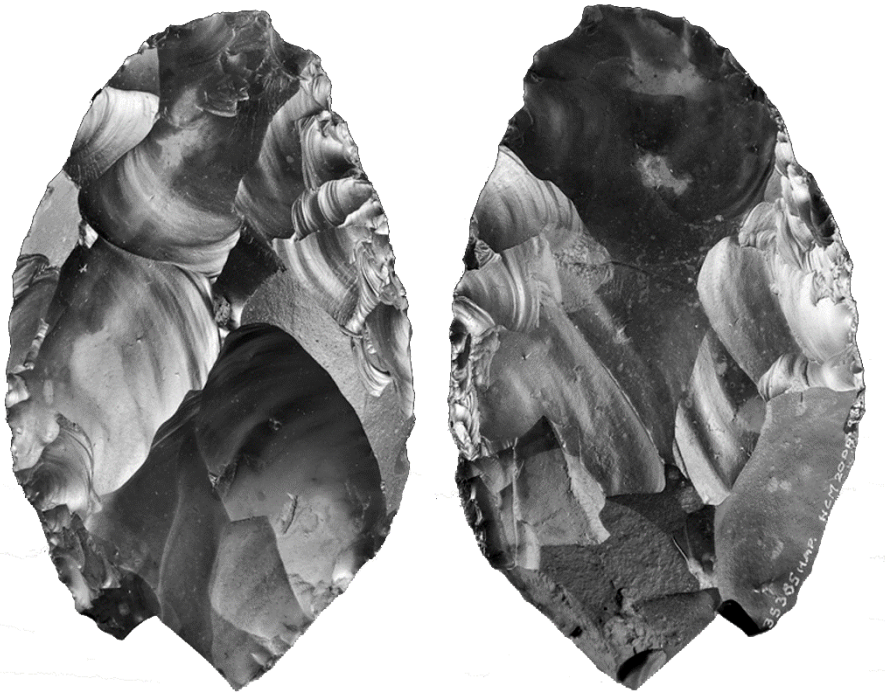
Enhancement of early prehistoric information within the Norfolk Historic Environment Record

English Heritage Project 6623

End-of-Project Report



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INTRODUCTION

This report provides an overview of the successes and challenges encountered during the enhancement of early prehistoric information held within the Norfolk Historic Environment Record (NHER), English Heritage Project 6623. This project was undertaken by Norfolk County Council's Historic Environment Service (NHES) in partnership with Norfolk Museums Service (NMS) to fulfil Activity 4G1.401 of the National Heritage Protection Plan (English Heritage 2012). Since there will not be a separate phase of post-project evaluation, the report also evaluates the project against the four main aims as set out in the Project Design (Cattermole 2013). In addition, it considers project management, quality assurance and risk management, and highlights effective working practices developed during the course of the project. The key lessons learned are highlighted, and it is hoped that these will assist in the development and planning of similar projects in future. Finally, some suggestions for further work are made.

PROJECT EVALUATION

Broadly speaking, the project achieved all of the stated Aims and Objectives as per the Project Design. However, in order to evaluate the project each aim is addressed in turn, with successes and challenges summarised below.

AIM 1: HISTORIC ENVIRONMENT RECORD ENHANCEMENT

'To increase our understanding of Norfolk's Palaeolithic and Mesolithic activity and remains by reviewing and enhancing all relevant records within the Norfolk Historic Environment Record in order to ensure consistency and completeness of data, and adherence to all relevant data standards.'

This aim formed the major focus of the project, and at Project Design stage this was the task which, although relatively straightforward, was most difficult to plan in terms of the time and resources required. In terms of resources, 52% of the project budget was spent on this task. One of the greatest challenges prior to the start of the project was quantifying those records which would fall within the scope of the enhancement work. When the Project Design was written there were almost 1,800 monument records within the NHER which documented the discovery of early prehistoric material. Just over 2,250 finds records related to early prehistoric material, although the vast majority of these did not contain detailed information. Instead they acted as index terms used to highlight the presence or absence of artefact types and were intended to aid the retrieval of relevant monument records. A further 19,750 finds records indexed as being 'prehistoric' were excluded from the scope of this project. Although there may be some early prehistoric material catalogued under this broad heading it would not have been possible to re-examine all of these records in order to

identify it and from experience it is clear that the vast majority of this material pertains to later periods.

At the end of the project, there are now over 4,700 early prehistoric finds records, 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 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 at the project development stage.

At the start of the project it was clear that those with an interest in the county's Palaeolithic and Mesolithic archaeology were faced with a number of challenges. Although a wealth of information was available, this was dispersed across a wide range of individual sources, including the NHER's own records, individual researchers' archives, gazetteers, museum records, site reports, journal articles and synthetic publications. The NHER is uniquely placed to act as the hub linking together these various sources. Its status as a live, actively-maintained database also ensures that the data can be easily adjusted in the future to reflect new discoveries and the inevitable revisions to current identifications and interpretations. The structure of the HBSMR database (supplied by exeGesIS Spatial Data Management) which we use to manage the digital components of the NHER ensured strict adherence to the event–monument–archive structure as set out in *Informing the Future of the Past 2* (Gilman and Newman 2007).

Prior to starting the NHER enhancement work it was necessary to give careful thought to how future researchers may wish to engage with the county's Palaeolithic and Mesolithic resource. The key issue was the fact that these periods are principally represented by artefactual evidence, much of which was recorded in large, complex NHER monument records which often deal primarily with evidence associated with much later periods of activity. Although there are a number of significant Palaeolithic and Mesolithic sites recorded as monuments in their own right, all of which were fully enhanced as part of this project, much of what researchers would be interested in is hard to untangle from later 'noise' in many of the complex multi-period monument records. 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, as distinct from the monument records to which they are linked. As the NHER already contains detailed finds records imported from the Portable Antiquities Scheme (PAS), this approach did not represent a radical departure, but rather an attempt to raise the Palaeolithic and Mesolithic finds records up to a roughly equivalent standard.

The first part of the HER enhancement process comprised a literature review and the creation or enhancement of source records for all relevant publications. While many sources were consulted on a site-by-site basis as part of the ongoing record enhancement process, the literature review identified a number of key sources where a more systematic and exhaustive approach was taken in order to ensure that all relevant entries were accounted for in the NHER. These were not all primary sources; rather, most are well known and readily available and are therefore likely to be the first sources consulted by many researchers. Consequently it was important that all relevant material in such sources be easily associated with a relevant NHER record. Key sources for this project included the *CBA Gazetteer of British Lower and Middle Palaeolithic Sites* (Roe 1968) and the *CBA Gazetteer of Mesolithic sites in England and Wales* (Wymer and Bonsall 1977), both of which remain key works despite their age. John Wymer's *Palaeolithic Sites of East Anglia* (1985) was also of particular importance, as this remains by far the most detailed review of the evidence from Norfolk. Other sources which were subject to a systematic review included the two Norfolk Fenland Survey volumes (Silvester 1988; 1991) and Francis Healy's review of evidence for pre-Iron Age occupation in the Wissey embayment (1996), the latter based on analysis of several important privately-held collections. The gazetteer of possible Final Upper Palaeolithic Long Blade sites in Norfolk published by Peter Robins and John Wymer in 2006 was also a key source.

Once the literature review was complete, all existing NHER source records were checked for accuracy and additional records created where necessary. Aside from published sources, the NHER holds a range of record cards, reports and other paperwork containing additional information on the sites recorded in its digital database. Many of these records pre-date the current database and in some cases the NHER itself. The integration of additional information from these sources was identified as a key enhancement task.

Arguably the most important of the older sources is a series of record cards which were previously held and maintained by the staff of the Norwich Castle Museum (NCM). These are an invaluable source of information on the earliest Palaeolithic and Mesolithic discoveries, providing not only information on material seen and/or acquired by the museum, but also a near-exhaustive list of relevant late 19th-century and early 20th-century sources. A duplicate series of record cards known as the Norfolk Archaeological Index was produced following the establishment of the Norfolk Archaeological Unit (NAU) in 1974, with these eventually containing more structured information on particular events and finds and forming the basis of the Sites and Monuments Record (SMR, now the NHER). The NHER's secondary files contain the typed sheets of information which were produced for more complex and important sites as well as copies of the many object identifications produced by the Norfolk Finds Identification and Recording Service (I&RS) during the course of the last four decades. The recording practices developed in Norfolk informed the

development of the PAS, meaning that the NHER contains considerably more small finds than many other HERs. The unpublished reports submitted by commercial archaeological units through the archaeological planning process provided information on some of the more recent discoveries.

Source records relating to some of the earliest discoveries were found to need the most work, largely due to the fact that most had been created from highly abbreviated references listed on the early NCM record cards. Few of these sources had been consulted by NHER staff and as a result the references had often been misinterpreted. When linking sources to particular records a note was made of any key references, such as the site codes contained in The Early Rivers Projects (TERPS) and Palaeolithic and Mesolithic Lithic Assemblages (PaMeLA) databases. When adding additional information to the HER database records, particular emphasis was placed on establishing the primary source(s) of information for each discovery. This was particularly important for the earlier discoveries, the exact nature and provenance of which was often uncertain. All references listed in the principal sources were therefore followed up and consulted wherever possible. This meant that within the descriptive text a clear distinction could be made between the sources which provide key details and those that simply reproduce or make brief reference to this information.

In order to identify successfully and retrieve all records which included a Palaeolithic and/or Mesolithic component it was necessary to run a series of database searches focussing on different elements of the records (find types, find dates, monument types, monument dates and free-text fields). Additional searches were run to identify records which had been assigned a broader Mesolithic/Neolithic date range, and for object types such as pebble mace-heads and antler mattocks for which a Mesolithic date was possible, but which may not have been indexed as such. The results of these various searches were amalgamated into a project database which was then used to track progress and record notes.

It was decided that the NHER record enhancement programme would be carried out on a geographical basis, with the monuments, events and finds records being examined in parish groups. This decision was made to enable material which had only a parish provenance to be quickly assessed, and so that once all records from a particular parish had been completed these could be checked against the key gazetteers and databases to ensure all information from that particular location had been accounted for. An additional benefit of this approach was that it allowed the Project Officer to build up a clear understanding of the varying nature of the early prehistoric archaeological resource as the project progressed. It is recommended that future HER enhancement projects adopt a geographical/parish-based approach.

One of the major elements of the database enhancement work was the transformation of our finds records. Previously, finds records had been attached to monument records within

the NHER database as if they were index terms, indicating only the presence of a particular artefact type and date, but including no detail or quantification about the related artefact(s). For this reason it was not possible to quantify artefacts or access any descriptive information without referring to the hard-copy (often handwritten) object and event descriptions in the HER secondary files. The only exceptions to this were recently downloaded Portable Antiquities Scheme (PAS) finds records. Due to the large size of some of the recorded early prehistoric assemblages it was neither practical, nor indeed desirable, to create individual finds records for each and every object. Instead, the finds records were subdivided on the basis of available information, with separate finds records being created to represent objects of different type, date and material with further distinctions being made where accession numbers were available for some or all of the objects, and/or where it was known that they were recovered at separate times.

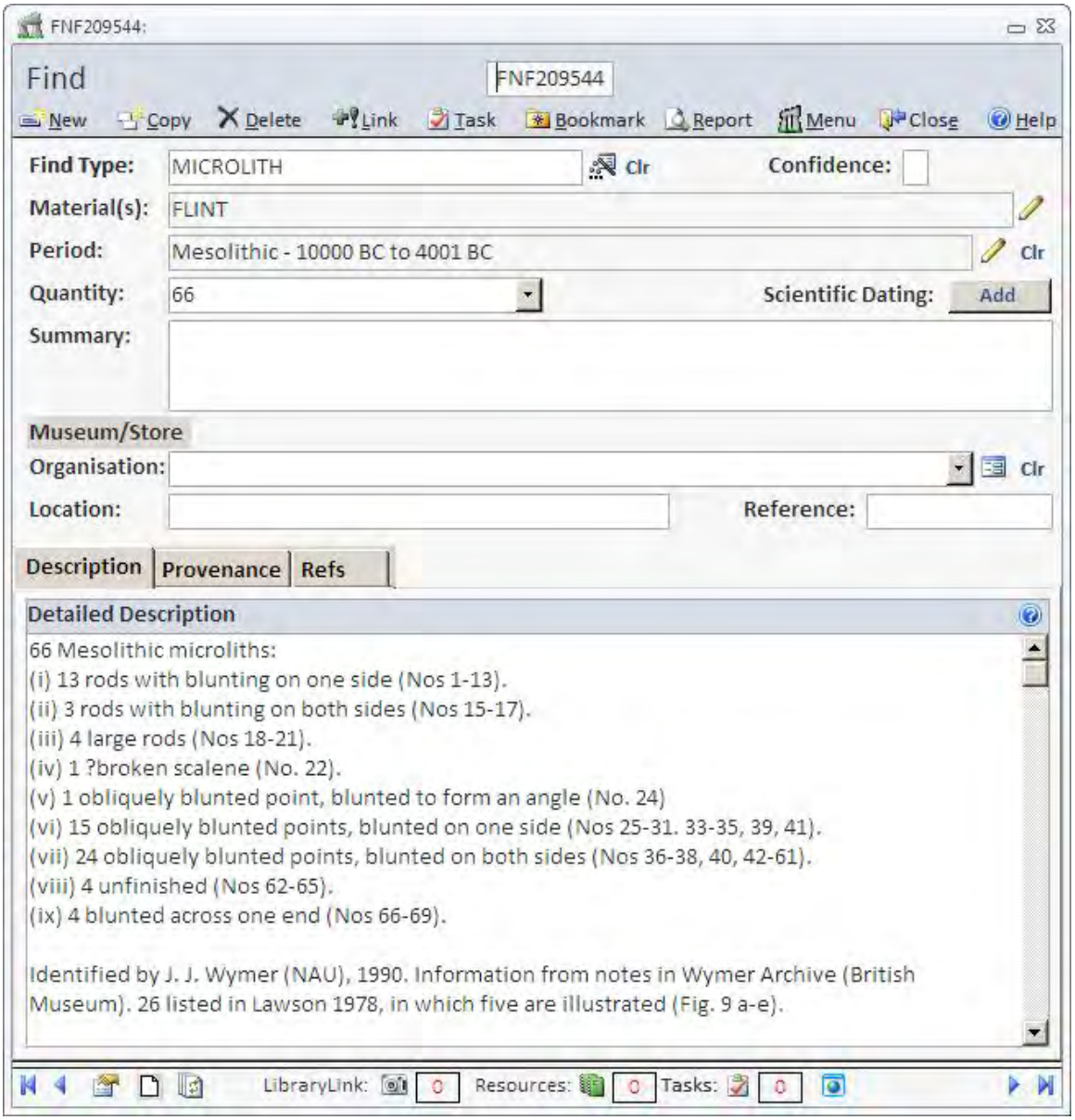

Figure 1. Finds record for a lithic assemblage

To further improve the utility of the new finds records it was decided to make use of the HBSMR function which allows a relational link to be created between find and event records to enable HER users to see at a glance exactly when and how particular finds were recovered. This function had not previously been used within the NHER, but the benefits demonstrated by its use for this project have resulted in its being immediately adopted for all new finds added to the NHER.

