Project 6637
Stour Basin Palaeolithic Project:

Final Fieldwork Report

Version 2.1

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Figure 13 Project 6637 Final Report (Wenban-Smith and Cuming 2015)

This project was managed by Kent County Council's Heritage Conservation team and carried out in collaboration with the University of Southampton' Department of Archaeology, Canterbury City Council and the Canterbury Archaeological Trust. The project focused on the Stour catchment basin in north-east Kent. This was chosen because it is an area of known Palaeolithic potential experiencing high development pressure, which is archaeologically under-investigated in comparison to other parts of the county. A key aim of the project was the enhancement of the Palaeolithic HER for the study area, resulting in a comprehensive dataset with newly structured event and source information and improved GIS mapping.

A programme of HER enhancement was undertaken for the part of the Kent HER which covered the Stour Basin study area, an area of approximately 1,200sq km. An initial list of 171 monument records relating to possible Palaeolithic sites and finds was extracted from the Kent HER and these formed the basis of the HER enhancement process. Given the collaborative nature of the project, it was necessary to create a separate project database to collate site information for the duration of the project, and this was structured in such a way as to enable the reintegration of the new and enhanced data back into the Kent HER. Detailed checking of the existing HER records and the removal of duplicated and uncertain entries resulted in a dataset of 120 Palaeolithic monument records for the study area

These records were checked and cross-referenced against key published sources, principally Evans' British Palaeolithic survey (1897), Roe's *Gazetteer* (1968), the results of the *Southern Rivers Project* (Wessex Archaeology 1993) and the Kent HER. Relevant grey literature was also checked for new material. It was found that the existing monument records contained numerous inaccuracies regarding site locations, descriptions and artefact terminology which were amended as part of the enhancement process. Recent grey literature added six new records and the splitting off of Palaeolithic elements from multi-period records resulted in 20 new monument records, but most alarming was the number of sites listed in the published sources which had never been incorporated into the HER. A total of 65 sites identified in the *Southern Rivers Project* had not previously been added to the Kent HER. The result of the enhancement process was a greatly improved

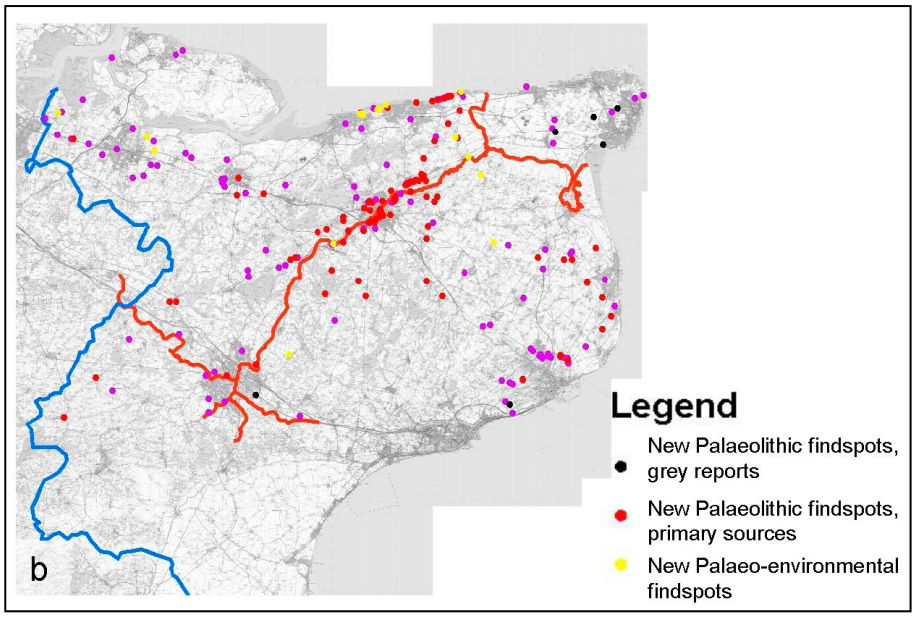


Figure 14 The Stour Valley study area showing post-enhancement records plotted against OS base mapping and existing Palaeolithic records (purple dots) (from Wenban-Smith and Cuming 2015)

Palaeolithic HER for the study area, which contained a total of 243 monument records at the end of the project (76 of which were completely new to the HER), more than double the number of monument records identified at the outset.

This enhanced HER data underpinned the production of a predictive model identifying and characterising areas of Palaeolithic potential. This predictive model was incorporated into the Areas of Archaeological Potential GIS which is used to trigger consultations from Local Planning Authorities. In total 44 Palaeolithic Character Areas (PCAs) were defined, based primarily on geological deposit data, supplemented by fieldwork results, enhanced HER records and deposit modelling. These areas were initially developed on hard copy maps and were subsequently digitised. Each PCA was scored on the 'Likelihood' of Palaeolithic remains surviving within it and the likely 'Importance' of any such remains, with an overall index of 'Palaeolithic Potential' being calculated from these scores.

Both the enhanced HER records and the PCAs fed directly into the additional outputs for the project, which included advice for practitioners on how Palaeolithic archaeology is curated in Kent and a specification for desk-based assessment of the Palaeolithic resource. As part of the wider project, targeted fieldwork was carried out to improve the understanding of the archaeology of the study area, the results of which were fed back into the HER. The fieldwork itself falls outside the scope of this assessment.

The Stour Basin project team worked closely with the team delivering the parallel *Managing the Essex Pleistocene* project (Project No. 6639), who were trying to achieve some of the same aims (see below) and for which Dr Francis Wenban-Smith was also the Palaeolithic expert. Public-facing outreach and engagement

were not considered to be specific aims of the Kent project, which was a specialist project primarily aimed at addressing curatorial goals, although members of the project team did present elements of the project to a number of local and special interest groups. A joint seminar with a curatorial focus was jointly held by the Kent and Essex projects to help to compare and contrast the different approaches taken to their projects and to inform future work.

Overall, the HER enhancement process was very successful, although the project team had not expected to discover that data contained in key sources such as the *Southern Rivers Project* had never been fully integrated into the HER and warned other HERs not to make similar assumptions. Additional complications were created by the need to extract data tables from the HER in order for records to be worked upon and added to outside the live HER database and GIS, which resulted in the need for the enhanced data to be manually re-keyed into the Kent HER. The project team considered this to be an acceptable methodology given the limited number of records involved, although they accept that this would not have been feasible for a larger project. The results of the project have already had a very positive impact upon development management within the study area, so much so that Kent County Council are funding their own expansion of the HER enhancement work into other parts of the county where the potential for Palaeolithic material is high.

Project Name	Stour Basin Palaeolithic Project			
Project Number	6637			
Periods	Palaeolithic		**Project Area**	1,200 sq km
HER	Kent HER		**HER Platform**	HBSMR
Enhancement	***Before***	***Record Density***	***After***	***Record Density***
Monuments	120	0.1 per sq km	243	0.2 per sq km
Predictive Model	44 specialist-derived Palaeolithic Character Areas (PCAs)			
Other Resources	Archaeological planning advice			
Key Sources	Evans' British Palaeolithic survey (1897); Roe's Gazetteer (1968); Southern Rivers Project (Wessex Archaeology 1993)			

Table 6. Key facts for the Kent HER enhancement project (HE Project 6637)

Project VII: Essex HER (HE Project 6639)

This project aimed to establish a methodology for creating a predictive model of the Palaeolithic archaeological resource at a county scale using existing datasets held and managed by Essex County Council. The main purpose of such a model is to facilitate the delivery of consistent and considered responses to development proposals by Archaeological Planning Officers and to offer appropriate advice on management of the archaeological resource (see O'Connor 2015).

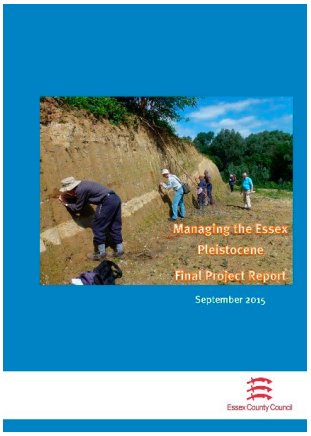


Figure 15 Project 6639 Final Report (O'Connor 2015)

Essex was considered a suitable candidate for applying a test methodology as it has a significant wealth of geological deposits in which Palaeolithic material has been shown to be present. Additionally, the Palaeolithic has been the subject of several Aggregates Levy Sustainability Fund (ALSF) projects in the county in recent years, providing useful baseline data for this latest project. The ALSF projects that have taken place in Essex together cover approximately 15% of the county. A key objective of this project was to provide spatial and descriptive data on the Pleistocene deposits found in Essex with an indication of the archaeological, geological and palaeoenvironmental evidence within these areas.

Unlike the other projects considered here, no HER enhancement was undertaken prior to the development of the predictive model and the Palaeolithic data from the Essex HER was exported and used in the form in which it stood at the start of the project. This data comprised 225 Palaeolithic findspots and 13 additional PAS records. It was outside the scope of this project to update or enhance any of the Essex HER data, although inconsistencies, errors and omissions were identified during the process and, where possible, accounted for in any conclusions drawn. The project team ultimately recommended that time and resources should be invested in checking and updating Palaeolithic HER records prior to undertaking similar work in the future, even if existing datasets were considered reliable.

The project used a Quaternary specialist to establish the Lithological Units that form the basis of the deposit model, drawing upon BGS data supplemented by borehole data and current understanding about significant Pleistocene geologies. The Pleistocene geologies were grouped into 14 separate Lithological Units (LUs) according to the main characteristics of the sediment(s). These LUs and their descriptions were supplied to the Palaeolithic specialist along with overlaid HER, PAS data and other relevant datasets. This allowed an assessment of each LU to be made in terms of its potential for containing or being associated with Palaeolithic archaeological remains. This specialist input allowed for baseline scores to be assigned to all LUs. A series of intersect queries were run in GIS by the in-house team to select LU polygons that intersected with any other GIS datasets that provided direct or indirect evidence for the presence of Palaeolithic remains within the LU layer and these polygons were extracted into a new

Palaeolithic Potential Areas (PPA) layer. Once this process was complete, the interrelationships between objects in the PPA layer were assessed and these areas were assigned a score based on the nature of the existing evidence and the characteristics of the LU.

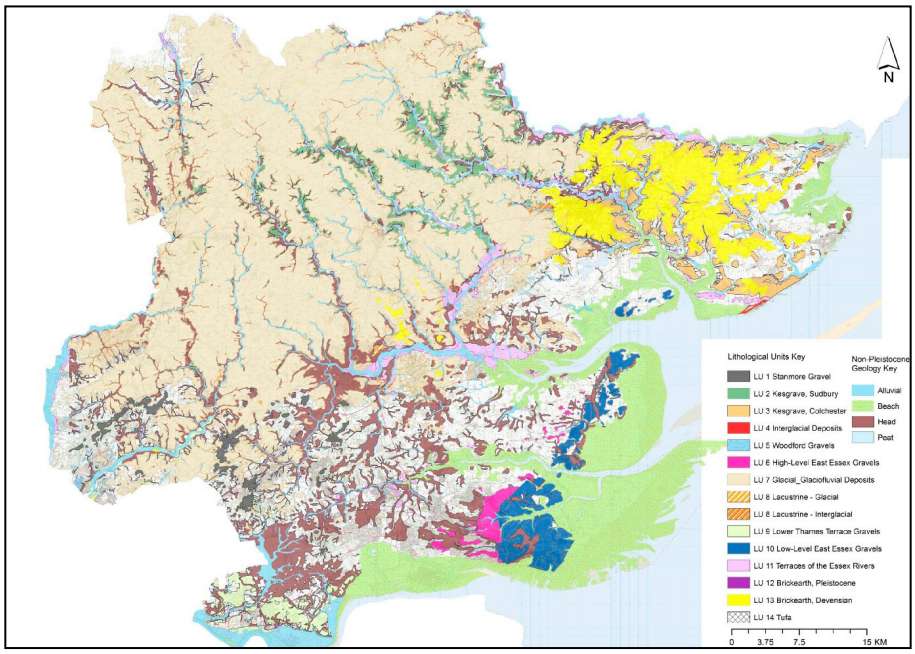


Figure 16 The Essex study area showing the 14 identified Lithological Units (LUs) (from O'Connor 2015)

The project team consider that the creation of the LUs from the BGS data was critical to the methodology, as the LUs became a significant GIS dataset to use in areas which were lacking in information. The LU description allowed a moderate degree of confidence in classifying polygons where there was no existing HER data by using the characteristics of the LU itself, based on comparative information about that LU in other areas where information on the Palaeolithic period had been established.

In stark contrast to what was expected in terms of identifying areas of high Palaeolithic potential, the project revealed that a significant number of HER findspots were located within LUs which would otherwise have been perceived to be of low potential. For example, glacial and glaciofluvial deposits were found to contain material which cannot be evidence for contemporaneous human activity since the climatic conditions were too inhospitable. The likelihood is that these finds have either been picked up from earlier deposits as the ice moved over them, or that there are Pleistocene deposits surviving below the glacial sediments that do preserve Palaeolithic material. It may not be possible to work factors such as these into a model, but they need to be considered in future predictive modelling.

Given the overlapping methodologies and the use of the same Palaeolithic specialists, Essex and Kent collaborated on their projects and jointly devised curatorial advice and management guidance to be used by their archaeological curators. Information from the PPA GIS layer is cited in planning responses and

the PPAs will also be one of the key sources which will be used to inform Essex CC's consultation response to the updated minerals allocations. Although the project team consider the end results still to be too complex for non-specialists to use, details of the PPAs are sent out with other HER data in areas where potential for Palaeolithic remains is high or medium. The project has also resulted in the amendment of briefs for Desk-Based Assessments, including the requirement to consult all available information including borehole data. Some changes have also been made to the specified archaeological evaluation techniques, for example requesting excavation of deeper pits within trenches and requiring on-site input from a geoarchaeologist or Palaeolithic specialist.

The interpretation of findspot data in terms of its ability to inform conclusions about an area's potential for the possibility of further Palaeolithic finds is particularly problematic, as both accuracy and provenance need to be considered. Often the source data is not sufficient to allow confident conclusions to be drawn. The input of specialists into this project was hugely beneficial, but since neither of the specialists involved works with GIS or with digital HER data, the Essex County Council team had to spend a lot of time extracting relevant information from the HER and producing hard copy maps and records for the specialists to work from. The creation of the LUs took longer than anticipated due to the scale of the project, the complexity of the geological mapping, and the need for hard copy maps and records. It would have been far more efficient if the specialists had used GIS and had access to the live HER database for this part of the project.

The nature of Palaeolithic archaeology is such that there are still large areas of Essex with little obvious potential and no known deposits. The predictive model does not help in such areas as it is very difficult justifying any methods that might help recover any material to add to the evidence base. The Essex methodology is dependent upon specialist input in the first instance, and therefore the processes which they followed cannot be seen as particularly quick or repeatable in terms of updating the Essex model or applying the same methodology to other geographical areas. In terms of sustaining the predictive model, this is dependent upon members of the Essex County Council project team adding any relevant new information to the model and manually updating the PPAs.

Project Name	Managing the Essex Pleistocene			
Project Number	6639			
Periods	Palaeolithic		**Project Area**	3,670 sq km
HER	Essex HER		**HER Platform**	HBSMR
Enhancement	***Before***	***Record Density***	***After***	***Record Density***
Monuments	225	0.1 per sq km	N/A	N/A
Predictive Model	14 specialist-derived Lithological Units (LUs)			
Other Resources	Archaeological planning advice			
Key Sources	Evans' British Palaeolithic survey (1897); Roe's Gazetteer (1968); Southern			

Table 7. Key facts for the Essex HER enhancement project (HE Project 6639)

Historic Environment Record (Host Authority)	HE No.	Period(s) Enhanced	HER Enhancement	Predictive Model	Other Resources	Online Report
South Yorkshire SMR (South Yorkshire Archaeology Service hosted by Sheffield City Council)	6618	Palaeolithic & Mesolithic	238 new records (104% increase)	N/A	Planning guidance	Link
West Yorkshire HER (West Yorkshire Archaeology Advisory Service hosted by Wakefield Metropolitan District Council)	6619	Palaeolithic & Mesolithic	592 new records (116% increase)	N/A	Planning guidance	Link
Norfolk HER (Norfolk County Council)	6623	Palaeolithic & Mesolithic	418 new records (23% increase)	N/A	Planning guidance Toolkit Outreach programme	Link
Worcestershire HER (Worcestershire County Council)	6632	Palaeolithic	127 new records (423% increase)	21 Areas of Palaeolithic Potential	Planning guidance Toolkit Outreach programme	Link
West Berkshire HER (West Berkshire Council)	6633	Palaeolithic & Mesolithic	N/A	GIS-derived areas of 'High' and 'Highest' potential	Planning guidance	Not yet available
Kent HER (Kent County Council)	6637	Palaeolithic	123 new records (103% increase)	44 specialist-derived Palaeolithic Character Areas (PCAs)	Planning guidance	Not yet available
Essex HER (Place Services on behalf of Essex County Council)	6639	Palaeolithic	N/A	14 specialist-derived Lithological Units (LUs)	Planning guidance	Link

Table 8. Summary of the HER enhancement projects

3 EVALUATION AND RECOMMENDATIONS

The seven projects which form the basis of this evaluation all took different approaches to the challenge issued in the original call for papers. This section of the report considers all of the projects together, highlighting best practice, detailing some of the key issues encountered during the projects and making recommendations which will aid future HER enhancement work.

This section examines the HER enhancement process on a stage-by-stage basis, and is structured to mirror the project lifecycles adopted by the various enhancement projects. Sequentially numbered recommendations are made throughout the text where issues were encountered, and these are considered further in the concluding section of this report.

While many of the issues encountered during the delivery of the projects are specific to the enhancement of early prehistoric HER entries, a number of issues pertaining to the wider process of HER enhancement were also identified and documented, and these are considered separately in the conclusion.

Approaches to HER Enhancement

HER enhancement is generally undertaken in order to fill gaps in content and improve the quality of HER records. However, the seven projects evaluated in this report demonstrate just how widely the methods and approaches to HER enhancement vary, even when the subject of the enhancement work is similar. Likewise, the scope of the enhancement work varied greatly, with some projects focusing only on enhancing particular types of records (usually monuments and/or finds), while other projects chose to enhance all records associated with early prehistoric material (including event and source records).

Scope of Work

Planning an HER enhancement project is a complex task, since it is often difficult to quantify what needs to be done until the enhancement work actually starts. One of the key parts of defining the scope of the enhancement project is determining which existing HER records (monuments, events, sources and finds) will be examined and which are out of scope. For example, when planning the Norfolk HER enhancement project, the scope of the project was limited to those records that were already considered to have a strong likelihood of being early prehistoric, either because they had already been assigned a date range within the early prehistoric period, or because they included chronologically diagnostic artefact types (e.g. handaxe). This meant ignoring almost 20,000 further flint finds that had been ascribed a broad prehistoric date range.

Decisions of this kind are essential in clearly defining the scope of enhancement work before this work starts. This helps guard against 'mission creep', since almost all enhancement projects will discover records and sources not directly

related to the current enhancement work that are also in need of attention. In order to ensure the successful completion of an enhancement project, these unrelated records and sources must be ignored and addressed at a later date. With this in mind, it is recommended that the criteria upon which records are selected for enhancement are clearly defined in a project design or project initiation document in order that future enhancement projects focus on other parts of the HER.

Recommendation 1: The scope of HER enhancement projects should be clearly defined, quantified and documented at the Project Design stage.

Action 1: Summary guidance on HER enhancement to be added to *Informing the Future of the Past 2* (IFP2).

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Detailed scope of work to be required in future HE enhancement project Calls for Proposals and clearly set out in Project Designs.

Responsible bodies: HE research lead; HER managers; HER staff.

Audit of Key Sources

Once the scope of the enhancement project has been defined, the process of planning the record enhancement can begin. The first task for all HER enhancement projects should be a rapid audit, to establish the current state of knowledge. The purpose of this is to find out which sources the HER already includes and whether these are fully integrated into the HER. Many of the enhancement projects reviewed here discovered that key sources relating to early prehistory had not been added at all, or had only been partially added and that significant information detailed in these sources was still omitted from the HER. It is important not to assume that because a source has been added to an HER, all of its content will have been added to monument, event and find records. The early prehistoric HER enhancement projects reviewed here clearly indicate that this is often not the case. For example, in Kent, it had been assumed that because some sites from the *Southern Rivers Project* were already on the HER, everything from this project had been fully included on the HER. However, while undertaking the HER enhancement, it became apparent that 65 sites identified in the *Southern Rivers Project* had not been added to the Kent HER. Key sources of information pertaining to the early prehistoric period are considered in the context of improving access to sources of information below.

Recommendation 2: Key sources should be identified and checked to ensure that they have been added in their entirety.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Full integration of defined key sources to be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Phases of Work

Most of the projects evaluated in this report planned their HER enhancement work in two phases, one being the enhancement of existing records, and the other being the creation of new records. This separation of tasks almost certainly reflects one of the major difficulties encountered when planning HER enhancement work, namely that during this planning stage it is possible to identify with some precision the number of records requiring enhancement, but new content is more difficult to anticipate, quantify and adequately resource. This is also reflected in feedback from project managers, most of whom noted that the time required to create new content tended to be underestimated. Although the HER enhancement work was usually planned as two separate tasks, most projects reported that when it came to undertaking this work, it was far more efficient to enhance existing records and create new records in tandem, rather than as two separate tasks. In some projects, the process of record enhancement and creation was source-focussed, with each source being checked and used to enhance existing monument, event and find records and to create new monument, event and find records. In other areas, a more geographically-based approach was adopted, with records for each parish being checked, enhanced and added. Although this approach lacks the simplicity of the source-focussed approach, it was found to be especially useful for HERs which include a lot of poorly-provenanced material, for example where much of their information is derived from antiquarian collections where site locations are only recorded by parish or place-name.

In terms of planning HER enhancement work, accurately estimating the time required to create new records and enhance existing records can be very difficult. Several of the projects observed that enhancing records is often a lot more complex and time-consuming than adding new records. This is because any existing HER records must be validated by consulting all the sources from which this information is derived and updating existing records with any new or additional information from those and other sources that was not previously included in the HER. It is also often the case that when dealing with such 'legacy' HER records, these records do not meet current recording standards and therefore need to be rewritten and re-indexed. Enhancing existing records is very often far more time-consuming than creating new records because of the time involved in locating and consulting the sources that the 'legacy' records refer to and because of the complexity of incorporating the existing content into an enhanced record that complies with current recording practices.

This point clearly demonstrates why it is essential that planning of HER enhancement projects needs to be undertaken by someone with a detailed knowledge of the existing content of the HER. It also explains why the resources required for HER enhancement vary so much. There is no clear relationship

between gaps in the 'state of knowledge' and the resources required to address these gaps through HER enhancement. This was highlighted by the West Yorkshire project, which noted that in West Yorkshire, where records existed for early prehistoric sites and finds, the process of enhancing these legacy records and then filling in any gaps with new records was more laborious than in neighbouring South Yorkshire, where there were fewer pre-existing HER records, so most of the enhancement work comprised creating new records for information not previously recorded on the HER.

This also highlights why it is preferable for HER enhancement to take a comprehensive form and to include enhancement of related monument, event, source and find records at the same time as the creation of new records. In many HERs monument records have traditionally been considered the main unit of record, with less emphasis having been placed upon event records. It is essential that HER enhancement projects redress this balance, and enable the HER to fully comply with the monument-event-archive model.

> **Recommendation 3:** Project designs for HER enhancement must quantify all existing records (monuments, events, sources and finds) that are in scope and estimate the likely number of new records (monuments, events, sources and finds) to be created. Records should be created and enhanced as part of a single systematic process.
>
> **Action 1:** Creation of guidance on HER enhancement to be added to IFP2.
>
> **Responsible bodies:** ALGAO HER committee; HER forum
>
> **Action 2:** Quantification of records and description of approach to enhancement to be a requirement of future HE enhancement project Calls for Proposals.
>
> **Responsible bodies:** HE research lead; HER managers; HER staff.

Technological Work Flow

A significant issue which several projects highlighted was the need to ensure efficient working methods throughout the course of the project. In particular, it is necessary for any non-HER staff working on the project to have access to the live HER database and GIS, and to have received sufficient training to enable them to input and amend HER records and related GIS data. This problem was identified in both Essex and the Stour Valley where none of the specialists worked with or had access to GIS or the HER database. Working in this way introduces a time-lag and means that the data is not immediately accessible to colleagues and other HER users. In Essex, the need to produce hard-copy HER records and to print hard-copy maps from GIS added considerably to the time and resource requirements of the project. Similarly, the creation of the Lithological Units which underpin the Essex predictive model would have been a much more efficient process had the specialists been using GIS. In Kent the fact that project staff did not use the live HER database delayed the integration of new data into the HER and meant that any such data had to be input by HER staff. As well as there

being significant cost implications of project staff not working in the live HER and GIS environment, this increases the risk of errors creeping in as information is transferred from one format to another, particularly where some information is created in hard copy only. The Essex and Kent project managers considered this to be an acceptable methodology for these projects because of the relatively small number of HER records involved.

Recommendation 4: HER enhancement should be undertaken within the live HER database by someone with detailed knowledge and experience of HER datasets, using staff resources most efficiently and increasing quality assurance.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Direct working in the live HER database to be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Record Structure: 'Lumping and Splitting'

One issue which several projects encountered was determining the extent to which HER data should be 'lumped' together or 'split' into separate records. Many HERs originated as tools for use in the planning system and often adopted a geographical approach to monument recording, mapping the archaeological potential of individual parcels of land, rather than recording individual archaeological sites and finds as separate monument records. This often results in archaeological remains of all periods within a parcel of land being 'lumped' together into a single monument record. While this approach may be helpful for development management, increasingly the need to present information about different phases of activity on a site has given rise to the 'splitting' of records according to the information available about each broad phase of activity. This is an issue that all HERs need to address, but it is important that a consistent approach is taken when HER enhancement work is carried out, in order that the enhanced records take a consistent form and that search results are coherent.

When enhancing existing HER monument records it is sometimes advisable to consider splitting the record by period, especially if large amounts of new information are being incorporated for one particular period. This is what several of the HER enhancement projects did, by separating early prehistoric material from multi-period finds and remains and creating a separate monument record for the early prehistoric components. This approach is usually considered preferable to enhancing part of an existing record. Partially enhanced records are confusing for HER users and can result in the significance of unenhanced content being undervalued, since it is less well represented within a multi-period record. Given that these HER enhancement projects were limited to the early prehistoric period, the time and resource limitations meant that it was not possible to

enhance the other parts of multi-period records. Similar issues were encountered in relation to recording objects (see below).

More complicated are the methods for recording poorly provenanced sites and finds, particularly those such as antiquarian discoveries where it is very unlikely that further, more precise locational information will become available. Some HERs chose to lump together objects where the circumstances of discovery (i.e. finder and date) and the limited locational information were the same into a single monument record. Others chose to lump together all material with a limited provenance. For example, in Norfolk, there were numerous antiquarian records with only a parish provenance, and these were generally grouped into a single monument record for early prehistoric finds from each parish, with event records used to detail different collectors and dates and group together the finds from these collections. Although this is not ideal, it was considered more desirable than creating multiple monument records for poorly provenanced material from each parish.