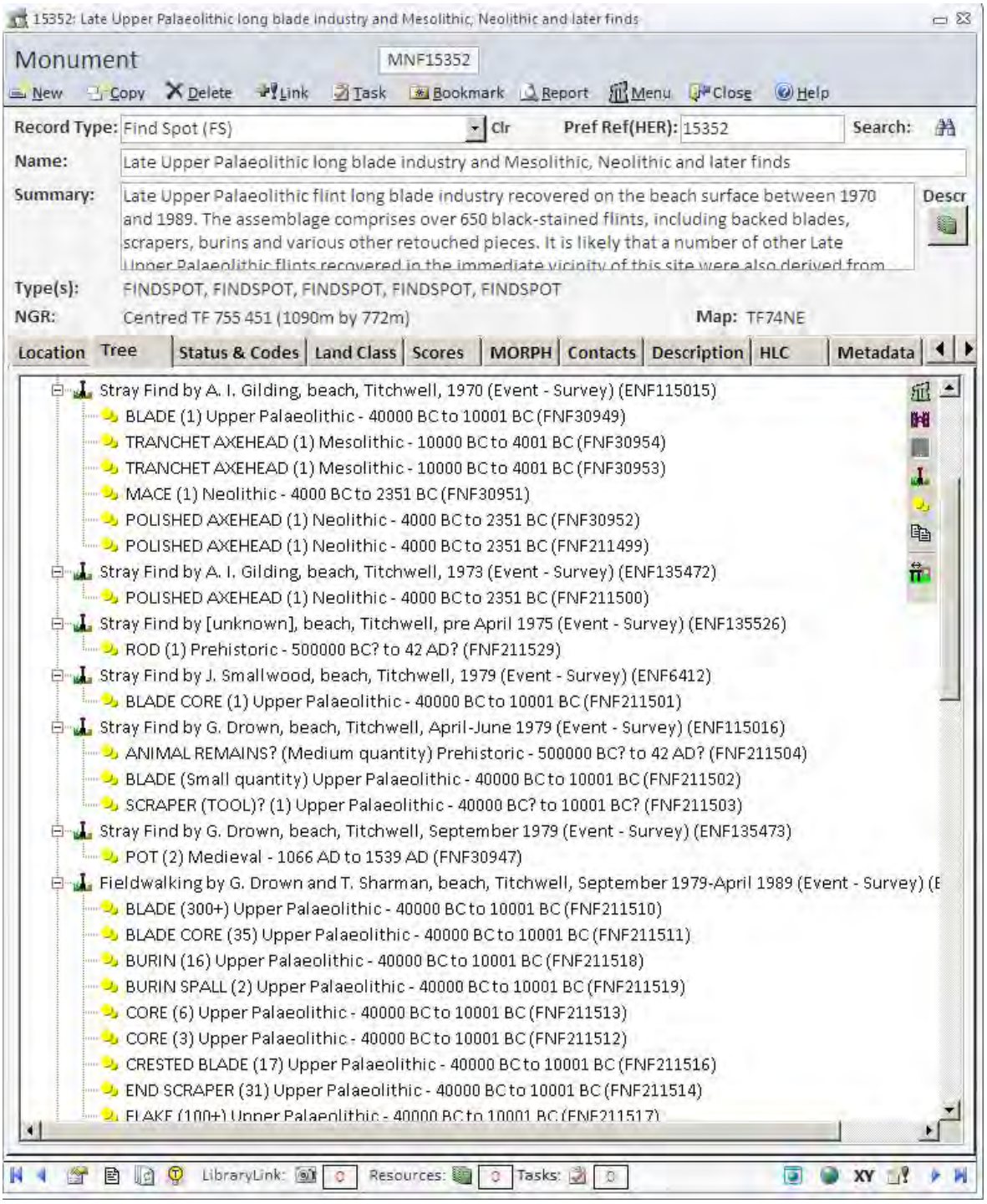

Figure 2. NHER 15352 showing Finds from Titchwell beach linked to Event records in the Monument 'tree'

One of the major problems encountered during the record enhancement stage of this project was the limitation imposed on finds recording by the Forum on Information in Heritage Standards (FISH) Archaeological Objects Thesaurus (formerly the MDA Object Type Thesaurus). When we began working through the early prehistoric records it soon became apparent that there were a number of issues, not only with how these terms had previously been used in the NHER, but also with the structure and content of the thesaurus itself. A common issue in relation to the former was the use of overly general terminology, although this and other minor issues with the indexing were easily fixed. The issues with the thesaurus itself were more serious, not least as the creation of individual finds records meant that only a single index term could be applied to a particular object (whereas previously multiple index terms were used for object types not specifically represented in the thesaurus).

Particular problems with the thesaurus included the uneven provision of specific terms (*i.e.* the existence of RETOUCHED FLAKE but not RETOUCHED BLADE) and the provision of an additional layer of very specific terms, but only for particular artefact types (*i.e.* the existence of TRANSVERSE END SCRAPER, LANCEOLATE MICROLITH, but not a single term for the various Upper Palaeolithic implements such as leaf/blade points and shouldered points). At the same time, terms relevant to lithic implements are scattered across many different sections of the thesaurus and most were not originally created with this use in mind. The application of these terms has been further hampered by poor scope-notes which often provide little or no guidance on the circumstances in which particular terms should be applied, a problem obviously not helped by the need to 'borrow' terms, which would more commonly be used for later metal objects. These problems were compounded by the diverse ways in which lithic objects are described in the various published and unpublished sources, with terminology varying considerably not just over time but also between different specialists.

The need for the improvement and enhancement of the FISH Archaeological Object Thesaurus was one of the key issues identified by staff working on this and other projects being carried out as part of English Heritage Activity 4G1.401 (Palaeolithic and Mesolithic HER Enhancement). As a result of these discussions this and other issues relating to the development and use of controlled vocabularies for Palaeolithic and Mesolithic data were the subject of an e-conference hosted by FISH in October 2014, to which the Project Officer made significant contributions. This is hopefully the start of a process that will see considerable improvements made to the Archaeological Objects Thesaurus. In the interim a series of candidate terms was created within the NHER to ensure that it was possible to distinguish certain key Palaeolithic and Mesolithic artefact types. A document was created that details how the terms commonly encountered in the literature have been mapped onto the various existing index terms (see Appendix 1). This document will act as a guide both for

those inputting data in the future and those looking to retrieve information on particular artefact classes. However, until the Archaeological Objects Thesaurus is updated there is no mechanism for our PAS colleagues to use our project-derived candidate artefact type terms within the PAS database. This means that we will need to reassign many early prehistoric objects to the appropriate artefact type once records have been downloaded from the PAS database and imported into the NHER.

As well as encountering problems with artefact type terminologies, the indexing of early prehistoric material has been further complicated by recent discoveries, including those at Happisburgh in Norfolk (Parfitt *et al.* 2010), which have redefined our understanding of Palaeolithic chronologies. These chronologies have diverged considerably from the date ranges and broad period types currently employed by Historic Environment Records (HERs), the PAS and other similar organisations. These issues are being reviewed by the archaeological community at the time of writing and it is likely that a revised framework will be adopted by HERs in the future. For this project the decision was taken not to pre-empt the results of this review, but to focus more on ensuring that object date ranges were broadly accurate and applied consistently. In particular, it was necessary to make many changes to ensure that material of probable Lower–Middle Palaeolithic date was adequately distinguished from that which was Upper Palaeolithic or merely potentially Palaeolithic. Much greater use was also made of qualifiers to indicate uncertain date ranges.

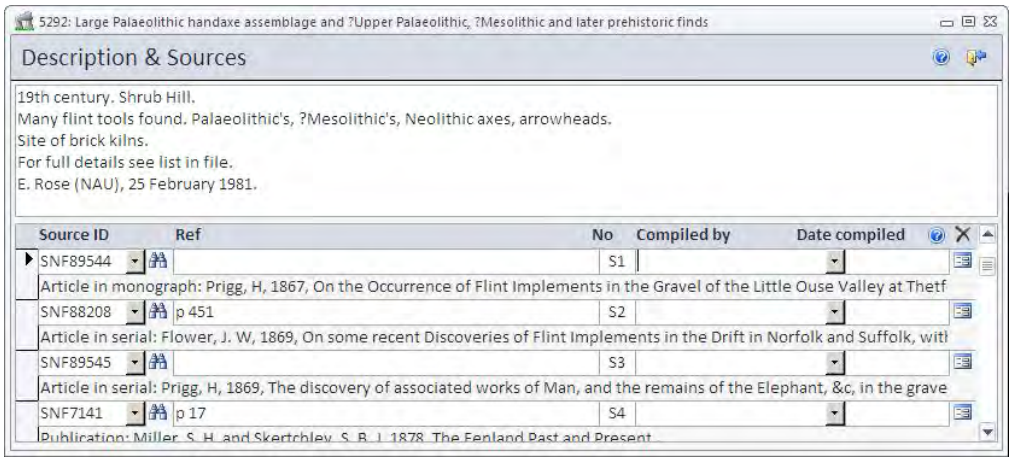

Figure 3. Monument description for Shrub Hill, Feltwell (NHER 5292) before enhancement

Wherever possible a full artefact description was inserted into each find record, although the length and quality of these descriptions was inevitably dependent on the nature of the source(s) available. Many of the objects listed on early records were only associated with brief notes, whereas the majority of those objects identified by Norfolk County Council (NCC)'s I&RS were seen by specialists (most recently Prof. Peter Robins) and are consequently associated with detailed descriptions. Descriptions were also taken from a range of other sources including books, journal articles and the specialist analyses in

published and unpublished archaeological reports. Wymer's *Palaeolithic Sites of East Anglia* (1985) and the PaMeLA database provided the best available descriptions for many objects. In the small number of cases where conflicting or revised descriptions existed, both were added. The source of a description was clearly stated and the existence of any published or unpublished illustrations noted.

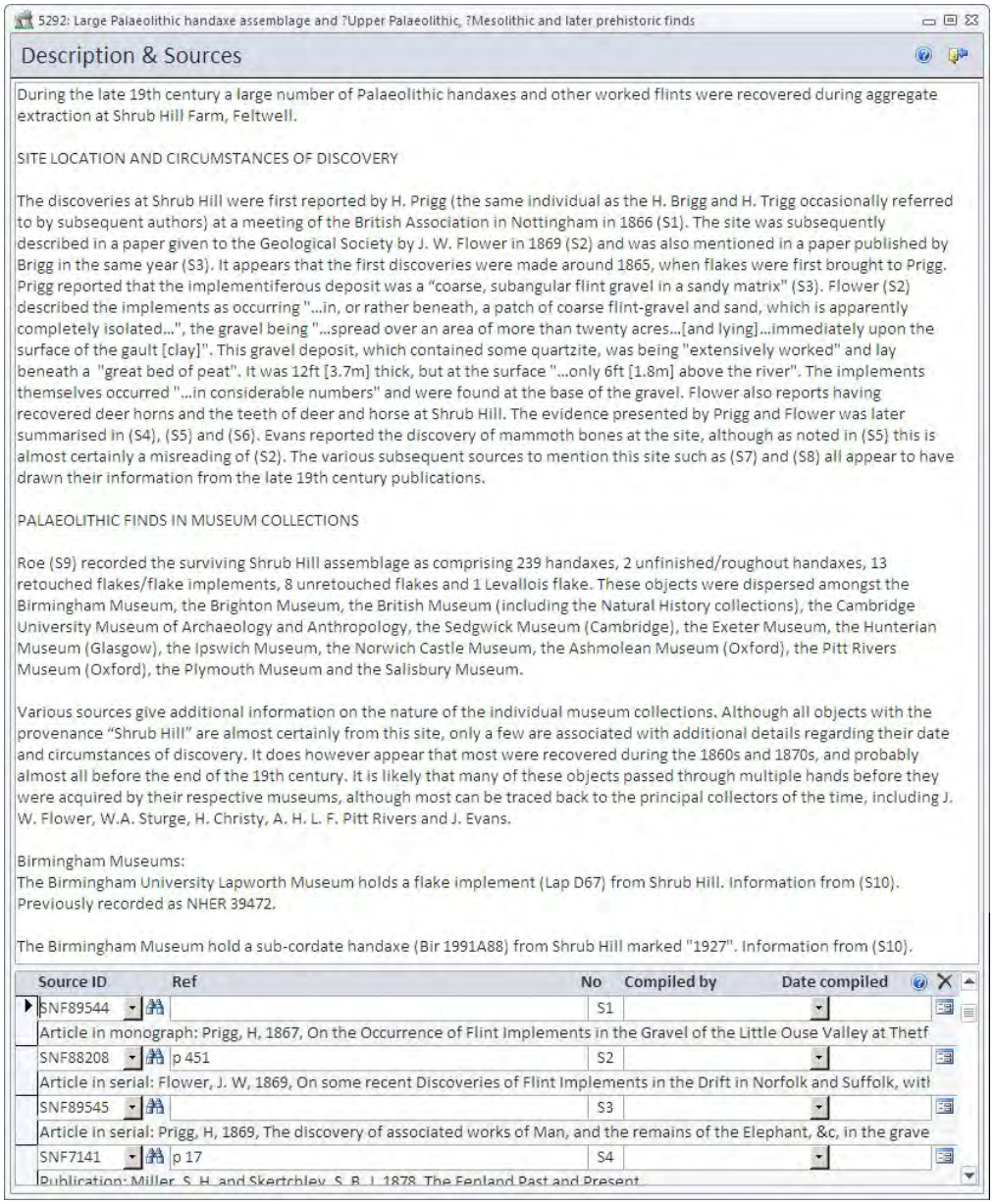

Figure 4. Monument description for Shrub Hill, Feltwell (NHER 5292) after enhancement

Although the primary focus for enhancement was on the finds records themselves, all related monuments also underwent significant checking and updating. Once the finds, sources and events had been added and/or enhanced, the monument indexing, descriptions and summaries were also updated. For sites which were exclusively early prehistoric the entire record was completely overhauled. However, for large complex multi-period

monuments which included an early prehistoric element, the description field was enhanced to ensure that the early prehistoric discoveries were not overlooked. Inevitably the parameters of this enhancement work had to be strictly defined and in most cases limited only to the descriptive text and records that related to events that had produced evidence for early prehistoric activity. This unfortunately means that there are now many monument records in the NHER which have been partially, but not fully, enhanced, resulting in different levels of detail being available for different parts of the record. Completing the enhancement of these records will be a high priority should any further HER enhancement work take place.

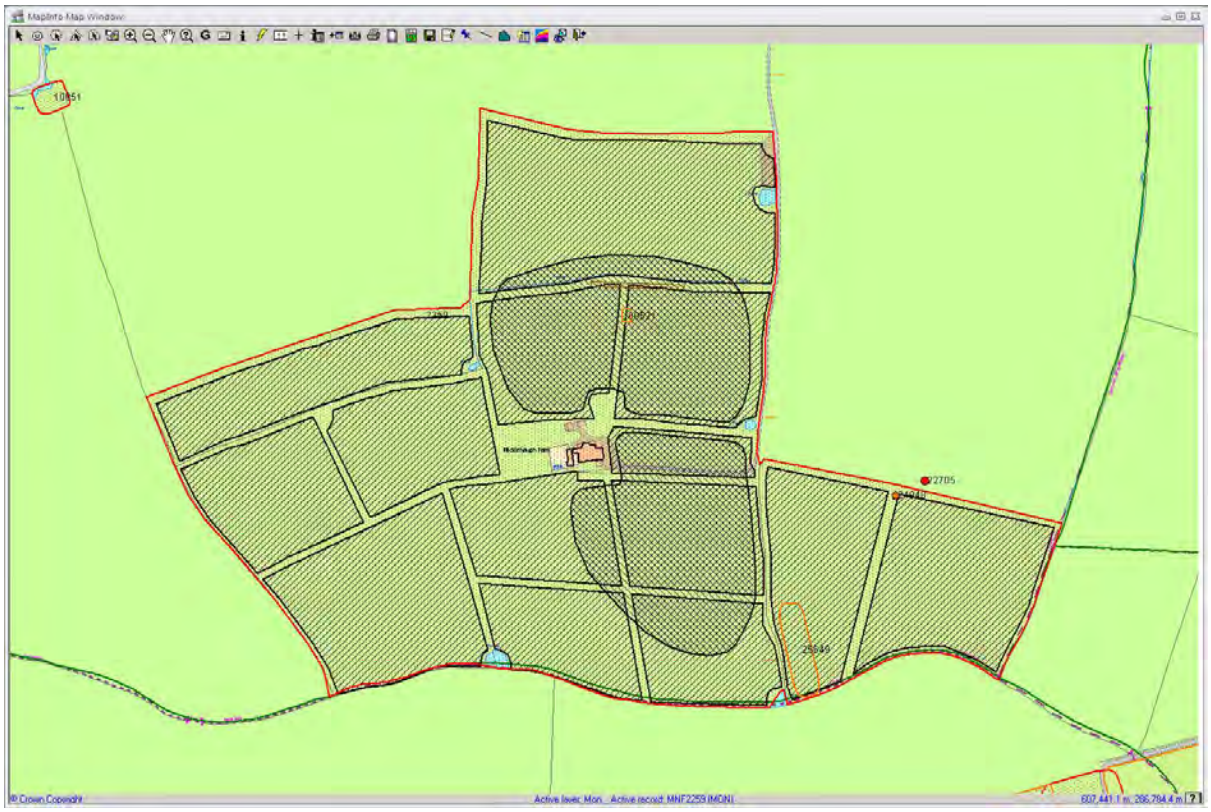

Figure 5. Micklehaugh Farm, Banham (NHER 2259)

As well as updating the descriptive text and indexing of monument records, the enhancement process including the checking of all related GIS data. For many of the earliest discoveries the available locational information was poor. For others, the secondary files contained finders' maps detailing the specific locations at which individual objects had been found. Where available these details were imported into GIS and used to check, and if necessary correct, the monument polygons. At Micklehaugh Farm, Banham, which has a long history of investigation, the detailed mapping of individual events and discoveries enabled the main 'clusters' of Mesolithic material to be identified (see Fig. 5). At Titchwell/Thornham on the coast plotting individual artefacts in GIS based on coordinates recorded by their finders enabled significant modification of the monument polygons and

enhanced our understanding of how coastal processes were affecting the redeposition of these artefacts (see Fig. 6).

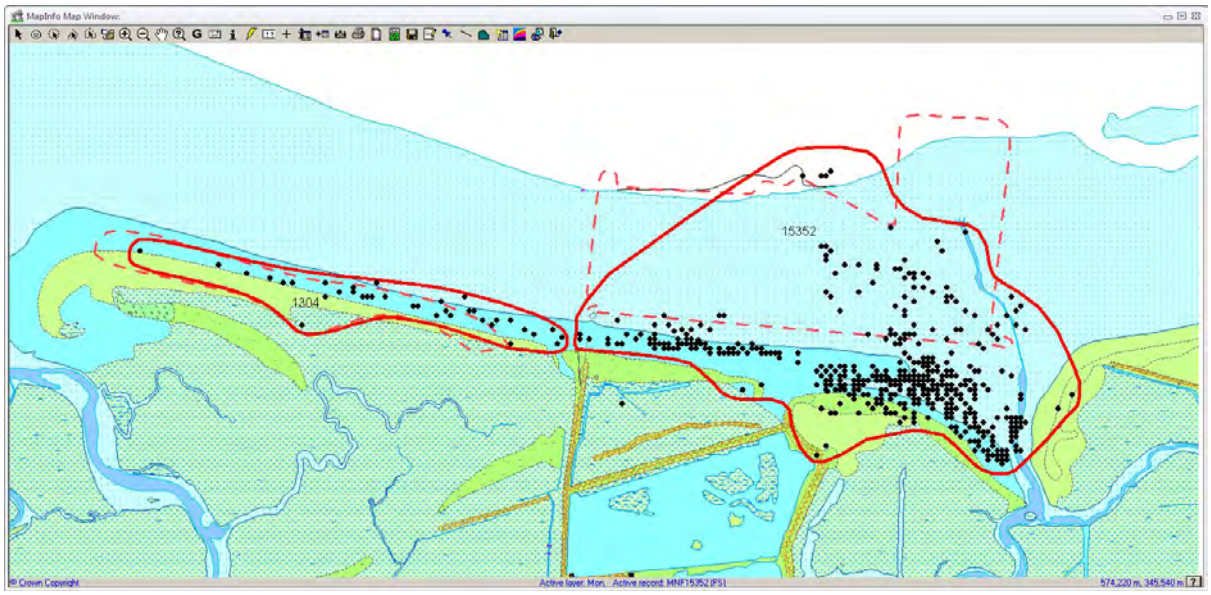

Figure 6. Artefacts recovered on Titchwell/Thornham beach (NHER 1304 and NHER 15352). Dotted lines show previous extent of monument polygons.

Aim 1: Key lessons learned:

- A geographical approach is preferable for HER record enhancement especially when dealing with poorly provenanced material.
- The FISH Archaeological Object Thesaurus requires considerable further work.
- A refinement of chronologies is anticipated, and changes will be made to NHER database records *en masse*.
- It is neither practical nor desirable to create individual finds records for each and every object.
- The use of the HBSMR find–event link function is very effective, and has already become standard NHER practice.
- There is a need to complete enhancement of multi-period monument records to ensure later periods get the same attention given to the early prehistoric material.

AIM 2: INCORPORATION OF NEW MATERIAL

'To incorporate new and historical material relating to Palaeolithic and Mesolithic activity into the Historic Environment Record, including material from other archives, unpublished notes and documents, and information on artefacts held in museum collections in order to ensure that the HER dataset is as complete as possible and that early prehistoric material in museums is signposted from the HER.'

The archive of the late John Wymer (1928–2006), one of the country's leading Palaeolithic specialists, was identified at the Project Design stage as an important resource for those

researching the county's early prehistory, especially since Wymer spent almost a decade working in Norfolk. A key element of the archive is Wymer's eight field notebooks, which were recently digitised by Wessex Archaeology as part of a project commissioned by English Heritage (with the support of the Aggregates Levy Sustainability Fund) (Powell 2009). These notebooks record the majority of the site visits which Wymer made between 1949 and 2003 and contain extensive notes as well as site location plans, section drawings and photographs. They also record all of the individually numbered objects that were once part of his personal collection, including finds he recovered himself as well as material which he had inherited from his father. A proportion of these objects were recovered in Norfolk, many of which were not previously recorded in the NHER, and it was established that the bulk of these objects had been donated to Royal Holloway for use as a teaching collection. In order to facilitate the integration of the information contained in the notebooks, a database was compiled for all of the information relating to Norfolk sites and discoveries. The relevant parish was recorded for each entry and an arbitrary sequence of site numbers used to bring together all the entries that related to particular locations (some of which had been visited numerous times).

The British Museum also holds a large collection of Wymer's research notes, drawings and correspondence, which they kindly loaned to the NHER so that it could be examined in detail. This portion of the archive proved to be of immense value, containing descriptions (and in some cases illustrations) of many previously unrecorded artefacts and providing considerable additional information on a number of key sites. Complementary folders containing information relating to sites and projects that Wymer had been involved with during his time as a Field Officer with the NAU in the 1980s were also found in the NHER archives and these have now been passed to the British Museum to form a single coherent archive.

Another key component of the Wymer archive is the card index he compiled detailing virtually all known Lower and Middle Palaeolithic finds in the country. These records were generated over the course of many years and would form the basis for two major research projects which were undertaken by Wymer in conjunction with Wessex Archaeology: the *Southern Rivers Palaeolithic Project* and the subsequent, larger, *English Rivers Palaeolithic Project* (TERPS). Although a number of publications were produced at the conclusion of these projects these inevitably contained only a proportion of the information which had been recorded. The TERPS dataset was digitised at the same time as Wymer's notebooks and this was identified as an important source. Although this database does not contain Wymer's detailed artefact descriptions, it nevertheless contains much important information, including site notes not found elsewhere and full bibliographic references. Linking the TERPS database to the NHER was straightforward as Wymer had recorded NHER numbers for almost all of the 230 Norfolk entries.

Provision had only been made within the Project Design for the integration of material from the Wymer archive. However, during the course of the project, the Project Officer was informed that the archive of the late Dr Roger Jacobi had recently been digitised. This is an invaluable resource for the study of the Upper Palaeolithic and Mesolithic periods in Britain. The principal component of the archive is Jacobi's extensive card index, which includes information on the thousands of artefacts which he examined over the course of his career. It also incorporates the information gathered during research for the CBA Mesolithic gazetteer (Wymer and Bonsall 1977). This card index formed the basis for the Palaeolithic and Mesolithic Lithic Artefact (PaMeLA) database, compiled by Wessex Archaeology as part of the English Heritage-commissioned *Colonisation of Britain by Modern Humans* project. A reorganised version of the database was also created, known as the *Colonisation of Britain Database* (CBD), which contained a number of additional, searchable fields. This dataset is important because it provides not only information on particular sites, but also detailed descriptions of many individual objects. In order to make use of this resource the Norfolk entries from both the PaMeLA and CBD databases were extracted and combined to give a single database. Within the Jacobi archive there were 587 entries for Norfolk which resulted in additions to over 225 monument records. The additional costs of integrating this dataset into the NHER were borne by Norfolk County Council, having recognised the benefits that the additional information from the Jacobi archive would yield. The integration of this extra, unexpected data was one of the major factors behind the request for a time variation for the project.

As researchers often wish to make a physical examination of Palaeolithic and Mesolithic artefacts it was important to establish the locations of those artefacts that are accessible in museum collections. The Project Design limited the scope of this assimilation of new information from museum collections to those artefacts held by the Norfolk Museums Service (NMS, formerly Norfolk Museums and Archaeology Service), which, as would be expected, feature a significant proportion of the surviving early prehistoric finds from the county. For NMS collections the intention was to ensure that the NHER included information on all objects of probable Palaeolithic or Mesolithic date held by the Norwich Castle Museum (NCM) and the smaller museums at King's Lynn, Thetford, Great Yarmouth and Cromer. In order to complete this task it was necessary to gain access to NMS's MODES collections database. Various searches were then undertaken in order to identify and highlight the records likely to relate to Palaeolithic and Mesolithic objects. In total 1,068 objects and collections were identified, the majority of which are held by NCM, although Thetford and King's Lynn museums also hold significant early prehistoric collections.