Recommendation 5: A consistent approach to 'lumping' and 'splitting' of records is required to minimise partial enhancement of records.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: HERs to detail their approach to 'lumping' and 'splitting' of records during enhancement work as a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Portable Antiquities Scheme (PAS) Data

The use and/or incorporation of PAS data into HERs is a long-running issue within the HER community and is one which is of wider relevance than the seven projects discussed here. Some HERs have PAS records fully integrated into their HER database, where it is on a par with existing data and can be automatically queried along with other HER datasets, but these records have to subsequently be screened out if data are to be put online in order to comply with the terms of data-sharing agreements between the PAS and HERs. Although data-import tools do exist which enable PAS data to be downloaded and imported into HERs as a series of findspots, considerable time and effort is involved in merging these data into existing records and/or creating new monument records derived from these finds. Given the thousands of new PAS records being created each year, the scale of this problem is only going to worsen over time, and many HERs are past the point at which a full data integration process could be resourced.

Several of the early prehistoric HER enhancement projects attempted to use PAS data to enhance their HER. However, both South Yorkshire and West Yorkshire did not fully integrate the PAS records into their HERs, but instead created a GIS layer with hotlinks back to the individual PAS database records. In Norfolk, all

PAS records are imported and fully integrated into the HER, so early prehistoric material was included in this process as standard practice.

Given the relatively limited quantity of early prehistoric objects now recorded by the PAS (there are currently 843 Palaeolithic and 7,762 Mesolithic records) the problems associated with integrating data from this source should not deter HERs from using PAS data to create records for early prehistoric material.

Recommendation 6: PAS data should be integrated into HERs, either as a full data import or via the creation of a linked GIS layer.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Inclusion of relevant subsets of PAS data to be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff; PAS database manager.

Digitisation

Several projects included the creation of new digital resources as part of the HER enhancement process. These included taking digital photographs of objects in museum collections, commissioning illustrations of key artefact types and converting hard-copy finds distribution plots to GIS. In most cases these digital resources were linked to relevant HER database records or integrated into the HER's GIS. In Norfolk, finds illustrations from the HER archive dating back over several decades were scanned and made available online, enabling visual reassessment of this material by any interested parties without having to physically access the HER archive. Digital photographs and digitised illustrations have been used for a wide range of purposes, including illustrating exhibitions and lecture slides, finds identification guides and resources for schools. The Norfolk HER also shared the digital images with the museums in which these objects were held, so that they can be integrated into the collections catalogue. Creating these digital resources that are available online has brought these objects to new audiences, and has made them accessible to audiences who may not be able to physically access the objects.

Recommendation 7: Key graphic material should be digitised to enable visual assessment of significant artefacts and provide intellectual access, particularly where physical access is limited.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Digitisation and dissemination of key graphic material records to be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Approaches to Recording Objects

The evaluation of these seven HER enhancement projects has highlighted the fact that while there is growing agreement within the sector about how to record monuments, events and sources/archives, there are still huge differences in approaches to recording objects within HERs. This issue was identified in IFP2 C4.4 (http://archaeologydataservice.ac.uk/ifp/Wiki.jsp?page=SectionC.4), and little has been done since then to promote more consistent recording of objects in HERs. IFP2 recommends that 'the HER's recording guidelines should set out the level of detail at which artefacts and ecofacts will be recorded' and that 'Artefacts and ecofacts should be recorded to a consistent level of detail across the HER database; HER managers should decide upon detail that can be consistently maintained rather than recording some objects in great detail and others not at all'.

The seven projects demonstrate the range of approaches still taken by HERs when recording objects. For example, West Yorkshire includes detailed object descriptions in the monument description field, while Norfolk only lists objects in the monument description field, and includes detailed object descriptions in the finds description field. Similarly, if HERs are to record museum accession numbers or other cross-references, these need to be entered consistently in order to allow easy retrieval. In West Yorkshire, these are included in the monument description field, whereas in Norfolk they form part of the finds records. The Norfolk project noted that it is neither practical nor desirable to create individual finds records for each and every object, but that in some instances it is better to create a find record that represents a group of objects with similar attributes. A similar approach was taken by Worcestershire when integrating the collection of 2,000 faunal remains into their HER.

The approach taken to object recording during HER enhancement work needs to be clearly defined at the outset of any such project, and should follow guidance set out in an HER's recording manual, in order that the new records created during the HER enhancement project are consistent with other HER records in their level of detail and in where information relating to objects is recorded. If no such guidance exists, this should be written prior to starting the enhancement work. Several of the projects reported that records for finds included in their HER enhancement were much more detailed than most other records in the HER, and that they will aim to replicate this level of detail for new material being added to the HER. However, this change in approach has significant resource implications, not least in terms of the need to enhance other existing object records to a similar level of detail.

Recommendation 8: The methodology for recording objects should be clearly defined and consistently applied, and details of individual or groups of objects should be added to find records, not monument records.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Details of approach to finds records to be required in future HE enhancement project Calls for Proposals and clearly set out in Project Designs.

Responsible bodies: HE research lead; HER managers; HER staff.

Early Prehistoric Date Ranges

The HER enhancement projects generated considerable discussion about the currency of date ranges being used by HERs to record early prehistoric material. Although every HER has the ability to set their own date ranges and/or to record material using numerical values rather than period names, and it is recognised that not all periods start at the same time in every part of the country, most HERs are working with a date range that starts at 500,000 BP. This has proved to be inadequate when confronted by material from Happisburgh, for example, which potentially dates from as far back as 980,000 BP, and the Historic England period list recommended by FISH gives a start date of 1,000,000 BP for the Lower Palaeolithic (http://heritage-standards.org.uk/chronology/). Individual HERs need to consider their application of the suggested date ranges and adjust them accordingly, and a more universal approach to this issue should be explored.

Recommendation 9: HERs should revise the date range systems they employ to accommodate discoveries potentially as old as 1,000,000 BP in line with the current Historic England Period List.

Action 1: Individual HERs to assess their own needs and update systems accordingly.

Responsible bodies: HER managers; HER staff.

Action 2: Exploration of the issue at a higher level to agree a national consistency of approach, accompanied by suitable guidance note and update of IFP2.

Responsible bodies: HE Knowledge Organisation Services; FISH Terminology Working Group; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK); ALGAO HER committee; HER forum.

An additional consideration may be the adoption of chronological frameworks used outside of archaeology. In Worcestershire Marine Isotope Stages (MIS) were used for the dating of the project results with the dates for the MIS boundaries being those that are shown in Lisiecki and Raymo (2005). This chronological framework has been widely used in Quaternary Science publications for many years and the majority of the geological, climatic and environmental data, within which the archaeological record sits, are presented in this refined format.

This approach was challenged at one of the project seminars, as much of the available archaeological material cannot be dated with great precision, and there were some concerns about conveying 'false precision' if MIS ranges were used without reference to other dating methods (Wenban-Smith, pers. comm.). While this may be true of residual or reworked artefacts, in-situ deposits containing artefactual, faunal and/or palaeoenvironmental remains can commonly be placed into a more tightly focused time span through the identification of biostratigraphical indicator species and/or the application of radiometric dating techniques (Russell and Daffern 2014, 5–6).

A further consideration is the fact that the use of MIS for dating provides a more precise environmental and climatic context, reflecting the enormous fluctuations that occur throughout early prehistory and which are not acknowledged by the traditional tripartite (Upper, Middle and Lower Palaeolithic) dating framework.

> **Recommendation 10:** The potential for the routine use of MIS date ranges in HERs, to complement existing periods, should be explored.
>
> **Action:** Assessment of the suitability of MIS date ranges for HER purposes and feasibility of their integration into HERs and national data recording systems.
>
> **Responsible bodies:** HE Knowledge Organisation Services; FISH Terminology Working Group; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK); ALGAO HER committee; HER forum.

Object Thesauri

Almost all of the HER enhancement projects mentioned difficulties indexing finds using the current object thesaurus, either because the terms that they needed to use were not in the thesaurus, or because terms were having to be 'borrowed' from other parts of the thesaurus and knowingly used inappropriately. Most projects highlighted the need for refined object thesauri, and the consensus is that the current thesauri terms are not fit for purpose. This issue was particularly problematic given that for most areas of the country artefacts are the main source of evidence for the early prehistoric period.

Issues noted with the thesaurus included the uneven provision of specific terms (e.g. the existence of the term 'retouched flake', but not 'retouched blade') and the provision of an additional layer of very specific terms, but only for particular artefact types. For example, there are no terms that relate to Upper Palaeolithic implements such as leaf/blade points and shouldered points. Additionally, the terms relevant to lithic implements are scattered across many different sections of the thesaurus, reflecting the fact that most were not created with this use in mind. These terminological problems are compounded by the diverse ways in which lithic objects are described in published and unpublished sources, with the use of terms varying considerably over time and between different specialists. It is essential that any updating of the thesaurus is carried out with reference to and

input from a panel of specialists and that clear scope notes are defined for each term.

As an interim measure, several of the HERs involved in the HER enhancement projects devised 'candidate terms' and documented their use. For example, Norfolk produced a *Worked Flint Indexing Guide* which they used throughout their HER enhancement project and which the Norfolk HER has since adopted to ensure that all lithic material is catalogued using the terms defined in this document. While this solution is useful for individual HERs, it would be far more desirable to see a national solution to this problem, and the enhancement and amendment of the Object Type Thesaurus via the FISH Terminology Working Group.

This is not a new observation, and these issues have already been discussed in the *Labels, Lithics and Landforms* e-conference held in 2014, which specifically focussed on controlled vocabularies for Palaeolithic and Mesolithic data (Campbell 2014). Ongoing work to update the object type thesaurus relating to Palaeolithic and Mesolithic implements needs to be finished as a priority, and the FISH Object Type Thesaurus modified accordingly prior to any further early prehistoric HER enhancement projects of this kind being carried out.

> **Recommendation 11:** A new list of lithic terminology should be developed and agreed by a panel of specialists and deployed ahead of further early prehistoric HER enhancement work.
>
> **Action:** A panel of period specialists should be convened to develop and agree a new list of lithic terminology for universal application before any further early prehistoric HER enhancement projects are commissioned. The agreed list of lithic terms needs to be integrated into the FISH Object Type Thesaurus and its use promoted amongst period specialists and the wider HER community.
>
> **Responsible bodies:** HE Knowledge Organisation Services; FISH Terminology Working Group; specialist groups and networks (e.g. Prehistoric Society, Lithic Studies Society, PalNetUK); ALGAO HER committee; HER forum.

Recording Changing Interpretations

Allied to issues of terminology, examination of the different approaches adopted for the seven HER enhancement projects raised the question of how best to deal with legacy records, and what to do with information that is no longer considered valid or interpretations that have changed. IFP2 section C.5.4 clearly sets out the requirement for HER monument records to record previous or uncertain interpretations, and it is important that this is considered when undertaking HER enhancement (http://archaeologydataservice.ac.uk/ifp/Wiki.jsp?page=SectionC.5). Although there is no specific guidance in relation to reclassification of finds, a similar approach should be adopted where an object identification has been refined or has changed.

There are likely to be some exceptions to this approach, in particular where an HER has been given very little information in the past which has limited indexing of finds, but where new information is now available. In such instances, a very broad object type (e.g. lithic implement) may have been used because the material has not been examined by a specialist. Where a specialist has been able to classify this material more precisely, there is arguably little value in retaining the previous broad object type. It is more difficult is when specialists do not agree on the identification of object types and in this circumstance both interpretations should be recorded in the HER. This was a significant problem in the West Yorkshire project, where many records had been added to the HER by non-specialists with a limited understanding of lithic dating and typologies, requiring most of these records to be modified.

Recommendation 12: HERs should ensure that a suitable mechanism is in place to record former identifications and contested or multiple interpretations of artefacts.

Action: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum; HER managers; HER staff.

Using Museum Collections

Three of the HER enhancement projects included the integration of data from museum collections, especially those resulting from antiquarian collectors or amateur fieldworkers. In Worcestershire, the main source of new information for the HER was the Whitehead Collection at the British Museum, which resulted in 229 new Palaeolithic objects being added to the HER, with 12 further Palaeolithic objects being identified in local collections. In West Yorkshire, the project focussed on the examination and recording of selected local museum holdings of Mesolithic and possible Palaeolithic material. In Norfolk, the integration of information about Palaeolithic and Mesolithic objects was limited to those objects held in the collections of the Norfolk Museums Service.

Provenance

A general observation made by all three projects was that museums' recording focuses specifically on the artefactual material rather than the context from which this material was recovered. Detailed locational information had clearly not been a requirement of accessioning in many museums, with sites often identified only by name or general location. In general, the examination of museum collections was useful in terms of individual objects, but it was not always possible to place artefacts in anything other than a broad landscape setting. Although the level of detail provided by different collectors differed hugely, with some providing detailed maps and individual findspots, in the absence of such material very little can be done to address this retrospectively. Steps should be taken, however,

to ensure that newly accessioned material is accompanied by contextual information, where available.

Recommendation 13: Collectors and museum professionals should be reminded of the need to record locational and contextual data when accessioning and cataloguing archaeological material.

Action: Liaison with the Society for Museum Archaeology (SMA) and the Portable Antiquities Scheme to agree an advice note for museum professionals and depositors.

Responsible bodies: ALGAO HER committee; HER forum; HER managers; HER staff; PAS; SMA.

Data compatibility

Although museum collections are recognised as a very valuable resource, particularly in areas which have been regularly visited by collectors, these recent projects have highlighted several difficulties in using museum collections for HER enhancement. Aside from the issues relating to the information retained in (or missing from) museum collections and catalogues, the whole process is further hampered by the general lack of interoperability between digital museum catalogues, other collections software and HERs.