The quality of NMS's records varied considerably, although in many cases they were reasonably detailed and occasionally contained important information that was not recorded by the other available sources. Much of this information was relatively

straightforward to integrate, particularly in the instances where NHER numbers had been listed. Where NHER references were not listed it was necessary to rely on recorded grid references, site names and parishes in order to establish the location of particular discoveries. Any NMS records which had missing or incorrect NHER numbers were amended at the end of the project, further improving the links between MODES and the NHER. This was seen as a major step forward by all project partners, and especially the NMS, and it is hoped that the methodologies established during this project will have broader applications and be built into future enhancement projects.

Figure 7. Watercolour illustration of handaxe from Southacre Pit (NHER 4097)

As well as integrating descriptive information relating to early prehistoric material in NMS's collections, we were able to borrow much of this material and ensure that a representative sample of these artefacts were illustrated and/or photographed. The physical examination of these collections also resulted in a number of additional corrections and additions to the related finds records. Prior to commissioning an illustrator to draw artefacts we brought

together and scanned all existing early prehistoric object drawings, of which there were 651, including 55 Wymer originals. This allowed us to select objects which had not previously been illustrated, and which were of particular interest either because there were few equivalents within our collection of illustrations or because the objects themselves were unusual in some way. Although colleagues in our Finds Identification and Recording Service and the PAS do select some early prehistoric material to be illustrated, the budget for this is very limited and not everything which arguably warrants illustration can be recorded. This project allowed us to fill in some of the gaps in our existing visual records.

Digital photographs were taken of 359 separate objects from NMS collections, providing a broad cross-section of the early prehistoric material in these museums. These photographs have been edited to create composite images following PAS guidelines (see Fig. 7), and linked to the relevant HER records. They have also been supplied to NMS in order for these to be integrated into their digital catalogue. The usefulness of these photographs has been acknowledged by our colleagues in the Finds Identification and Recording Service, and they are keen to take more digital photographs of worked flints in future. These images are an invaluable resource for outreach being undertaken both by NCC's Historic Environment Service and by our colleagues within NMS. They have also been extensively used to illustrate our online summaries of key themes (Product 6) and the early prehistoric flint identification toolkit (Product 7).

For artefacts in private collections and in museums other than the NMS, it was agreed in the Project Design that references to this material would be added to the HER where possible but that no further assessment of this material would take place. References were added from secondary sources, with additional information sometimes being obtained from available online collections databases and catalogues. The PaMeLA database was by far the most useful source, recording accession numbers, individual object references and other general information on particular collections.

One of the greatest difficulties encountered during this process was keeping track of the transfer of objects from one museum or collection to another, and some of the confusion around the quantification of certain objects was resolved once it was established where objects had been transferred between collections and effectively been double-counted. The British Museum and NCM hold collections which had been transferred to them from various smaller museums and private collections. For example within the holdings of NCM were H. Apling's collection which included much material that was originally in the possession of J.E. Sainty, a prolific investigator of Norfolk's prehistoric sites in the early 20th century. Any transfers of ownership which took place between the 1960s and the 1980s are a potential source of confusion since the early prehistoric material was recorded in one museum by Roe in 1968 and in another by Wymer in 1985, so these had sometimes been recorded as two separate assemblages in the NHER. This had happened with a small collection from Shrub

Hill, Feltwell (NHER 5292), which was transferred from Salisbury Museum to the British Museum at some time between 1968 and 1985 and had ended up being duplicated in our records.

Figure 8. Digital photograph of a Late Upper Palaeolithic blade from Stalham (NHER 8199)

The time we invested in disentangling confusion caused by the transfer of objects between museums has paid dividends in terms of enabling us to be much more confident about our recording of the locations of key early prehistoric collections and artefacts. This was extremely useful when we were approached by the Pitt Rivers Museum as part of the *From Museums to the Historic Environment* element of their Arts Council-funded *Excavating Pitt-Rivers* project which is attempting to improve the understanding and wider awareness of their founding collections. We were able to supply the Pitt Rivers Museum with detailed information about all of the sites at which artefacts in their collection had been discovered.

Aim 2: Key lessons learned:

- Publicise the usefulness of archive and museum resources more widely, *e.g.* to other HER officers.
- Forge closer links between the NHER and NMS's MODES collections database.
- Recognise the potential for duplication of records where objects have been transferred between collections/museums. This of course has implications for material of all periods and for HERs and museums nationwide.

AIM 3: PLANNING GUIDANCE AND PROTOCOLS

'To ensure that Palaeolithic and Mesolithic remains are adequately protected from the threats posed by development, mineral extraction and coastal erosion via the development and implementation of appropriate planning guidance and protocols.'

This part of the project could not be undertaken until the enhancement work was completed and the Resource Assessment (Product 4) written, since the guidance needed to take into consideration all of the factors highlighted during the enhancement and assessment processes. The production of the Resource Assessment and the development of planning guidance accounted for only 7% of the project budget.

In terms of ensuring the effective management of early prehistoric remains through the archaeological planning process, we are extremely fortunate that Norfolk has been the focus of a significant number of high-profile early prehistoric discoveries in recent years, many of which are of international significance. As a consequence of discoveries such as those made at Happisburgh (Parfitt *et al.* 2010), Carrow Road (Adams forthcoming) and Lynford (Boismier *et al.* 2012), the importance of early prehistoric sites, and more particularly the potential for the discovery of other sites like them, sits high in the consciousness of planning archaeologists, colleagues in district councils, developers, and the wider public. This part of the project was intended to build on this advantageous situation and provide some supporting qualitative and quantitative materials, including the Resource Assessment, to help inform future planning decisions affecting the early prehistoric archaeological resource.

Preparation of the Early Prehistoric Resource Assessment (Product 4) was an ongoing task which was carried out in tandem with the HER record enhancement process. The main difficulty encountered in preparing this document was the quantity and complexity of the sources that the Project Officer 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 we would have benefited from having more specialist input during the report-writing process.

In NCC's Historic Environment Service the NHER sits at the heart of the planning process and all members of the Archaeological Planning Team have access to the live NHER database. As a consequence, all of the records enhanced during the project were immediately available for use within the archaeological planning process, meaning that planning decisions were consistently being based on the most up-to-date data. The Norfolk HER also downloads and integrates all finds recorded by the PAS in the county on a monthly basis, meaning there is only ever a short time-lag between the discovery of new early prehistoric artefacts and their appearing in the live HER dataset where they are immediately able to inform planning-related decision making.

The accessibility of this new data is complemented by a new internal Planning Guidance Document (Product 5), which has been 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 NHES staff via a programme of Continuing Professional Development to be delivered by the project team.

As a part of preparing the Resource Assessment and Planning Guidance Document, the possibility was considered of producing a series of archaeological constraint maps highlighting areas with high potential for the discovery of early prehistoric sites and finds. However, after discussions with our Archaeological Planning Team it became apparent that these would not, in fact, be an appropriate mechanism for managing the early prehistoric archaeological resource. Mapping of this kind is not routinely used for the management of archaeological remains of any other period in Norfolk, with the members of the Archaeological Planning Team instead basing their decisions on data contained within and inferred from the NHER. The ready access to the up-to-date results of the project's enhancement work available directly via the HER, discussed above, was felt to be sufficient for the purposes of guiding archaeological planning decisions.

Neither was it considered to be necessary to produce a series of alert maps for District planning authorities, as, unlike some county archaeological authorities, NHES does not routinely supply the county's District Councils with HER mapping against which to check planning applications and automatically trigger consultations. Rather, the Archaeological Planning Team provides tailored advice to the Districts on a case-by-case basis under a series of Service Level Agreements. Again, the enhanced HER data was considered to be sufficient in this respect. The successful management of the early prehistoric resource at District level is also greatly enhanced by their long history of partnership working with NCC's Historic Environment Service, which has placed heritage matters firmly in the foreground. A particularly good case in point is North Norfolk District Council, which recently hosted the Defra-funded Coastal Change Pathfinder Programme, much of which was based in and

around Happisburgh and of which the Coastal Heritage Project delivered by NHES formed a significant part (Hoggett 2012).

It is undoubtedly the case that NHES will continue to rely upon voluntary organisations such as the Norfolk Geodiversity Partnership who provide informal monitoring of sites where development is likely to have an impact on early prehistoric remains. This takes place outside of the formal planning process on a case-by-case basis.

Aim 3: Key lessons learned:

- The greatest benefits for archaeological planning are to be gained via ready access to up-to-date and accurate HER data.
- The results of the project are best consolidated with a short guidance document and a programme of appropriate CPD.
- Archaeological constraint mapping is not an appropriate tool for managing Norfolk's early prehistoric archaeological resource.

AIM 4: OUTREACH AND ENGAGEMENT

'To deliver 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.'

The outreach and engagement programme undertaken as part of this project accounted for 13% of the budget and has benefited greatly from NHES's ongoing commitment to community engagement and finds identification. We currently have a full-time Community Archaeologist, as well as hosting two PAS Finds Liaison Officers and employing two additional full-time finds identification staff. This provided a useful framework within which to conduct the outreach programme and gain specialist input into the resources developed such as the flint identification guide (Product 7). It also gave the project access to additional resources, such as GPS units which can be loaned out to members of the public. Looking to the future, this additional capacity will also enable the continuation of the outreach and engagement beyond the lifetime of this project, and allow NHES to continue to offer support and advice to groups and individuals with whom positive relationships have been established during the course of this project.

As was discussed above, during the last four decades archaeologists in Norfolk have worked closely with members of the public to identify and record archaeological artefacts discovered in the county. In Norfolk the PAS is integrated into NCC's I&RS and on average 20,000 finds *per annum* are reported to us, with the detailed finds descriptions and digital photographs imported directly into the NHER. The huge value of the contribution that the reporting of such discoveries can make has been widely recognised, and is of particular value in a rural county where a large proportion of the land is under agricultural cultivation.

More particularly, in areas of dynamic coastal erosion, the reporting of objects which have eroded from the cliffs and beaches is especially important and has, on occasion, transformed our understanding of the county's early prehistoric resource. The 'Happisburgh Handaxe', for example, was discovered and reported by a member of the public in 2000, proving for the first time that human artefacts were to be found *in situ* in the Cromer Forest Bed Formation (Parfitt *et al.* 2010).

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. Our recent work on the north Norfolk coast undertaken as part of North Norfolk District Council's Coastal Change Pathfinder Programme clearly demonstrated the benefits that collaboration with local groups to establish such monitoring programmes can bring (Hoggett 2012), and the current project has attempted to consolidate and build on these working practices to develop a network of volunteer monitors and recorders. Of particular value has been the development of an Early Prehistoric Flint Identification Toolkit (Product 7), which draws heavily on the new imagery created during the project, and which can be used to train interested parties to recognise, record and report relevant artefacts. The successful ongoing management and support of this toolkit and training network is something which will be continued under the auspices of the NHES Community Archaeology team after the end of the project.

In order to facilitate the recording and reporting of such artefacts, the project explored the possibility of developing a bespoke online recording form which could be completed by volunteers and to which images could be attached before submitting the details to NHES (Product 8). Discussions with volunteers and Finds Identification and Recording Service staff highlighted the importance of direct contact between finders of early prehistoric material and NHES staff, particularly in order to ensure the ongoing reporting of finds and to provide finders with an opportunity to learn more about the objects which they have recovered. It was also felt that the creation of such a form was to a certain extent attempting to replicate elements of the recording and reporting processes established by the PAS, who are themselves currently exploring the possibility of finders entering details of their own finds straight into the national PAS database. For these reasons an online form was developed and tested but has not been brought into use, although a version of this form being used for more specific purposes in the future remains a possibility.

All of the project processes ran smoothly, with the exception of the planned series of public talks to be undertaken by the Project Officer. Talks and artefact handling sessions delivered during the course of the project have been popular and included the Methwold History Group, who have already requested additional follow-up sessions. However, despite

considerable interest from local groups in hearing about the results of the project, it has proved more difficult than anticipated to fit the talks into their already busy programmes during the relatively short lifespan of the project, given that many of the groups with whom we are engaged book their speakers at least a year ahead. Similarly, with previous projects we have used the county's extensive network of public libraries as venues for presentations and outreach events, finding them to be very well suited to the task. Many of the Community Librarians who facilitate these sessions have expressed an interest in hosting talks on the results of the project, however, because of the timing of our project we found that their programmes are currently focussed on events related to the hundredth anniversary of World War One, so it was more difficult for the libraries to accommodate us. As a consequence, we have a series of additional group- and library-based outreach events planned extending beyond the end of the project, some of which will be delivered by our Community Archaeologist rather than the Project Officer. These forthcoming engagements include visits to the county's six metal-detecting clubs, whose members have shown a keen interest in hearing about the work we have done.