Two of the projects made no attempt to extract data digitally from museum catalogues. In Norfolk, attempts to interrogate the Norfolk Museum Service's MODES collections database for relevant material were unsuccessful, so the whole collections database was exported as a .csv and interrogated using keyword searches in Microsoft Excel. Although it was useful for the Project Officer to access this collections information digitally, the process revealed another significant difference between museum catalogues and HERs. Although museums and HERs are theoretically using the same thesauri to record objects, the use of controlled vocabulary and adherence to data standards, such as SPECTRUM, appears to be much less rigorously applied in museums than in HERs, making it far more difficult to extract details relevant to HERs from museum catalogues.

The West Yorkshire project, which made use of the collections of several different museums, highlighted the great variation in the usefulness of the material that they encountered in each museum. By contrast, the Norfolk project highlighted the variability present even within the collections of a single organisation, with the most significant factor affecting data quality being the finder, and their approach to recording the nature and location of what they had found.

Recommendation 14: The nature, quality, size and compatibility of museum collections data should be ascertained before HER enhancement projects are initiated.

Actions: Enhancement projects should be preceded by discussions between HERs and museums about the nature, quality, size and compatibility of collections datasets. Sample collections data should be

supplied to HERs by museums, to inform a decision as to the viability of their inclusion. Project Designs which include the incorporation of museum collections information into HERs should include detailed information relating to this preliminary work.

Responsible bodies: HER managers; HER staff; museum curators.

Incorporating Palaeoenvironmental Data

Palaeoenvironmental data are essential for understanding and reconstructing past environments, yet this type of information is often poorly represented in HERs. This is due in part to many HERs experiencing difficulties accessing reliable and accurate palaeoenvironmental information, but is also due to HERs not being clear about the most effective ways to incorporate this information into their databases, the current thesauri and recording practices not being ideally suited to this type of data.

Several of the projects attempted to integrate palaeoenvironmental information into their HERs, and this was one of the suggestions made in the call for proposals. South Yorkshire attempted to use the Environmental Archaeology database (http://archaeologydataservice.ac.uk/archives/view/eab_eh_2004/), but found no new records to add to their SMR. They also warned against extrapolating from a few isolated pollen cores, citing the findings of Whitehouse and Smith (2009) who clearly demonstrated the highly variable nature of the landscape during the Mesolithic period. Worcestershire successfully incorporated palaeoenvironmental remains into their HER, indexing many of their Areas of Palaeolithic Potential with the candidate term 'Environmental Deposit', and noting locations where dated deposits had been recorded and subsequently published. However, the report on the Worcestershire project does note that if the project were to be repeated elsewhere, 'specialist support for reviewing Quaternary datasets may be necessary given the unfamiliarity of the techniques and evidence' (Russell and Daffern 2014, 14).

These issues are not limited to records relating to early prehistory, and a review of the methodology and terminologies required for the successful and effective integration of environmental data in HERs would be beneficial.

Recommendation 15: HER recording practices for palaeoenvironmental data should be reviewed and updated as a matter of priority.

Action: A review of HER recording practices for palaeoenvironmental data needs to be undertaken to ensure that they are fit for purpose and to ensure that HERs have suitable terminologies and data structures. To be accompanied by suitable guidance note and update of IFP2.

Responsible bodies: HE Knowledge Organisation Services; FISH Terminology Working Group; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK); ALGAO HER committee; HER forum.

Improving Access to Sources of Early Prehistoric Information

Most of the projects used a wide range of sources to capture new data and check existing HER records during the course of their enhancement work. One of the recurring themes to have emerged is that details of sites and finds published in the standard gazetteers and online databases of early prehistoric remains were often incompletely recorded in the HER and in many instances had not been added at all. Several of the project teams warned against the presumption that such records would already be in the HER and considerable headway could be made in the enhancement of the early prehistoric content of all HERs by systematically checking through these sources and updating and creating records as necessary. Many of these key sources have been digitised and placed online in recent years, making them even more accessible to those undertaking HER enhancement.

Gazetteers

One of the key sources of information which many of the projects referred to was the gazetteer of Upper Palaeolithic and Mesolithic sites published by Wymer and Bonsall in 1977. Although a considerable amount of new material has come to light during the last 40 years, several HERs found that they had not yet fully added this material to their records. Many of the records contained within the gazetteer were incorporated into the online Palaeolithic and Mesolithic Lithic Artefact (PaMeLA) database, which several projects identified as being one of the most useful sources of information (http://archaeologydataservice.ac.uk/archives/view/pamela_2014/). The database comprises digital transcriptions of the late Roger Jacobi's archive of index cards recording archaeological sites and finds, and in the South Yorkshire project, for example, the PaMeLA database accounted for 80 new monument records out of a total of 238. It is recommended that all HERs consult this database for records pertaining to their area. A second key data source is the online database of Lower and Middle Palaeolithic sites derived from the card index created by John Wymer for the Southern Rivers Palaeolithic Project and the English Rivers Palaeolithic Project (TERPS) (http://archaeologydataservice.ac.uk/archives/view/terps_eh_2009/), the results of which were published in 1999 as *The Lower Palaeolithic Occupation of Britain* (Wymer 1999). Regional gazetteers were also found to be of great value and many of these had not previously been fully integrated. Within East Anglia, the gazetteer of Palaeolithic sites published by Wymer in 1985 remains a standard source. This has subsequently been augmented by the digitisation of the Wymer archive, particularly his site notebooks, which has provided access to additional material that is of use to HERs in the areas where he lived and worked (http://archaeologydataservice.ac.uk/archives/view/wymer_eh_2008/). The Kent project discovered that a significant number of the results of the *Southern Rivers Project*, another project with which Wymer was involved, had not been added to the HER, despite copies of the project reports being held by the HER.

> **Recommendation 16:** Key sources of early prehistoric data should be more widely publicised among the HER community.

Actions: Creation of guidance on key early prehistoric sources to be added to IFP2 and disseminated to HER community. Any future early prehistoric HER enhancement projects should include an audit of key sources at an early stage in their work programme.

Responsible bodies: ALGAO HER committee; HER forum; HE Heritage Information Partnerships Team; Archaeology Data Service (ADS).

Academic Publications

A substantial proportion of new Palaeolithic and Mesolithic sites are being discovered during research-focussed fieldwork, often led by academic institutions or major research projects (e.g. the Ancient Human Occupation of Britain Project (AHOB) project), and often undertaken across a wider landscape rather than focusing on individual sites. As these projects operate outside the established planning and development control framework, there is no legal imperative for local authorities to be consulted on or even informed about the fieldwork taking place, let alone its results, and there have been several instances, including some of the more spectacular finds at Happisburgh in Norfolk, where the HER has become aware of the discovery at the same time as the general public. The Stour Basin project is a good example of collaboration between the HER and the academic sector producing mutual benefits.

Recommendation 17: Funding bodies must be made more aware of the need for research projects to work with HERs and the wider heritage sector and to contribute to Research Frameworks.

Action: Production of a guidance note for funding bodies emphasising the importance of research results being submitted to HERs via OASIS and the need for researchers to engage with local authority staff to raise awareness of such projects.

Responsible bodies: ALGAO HER committee; HE Heritage Information Partnerships Team; Council for British Archaeology (CBA); Chartered Institute for Archaeologists (CIFA).

Several of the projects reported significant problems tracking down and accessing relevant material, including difficulties with both physical access and intellectual access. Many articles of relevance to the Palaeolithic and Mesolithic periods are published in journals to which HER staff do not usually have access. Articles appear in journals such as *Nature or the Journal of Quaternary Science*, to which local authorities do not have access. Copies of offprints can be obtained directly from the authors, or via the Academia website or, most often, by calling in favours from colleagues with connections to university departments with OpenAthens logins.

Occasionally, articles are published in open access journals or made available to a wide readership for free. One such example is the report of the Happisburgh footprints in Norfolk, which was published in the journal *PLoS ONE* (Ashton *et al* 2014) and has now been viewed online over 84,000 times. Again, this is not

a problem exclusive to the early prehistoric period, and is one which affects the sector more widely.

However, having gained access to a copy of a relevant article or research paper, several projects reported that there are substantial intellectual barriers to being able to access and use the contents of these articles and translate them into the user-friendly summaries which are required for HER records. Like every specialist area, there is a distinct language and terminology used by Quaternary scientists which is unfamiliar to many archaeologists specialising in later periods, and it is often necessary to have a subject specialist who can effectively 'translate' the contents into a more accessible form.

Quaternary science and geological journals were reviewed as part of the Worcestershire project, and the project team acknowledged that the incorporation of material from these sources would not have been possible without the input of a Quaternary specialist. Again, to take Happisburgh as an example, the original paper was published as a letter in Nature, and therefore only the abstract is widely accessible. The paper was entitled 'Early Pleistocene human occupation at the edge of the boreal zone in northwest Europe' (Parfitt et al. 2010). This can be compared to the more popular account of the findings which was published in British Archaeology as 'One Million Years UK' and likewise in Current Archaeology, where the results were headlined 'Earliest human footprints outside Africa found – in Norfolk'.

> **Recommendation 18:** Academic researchers need to be made aware of the need for research publications and/or accessible abstracts to be shared with HERs.
>
> **Actions:** Production of a guidance note for academic researchers emphasising the need for research results to be submitted to HERs, including via OASIS. Offprints of academic articles should be provided to relevant HERs as standard practice.
>
> **Responsible bodies:** ALGAO HER committee; HE Heritage Information Partnerships Team; CBA; CIFA; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK).

Deposit Mapping and Modelling

The call for proposals highlighted deposit mapping and predictive modelling as one of the elements that Historic England wanted to be included in the HER enhancement projects that they funded. This reflects the recommendations of both regional and period-based research frameworks which suggest that HERs should aim to characterise sediments and identify areas of high potential. A deposit model is widely regarded as a useful way of characterising buried remains in order to better understand an area's archaeological potential and thereby inform decision-making in terms of development management and use of appropriate archaeological methods. A predictive model grades the potential of

these deposits to contain relevant archaeological material, based on a recognised set of characteristics and probabilities derived from an understanding of the archaeological resource. It is therefore not an archaeological map *per se* and should not be treated as such. Most of the projects included some form of deposit mapping and/or predictive model, but the methods and approaches varied a great deal.

Methodological approaches

Fundamental to the development of all of the deposit and predictive models devised during these HER enhancement projects were the British Geological Survey (BGS) datasets which provide information about the solid and superficial geology of the project area. Some of the models were more heavily reliant upon the BGS data than others, and in some areas the BGS data appeared to be more reliable and better suited to this purpose than in others. In Essex, the BGS data was the main source of information for the development of Lithological Units, but this data was also complemented by borehole logs. In South Yorkshire, it was intended that the BGS's online borehole viewer would be used to help develop their deposit model, in particular to test for any association between apparent occupation sites and peat formation. However, once this project was underway it became clear that the BGS borehole data was not suitable for application at a county-wide scale, although its potential for use in investigating individual sites was noted.

Both the Stour Basin and Essex predictive models were reliant upon specialist input in the early stages of devising their predictive models. The structure underpinning these models was intellectually rather than algorithmically derived, with Lithological Units being defined by a specialist, based on a detailed examination of geological, borehole and archaeological data combined with an academic understanding of the Palaeolithic resource. It is particularly advantageous that both of these projects used the same specialists, Dr Francis Wenban-Smith, so there is some consistency of approach and interpretation. In the Middle Kennet Valley, specialist input was also sought, but with a focus on the weighting of individual datasets and their content, leaving the GIS to calculate algorithmically the overall archaeological potential in different parts of the study area. It appears that this process could be updated and repeated in response to new information, thereby allowing the model to be refined and reducing the likelihood of obsolescence.

It was suggested by several of the project managers that further work is needed to better understand the most suitable methods for devising predictive models of the archaeological resource. There has been considerable academic research in this area in contexts unrelated to early prehistory, and it would be useful to discover whether the findings of this research are applicable in the context of modelling early prehistoric human activity. While the projects considered here give some insight into the pros and cons of different approaches to deposit and predictive modelling, the nature, size, scope and available baseline information is so variable that like-for-like comparisons are not possible.

Recommendation 19: Different methodological approaches to deposit mapping or predictive modelling should be compared to find the most suitable model(s) for HERs.

Actions: A pilot area should be selected, within which different approaches to predictive modelling can be trialled independently and their results compared and contrasted. This should be followed by ground-truthing to test the validity of the models.

Responsible bodies: HE research lead; ALGAO HER committee; HER managers; HER staff; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK).

Baseline data

The Essex project's main product was a county-wide predictive model of the Palaeolithic resource. Their main aim was to formulate a methodology for creating such a model in GIS using existing datasets, in order that the model can be used to facilitate considered and consistent responses to development proposals and to enable better management of the Palaeolithic archaeological resource. The Essex model was developed without any HER enhancement being undertaken since it was thought unlikely to be necessary. However, when the HER data was interrogated in order to build the predictive model, several errors, omissions and inconsistencies were identified.

Likewise, in the Middle Kennet Valley, unenhanced HER data was also used to underpin the predictive model. In the Stour Basin, HER enhancement was undertaken ahead of building the predictive model, with an initial list of 171 Palaeolithic sites being refined to just 120, and complemented by new information giving a total of 243 Palaeolithic monument records upon which to base their model. These examples demonstrate the need to allow time for HER enhancement, if only to ensure consistency within the records, ahead of any models being developed.

Recommendation 20: HER enhancement (updating records and adding simplified mapping of Quaternary deposits) should be completed before predictive models (detailed identification of areas of potential) are built to ensure that the baseline data from which these models are derived are as accurate, complete and consistent as possible.

Action: HER enhancement to be a requirement of future HE deposit mapping/predictive modelling Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Ongoing maintenance

For HERs to successfully create, maintain and use deposit and predictive models, these models need to be easily integrated into the HER in a digital format, ideally via GIS, and made accessible to all HER users, including in-house development management staff. The models created need to be derived in such a way that

they are responsive and adaptable when new information is added to the HER. HER staff should be able to maintain such models without ongoing specialist input, either through step-by-step maintenance instructions for non-specialists or through full automation of the model.