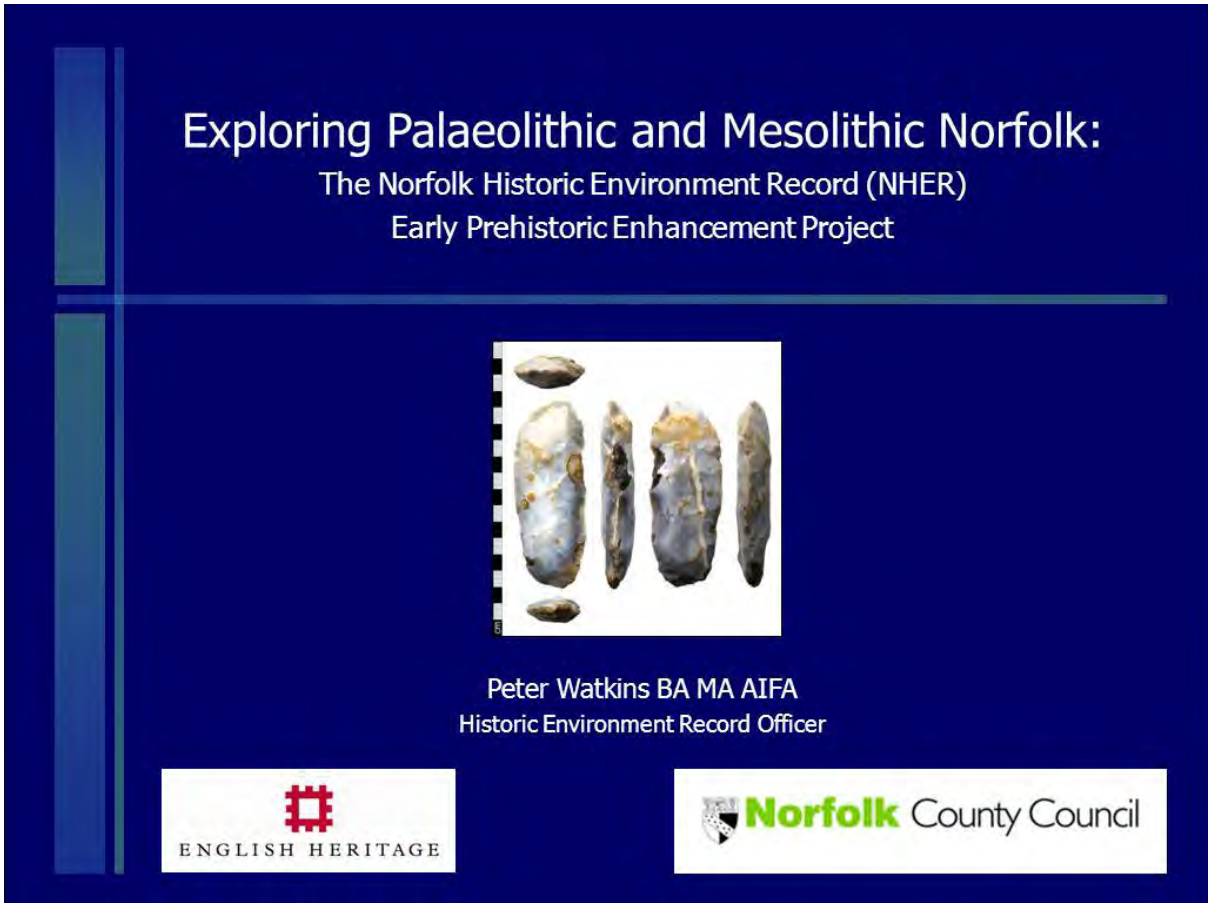

Figure 9. Title page of the PowerPoint presentation delivered by the Project Officer.

The enhanced HER records are available online via the Norfolk Heritage Explorer website <www.heritage.norfolk.gov.uk> and also via the Heritage Gateway website

<www.heritagegateway.org.uk>. When the Norfolk Heritage Explorer was developed during 2006–07, we created a series of discursive Theme records in order to provide accessible summaries of specific aspects of Norfolk's archaeological record and historic environment. Since then, we have received lots of positive feedback from members of the public who have enjoying reading these summaries, which is why we decided that this would be a useful means of disseminating some of the information we have gathered during this project. At the beginning of the project we did not have any existing Theme records which looked at Norfolk's early prehistory in detail. The new suite of Theme records which have been developed by the Project Officer have allowed us to summarise the findings of our project chronologically and to signpost key sites and notable artefacts. We have also been able to make extensive use of our newly acquired digital photographs and illustrations within the Theme records, which have greatly enhanced the educational content and visual appeal of these pages.

Aside from the outreach designed as part of this project, the enhanced records have already been requested for two significant research projects, clearly demonstrating their utility for academics researching early prehistory. The enhanced HER dataset has been incorporated into Lawrence Billington's English Heritage-funded doctoral work at the University of Manchester entitled 'Defining the Potential of Ploughzone Lithic Scatters for Interpretation of the Final Palaeolithic and Mesolithic Landscape', and he has noted that no other HER has been able to supply such comprehensive and detailed records. The Palaeolithic records have been requested by Claire Harris, a post-doctoral researcher at the British Museum, to provide a case study for her current project, Mapping Palaeolithic Britain. That two such projects should request the enhanced HER records in such a short space of time clearly demonstrates that there is a demand for this data, and that where high quality information is available, it is the exception, rather than the norm. It is hoped that by using the enhanced Norfolk HER records, not only will Norfolk's early prehistory be better understood within the academic world, but that our ongoing contribution to and liaison with such research projects will help counter the lack of early prehistoric expertise within the museums and historic environment sector in Norfolk. It is also hoped that where Norfolk HER data has been used in research, the results of these projects might be fed back to us and we can use these new interpretations to help us better understand the county's archaeological resource and present this to the public through our ongoing outreach and community engagement work.

Aim 4: Key lessons learned:

- Networks of trained and supported volunteers who regularly monitor the same areas of ground are invaluable to the detection and recording of new and important early prehistoric material.

- It is necessary to plan outreach events well in advance, as local groups and libraries often book their speakers a year or more ahead.
- Online finds reporting removes the face-to-face dialogue which is an important part of the finder–recorder relationship. For this reason online forms have not become widely used for this purpose in Norfolk.

PROJECT PROCESSES AND MANAGEMENT

Having evaluated the delivery of the project's aims and objectives, this section of the report addresses some of the more general issues which were encountered, and highlights some key lessons learned which may be of assistance in planning future projects.

Quality Assurance

In general the quality assurance procedures worked well. Data standards for enhanced HER records (Product 1) were relatively easy to apply. However, significant gaps and inconsistencies within the Forum on Information in Heritage Standards (FISH) Archaeological Objects Thesaurus were identified (see above). Feedback on this was sent to English Heritage during the project, and this feedback was also included in the recent FISH *Labels, Lithics and Landforms* e-Conference. The digital material generated during this project (Product 2, digital photographs (see Fig. 7) and scanned illustrations of early prehistoric objects) was archived in accordance with established guidance used for archiving similar material passed to the NHER by the PAS. Data standards for GIS (Product 3) were simple to apply, since the NHER already has a consistent approach to the use of GIS for mapping archaeological sites and finds. Capturing this data also allowed us to verify the extent of monument polygons on the HER monument layer and modify these if necessary (see above, Figs 3 and 4).

As far as the written products of this project are concerned (Products 4, 5, 6 and 7), we had some very helpful input from colleagues within NHES, which was especially useful in the case of the Planning Guidance Document (Product 5) and the Flint Identification Toolkit (Product 7). However, we would have benefited from more specialist input to ensure the validity of the conclusions we, as non-specialists, have drawn from the assessment of the early prehistoric material (Product 4). However, the very tight timescales within which we had to compile these products at the end of the project meant there was insufficient time to circulate these as widely as we would have liked for review and comment. As the Assessment Report (Product 4) and the Online Summaries (Product 6) are both regarded as active documents, we will seek further feedback and amend them if necessary after the project is complete. Similarly, we welcome any comments on this report (Product 10).

Risk Management

The Risk Log documented all of the major risks that we anticipated we would encounter. However, provision was not made for the inclusion of additional material and resources discovered during the course of the project, such as the Jacobi archive. The desire to include these resources meant that it was necessary to seek a time-only variation. It was decided that it was preferable to integrate these resources as part of this project and that the benefits of doing so outweighed the costs of the additional staff time, so this work was carried out at no cost to English Heritage.

The main problems encountered during this project can be attributed to the lack of availability of key individuals, all of whom were expected to have a significant input into the project at various stages. Although staff change was noted as a risk in the Risk Log, the probability of this was considered to be low at Project Design stage, and the scale of the changes was unfortunately not anticipated, as is discussed below.

In the Project Design it was anticipated that Prof. Peter Robins, Research Associate with NMS, would provide academic input into the project, as well as guiding the Project Officer through NMS's early prehistoric collections. His familiarity with Norfolk's early prehistoric collections is unparalleled and he had agreed to work with the Project Officer throughout Stage 2 of the project. However, shortly after the project started, Prof. Robins emigrated, leaving a huge gap both in terms of his collections knowledge and his understanding of early prehistoric Norfolk. The curatorial staff at Norwich Castle Museum were very accommodating and allowed the Project Officer additional time to familiarise himself with their collections. They also allowed us to borrow much of their early prehistoric material, in order to enable us to make selections for photography and illustration at a more leisurely pace, partly in tandem with record enhancement. Despite this, the lack of detailed collections documentation meant that some objects could not be located, and others took longer than anticipated to find. These factors had an impact on the project timetable.

It was intended that this project be managed by the author, Alice Cattermole, as manager of the NHER, drawing upon her previous experience of HER enhancement work and allowing her to assist the Project Officer in making key decisions. However, the author was absent on maternity leave for a year from October 2013, only returning in October 2014 when the project was nearing completion. Corporately the decision was made not to back-fill the post of Senior Historic Environment Officer (Records), with the post's responsibilities being shared between the other members of the HER team, including the Project Officer. This meant that all members of the HER team were already working beyond their usual job descriptions, and their additional capacity was very limited. In the author's absence all project management tasks were delegated to Alison Yardy (Historic Environment Officer, Landscapes), who was able to ensure that key tasks were accomplished in accordance with

the project plan, and liaised with our Project Assurance Officer. Input and guidance into the decision-making processes and particularly into the HER record enhancement was provided by Heather Hamilton (Historic Environment Officer, Records). While this worked well, with only a minor time variation being requested, with hindsight it would have been preferable for the project management and oversight to have been carried out by a single individual to ensure a coherent overview and consistent approach were maintained. Additionally, it would have been better for the Project Officer and other members of the team if this piece of work had been carried out at a time when the HER team's resources were less stretched. However, this was not possible because of the deadlines involved and the short-term availability of the funding kindly provided by English Heritage.

The Project Officer, although not an early prehistoric specialist but a very competent database, GIS and HER professional, was very capable of undertaking all of the tasks allocated to him within the Project Design, and completed these tasks to a very high standard. However, the lack of specialist academic input into the project at an early stage meant that the Project Officer had to spend more time than we had anticipated on background research, the literature review and establishing a support network of specialists working on early prehistoric material elsewhere in the country, all of whom gave their time freely, and to whom we are very grateful.

The outreach element of this project was developed in close collaboration with NCC's then Community Archaeologist, Dr Richard Hoggett. Richard worked closely with the Ancient Human Occupation of Britain team at Happisburgh as part of the North Norfolk Coastal Change Pathfinder Programme, and worked extensively with local communities in areas where early prehistoric material was regularly encountered. However, in March 2013 Richard left NCC and a protracted recruitment process resulted in a hiatus of several months until a new Community Archaeologist was appointed. The new post-holder, Claire Bradshaw, has a background in community engagement, but has little experience of developing resources such as those planned for this project and only limited experience of Norfolk's early prehistoric archaeology. This meant that the Project Officer spent more time on the outreach aspects of the project than had been anticipated in the Project Design.

The absence of so many key individuals during the lifetime of the project inevitably had an impact on the progress of the project, and is the main reason that a time-only variation had to be requested. The Risk Log included 'The project taking longer due to staff change', but this was considered a low probability. We had not anticipated so many staff changes in such a short space of time. We were, however, very fortunate that our Project Officer was able to take on tasks not originally intended to be undertaken alone, and to rapidly acquire the necessary skills and subject knowledge to tackle the complexities of this project.

SUGGESTIONS FOR FURTHER WORK

Academic Research

This project has facilitated the development within the Norfolk HER of an unparalleled resource relating to the early prehistoric archaeology of Norfolk. This resource has already been passed on to one doctoral researcher, Lawrence Billington, who is undertaking a collaborative studentship set up by English Heritage and the University of Manchester to investigate Late Upper Palaeolithic and Mesolithic flint scatters in the East of England. It is anticipated that some or all of the data will prove invaluable in further academic research projects. Norfolk's early prehistory is clearly still poorly understood and now that we have put together such a comprehensive dataset it is hoped that this may stimulate and facilitate further research in this area.

This project has highlighted the lack of early prehistoric expertise within the museums and historic environment sector in Norfolk, in particular since the departure of Prof. Peter Robins. It also emphasised the immense contribution made by a few notable individuals including renowned prehistorians such as John Wymer and Roger Jacobi, as well as antiquarians and prolific amateur site investigators, without whom almost nothing would be known of Norfolk's early prehistory. In the absence of resident early prehistorians, it should be a priority to improve liaison between NHES and the Leverhulme-funded Ancient Human Occupation of Britain (AHOB) project, building on the links established by the Project Officer during this project. It would also be advantageous if this skills shortage was redressed in future recruitment to the Historic Environment Service and/or the Museums Service in Norfolk.

Planning and the early prehistoric archaeological resource

This project provided an opportunity for planning archaeologists to reconsider the current approach to early prehistoric deposits, which are often not adequately provided for within the archaeological planning process. In addition to use of the Planning Guidance developed as part of this project, it will also be necessary to continue to engage the voluntary sector and in particular special interest groups such as the Norfolk Geodiversity Partnership, to monitor sites where *in situ* early prehistoric remains are under threat. It would be beneficial to extend the programme of engagement to include planners in District Councils, with tailored advice and summary resource assessments for each district being provided to raise awareness.

Finds Recording

Our ongoing liaison with colleagues within our Finds Identification and Recording Service and the PAS during this project enabled them to benefit from some of the approaches we took to recording the early prehistoric material in NMS collections. In Norfolk, worked flints

have not been photographed as a matter of course during the identification and recording process, with photography usually being limited to unusual or exceptional early prehistoric objects such as handaxes. Similarly, very few early prehistoric objects were illustrated during the course of the project, since we have a very limited budget for finds illustration. The photographic records we made during this project provided some information that could not be readily determined from line drawings. They were also recognised as a relatively affordable means of producing a visual record for objects that could not be drawn because of budgetary constraints. Our colleagues in the Finds Identification and Recording Service have agreed that they will use digital photography more extensively for the recording of early prehistoric artefacts in the future. These digital photographs are archived with the NHER.

Links to Museum Collections and Archives

This project is the first time in recent years that NHES has had the opportunity to work closely with collections held by NMS. It provided a framework within which the Project Team were able to work with NMS's MODES collections database to enhance HER finds records, and to update MODES with correct HER numbers. This highlighted the great potential that could be unlocked if it were possible to have a dynamic link between the Norfolk HER and NMS's MODES database, with benefits for enhancement of both databases. This is something which it is hoped will be developed further following the completion of the project.