Recommendation 21: Full digital integration with HERs and a facility for ongoing non-specialist maintenance need to be designed into any deposit maps or predictive models commissioned in the future.

Action: Details of HER compatibility and long-term non-specialist maintenance strategies to be a requirement of future HE deposit mapping/predictive modelling Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK).

Accessibility

A related issue is the need for deposit and predictive models and their associated resources to be accessible to all who need to use them. Many of the projects reported that their models required considerable explanation and interpretation before they could be used by other archaeological staff. In Essex, the Palaeolithic Potential Areas are sent out with HER search request data in order to raise awareness of the potential for Palaeolithic remains, but the project manager reported that this often results in follow-up conversations, since the PPAs were not designed with intellectual access in mind.

Recommendation 22: The content of deposit maps and predictive models needs to be both physically and intellectually accessible to a wide audience, and suitable for use by non-specialists.

Action: An emphasis on accessibility and requirements for a suitable explanatory framework for non-specialists to be requirements of future HE deposit mapping/predictive modelling Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK).

The Use of Enhanced HER Records

The enhanced early prehistoric HER records have a variety of different audiences and end-users, each with different expectations of the data. HERs underpin the archaeological planning system, and therefore any HER enhancement work will, by default, have a direct impact on archaeological planning and development management, both in terms of the advice given and the approaches taken to sites by archaeological contractors. HERs also perform a very important role for those undertaking academic research into the early prehistoric period (and other period), many of whom have vastly different demands of the data. Finally, as publicly-funded bodies, HER teams also have a responsibility for promoting the

information contained within HERs to a wide audience and making HER data as accessible as possible. This section considers the impact of the enhanced early prehistoric HER records on these key audiences, and presents case studies to illustrate these points.

It was intended that this evaluation project would include a survey of external end-users of the enhanced datasets. However, consultation with project managers revealed that in most cases they had received no feedback on the enhanced records, and that they were not readily able to provide details of HER users who had accessed the enhanced datasets. It was therefore decided in consultation with the Project Assurance Officer that the proposed systematic survey of HER users would not be undertaken. Instead, feedback was sought from individuals who had direct experience of using the enhanced datasets.

Many HERs routinely collect feedback from their users, and those HERs which have benefitted from the enhancement project should be encouraged to seek specific feedback on the experience of using their Palaeolithic and/or Mesolithic records as and when the opportunity arises. This will be especially useful in attempting to understand the varying needs of users and may enable the identification of approaches to HER enhancement which best suit specific purposes.

Recommendation 23: HERs which enhanced their early prehistoric records as part of this programme should routinely seek feedback from in-house and external users of their early prehistoric data.

Action: HERs which have enhanced Palaeolithic and/or Mesolithic datasets should routinely collect feedback to evaluate their enhancement work and improve their understanding of the requirements of HER users. This feedback should be collated and analysed after a fixed period of time to provide an assessment of the ongoing impact of the projects.

Responsible bodies: HE research lead; HER managers; HER staff.

Archaeological Planning and Development Management

The enhanced HER records and the creation of other resources such as deposit models are intended to raise awareness and representation of the early prehistoric archaeological resource in the archaeological planning process. The Palaeo 2020 Conference hosted by the Society of Antiquaries in London in 2016 focused on the current challenges facing Palaeolithic archaeology, and raised concerns about the impact of local government cuts on the development management process. Most of the HER enhancement projects were undertaken with development management in mind, and several projects produced guidance documents for development control officers, developers and aggregate companies. These guidance documents generally aimed to raise awareness of the early prehistoric archaeological resource, and to emphasise the different methodological approaches that are required on sites with high potential for discovery of early prehistoric remains.

Several projects emphasised the need to involve period-based or geoarchaeological specialists at an early stage in developer-funded projects. Many project managers noted that desk-based assessments and Environmental Impact Assessments often underestimate the potential for encountering early prehistoric remains, and this period is generally poorly represented in such documents. Some local authorities now include a requirement that appropriate specialists are engaged to write these sections of desk-based assessments. For example, on sites with high potential for encountering early prehistoric remains in Essex this requirement is now included in the project brief, along with a requirement to refer to borehole data.

Many of the projects considered here noted how few records of Palaeolithic and Mesolithic material are actually derived from the development control process. For example, in South Yorkshire just 16 out of 467 sites have been discovered as a result of development management, with four of these being from a single large-scale excavation. A number of reasons have been put forward for this, foremost amongst them being the fact that very few developments, with the exception of major quarry sites, reach the depths required to encounter early deposits. Despite the recent HER enhancement projects resulting in the existence of much more comprehensive information relating to early prehistoric remains, even where high potential of encountering such material is accepted, many project managers reiterated the difficulties that their development control colleagues have when requesting conditions on such sites. Some project managers felt that some of the methodological issues cannot move forward without support for more research-focused projects to evaluate the efficacy of sampling strategies and different methodological approaches. Research in this area would help justify the additional costs involved in employing new, different or more specialised techniques during developer-funded projects.

Several projects suggested that the paucity of early prehistoric sites arising from developer-funded fieldwork indicates that a reappraisal of current methodological approaches and mitigation strategies is required. In the case of the Mesolithic period, it has been observed that many 'sites' of this period effectively comprise a plough-soil scatter of material, and that many such scatters are lost during the stripping of topsoil ahead of fieldwork projects, which tend to focus on undisturbed features below the plough-soil. Most Mesolithic sites are represented by a 'background noise' of implements collected during evaluations and excavations, where they are most often found redeposited in later features.

Several of the projects produced guidance or toolkits aimed at archaeological planning officers with the intention of increasing recovery of material during the development control process, and one of the recurring planning-related recommendations was the need for systematic fieldwalking surveys to be undertaken across sites with suitable ground conditions (i.e. ploughed fields) in order to maximise recovery. While this may not be practicable in every case, this is a subject which has been debated more widely in archaeological circles, with some archaeological planning officers routinely specifying that fieldwalking, and

metal-detecting surveys, be carried out on larger sites as a method of informing excavation strategy and maximising recovery from all periods.

Recommendation 24: A review of the efficacy of different archaeological mitigation strategies for sites with early prehistoric potential should be undertaken.

Action: Research into the efficacy of different sampling strategies and mitigation strategies for the investigation of sites with early prehistoric potential should be commissioned, with a view to improving development management decisions and justifying the additional costs involved during developer-funded projects.

Responsible bodies: HE research lead; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK).

Academic research

Academic research into the early prehistoric period is more sporadic, and the majority of the enhanced datasets have yet to be used in academic research. At the time of writing, the only one of the enhanced early prehistoric datasets that is reported to have been used for academic research is the Norfolk HER, and an assessment of the new data is presented here as an illustrative case study. While it should be stressed that this case study presents the view of one user and one enhanced HER, qualitative feedback of this kind provides positive evidence for the success of the enhancement projects and it is anticipated that more feedback will be accrued as the new and enhanced records are used more regularly (see Recommendation 23).

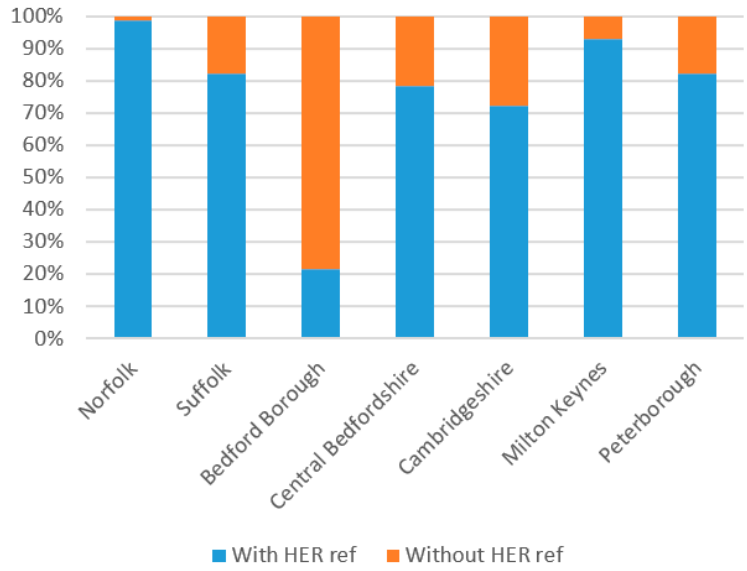
Case Study: Using the enhanced Norfolk HER records

by Dr Lawrence Billington (Independent Researcher)

From 2014–2015, as a part of doctoral research undertaken at Manchester University, I attempted to collect a comprehensive record of the evidence of Late Upper Palaeolithic and Mesolithic activity over an area of Eastern England including Bedfordshire, Cambridgeshire, Suffolk and Norfolk. This coincided with the enhancement project undertaken by the Norfolk HER and I was able to make use of the newly enhanced records in assembling my own database. It is difficult to overstate the contrast between the enhanced Norfolk records and those from other local authorities which I consulted over the course of this research. To some extent I had anticipated that the Norfolk records would be both more comprehensive and more detailed than those of other areas due to the excellent reputation of the Norfolk HER and the important and longstanding contribution made by many 'in house' or associated period/lithic specialists (e.g. J.J. Wymer, F. Healy and P. Robins). Nonetheless, it became very clear that the recent enhancement

project had transformed the record. My own experience of working with the HER records was limited to the Upper Palaeolithic and Mesolithic records but I have little doubt that many of the points raised below apply equally to the prolific records of Lower and Middle Palaeolithic archaeology from the county.

One of the most important points to make about the enhanced records is their comprehensiveness. In assembling my own 'eastern England' database I used the relevant HERs as a starting point for compiling lists of sites and findspots and supplemented these through systematic review of other sources – perhaps most notably relevant publications, the 1977 CBA gazetteer of Mesolithic/ Upper Palaeolithic sites and the PaMELA database (the digitised card index of the late Roger Jacobi). In the case of most HERs this exercise resulted in the identification of many records which had not been recovered by my searches of the records. This is crudely illustrated in the graph below, which shows the number of Mesolithic records from each of the HERs consulted, broken down according to whether I have recorded an associated HER number resulting from my initial searches.



Percentages of records in the database of Mesolithic (lithic) findspots assembled in my database which were identified during initial HER searches.

Some of these HERs are very small and have a less distinguished history and poorer resources than the NHER and this breakdown is in no way an indictment of these records – it is more of a reflection of the extraordinary pressures on HER staff across the country to attempt to maintain a comprehensive record. Nonetheless, it does clearly illustrate how comprehensive the Norfolk records are in comparison to every other HER, and the very few records which were not encountered in the HER search from Norfolk are

largely the product of my having added a few records from the PAS sometime after my original collection of the data from the county.

Aside from its comprehensiveness in these terms the enhanced records are also extraordinarily comprehensive in terms of the detail recorded for individual records. One of the major tasks that I faced during the assembly of records for other areas was in reconciling the HER records with other sources of data and there were very frequent, and inevitable, differences between the information from such sources such as location, number and type of artefacts and so on. In the case of the Norfolk records the most striking aspect of individual records was that in virtually all cases all available sources had been consulted and reconciled and were clearly set out for each record with any ambiguities discussed and often resolved. Aside from this the Norfolk records are unusual in the quality of documentation and often include accompanying artefact illustrations and the overall quality of individual records far surpasses that of other counties which I have consulted.

A further important aspect of the enhanced Norfolk is the manner in which it is based around finds/artefacts as much as sites/findspots. Each record includes available information on individual artefacts/groups of artefacts and this is extremely useful given that the record of these periods is dominated by artefacts as opposed to structural remains.

From my perspective the enhancement of the Norfolk records represents a considerable achievement. It has transformed a record which in other areas represents what could be best described as an initial starting point for further research into a truly comprehensive 'one-stop' record of Upper Palaeolithic and Mesolithic archaeology in the county. In many cases individual records provide detailed, fully referenced accounts of sites and findspots which sometimes add substantial detail to previously published accounts. My own interest in the records has been from a research perspective and the Norfolk records are now admirably suited to work of this kind and provide the kind of detail necessary to interpret many sites rather than simply 'adding dots to maps'. This is especially important for the periods in question where many discoveries never see publication, including very important sites – perhaps best exemplified by (but by no means restricted to) the extraordinary plough zone scatter at Micklehaugh Farm, Banham (NHER 2259), almost entirely unknown in the Mesolithic literature but which now, thanks to work of the HER enhancement project, will come to the attention of a wider community of researchers. Beyond this role in a research environment there is no doubt that the enhanced records will provide a much improved resource in terms of providing information on the distribution and character of findspots to allow the protection and management the resource in the context of planning applications/development.

> The success of the enhancement project, at least from my own perspective, suggests that it provides an excellent model of what could be achieved by other local authorities given appropriate resources. The need for this kind of work is hinted at by the somewhat partial coverage of the HER records held within my study area (see graph above) and by the often cursory nature of individual records. As noted above, HER records are of particular importance for these periods where published accounts are very rare and period specialists remain relatively few. Whilst the enhancement of early prehistoric records in other areas of the country is thus highly desirable, it should be emphasised that this kind of exercise is both complex and time consuming. In this context it should be highlighted that my own impression is that the success of the Norfolk project is owed in very large part to the commitment, rigour, knowledge and enthusiasm brought to the task by Peter Watkins over the two years of the project, and that such projects are dependent on appropriate resourcing both in terms of time/funding and personnel.

Several of the HER enhancement projects have highlighted the need for a closer working relationship between HERs and the academic community, as has already been highlighted by the issue of access to academic publications and accessible summaries of results (see Recommendations 17 and 18). This problem is by no means limited to early prehistoric material. There is an unfortunate lack of awareness of HERs amongst the academic community, with little or no mention being made of their existence during undergraduate courses, and only a few post-graduates making use of the unpublished data held within HERs. This situation is changing, and there is a growing awareness of the potential of archaeological grey literature amongst the academic community, as is evidenced by the success of the recent English Landscapes and Identities (EngLaId) project (http://www.arch.ox.ac.uk/englishlandscapes-introduction.html) and the Roman rural settlement project (http://archaeologydataservice.ac.uk/archives/view/romangl/).

> **Recommendation 25:** Academic audiences need to be made more aware of research potential of HER data of all periods.
>
> **Action:** Production of a guidance note for the academic sector emphasising the research potential of HER data.
>
> **Responsible bodies:** ALGAO HER committee; HE Heritage Information Partnerships Team; CBA; CIFA; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK).

Public Outreach and Engagement

Most of the enhancement projects included some elements of public outreach and engagement, either as part of their HER enhancement project or as a separate follow-on piece of work. In almost every case this comprised a series of talks

and lectures, with some projects targeting a wide audience and others such as Worcestershire putting together resources for use in local schools. In Norfolk efforts were focused on training volunteers in areas of high potential for early prehistoric remains to recognise early prehistoric worked flints, and to report this material to the Historic Environment Service. This method was adopted in part because Norfolk has a long tradition of working with volunteer recorders and field-walkers, and in part because of the need to monitor the rapidly changing coastal environment, particularly in areas such as the Cromer Forest Bed.

By far the most extensive programme of community engagement was carried out in Worcestershire, demonstrating the huge potential of enhanced HER data to help people of all ages better understand this period. This serves as an example of best practice, but it should be noted that delivery of a programme of this kind is reliant upon having a network of staff and specialists with a strong commitment to community engagement and the ability to present complex information in an accessible format to a range of non-specialist audiences. Delivery of such a programme would not be possible in local authorities with more limited resources.

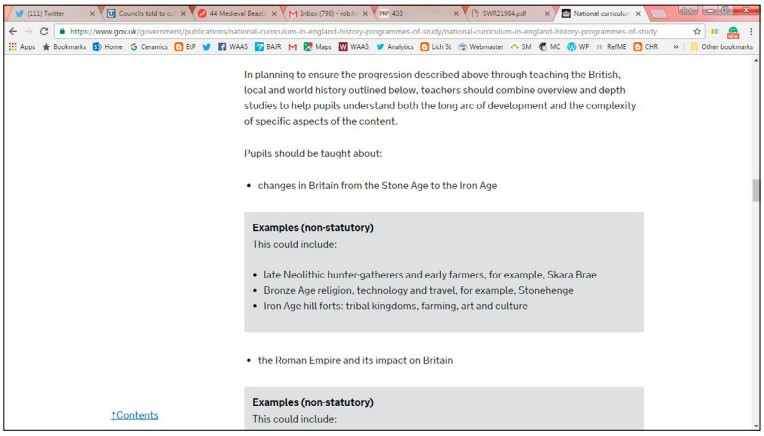
Case Study: Palaeolithic outreach in Worcestershire

by Rob Hedge (Worcestershire County Council Archive and Archaeology Service)

Education Resources

The revisions to the national curriculum published in 2013 brought the 'Stone Age to the Iron Age' into the history syllabus at Key Stage 2 for the first time. Little support was available to teachers beyond the sparse statutory guidance, which merely suggested:

Many teachers understandably struggled to plan for a subject with which few had more than a passing familiarity. WAAS Outreach staff held informal consultations and training sessions with teachers: a common theme was the lack of detailed information available on local discoveries for earlier prehistoric periods (Palaeolithic and Mesolithic). This led many teachers to skirt


In planning to ensure the progression described above through teaching the British, local and world history outlined below, teachers should combine overview and depth studies to help pupils understand both the long arc of development and the complexity of specific aspects of the content.

Pupils should be taught about:

- changes in Britain from the Stone Age to the Iron Age

Examples (non-statutory)
This could include:

- late Neolithic hunter-gatherers and early farmers, for example, Skara Brae
- Bronze Age religion, technology and travel, for example, Stonehenge
- Iron Age hill forts: tribal kingdoms, farming, art and culture

- the Roman Empire and its impact on Britain

↑Contents

Examples (non-statutory)
This could include:

Excerpt from National Curriculum in England: history programmes of study.

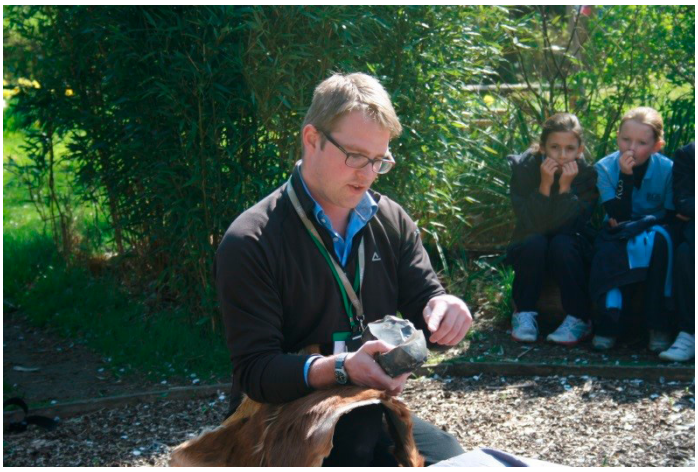
around these earlier periods, or to teach using overseas examples (e.g. continental cave paintings) with little local relevance, before focusing on large, national monuments once in later prehistory. Schools were largely unaware of prehistoric finds and settlement in their area, even in one case being unaware of the presence of a large Iron Age hillfort within their village.

Talking about prehistoric life in the local area brings the subject to life in a way that is lost when using national examples which pupils are unlikely to have an opportunity to visit. It also allows cross-curricular and thematic links to be drawn with geography, science, local studies, sustainability, and more. It opens up the opportunity to discuss parallels, connections and links which demonstrate that geographical and cultural links were extensive and wide-ranging.

Neanderthal Hunters at Kemerton, Late Middle Palaeolithic (about 40,000BC). Illustration by Steve Rigby

The outputs of the Historic England-funded project were incorporated into a suite of resources including reconstruction drawings of life in Worcestershire during each prehistoric period, a replica collection of flint tools, a selection of organic materials (animal bone/antler, hides, wool, bark etc.), and several examples of genuine artefacts that can be safely handled. These are regularly used in outreach workshops with Key Stage 2 school groups, often in conjunction with activities such as flint knapping and using flint flakes to create wooden objects.

In advance of each school workshop, a scan of HER records for local prehistoric monuments, sites and findspots is carried out. The systematic mapping of areas of Palaeolithic potential carried out as part of the Historic-England-funded project, along with the landscape-scale synthesis and recording of individual artefacts,



Flint-knapping demonstration by WAAS Community & Finds Archaeologist Rob Hedge

enables us to identify the nearest Palaeolithic material with ease, confidence, and above all clarity: with artefacts described and beautifully illustrated and deposits interpreted in a manner accessible to anyone with a sound grasp of British Archaeology, our outreach and education team can talk with confidence about the Palaeolithic landscape within each school's local area.

The results of the project were also discussed at a number of archaeology dayschools and in talks to non-specialist audiences such as the Worcestershire Archaeological Society.

The project has demonstrated the importance of producing outputs accessible to non-specialists. Such outputs add considerable value: through illustration, mapping and accessible syntheses, many hundreds more children and adults have been exposed to and inspired by the Palaeolithic prehistory of Worcestershire.

Outreach and engagement activities are fundamentally important for raising the profile of the HER and the data contained within it. Changes in the National Curriculum have placed the early prehistoric period high on the agenda, and this is an opportunity which HERs are well placed to take advantage of. HERs should seek opportunities to work in partnership with education providers, local societies and local media to promote their role and their data.

Recommendation 26: The archaeology of the early prehistoric period should be promoted as part of any future HER enhancement project.

Action: Outreach and engagement promoting the early prehistoric period, and the HER more generally, should be requirements of future HER enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Skills Gaps and Training Needs

Several of the projects identified a lack of early prehistoric expertise amongst HER and other local authority staff, and this was often cited as one of the

main factors in the underrepresentation of this period in HERs. HER staff are required to be generalists, as the nature of their day-to-day work requires a good understanding of sites and finds of all periods. Many are experts in data management, rather than having a period-based specialism. While this is obviously an issue that affects recording of sites and finds of all periods, several of the projects reported that HER staff find early prehistory a particularly problematic period to deal with, with many reporting a lack of confidence in indexing and summarising reports on this period. As the HER underpins development control decisions the impact of this is significant as it means that sites with potential Palaeolithic and Mesolithic remains may not be given appropriate consideration in the development management process.

A similar lack of expertise and resulting lack of confidence is also thought to affect archaeologists in development management roles, resulting in the significance and potential of early prehistoric sites not necessarily being recognised and development on these sites therefore not being appropriately mitigated. It is essential that this knowledge gap across the sector is addressed as a matter of some urgency if the situation is to be improved.

> **Recommendation 27:** Enhance understanding of early prehistory within the HER and development management sectors to improve confidence and inform decision-making.
>
> **Action:** Specialist training in understanding and managing early prehistoric material and deposits should be provided to HER and development management staff, enabling better consideration of the period in the planning process and thereby enhancing its protection.
>
> **Responsible bodies:** HE Capacity Building team; HE science advisors; ALGAO HER committee; HER forum; Archaeology Training Forum; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK).

HER Staffing / Capacity

Many of the project managers that were contacted during the course of this project reported that diminishing resources in local authorities in recent years are making it much more difficult for HERs to undertake enhancement projects. Several project managers noted that if a similar call for proposals for early prehistoric enhancement was to be issued today, they would not be able to put forward a project proposal in response as their resourcing and capacity is now significantly more limited than it was in 2012 when the original call for proposals was made. At present many authorities are so short-staffed that they would not have the capacity to prepare project designs, even if funding for these was made available. Similarly, they would struggle to find enough time away from their main roles to undertake the project management required. In the current climate many local authorities feel that they cannot afford to take on the financial risk of hosting such projects.

Another significant issue to consider when planning an HER enhancement project is the staff resources that will be required to undertake this work. HER enhancement is best undertaken by competent HER staff and ideally people with a good understanding of the HER within which they are working, since HERs vary considerably. This role is not one that can easily be undertaken by entry-level staff without a great deal of supervision, since it requires considerable decision-making and a good awareness of the wider HER context to ensure that the enhanced HER records fully adhere to the HER's recording practices.

Most of the early prehistoric HER enhancement projects were staffed by existing employees who were moved onto the projects from other roles within the organisation, and who had some experience of working with the HERs they were enhancing. Where these staff were working full time on the HER enhancement project their former role had to be backfilled. Several of the project managers noted that they faced difficulties recruiting to backfill posts, either because of the cost of the recruitment process or because many local authorities have been subject to recruitment freezes over recent years in response to diminishing resources within the sector. It is also difficult to attract suitable candidates for short-term contracts of this kind.

With many local authorities reporting problems in terms of staff capacity to undertake HER enhancement work, other models may need to be considered for future work of this kind. In South Yorkshire the HER enhancement work was undertaken by Archaeological Services WYAS as South Yorkshire Archaeological Service did not have the capacity to undertake this work in-house. Advances in technology and a move towards cloud-based hosting allow many HERs to provide remote access to their HER databases. This could potentially allow HERs to pool their resources in order to enable HER enhancement work to take place on a regional basis, by sharing skilled HER staff with other local authorities or jointly commissioning external contractors to undertake enhancement work across several HERs.

Recommendation 28: Alternative models of staffing HER enhancement projects need to be considered to address capacity issues in local government.

Action 1: Alternative models of staffing HER enhancement need to be considered in order to maximise the potential for existing HER staff and/or external specialists to work on the same database during enhancement projects.

Responsible bodies: ALGAO HER committee; HER forum.

Action 2: Details of staffing should be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

The Role of External Specialists

Many of the HER enhancement projects considered it to be essential that Palaeolithic/Mesolithic subject specialists were brought into the project team at the earliest opportunity and that they played a key role in project delivery. However, different models of collaborative working were adopted across the projects with differing results. West Yorkshire benefitted from already having an HER officer with artefact identification skills and a specialism in early prehistory, and there is no doubt that without Jason Dodds' specific skills, their project could not have taken the form that it did. Worcestershire employed an external specialist, Dr Andrew Shaw, to examine collections in the British Museum and other local collections. They noted in their project report that replicating their project methodology in other regions could be relatively straightforward, but cautioned that 'specialist support for reviewing Quaternary datasets may be necessary given the unfamiliarity of the techniques and evidence' (Russell and Daffern 2014, 14).

Both Essex and Kent used Dr Francis Wenban-Smith as their Palaeolithic expert, recognising in their project reports that despite increasing understanding and awareness within local authorities of the potential for Palaeolithic archaeology, particularly following high-profile projects such as the English Rivers Palaeolithic Survey, there remains a lack of specialist Palaeolithic knowledge amongst local authority staff. In Essex, liaison between Palaeolithic specialists and local authority staff was seen as necessary in order to provide 'sound academic justification for why archaeological investigation should be funded by developers' (O'Connor 2015, 7). The role of the specialists in the Essex project was more limited than in Kent. In Essex, the specialists were responsible for devising the Palaeolithic Potential Areas, with Dr Peter Allen providing expertise in Pleistocene geologies and Dr Francis Wenban-Smith providing a detailed understanding of Palaeolithic archaeology. In Kent, the specialist was also responsible for project development and planning, for undertaking fieldwork and for writing large parts of the final project report.