The project revealed the huge potential of archive material, such as that in the Wymer and Jacobi archives, for enhancing HER records for specific periods, in particular those which are poorly understood such as early prehistory. HERs do not normally have the capacity to explore such archives, and it is likely that many staff working in HERs are unaware that these under-utilised resources exist. The usefulness of these resources needs to be publicised more widely within the historic environment sector and within HERs in particular. When undertaking any future HER enhancement work in Norfolk we will be much more aware of the value of the information and detail that such archives are likely to yield.

We have agreed to provide a Case Study for the forthcoming revision of *Informing the Future of the Past Guidance for HERs*, highlighting the benefits of using museum collections and online archives to enhance HER records. We have also offered to provide a presentation at a future national HER Forum meeting, highlighting the potential of these resources.

Future HER enhancement

The project provided us with an opportunity to develop and test a robust methodology for record enhancement which will be applicable to any future HER enhancement work undertaken in Norfolk. The processes used were fully documented by the Project Officer

and the Historic Environment Officer (Records) as they were developed, and provide a useful reference source. The project statistics also provide some baseline figures upon which to allocate resourcing to any future enhancement work.

This project allowed us to devise a new approach to dealing with poorly provenanced finds and marginal records in order to maximise the information that such records might yield. This approach is especially useful for dealing with antiquarian finds and information passed on by third parties or from collections databases, where precise geographical information may not be available.

The project highlighted the merits of a geographical approach to HER enhancement, focusing on the civil parish as the key unit of record. A parish-based approach provides the greatest opportunity to ensure that, where possible, duplications and oversights in existing records are recognised and rectified. This approach will be immediately applicable in our ongoing enhancement of the Norwich HER records as we reintegrate the Norwich Urban Archaeological Database, but within the urban area ecclesiastical rather than civil parishes will form the main enhancement unit.

Within the NHER all of the old HER paper maps depicting the known extent of sites and monuments had already been converted to GIS to form the NHER monument layer. However, this project demonstrated how successfully this layer can be complemented by additional maps held in HER secondary files, for example those relating to specific investigations and those supplied by finders of objects detailing precise discovery locations for individual artefacts. Converting such sources to GIS was demonstrated to be of especial benefit in understanding complex multi-period sites with a long history of investigation. This methodology will be of benefit for records relating to later periods, and will be applied when further enhancement takes place.

It has long been an ambition to develop the finds element of the Norfolk HER to include detailed finds records, rather continuing to use these as index terms indicating the presence of one or more objects of a particular date and type. This project demonstrated the benefits of detailed finds records, particularly in terms of enabling the quantification of artefactual material, and in enabling artefact descriptions to be searched. At present converting all of our finds records to the standard of the enhanced early prehistoric records is unachievable without significant additional resources. However, any future enhancement work will include developing full finds records where appropriate, and all new finds records will include descriptive details and quantifications.

It has been possible to link finds to event records within the Norfolk HER database for several years. However, this had not previously been done because of the vast quantity of legacy (unlinked) find and event records. This project demonstrated the usefulness of linking finds to the event that led to their discovery, especially in terms of understanding the

history of discovery at more complex sites. For most sites this can only be gleaned by consulting the HER secondary files. We do not have sufficient resources to retrospectively link all existing finds records to their event record, and significant enhancement of finds records would be necessary prior to this taking place. This project has convinced us that all new finds records should be linked to their events, and we have commissioned a tool from exeGesIS to allow us to easily link PAS finds records with event records as we import these into the HER.

Once the project has finished, the Project Officer will work with the rest of the HER team to help identify and prioritise key future HER enhancement tasks.

ACKNOWLEDGEMENTS

We are very grateful to English Heritage for providing the funding for this project. The Project Team would also like to thank Dr Tim Pestell and Dr Alan West at Norwich Castle Museum for providing access to the museum's early prehistoric collections and allowing us to loan this material. At NHES, Dr Andrew Rogerson provided much useful advice and guidance on the finds recording process and Erica Darch gave us some useful insights into the workings of the Portable Antiquities Scheme. Anj Beckham provided detailed instructions on digital archiving and manipulation of artefact photographs, and Julia Richards provided assistance with scanning of finds illustrations. Dr Richard Hoggett (formerly NHES, now Suffolk County Council) provided much useful input during the project's development and read and commented on a copy of this report. Jason Gibbons (freelance illustrator) gave freely of his time and expertise. Dr Nick Ashton facilitated access to the Wymer archive at the British Museum and also supplied information relating to AHOB's work at Happisburgh. Lawrence Billington kindly supplied some of the results of his doctoral research. Francis Wenban-Smith commented on the lithics indexing guide.

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APPENDIX 1: NHER WORKED FLINT INDEXING GUIDE

HANDAXES, AXEHEADS, ADZES AND OTHER LARGE CORE TOOLS

Object type	Usage notes	Index term	Scope note	General notes	Period usage	Other notes
Core tool	Current	**CORE TOOL**	A larger lithic tool made by flaking a piece of lithic raw material.	Use for where an object is clearly a core tool but its exact type is unclear due to damage or the nature of the available description. A common example is an object that may be either an axe or an adze. This term should be primarily used for finished pieces that are of uncertain form. For unfinished pieces index as CORE TOOL ROUGHOUT.		This is also a useful term for crude bifacially worked tools that cannot be categorised as HANDAXE or a more specific form of handaxe. Also, perhaps a better alternative to "CHOPPER"
Adze	Current	**ADZE**	A CORE TOOL where the blade would have been hafted at right angles to the shaft. Tendency to curved profile and sub-triangular cross section.		Mesolithic, Neolithic	Often there is uncertainty as to whether an object is an ADZE or an AXE, particularly with incomplete examples
Axe/axehead	Current	**AXEHEAD**	A CORE TOOL that would have been hafted with the blade parallel to the handle. Tendency to straight profile and lenticular section.	Use for axeheads that are of uncertain type (usually due to limited information), Use specific terms where possible. Do not use AXE.	Mesolithic, Neolithic	
'Celt'	Archaic					
Chipped axe/axehead	Current	**FLAKED AXEHEAD**	A flaked axehead without evidence for polishing or other forming of finishing.	Use only where flaked or chipped is specified, otherwise index as AXEHEAD.	Mesolithic, Neolithic	
Flaked axe/axehead						
Tranchet axe/axehead	Current	**TRANCHET AXEHEAD**	A distinctive form of core tool where the cutting edge has been created through the removal at least one transverse TRANCHET FLAKE with a blow from one lateral edge.	To be used only for objects of probable Mesoltihic or Early Neolithic date. Although many such objects are technically adzes, it has long been common to refer to all forms as tranchet axes. Use FLAKED AXEHEAD or ADZE for Mesolithic or Early Neolithic tools that lack evidence of tranchet sharpening or that are of unspecified type.	Mesolithic and Early Neolithic only	It appears that many of the objects recorded as TRANCHET AXES are technically adzes.
Tranchet adze	Current					
Polished axehead	Current	**POLISHED AXEHEAD**	A flaked axehead that has been ground/polished to give a smooth surface	Also use for reflaked and broken polished implement. For small chips and flakes use	Neolithic	

Object type	Usage notes	Index term	Scope note	General notes	Period usage	Other notes
Ground axehead	Current		over all or part of the object.	POLISHED IMPLEMENT FLAKE		
Pick	Current	**PICK**	A CORE TOOL with a pointed head, probably used for breaking ground. Tendency to oval or quadrangular cross section.			
Chisel	Current	**CHISEL**	A cutting tool for shaping and carving materials, often used in conjunction with a hammer or mallet.			
Gouge	Older	**GOUGE**	A tool with a sharp, concave edge for shaping wood, stone or metal.	Not commonly used for flint objects so use with caution. Only use if this is an explicit identification. If in doubt use CHISEL or ADZE.		
Handaxe	Current	**HANDAXE**	A tool of flint or other stone, usually worked bifacially, and thought to be a fairly general purpose tool. Most are CORE TOOLS although in some cases large flakes were used as blanks for unifacial handaxes.	Most forms should be indexed simply as HANDAXE, the main exception being BOUT COUPE HANDAXES. Examples with flattened, transverse cutting edge at their distal ends are usually described as CLEAVERS and should be indexed as such.	Lower-Middle Palaeolithic	In the case of those with transverse distal ends there is an overlap with the term CLEAVER, these objects being both a form of handaxe and a particularly finely worked type of CLEAVER.
'Bout Coupé handaxe'	Current	**BOUT COUPE HANDAXE**	A particular form of flat-butted cordate bifacial implement. Generally seen as a form of handaxe.	Generally seen as being Middle Palaeolithic, although it has not been conclusively demonstrated that these were not produced in early times.	Middle Palaeolithic	
'Coygan handaxe'	Current but uncommon					
Cleaver	Current	**CLEAVER HANDAXE**	A particular form of handaxe.	Objects that are classified as cleavers range from finely worked pieces (that some authors have treated as a class of handaxe) to much cruder examples that are similar to choppers.		There is clearly a possible overlap between this term and CLEAVER and HANDAXE.
Chopper	Current	**CHOPPER**	A crude chopping tool. These include so-called chopper-cores although it is often far from certain that these represented utilised tools rather than simply cores.	To be used for only the cruder form of flint tools or discontinued.	Usually Palaeolithic, although Mesolithic and later prehistoric examples have been identified	It is likely that there has been a degree of overlap in the usage of this term and a CLEAVER
Chopper core	Current					
Roughout	Current	**CORE TOOL ROUGHOUT**	A piece of lithic raw material that has been crudely bifacially worked but regarded as unfinished.	Use for unfinished core tools of uncertain or unspecified type. Use specific term where possible. For unfinished objects that are close to completion (the 'preform' stage) index using the relevant tool type.	Post-Palaeolithic	
Axe/axehead roughout	Current	**AXEHEAD ROUGHOUT**	An unfinished, roughly shaped lithic axehead.	If final form is uncertain use ROUGHOUT Use for unfinished core tools thought to be post-Palaeolithic	Non-Palaeolithic	

Object type	Usage notes	Index term	Scope note	General notes	Period usage	Other notes
Handaxe roughout	Current	**HANDAXE ROUGHOUT**	An unfinished, roughly shaped Palaeolithic bifacial core-tool	To be used only for unfinished Palaeolithic bifacial implements	Lower-Middle Palaeolithic	"Rough-outs" are bit of a problem as a general concept, since one is having to second guess whether something is unfinished, and where it might have ended up

Core tools

The principal suggested addition to the existing thesauri is a general CORE TOOL term. This would be used for objects that are clearly core tools but their precise form is unknown/unclear. These can also be categorised using date fields to Palaeolithic, post-Palaeolithic or general Prehistoric

Handaxes and other Palaeolithic core tools

A case can be made for a separate sub-term for BOUT COUPE HANDAXE, although non-lithic specialists may mis-identify items. There are sufficient typological grounds for the term CLEAVER HANDAXE, which would be seen as a sub-division of HANDAXE.

The term CHOPPER should probably be discontinued and CORE TOOL used for objects that cannot be classified as CLEAVER HANDAXE etc.

Core tool roughouts

Although ROUGHOUT is satisfactory as a general term for an unfinished artefact there are nevertheless problems with the fact that AXEHEAD ROUGHOUT is the only available sub-term. For clarity is would perhaps be better if there was a separate term for HANDAXE ROUGHOUT (although it could be argued that an associated Palaeolithic date range is enough to indicate that such an item is being referred to). There is also the problem of objects that are clearly unfinished core tools but their intended final form is unclear (i.e. axe/adze/pick); in these cases only ROUGHOUT can be used – at which point the information that it is a core tool roughout is lost. Arguably there would be merit in a specific CORE TOOL ROUGHOUT term (but its use restricted to post-Palaeolithic artefacts – which are covered by HANDAXE ROUGHOUT).

FLAKES, BLADES OTHER DEBITAGE AND CORES

There is a big problem here in the thesaurus, in that cores are NOT debitage. Debitage is stuff that comes off a core, namely flakes, blades and other more specific terms. Furthermore, cores, flakes etc are often not by-products of tool manufacture. So the thesaurus embeds something that is just plain wrong, and is also wrongly structured conceptually. There needs to be a major revamp of the organisation of lithic terms in the "Manufacture and Processing" thesaurus, which is probably the right thesaurus. It may be necessary to add the new term ‘FLINT KNAPPING WASTE’ one level down from "BY PRODUCT". This would then split into CORE and DEBITAGE groups of terms.

BY PRODUCT	**FLINT KNAPPING WASTE**	CORE	LEVALLOIS CORE
			MULTIPLE PLATFORM CORE
			KEELED CORE
			IRREGULAR CORE
			HANDLE CORE
			BLADE CORE
		DEBITAGE	FLAKE
			BLADE
			BURIN SPALL
			AXE TRIMMING FLAKE
			LEVALLOIS FLAKE
			TRANCHET FLAKE
			MICROBURIN

FLAKES

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Flake/flake fragment	Current	**FLAKE**	A flake of stone struck from the core where the length is less than twice the width.	For unmodified flakes of unspecified type (without retouch). This category includes flakes that show evidence for having been utilised (edge damage etc).		
Primary/ secondary/ tertiary flake						
Blade-like flake	Current					
Utilised flake	Current					
Core trimming flake	Current					
Levallois flake	Current	**LEVALLOIS FLAKE**	A flake of predetermined form struck from a carefully prepared LEVALLOIS CORE. This technology was most common in the Middle Palaeolithic, although it does occur in some Lower Palaeolithic assemblage and was also employed during the Neolithic.	Index tools made on Levallois flakes usual the relevant tool type terms. The LEVALLOIS FLAKE term should also be added to the record if this technique has been identified.		
Levallois point	Current					
Burin spall	Current	**BURIN SPALL**	A narrow flake which is the by-product of making a BURIN.			
Graver spall	Old					
Axe trimming/t hinning flake	Current	**AXE TRIMMING FLAKE**	Characteristic waste flakes struck from a CORE TOOL ROUGHOUT during the production of axes and other larger bifacial CORE TOOLS such as HANDAXESs and FLAKED AXEHEADs.			
Handaxe thinning flake	Current					
Tranchet flake/ sharpening flake	Current	**TRANCHET FLAKE**	Characteristic sharpening flakes removed by a transverse blow to the cutting edge of a TRANCHET AXEHEAD.		Mesolithic, Early Neolithic	
Polished/ground implement flake	Current	**POLISHED IMPLEMENT FLAKE**	Flake struck (either deliberately or accidentally from a polished/ground implement.			