While it is certainly desirable to engage specialists in HER enhancement projects to ensure intellectual rigour and validity particularly where there is limited in-house expertise, it is also important that these specialists have access to all relevant data and systems in order that the value of their contribution is maximised. Specialists working on HER enhancement projects need to have a full understanding of HERs and their users, and need to be trained to use HER software and systems. In Essex the specialists' lack of access to GIS caused delays and was inefficient (O'Connor 2014, 133). Additionally, specialists are often academics and as such have high day-rates compared to local authority staff.

Recommendation 29: External specialist input into HER enhancement projects should be dictated by the needs of the HER enhancement project team.

Action 1: HERs should work with external specialists from the Project Design stage onwards to ensure that appropriate expert input is received as required. External input should be costed realistically.

Responsible bodies: HER managers; HER staff; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK).

Action 2: Details of external specialists and their costs should be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Building a Network

As described above, many of the projects evaluated here noted a lack of early prehistoric knowledge and expertise amongst local authority staff. The impact of this is that sites with high potential for the recovery of evidence for early prehistoric activity are not well-represented in HERs and are not necessarily being given appropriate consideration in the planning process. In order to address this issue, many staff involved in the HER enhancement projects identified a need for training and support to better enable them to deal with early prehistoric sites and finds. The Palaeo 2020 conference provided a focus for the curatorial sector and encouraged the sector to take stock and think about new ways of working. Several of the staff involved in the HER enhancement projects attended this conference and saw it as an opportunity to start building a network to promote greater collaboration between the curators (including local authority and Historic England staff) and the specialists who understand the resource. It was hoped that such a network could be used to improve understanding and promote best practice. However, several of the project managers consulted during this project expressed disappointment that there has been little follow-up from the conference, and that as yet they have not seen the emergence of a network including curatorial staff and period specialists.

Recommendation 30: The feasibility of establishing a national advisory network of early prehistoric specialists should be assessed.

Action: A national advisory network of early prehistoric specialists would be of great value in providing advice and guidance to national, regional and local authorities, HERs and other bodies – though how this could be established needs further consideration. Such a body's specific understanding of the issues and its subsequent advice could be used to guide the direction of future HE research and commissions relating to the early prehistoric period.

Responsible bodies: HE science advisors; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK); ALAGO; CIFA; CBA; HE research lead.

4 CONCLUSIONS

This project has reviewed the methods and outcomes of the seven early prehistoric HER enhancement projects in order to assess their overall effectiveness, to highlight best practice and to make a series recommendations to facilitate the commissioning and direction of future early prehistoric enhancement projects. All of the available project reports and other written outputs have been used to provide an overview of each of the projects and their wider context. Attempts have been made to understand the different starting points of each project, acknowledging that the seven HERs are quite diverse in terms of their format, scope and origins and that the potential of the pre-existing resources was therefore different for each project.

HER enhancement is usually undertaken in order to fill gaps in content and improve the quality of records. The seven projects evaluated in this report demonstrate how widely the methods, approaches and scope of HER enhancement vary, even when the subject of the enhancement work is similar. The issues discussed and recommendations made here have all been developed in the context of the enhancement of early prehistoric records in HERs. While some of the points raised are specific to the early prehistoric period, many of them are equally applicable to HER enhancement in general. This is unsurprising, as the data structures and recording processes developed by HERs have been deliberately designed to be applied to the recording of sites and finds of all periods.

This review has been structured to present a stage-by-stage analysis of the project lifecycles of each of the HER enhancement projects, from inception and design, through delivery to dissemination. This evaluation has resulted in a series of 30 recommendations pertaining to different aspects of the HER enhancement process placed throughout this report, and these are brought together in Appendix I. Some of these recommendations concern the subtleties of methodological approaches to HER enhancement, while others deal with wider contextual issues surrounding the early prehistoric period, but they also fall into a number of overarching categories which have implications for the commissioning and delivery of future early prehistoric HER enhancement projects, as well as approaches to the recording of the early prehistoric period more generally.

The first major group of recommendations pertains to the practice of HER enhancement itself, applied in this context to records relating to the early prehistoric period. While there is a great deal of subjectivity involved in the creation and enhancement of HER records, these projects have highlighted that there is also a considerable degree of common ground. At a general level, it is recommended that a new guidance document focussing on recommendations for best practice in HER enhancement, informed by these projects and others, should be produced and published as part of the IFP2 wiki-based guidelines for HERs and promoted via the HER forum (see Recommendations 1, 2, 3, 4, 5, 6, 7, 8 and 12). This will enable the lessons learned during the course of these projects to reach their target audience.

With regard to the commissioning of new HER enhancement projects by Historic England, the Call for Proposals from which the current batch of projects arose was deliberately non-prescriptive, but in the light of the experiences discussed here it is recommended that any future Calls for Proposals relating to early prehistoric HER enhancement (or indeed that for other periods) should be more specific about the preferred methodological approach. In particular, attention needs to be paid to precisely defining the scope of the enhancement work down to the level of individual records, and key sources should be identified and their incorporation into HERs made a first priority of the enhancement process. The methodological approaches to be taken to new and existing records, splitting records, managing finds records and PAS data, and digitisation of graphical material all need to be addressed in the Project Design. Working directly within HER digital systems and software, rather than on exported datasets, should be a requirement of any HER enhancement project.

In addition to these elements of best practice, future Calls for Proposals should also stipulate that the collection of feedback and other built-in methods of evaluating the impact of the project should be a requirement of the Project Design (see Recommendation 23), and that HER enhancement projects should include an element outreach and engagement to promote their work and its results (see Recommendation 26). There are significant issues surrounding the staffing of HER enhancement projects, which need to explored at the Project Design stage (see Recommendation 28) and, where necessary, realistically costed advice and guidance from external period specialists should be included in prehistoric HER enhancement projects (see Recommendation 29).

The second major group of recommendations relates to the need to refine the specific tools and approaches required for the recording of early prehistoric materials within existing HER data structures, in particular those pertaining to chronology, artefact terminology and palaeoenvironmental data. The HER enhancement projects generated considerable discussion about the currency of date ranges being used by HERs to record early prehistoric material, and the need for HERs to adopt an extended date range for the early Palaeolithic period to include very early finds such as those recently recorded at Happisburgh. It is recommended that individual HERs assess their own needs and update their systems accordingly, but there is also a need for this issue to be explored at a higher level to agree a national consistency of approach, accompanied by suitable guidance note and update of IFP2 (see Recommendation 9). A similar assessment of the possible adoption and adaptation of the MIS chronological framework for use by HERs also needs to be conducted (see Recommendation 10).

Almost all of the HER enhancement projects noted difficulties indexing finds using the current object type thesaurus, either because the terms that they needed to use were not in the thesaurus, or because these terms were having to be 'borrowed' from other parts of the thesaurus and knowingly used inappropriately. These issues have been discussed at length within the sector and it is imperative that a new list of lithic terminology for universal application should be developed and agreed by period specialists and integrated into FISH

Object Type Thesaurus before any further early prehistoric HER enhancement projects are commissioned (see Recommendation 11). Palaeoenvironmental data is essential for understanding and reconstructing past environments, yet this type of information is often poorly represented in HERs. A review of HER recording practices for palaeoenvironmental data also needs to be undertaken to ensure that they are fit for purpose and to ensure that HERs have and are able to use appropriate terminologies and data structures before further early prehistoric HER enhancement projects are commissioned (see Recommendation 15).

A third group of recommendations relates to accessing sources of information on early prehistoric sites and finds, specifically those held in museum collections, published in online gazetteers and databases, or resulting from academic research projects. Although museum collections are recognised as a very valuable resource, particularly in areas which have been regularly visited by collectors, these recent HER enhancement projects have highlighted some difficulties inherent in using museum collections. Given the issues encountered, it is recommended that a guidance note should be prepared for museum professionals highlighting the importance of context for archaeological material (see Recommendation 13) and that any future projects involving the examination of museum collections should be preceded by pilot projects and sharing of sample collections data to establish what is available and whether or not this material is fit for purpose (see Recommendation 14).

One of the recurring themes to have emerged from the HER enhancement projects is the discovery that details of sites published in the standard gazetteers and online databases of early prehistoric sites were often incompletely recorded in the HER and in many cases had not been added at all. Many of these key sources have been digitised and placed online in recent years, making them readily accessible to those undertaking HER enhancement, but their existence needs to be more widely signposted amongst the HER community (see Recommendation 16) and their inclusion made a standard part of any HER enhancement project (see Recommendation 2).

A number of projects highlighted issues surrounding physical and intellectual access to academic publications resulting from research projects, and awareness must be increased within the academic sector and amongst funding bodies of the need to provide HERs with copies of research reports, offprints of academic articles and accessible summaries of research results (see Recommendations 17 and 18). It is recognised that this is not an issue that is specific to the early prehistoric period, although the fact that much relevant material is published in geological and Quaternary research journals rather than in archaeological publications, makes the issue more relevant to this early period. At the same time, it was noted that academic audiences need to be made more aware of research potential of HER data of all periods (Recommendation 25).

A fourth group of recommendations relate to the development and testing of deposit and/or predictive models relating to the early prehistoric potential of deposits, with a view to them being incorporated into HERs and used to inform

development management decisions. The projects considered here gave some insights into the pros and cons of different approaches to deposit and predictive modelling, but before any further deposit/predictive models are commissioned the different methodological approaches employed in these and other projects should be systematically trialled and tested to find the most suitable model for HERs (see Recommendation 19).

Whichever model is ultimately adopted, it is essential that HER enhancement is undertaken in advance of building deposit or predictive models, to ensure that the baseline data from which these models are derived is as accurate, complete and consistent as possible (see Recommendation 20). It is also vitally important that any deposit or predictive model commissioned in the future incorporates full digital integration with HERs and that a facility for ongoing non-specialist maintenance of the model is designed into it, so that it is possible for the HER to maintain and update the model beyond the lifespan of the project without the need for ongoing specialist input (see Recommendation 21). The content of any commissioned deposit and predictive models needs to be both physically and intellectually accessible to a wide audience, and suitable for use by non-specialists such as development control officers, local planning authorities, contractors, consultants and the wider public and should be specified during the commissioning process (see Recommendation 22).

The fifth group of recommendations concerns the application of enhanced early prehistoric HER data to development management decisions, and the associated shortage of subject-specific knowledge within the local government heritage sector. Several of the projects identified a lack of early prehistoric expertise amongst HER and development management staff, resulting in the significance and potential of sites not necessarily being fully realised or translated into the HER. Specialist training in managing early prehistoric material and deposits should be provided to HER and development management staff, enabling better consideration of the period in the planning process and thereby enhancing its protection (see Recommendations 27).

HERs underpin the archaeological planning system, and therefore any HER enhancement work will, by default, have a direct impact on archaeological planning and development management. The enhanced HER records and the creation of other resources such as deposit models are intended to raise awareness and representation of the early prehistoric archaeological resource in the archaeological planning process, but it is apparent that there is also a need for a related review of the efficacy of different sampling strategies and mitigation strategies for the recovery of early prehistoric material, with a view to improving development management decisions and justifying any additional costs involved during developer-funded projects (see Recommendation 24).

Finally, it is recommended that a national network or advisory panel of experts in the early prehistoric period should be established to provide advice and guidance to national, regional and local authorities, HERs and other bodies, and help to address many of the issues raised in this report (see Recommendation 30). Such

a panel would need to span the heritage sector and would therefore require a collaborative approach from a number of relevant bodies and individuals, but it is a model which has worked successfully for other periods and subject areas, for example the Advisory Panel on the Archaeology of Burials in England. The specific understanding of the issues held by members of this network and their subsequent advice should be used to guide the direction of future HE research and commissions relating to the early prehistoric period, including the commissioning and delivery of many of the necessary reviews highlighted here.

Ultimately, although all seven HERs which hosted the enhancement projects discussed here had different starting points and are very diverse in terms of their format, scope and origins, each of the projects achieved significant and positive results within relatively limited timescales and budgets. The open-ended nature of the original call for proposals resulted in a range of different approaches to early prehistoric HER enhancement being developed and trialled, each of which has been tested and from which lessons have been learned. Each of the pilot projects can be deemed a success in its own terms, and a number of common themes have emerged which will guide future best practice when undertaking HER enhancement of the early prehistoric (and other) periods. It is anticipated that these results will inform the commissioning of future projects in order to ensure that Historic England funding is used effectively, and it is hoped that via such projects the significance of this most important and formative of periods will achieve the recognition and understanding it rightly deserves.

5 BIBLIOGRAPHY

Ashton, N, Lewis, S G, De Groote, I, Duffy, S M, Bates, M *et al* 2014 Hominin Footprints from Early Pleistocene Deposits at Happisburgh, UK, *PLoS ONE* **9**(2): e88329. doi: 10.1371/journal.pone.0088329

Blinkhorn, E H, 2012 'The Mesolithic and the Planning Process in England', Unpublished PhD thesis, University of York

Blinkhorn, E H, 2013 Enhancing the Palaeolithic and Mesolithic Records of the South Yorkshire SMR: PPG16 Evidence

Blinkhorn, E and Milner, N 2014 Mesolithic Research and Conservation Framework 2013. Council for British Archaeology

Cattermole, A and Watkins, P 2014 *Enhancement of early prehistoric information within the Norfolk Historic Environment Record: End-of-Project Report*. Norfolk County Council

Campbell, G 2014 *Labels, Lithics and Landforms e-conference on controlled vocabularies for Palaeolithic and Mesolithic data: summary of session 3: Artefacts*. http://studylib.net/doc/7886805/labels--lithics-and-landforms-e

Dodds, J 2015 *Report on the Enhancement of the West Yorkshire Historic Environment Record for the Palaeolithic and Mesolithic Periods*. West Yorkshire Archaeology Advisory Service

English Heritage 2012 *National Heritage Protection Plan Call for Proposals: Palaeolithic and Mesolithic HER Enhancement (4G1.401)*. English Heritage

English Heritage 2012 *MIDAS Heritage: The UK Historic Environment Data Standard*. English Heritage

Evans, J 1897 (2nd edition) *The Ancient Stone Implements, Weapons and Ornaments of Great Britain*. Longmans

Grassam, A and Weston, P 2014 *Enhancing the Palaeolithic and Mesolithic Records of the South Yorkshire SMR*. Archaeological Services WYAS Report 2583

Historic England 2015 Project brief for: *Review of HER enhancement projects for the Palaeolithic and Mesolithic*. Historic England

Historic England 2015 *Historic England Action Plan 2015–18*. Historic England

Lisiecki, L E, and Raymo, M E, 2005 A Pliocene-Pleistocene stack of 57 globally distributed benthic $\delta^{18}O$ records, *Paleoceanography*, **20**, PA1003, doi:10.1029/2004PA001071

O'Connor, T 2015 *Managing the Essex Pleistocene: Final Project Report*. Essex County Council

Parfitt, S A, Ashton, N M , Lewis, S G , *et al* 2010 Early Pleistocene human occupation at the edge of the boreal zone in northwest Europe, *Nature* **466**, 229–33

Pettitt, P, Gamble, C and Last, J (eds) 2008 *Research and Conservation Framework for the British Palaeolithic*. English Heritage/Prehistoric Society.