The fact that unmodified flakes were often utilised is reflected by the fact that FLAKE appears both in the ‘Manufacturing and Processing’ and ‘Tools and Equipment thesauri’. This could be improved by creating terms for UTILISED FLAKE and UTILISED BLADE, although this is not considered essential.

Another possible additional would be POLISHED IMPLEMENT FLAKE, which would be a more appropriate term for the debris from broken/rechipped polished/ground implements.

BLADES

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Blade	Current	**BLADE**	A struck piece of flint or other stone where the length is at least twice the width.	Use for most unmodified flint blades and blade fragments. Also use for the smaller forms associated with the production of microliths (bladelets and microblades). Exceptions to be indexed separately include CRESTED BLADES and MICROBURIN.		
Blade segment	Current					
Bladelet	Current					
Microblade	Current (occasional)					
Long blade	Current					
Utilised blade	Current					
Bruised/'mashed blade	Current					
Crested blade	Current	**CRESTED BLADE**	A flint blade with negative impressions of removals on one side of the dorsal surface, creating a crest. These constitute part of a previously worked striking platfom or result from preparing the flaked surface on a core before detaching flakes or blades.			
Microburin	Current	**MICROBURIN**	A by-product of the production of microliths.			

The principal question with regard to blades is whether there is a need to accommodate terms that are often used to describe the smaller examples, such as *bladelet* and/or *microblade*. Although these terms currently appear in the thesaurus their usage is extremely inconsistent (there are for example, terms for BACKED BLADELET AND CONICAL MICROBLADE CORE but not for BLADLET or MICROBLADE). Given that the distinction between blade and bladelt/microblade is often subjective and not made by many I do not feel that they warrant separate index terms. This also avoids the need for additional sets of terms for particular tool and core types. A specific term for *long blade* would be rejected on similar grounds.

As with flakes there is the possibility of creating a term for UTILISED BLADE, although, again, this is probably unnecessary. Utilised blades (and specific forms such as *bruised blades*) should be indexed simply as BLADE.

OTHER DEBITAGE

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Debitage	Current	**DEBITAGE**	Waste flakes and other debris produced in the manufacture of lithic implements.	To be used for any waste material from flint working that cannot be classified as flakes, blades etc. Generally this will be the smaller pieces such as spalls, chips etc. Also use for any miscellaneous struck pieces that cannot be indexed in any other way. It should be noted that COREs are not a form of debitage.		
Fragment	Current					
Chip	Current					
Spall	Current					
Shatter	Current					
Waste/irregular waste	Current					
Trial piece	Current	**TRIAL PIECE**	Piece of work to test eventual pattern, sometimes small and used as a demonstration of crafter's skill.	Use for 'tested nodules' etc.		Potential overlap with WORKED OBJECT

There are currently no specific terms for any of the specific forms of lithic waste that is are not classifiable as either FLAKE or CORE; these include spalls, 'chunks', shatter pieces and so forth. At present it is suggested that the term DEBITAGE is used for such material, rather than any of the other available options such as WASTE. TRIAL PIECE can possibly be used for 'tested nodules' and similar.

CORES

Object type	Usage notes	Index term	Scope note	General notes	Period usage	Other notes
Core	Current	**CORE**	The piece of stone or flint remaining after flakes have been produced. This is a by-product of tool manufacture. It should be noted that COREs are not considered DEBITAGE	Use both for objects described as flake cores and cores of unspecified/uncertain type. Use BLADE CORE and LEVALLOIS CORE where specified.		
Flake core	Current					
Multi-platform/ irregular core	Current					
Core fragment	Current					
Cone	Archaic					
Keeled core	Current	**KEELED CORE**	Core where flakes have been struck from either side of a ridge at the base of the core.			
Levallois core	Current	**LEVALLOIS CORE**	Discoidal keeled core from which flakes of predetermined form was removed from one face (LEVALLOIS FLAKEs). This technology was most common in the Middle Palaeolithic, although it does occur in some Lower Palaeolithic assemblage and was also employed during the Neolithic.		Middle Palaeolithic/ Neolithic	
'Tortoise core'	Archaic					
Blade core	Current	**BLADE CORE**	The piece of stone or flint remaining after blades have been produced.	Use for all forms of blade core.		Although the thesaurus includes terms for several specific forms of blade core (conical, conical microblade, cylindrical) these have not generally been used previously.
Bladelet core	Current					
Microblade core	Current (occasional)					
Single-platform/conical blade core	Current					
Two-opposed platform/bipolar blade core	Current					
Core rejuvenation flake	Current	**CORE REJUVENATION FLAKE**	Flake removed from a core in order to rejuvenate an existing platform			
Core tablet	Current (occasional)					

The term CORE is currently utilised at two different levels in the hierarchy, being used to index both *flake cores* and cores of unspecified/unclear type. The term FLAKE CORE could be added to correct this, although this is probably not necessary.

It is clearly important that *blade cores* can be distinguished from *flake cores* and LEVALLOIS CORE also warrants a separate index term. The key question is the extent to which any of these terms should be subject to further sub-division. At present the existing range of terms is messy, being a mix of terms that describe the overall form of the core (i.e. CONICAL BLADE CORE) and those that describe the number of platforms (i.e. MULTIPLE PLATFORM CORE). There is also an imbalance between the numbers of terms available to described blade cores and flake cores. If sub-terms are to be used I would suggest that the number of platforms should be given priority. SINGLE PLATFORM and MULTIPLE PLATFORM would be the most obvious terms to adopt, although

a case could also be made for the addition of TWO PLATFORM. Clearly there would need to be separate sets of terms for blade cores and flake cores (SINGLE PLATFORM BLADE CORE, MULTI PLATFORM FLAKE CORE etc.). As discussed above in relation to BLADE I believe it is not necessary to distinguish between blade cores, and bladelet/microblade cores. Although many of the classification systems that I have seen also list KEELED CORE as a principal type of core, its use should probably depend on whether the postulated subdivision of CORE and BLADE CORE is adopted (being a form of flake core, rather than being related to a distinct industry).

There is also the question of how to index core waste. It appears that the thesaurus previously had terms for CORE FRAGMENT and CORE REJUVENATION FLAKE – both of which now redirect to CORE. I would argue that CORE REJUVENATION FLAKE certainly warrants a separate term. I occasionally come across the term *core trimming flake,* although at present I am leaning towards viewing these as a form of flake rather than as core fragments.

RETOUCHED BLADE AND FLAKE TOOLS

General

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Retouched flake	Current	**RETOUCHED FLAKE**	A flake that has had small flakes removed to blunt, sharpen, refine the outline or prepare the edge of the tool.	Use specific flake tool terms where possible.		
Retouched blade	Current	**RETOUCHED BLADE**	Blade with non-specialised retouch.	Use more specific term such as BACKED BLADE, NOTCHED BLADE or MICROLITH if possible.		
Truncated piece	Current	**TRUNCATED PIECE**	Flake or blade truncated at distal end (generally obliquely by abrupt retouch).			

As it is important that there are similar ranges of sub-terms for FLAKE and BLADE the terms RETOUCHED BLADE is a particularly important addition to the existing thesaurus.

It is felt that the term TRUNCATED PIECE is sufficiently widely used to warrant a specific index term.

It could be argued that there should be a term for *retouched Levallois flakes*, although this is not considered essential.

Blade tools

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Backed blade	Current	**BACKED BLADE**	A blade with one edge deliberately blunted by retouch.	A specific form of retouched blade.		Some objects described as backed bladelets may in fact be more appropriately classed as MICROLITHS
Backed bladelet	Current					
Backed piece	Occasional					
'Cheddar point'	Current					
'Creswellian point'	Current					
Microlith	Current	**MICROLITH**	A very small flint or other stone tool.	The term microlith is restricted to small tools made from retouched blade segments. Very small bladelets should be indexed as BLADES		
Obliquely blunted point	Current					

Although the thesaurus currently subdivides the term MICROLITH it is clear that the existing terms fails to encompass the full range of forms that exist. At present I do not think that any form of subdivision is desirable. This is principally due to the large number of forms that occur and the fact that at least two markedly different typologies have been widely used. Although certain terms, such as *obliquely blunted point,* have seen wide usage there would also be a need to accommodate the wide range of other forms that are identified.

Scrapers

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Scraper	Current	**SCRAPER (TOOL)**	A flake or blade with retouch along one or more edges.	Use for scrapers of unspecified type. Also use for more unusual forms of scraper with no appropriate index term. Use specific terms where possible		
Side scraper	Current	**SIDE SCRAPER**	A scraper with retouch at right angles to the bulb of percussion.			
End scraper	Current	**END SCRAPER**	A flint blade or flake with retouch on one or both ends.			
Double end scraper	Current					
Convex/concave/ straight/transverse end scraper	Uncommon					
Nosed scraper	Current					
Carinate scraper	Current					
Hollow scraper	Current	**HOLLOW SCRAPER**	Scraper with broad concave area of retouch along one lateral edge, or occasionally at the distal end.	These should not be confused with NOTCHED FLAKES on which the notch is generally a much smaller area of retouch.		
Horned scraper	Current					
Side and end scraper	Current	**SIDE AND END SCRAPER**	A combined side and end scraper.			
Discoidal/disc scraper						
Horseshoe scraper						
Thumbnail scraper	Current	**THUMBNAIL SCRAPER**	A small semi circular scraper current in the Bronze Age.			
Button scraper	Older					

Although a range of scraper terms exist these are far from ideal when considered as a group. A number of terms are overly specific (TRANSVERSE END SCRAPER etc.) whilst there are particularly classes of scraper for which there are no specific terms at all. I have suggested that terms are created for SIDE AND END SCRAPER and HOLLOW SCRAPER. The SIDE AND END SCRAPER term is particularly important as it also acts as a general term for a number of particular scraper types (horseshoe, discoidal etc). Of these only THUMBNAIL SCRAPER has its own index term. I am not convinced that the other forms warrant their own index terms (but am open to persuasion).

There is no logical reason for the general term to be SCRAPER (TOOL) rather than simply SCRAPER.

Notched implements

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Notched implement	Current	**NOTCHED IMPLEMENT**				
Notched blade/flake	Current					
Notched flake	Current	**NOTCHED FLAKE**	Flake with notch formed by abrupt or semi-abrupt retouch. In some cases a large notch was formed by the removal of a single large flake from a prepared platform (implements which are often simply described as 'notches').			
Notched piece	Current					
Notched blade	Current	**NOTCHED BLADE**	A blade with one or more deliberately formed notches. Some examples on smaller blades are incomplete microliths (the notches created to aid the removal of proximal and distal microburins).			
Notch	Current	**NOTCH**	Crude implements with a single, large notch, usually created by the removal of a single flake.			
Clactonian notch	Current					
Spokeshave	Current (occasional)	**SPOKESHAVE**	Implement with at least one retouched lunate notch in one edge.			

Notched pieces will invariably be distinguished from other forms of retouched implement and are clearly distinct from serrated/denticulated implements. However, at present there are no relevant index terms, the only exception being NOTCH (which is listed as a form of scraper). The terms NOTCHED FLAKE and NOTCHED BLADE are therefore proposed, maintaining the distinction between flake tools and blade tools (this seem particularly important in this case given that notched blades are often indirect evidence for microlith production). In order to be consistent with the approach adopted for other classes of artefact there should probably also be a general term: NOTCHED IMPLEMENT (which would be more appropriate that the existing term NOTCH). Although the suggested scope for the existing term NOTCH is problematic, the term could be retained for the cruder implements with a single large notch.

Although it is rare for lithic implements to be described as *spokeshaves,* I have come across it and as the term SPOKESHAVE exists in the thesauri there seems no reason that it cannot be used.

Serrated/denticulated implements

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Serrated implement	Current	**SERRATED IMPLEMENT**				
Serrated flake/blade	Current					
Saw	Older					
Serrated flake	Current	**SERRATED FLAKE**	Flake with one or both lateral edges finely serrated.			
Serrated blade	Current	**SERRATED BLADE**	Blade with one or both lateral edges finely serrated.			
Microdenticulate	Current (occasional)					
Denticulate	Current	**DENTICULATE**	Serrated implement with three or more coarse teeth along one or both lateral edges.	Although the scope notes		Many object that would almost certainly now be described as DENTICULATES are currently indexed as SAWS
Denticulate scraper	Older					

Determining how best to index this category of retouched tool is somewhat difficult. The key decisions that must be made are:

(i) Whether there should be a general term for implements of this type.

(i) Whether a distinction should be made between the tools made on flakes and those made on blades.

(ii) Whether a distinction should be made between coarse and fine serrations/denticulations.

At present the thesaurus presents a hierarchy of SERRATED IMPLEMENT > DENTICULATE > MICRODENTICULATE, thus making no distinction between flakes and blades. It is also clear from the scope notes that both SERRATED IMPLEMENT and DENTICULATE are intended for use a general terms. This is an example of what appear to be a more general lack of consistency in how implements with teeth are described – are they 'denticulated' or 'serrated'?. DENTICULATE as a general term is particularly problematic as it is usually used to refer only to coarsely serrated/denticulated pieces – a microdenticulate is therefore not a form of denticulate. The term MICRODENTICULATE is also somewhat problematic in that its usage is quite restricted, referring to very finely serrated blades – i.e. being used as a sub-type of *serrated blade*. The previous usage of these terms is therefore almost certainly inconsistent, with some people following the scope notes and others following the more correct specialist usage (one only has to look at the objects recorded by the PAS to see this problem).

It is suggested that SERRATED IMPLEMENT is retained as a general category, being used for objects that have been described using older terminology (i.e. *saw*) or where a serrated flake/blade category has been used. The specific terms (if they are deemed necessary) clearly need to be reworked. The simplest solution would be to have the terms SERRATED FLAKE and SERRATED BLADE (particularly as *serrated blade* is by far the most commonly encountered description for implements of this type). DENTICULATE could to be retained as it is an existing term, but its future usage should probably be restricted to its correct usage (coarsely serrated implements). I would suggest recommending that MICRODENTICULATE be avoided in future.

Perforation tools

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Borer	Current	**BORER**	Implement with a narrow retouched projection, apparently used for perforation.	Use for objects described as either piercers or borers. Distinct from AWLS.	-	Although a number of authors make a clear distinction between awls and borers/piercers this has probably not always been the case and there is almost certainly a degree of overlap in how these terms have been used.
Piercer	Current					
Reamer	Older					
Bec	Current (occasional)					
Spurred piece	Current (occasional)					
Awl	Current	**AWL**	A flake or blade retouched to form a point at one end. Generally has a thinner cross-section than a borer and was probably used to work thinner or less-tough material (Butler 2005).	To be used only for objects specifically described as awls. Distinct from objects described as BORERS	-	
Burin	Current	**BURIN**	Flake or blade on which a point has been formed by the removal by the removal of a narrow splinter (BURIN SPALL)	Burin have in the past been referred to as gravers, although it is just as likely that they were used to make bone and antler tools. BURIN SPALLS should be indexed separately.		
Dihedral burin	Current					
Truncation burin	Current					
Graver	Older					
Drill bit	Current (occasional)	**DRILL BIT**	A relatively rare form of Mesolithic piercing tool. Small bladelets that have been abruptly retouched along both lateral edge to form a lanceolate shape with a point at either end (Butler 2005).	To be used with caution as this term appears to only be used in relation to a very specific form of Mesolithic implement. If unsure use AWL	Mesolithic	
Mèche de foret	Current (occasional)					

Piercing tools are another somewhat problematic category, particularly in relation to the narrow implements that are variously described as *borers*, *piercers* and *awls*. In some cases *piercer* is used as a general term and in others *borer* is the general term. Given that only BORER exists as an index term it seems logical to retain this as a general category. The question then is whether there are any other tools of this type that warrant their own index terms. The obviously candidate is *awl,* which some appear to see as a distinct form of tool (although others clearly class them as a form of borer).

Burins are clearly a distinct form of tool and an appropriate index term exists. I have also included DRILL BIT, although the usage is restricted to a very specific form of tool.

Knives

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Knife	Current	**KNIFE**	A cutting blade with handle used for food preparation and consumption.	Use specific type where possible		
Scale-flaked knife	Current					
Backed knife	Current					
Discoidal knife	Current	**DISCOIDAL KNIFE**	A discoidal flint tool often has a ground edge.			
Plano-convex knife	Current	**PLANO CONVEX KNIFE**	A flint tool with a convex top and flat base.			
Slug knife	Archaic					
Polished knife	Current	**POLISHED KNIFE**	A stone tool, often only polished on the edge.			
Edge-ground knife	Current (occasional)					

This category is relatively unproblematic and is adequately covered by the existing range of index terms. The only possible issue is whether *backed knives* and *invasively-retouched knives* ('scale-flaked knives) should be distinguished from the general term.

OTHER TOOLS AND IMPLEMENTS

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Combination tool	Current	**COMBINATION TOOL**	A tool which combines two or more different types of tool. Common combinations include a scraper and a notch, a scraper and a piercer, and a notch and a piercer (Butler 2005).			
Fabricator	Current	**FABRICATOR**	Flint implement used for retouching other flint tools, grinding or possibly for fire lighting. Generally rod shaped and can be made on flakes, blades or other fragments. Normally flaked over much of their surface.			
Rod	Current					
Strike-a-light	Current	**STRIKE A LIGHT**	A triangular sectioned rod probably used for making sparks.			
Hoe	?Current (occasional)	**HOE**	A tool used for weeding and breaking up the ground prior to planting.			

Although it is rare for lithic implements to be described as *hoes,* I have come across it and as the term HOE exists in the thesauri it can probably be used.

POINTS, ARROWHEADS AND OTHER BIFACIAL IMPLEMENTS

Points

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Point	Common	**POINT**	Thin, bifacially worked and generally symmetrical pointed implements.			
Mousterian point (made from a triangular Levallois point)	Rare but current					
Spear/spearhead	Generally an older term					
Projectile point	Occasional					
Leaf-shaped point	Rare but current	**LEAF POINT**	Leaf-shaped point made on long blade, with triangular cross-section and point at distal end.		Upper Palaeolithic	
Tanged point	Rare but current	**TANGED POINT**	Point made on blade, with long narrow tang at one end.		Upper Palaeolithic	
Shouldered point	Rare but current	**SHOULDERED POINT**			Upper Palaeolithic	
Laurel leaf	Common	**LAUREL LEAF**	A large flake or blade blank thinned on both faces to form an approximate leaf shape. Precise function unknown. Similar in form to a leaf arrowhead, but larger.			

POINT is a useful general term for bifically flaked, generally symmetrical pointed implements. At present LAUREL LEAF is the only specific form of point with its own index term. *Mousterian points* are slightly problematic as they could be classed as a RETOUCHED FLAKE, a RETOUCHED LEVALLOIS FLAKE (which would require an additional term), a POINT or as a distinct class of point (MOUSTERIAN POINT).

The various Upper Palaeolithic implements described as ‘points’ present something of an indexing challenge. With the exception of leaf-shaped points (which probably should have a separate LEAF POINT term), the majority do not appear to be bifacial implements but rather specialised forms of backed blades and retouched blades. A distinction can probably be made between the backed blades such as ‘Cheddar points’ and ‘Creswellian’ points (indexed as BACKED BLADES?, see above) and those where a blade has been retouched to form a ‘point’, such as *tanged points* and *shouldered points.* Should the latter have their own index terms?

Arrowheads

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Arrowhead	Common, current	**ARROWHEAD**	The weapon end of an arrow, often shaped for particular uses.	For arrowheads of unspecified type, or where an appropriate, more specific term does not exist		
Unfinished arrowhead	Common, current					
Barb(ed) and tang(ed) arrowhead	Common	**BARBED AND TANGED ARROWHEAD**	A triangular arrowhead retouched to form a central tang and lateral barbs. The sides may be straight or concave.	Following Green (1980) this index term covers both tanged arrowhead and those with barbs and a tang. Oblique arrowheads with tangs should still be indexed as TRANSVERSE ARROWHEAD.		
Tanged arrowhead	Common					
Hollow based arrowhead	Common	**HOLLOW BASED ARROWHEAD**	An arrowhead with its base hollowed to allow it to fit onto the shaft of an arrow rather than having a tang that fits into the shaft.			
Leaf-shaped arrowhead	Common	**LEAF ARROWHEAD**	A leaf or diamond-shaped arrowhead with shallow retouching at the edges.			
Transverse arrowhead	Common	**TRANSVERSE ARROWHEAD**	An arrowhead which has a straight cutting edge.			
Chisel arrowhead	Common					
Petit tranchet	Common (Green 1980 etc.)					
Oblique/transverse petit tranchet derivative	Healy 1978					
Oblique arrowhead	Common (Green 1980 etc.)					
Triangular arrowhead		**TRIANGULAR ARROWHEAD**	A three-cornered arrowhead. Some may be the blanks for barbed and tanged arrowheads.			

Arrowheads appear to be an unproblematic category, the existing index terms corresponding with the broad categories adopted by Green. The TRANSVERSE ARROWHEAD category includes quite a few forms, but given that most are later Neolithic types this is not seen as a problem.

Other bifacial implements

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Bifacial implement	Common	**BIFACIAL IMPLEMENT**				
Biface (non-handaxe)	Uncommon					
'Proto-handaxe'						
Waisted tool	Uncommon					
Tribrarch/Y-sharped tool	Uncommon					
Ovate						
Dagger	Common	**DAGGER**	Bifacial implement with foliate outline, sometimes two-pointed, sometime with blunt, elongated tang. Seen as copies of copper alloy daggers.			
Sickle	Common	**SICKLE**	A tool with a curved blade and a short handle. The blade is on both sides of a line extended from the handle. If just on one side use reaping hook.	Although the thesaurus definition states that REAPING HOOK should be used for single-sided implements this term is not used in relation to flint artefacts.		
Reaping hook	Rare					

There appears to be a need for a general term for bifacial implements that do not fit into any of the categories discussed above. This BIFACIAL IMPLEMENT term would, for example, be used for the bifacial Palaeolithic implements that, whilst not true handaxes, nevertheless appear to be finished implements. It could also be used for some of the specific forms of Neolithic implement that would otherwise be difficult to index (*ovate*, *waisted tool*, *tribrarch* etc.). Such a term can also be used for rough pieces that are probably unfinished bifacial implements but are of uncertain intended form.

The term DAGGER is to be restricted to the finely made Late Neolithic/Early Bronze Age implements.

MISCELLANEOUS

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Burnt flint	Common	**BURNT FLINT**				
Pot boiler	Common	**POT BOILER**	A stone heated in a fire then dropped into a liquid to heat it.			This term has was probably overused for a period of time. Many finds indexed as pot boilers should probably be recorded as burnt flint – there is not necessarily evidence that they were used in this way
Eolith	Old	**EOLITH**	Naturally fractured flints originally misidentified as deliberately struck implements.	Use only for objects that were wrongly identified as Palaeolithic during the late 19th and early 20th centuries.		
Gunflint	Common	**GUNFLINT**	A shaped flint used in flintlocks to create the spark to fire the gun.			
Hammerstone	Common	**HAMMERSTONE**	A stone used as a hammer in making stone tools.			
Harpoon	No longer in use	**HARPOON**	A barbed spear head used to catch marine life, usually has a rope or line attached to it.	The small number of flint objects identified as harpoon barbs were mostly recorded in the late 19th century and early 20th century. It appears that most, if not all, would now be identified as either Mesolithic microliths or Neolithic transverse arrowheads. The term is retained only where it is now impossible to determine the nature of the artefacts.		
-	-	**LITHIC IMPLEMENT**	Knapped or ground stone/flint tool where the specific type is unknown. Use more specific type where known.	To be avoided at all costs! Although there are many examples of this term in the database future use is to be restricted to cases there it is known that lithic implements have been found but no additional information is available.	-	-

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
-	-	**UNIDENTIFED OBJECT**	An item that cannot be identified. Use more specific term, if possible.	Use only for pieces that are clearly tools or implement but of unusual form or unfinished to the extent that there intended final form cannot be determined		
		LITHIC OBJECT	An lithic object showing signs of being worked. Use more specific term where known.	Generally for use where the available information is extremely limited		

There is clearly a need for terms that can be used for particularly undiagnostic pieces, or where little information on an assemblage has been recorded. It has been extremely common for the latter to be indexed as LITHIC IMPLEMENT, although I would argue that this term should be restricted (as the scope note suggests) to objects that we know to be tools rather than knapping waste/debitage.

There is therefore a need the new catch-all term of LITHIC ARTEFACT somewhere, probably alongside "Carved object" at one level down from "Worked object" in the "Unassigned" thesaurus.

NHER STONE OBJECT INDEXING GUIDE

SHAFT HOLE IMPLEMENTS

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Perforated object Shaft hole implement		PERFORATED OBJECT		Use where the tool type is uncertain. Usually this will either be due to the object being poorly recorded and/or incomplete. Use specific object type wherever possible.		
Shaft hole axe/ perforated axe	Common	AXE	A perforated bladed stone implement where the blade would have been hafted parallel to the shaft.			
Shaft hole adze/ perforated adze	Common	ADZE	A perforated bladed stone implement where the blade would have been hafted at right angles to the shaft.			Although it is not possible to specify that an object is a shafthole adze, it should be noted that all of the stone adze currently recorded are perforated.
Adze hammer	Common	ADZE HAMMER	Similar to an AXE HAMMER but with the blade at right angles to the shaft.			At present there are no stone ADZE HAMMERS recorded. This may suggest that any such objects have been recorded as AXE HAMMERS or ADZES
Axe hammer	Common	AXE HAMMER	A large and usually heavy kind of perforated stone axe with a broad flat butt at one end, a tapered blade at the other, and a shaft-hole.	Use unless object has been specifically described as a BATTLEAXE.		It is likely that there is a degree of overlap in the usage of these two terms. Single-bladed battle axes are very similar to what would commonly be described as axe hammers and not all authors have made a distinction (viewing all such implements as axe hammers) Relatively few objects are currently recorded as battle axes in the database.
Battle axe	Common	BATTLEAXE	Perforated stone object with centrally placed shaft-hole and expanded blades and butts. Some have a blade at both ends.			

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Mace/macehead	Common	MACE	Perforated stone implement with rounded edges. Sometimes polished and/or worked into a specific form.	In most cases objects formerly described as hammers would now be classed as MACES. Use PEBBLE MACE if relevant.	In most cases these have a slightly more restricted date range	Many objects that we would now class as PEBBLE MACES were not originally described as such. An attempt has been made to identify and reclassify as many as possible. There are however still some objects that *may* qualify as PEBBLE MACES but where the recorded information is not sufficient to be certain. These objects remains classed simply as MACES.
Hammer	Generally an older term					
Pebble mace	Common	PEBBLE MACE	The simplest form of mace, unmodified apart from a central perforation. The perforation usually has an hour glass form reflecting its creation by pecking rather than drilling. Commonly made of quartzite.	Use this term where possible. Where it is unclear whether the surface or form of the object has been modified use MACE. This term should also be used to for partially perforated examples, which are most likely unfinished maces.	Not closely datable, having been found in both Mesolithic and later prehistoric contexts.	
Pebble hammer	Not in common usage					
Partially perforated pebble mace/hammer	Common, Current					
Cupped pebble	Occasional, older					

OTHER STONE TOOLS

Object type	Usage	Index term	Scope note	General notes	Period usage	Other notes
Stone axe/axhead		AXEHEAD				
Polished/ground stone axehead		POLISHED AXEHEAD				