Preston, P R 2012 'Lithics to Landscapes: Hunter-Gatherer tool use, resource exploitation, and mobility during the Mesolithic of the Central Pennines'. Unpublished D.Phil. Thesis, University of Oxford

Roe, D A 1968 *A Gazetteer of British Lower and Middle Palaeolithic sites*. CBA Research Report 8. Council for British Archaeology

Russell, O and Daffern, N 2014 *Putting the Palaeolithic into Worcestershire's HER: Creating an Evidence Base and Toolkit. Final Report and Assessment*. Worcestershire County Council Archive and Archaeology Service

Watkins, P with Cattermole, A 2014 *Enhancement of early prehistoric information within the Norfolk Historic Environment Record: Resource Assessment*. Norfolk County Council

Wenban-Smith, F and Cuming, P 2015 *Stour Basin Palaeolithic Project: Final Report*. Kent County Council

Wessex Archaeology 1993 *The Southern Rivers Palaeolithic Project, Report No. 2 — The South West and South of the Thames*. Wessex Archaeolog.

Wessex Archaeology [In prep] *Tracing their Steps: Predictive Mapping of Upper Palaeolithic and Mesolithic Archaeology – A Case Study of the Middle Kennet Valley*. Wessex Archaeology

West Berkshire Council Archaeology Service 2015 *Late Upper Palaeolithic and Mesolithic Archaeology and Environment in West Berkshire: A Best Practice Guide for Developers and Extractors*. West Berkshire Council Archaeology Service advisory leaflet

Wymer, J J 1985 *Palaeolithic Sites of East Anglia*. Geo Books

Wymer, J J 1999 *The Lower Palaeolithic Occupation of Britain*. Wessex Archaeology and English Heritage

Wymer, J J and Bonsall, C J 1977 *Gazetteer of Mesolithic sites in England and Wales with a gazetteer of Upper Palaeolithic sites in England and Wales*. CBA Research Report No 20

APPENDIX I: LIST OF RECOMMENDATIONS

(NB the shading distinguishes those recommendations specifically relevant to early prehistory [grey] from those relevant to any HER enhancement work [gold])

Recommendation 1: The scope of HER enhancement projects should be clearly defined, quantified and documented at the Project Design stage.

Action 1: Summary guidance on HER enhancement to be added to Informing the Future of the Past 2 (IFP2).

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Detailed scope of work to be required in future HE enhancement project Calls for Proposals and clearly set out in Project Designs.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 2: Key sources should be identified and checked to ensure that they have been added in their entirety.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Full integration of defined key sources to be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 3: Project designs for HER enhancement must quantify all existing records (monuments, events, sources and finds) that are in scope and estimate the likely number of new records (monuments, events, sources and finds) to be created. Records should be created and enhanced as part of a single systematic process.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Quantification of records and description of approach to enhancement to be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 4: HER enhancement should be undertaken within the live HER database by someone with detailed knowledge and experience of HER datasets, using staff resources most efficiently and increasing quality assurance.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Direct working in the live HER database to be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 5: A consistent approach to 'lumping' and 'splitting' of records is required to minimise partial enhancement of records.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: HERs to detail their approach to 'lumping' and 'splitting' of records during enhancement work as a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 6: PAS data should be integrated into HERs, either as a full data import or via the creation of a linked GIS layer.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Inclusion of relevant subsets of PAS data to be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff; PAS database manager.

Recommendation 7: Key graphic material should be digitised to enable visual assessment of significant artefacts and provide intellectual access, particularly where physical access is limited.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Digitisation and dissemination of key graphic material records to be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 8: The methodology for recording objects should be clearly defined and consistently applied, and details of individual or groups of objects should be added to find records, not monument records.

Action 1: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Details of approach to finds records to be required in future HE enhancement project Calls for Proposals and clearly set out in Project Designs.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 9: HERs should revise the date range systems they employ to accommodate discoveries potentially as old as 1,000,000 BP in line with the current Historic England Period List.

Action 1: Individual HERs to assess their own needs and update systems accordingly.

Responsible bodies: HER managers; HER staff.

Action 2: Exploration of the issue at a higher level to agree a national consistency of approach, accompanied by suitable guidance note and update of IFP2.

Responsible bodies: HE Knowledge Organisation Services; FISH Terminology Working Group; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK); ALGAO HER committee; HER forum.

Recommendation 10: The potential for the routine use of MIS date ranges in HERs, to complement existing periods, should be explored.

Action: Assessment of the suitability of MIS date ranges for HER purposes and feasibility of their integration into HERs and national data recording systems.

Responsible bodies: HE Knowledge Organisation Services; FISH Terminology Working Group; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK); ALGAO HER committee; HER forum.

Recommendation 11: A new list of lithic terminology should be developed and agreed by a panel of specialists and deployed ahead of further early prehistoric HER enhancement work.

Action: A panel of period specialists should be convened to develop and agree a new list of lithic terminology for universal application before any further early prehistoric HER enhancement projects are commissioned. The agreed list of lithic terms needs to be integrated into the FISH Object Type Thesaurus and its use promoted amongst period specialists and the wider HER community.

Responsible bodies: HE Knowledge Organisation Services; FISH Terminology Working Group; specialist groups and networks (e.g. Prehistoric Society, Lithic Studies Society, PalNetUK); ALGAO HER committee; HER forum.

Recommendation 12: HERs should ensure that a suitable mechanism is in place to record former identifications and contested or multiple interpretations of artefacts.

Action: Creation of guidance on HER enhancement to be added to IFP2.

Responsible bodies: ALGAO HER committee; HER forum; HER managers; HER staff.

Recommendation 13: Collectors and museum professionals should be reminded of the need to record locational and contextual data when accessioning and cataloguing archaeological material.

Action: Liaison with the Society for Museum Archaeology (SMA) and the Portable Antiquities Scheme to agree an advice note for museum professionals and depositors.

Responsible bodies: ALGAO HER committee; HER forum; HER managers; HER staff; PAS; SMA.

Recommendation 14: The nature, quality, size and compatibility of museum collections data should be ascertained before HER enhancement projects are initiated.

Actions: Enhancement projects should be preceded by discussions between HERs and museums about the nature, quality, size and compatibility of collections datasets. Sample collections data should be supplied to HERs by museums, to inform a decision as to the viability of their inclusion. Project Designs which include the incorporation of museum collections information into HERs should include detailed information relating to this preliminary work.

Responsible bodies: HER managers; HER staff; museum curators.

Recommendation 15: HER recording practices for palaeoenvironmental data should be reviewed and updated as a matter of priority.

Action: A review of HER recording practices for palaeoenvironmental data needs to be undertaken to ensure that they are fit for purpose and to ensure that HERs have suitable terminologies and data structures. To be accompanied by suitable guidance note and update of IFP2.

Responsible bodies: HE Knowledge Organisation Services; FISH Terminology Working Group; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK); ALGAO HER committee; HER forum.

Recommendation 16: Key sources of early prehistoric data should be more widely publicised among the HER community.

Actions: Creation of guidance on key early prehistoric sources to be added to IFP2 and disseminated to HER community. Any future early prehistoric HER enhancement projects should include an audit of key sources at an early stage in their work programme.

Responsible bodies: ALGAO HER committee; HER forum; HE Heritage Information Partnerships Team; Archaeology Data Service (ADS).

Recommendation 17: Funding bodies must be made more aware of the need for research projects to work with HERs and the wider heritage sector and to contribute to Research Frameworks.

Action: Production of a guidance note for funding bodies emphasising the importance of research results being submitted to HERs via OASIS and the need for researchers to engage with local authority staff to raise awareness of such projects.

Responsible bodies: ALGAO HER committee; HE Heritage Information Partnerships Team; Council for British Archaeology (CBA); Chartered Institute for Archaeologists (CIFA).

Recommendation 18: Academic researchers need to be made aware of the need for research publications and/or accessible abstracts to be shared with HERs.

Actions: Production of a guidance note for academic researchers emphasising the need for research results to be submitted to HERs, including via OASIS. Offprints of academic articles should be provided to relevant HERs as standard practice.

Responsible bodies: ALGAO HER committee; HE Heritage Information Partnerships Team; CBA; CIFA; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK).

Recommendation 19: Different methodological approaches to deposit mapping or predictive modelling should be compared to find the most suitable model(s) for HERs.

Actions: The results of different approaches to predictive modelling should be compared and contrasted in order to allow HERs and specialists to develop the most appropriate models for each region. This could be followed by ground-truthing to test the validity of the models.

Responsible bodies: HE research lead; ALGAO HER committee; HER managers; HER staff; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK).

Recommendation 20: HER enhancement (updating records and adding simplified mapping of Quaternary deposits) should be completed before predictive models (detailed identification of areas of potential) are built to ensure that the baseline data from which these models are derived are as accurate, complete and consistent as possible.

Action: HER enhancement to be a requirement of future HE deposit mapping/ predictive modelling Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 21: Full digital integration with HERs and a facility for ongoing non-specialist maintenance need to be designed into any deposit/ predictive models commissioned in the future.

Action: Details of HER compatibility and long-term non-specialist maintenance strategies to be a requirement of future HE deposit/predictive modelling Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK).

Recommendation 22: The content of deposit/predictive models needs to be both physically and intellectually accessible to a wide audience, and suitable for use by non-specialists.

Action: An emphasis on accessibility and requirements for a suitable explanatory framework for non-specialists to be requirements of future HE deposit/predictive modelling Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK).

Recommendation 23: HERs which enhanced their early prehistoric records as part of this programme should routinely seek feedback from in-house and external users of their early prehistoric data.

Action: HERs which have enhanced Palaeolithic and/or Mesolithic datasets should routinely collect feedback to evaluate their enhancement work and improve their understanding of the requirements of HER users. This feedback should be collated and analysed after a fixed period of time to provide an assessment of the ongoing impact of the projects.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 24: A review of the efficacy of different archaeological mitigation strategies for sites with early prehistoric potential should be undertaken.

Action: Research into the efficacy of different sampling strategies and mitigation strategies for the investigation of sites with early prehistoric potential should be commissioned, with a view to improving development management decisions and justifying the additional costs involved during developer-funded projects.

Responsible bodies: HE research lead; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK).

Recommendation 25: Academic audiences need to be made more aware of research potential of HER data of all periods.

Action: Production of a guidance note for the academic sector emphasising the research potential of HER data.

Responsible bodies: ALGAO HER committee; HE Heritage Information Partnerships Team; CBA; CIFA; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK).

Recommendation 26: The archaeology of the early prehistoric period should be promoted as part of any future HER enhancement project.

Action: Outreach and engagement promoting the early prehistoric period, and the HER more generally, should be requirements of future HER enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 27: Enhance understanding of early prehistory within the HER and development management sectors to improve confidence and inform decision-making.

Action: Specialist training in understanding and managing early prehistoric material and deposits should be provided to HER and development management staff, enabling better consideration of the period in the planning process and thereby enhancing its protection.

Responsible bodies: HE Capacity Building team; HE science advisors; ALGAO HER committee; HER forum; Archaeology Training Forum; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK).

Recommendation 28: Alternative models of staffing HER enhancement projects need to be considered to address capacity issues in local government.

Action 1: Alternative models of staffing HER enhancement need to be considered in order to maximise the potential for existing HER staff and/or external specialists to work on the same database during enhancement projects.

Responsible bodies: ALGAO HER committee; HER forum

Action 2: Details of staffing should be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 29: External specialist input into HER enhancement projects should be dictated by the needs of the HER enhancement project team.

Action 1: HERs should work with external specialists from the Project Design stage onwards to ensure that appropriate expert input is received as required. External input should be costed realistically.

Responsible bodies: HER managers; HER staff; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, PalNetUK).

Action 2: Details of external specialists and their costs should be a requirement of future HE enhancement project Calls for Proposals.

Responsible bodies: HE research lead; HER managers; HER staff.

Recommendation 30: The feasibility of establishing a national advisory network of early prehistoric specialists should be assessed.

Action: A national advisory network of early prehistoric specialists would be of great value in providing advice and guidance to national, regional and local authorities, HERs and other bodies – though how this could be established needs further consideration. Such a body's specific understanding of the issues and its subsequent advice could be used to guide the direction of future HE research and commissions relating to the early prehistoric period.

Responsible bodies: HE science advisors; specialist groups and networks (e.g. Quaternary Research Association, Prehistoric Society, Lithic Studies Society, PalNetUK); ALGAO; CIFA; CBA; HE research lead.

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ISSN 2398-3841 (Print)
ISSN 2059-4453 (Online)