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forward thinking projects

THEME 4 - HERITAGE - ACADEMIC RESEARCH

RICH DEPOSITS - AGGREGATES EXTRACTION, RESEARCH & THE KNOWLEDGE POOL

Research funded through Defra's Aggregates Levy Sustainability Fund

ATKINS miro Mineral Industry Research Organisation defra Department for Environment Food and Rural Affairs ENGLISH HERITAGE

SUSTAINABLE AGGREGATES

Sustainable Aggregates:
Aggregate resources produced from sand and gravel deposits, crushed rock or dredged from the sea contribute to the economic and social well being of the UK. Their production and supply has environmental effects.

The Aggregate Levy Sustainability Fund (ALSF) has provided funding to undertake work to minimise and mitigate these effects. This report is part of a portfolio of work that reviews ALSF and other work undertaken between 2002-2007 on 'promoting environmentally-friendly extraction and transport' of land-won and marine aggregates to provide a state of knowledge account and to highlight the gaps in our understanding and practices.

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Miller, J., Poulter, A., Hewson, M., Penrose, S., with Gill Andrews and John Barrett 2008 ALSF Dissemination Project 2002-07 Benchmark Report: Rich deposits – Aggregates extraction and the knowledge pool London: Atkins Heritage, on behalf of English Heritage

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Cover Image: Excavation of Devensian fluvial sediments of the River Bain, near Kirkby on Bain, Lincolnshire. © Trent Valley 2002 (A. Howard)
Image this page: East Leake - Optically Stimulated Luminescence dating of probable Anglian glaciation outwash sands and gravels of the River Trent, East Leake, Nottinghamshire. © Trent Valley 2002 (A. Howard)

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EXECUTIVE SUMMARY

Quarrying and extraction of aggregates on land and at sea affects buried archaeological remains and the historic landscape. Since 2002, substantial sums from the Aggregates Levy Sustainability Fund have been spent on research projects which aim to help the aggregates industry and heritage sector predict where archaeological remains might be and develop ways of mitigating these effects. Focussed on the places and types of archaeological assets which are affected by aggregates extraction, the dividend has been new knowledge and new ways of exploring, understanding, explaining and challenging our thoughts about our past. This report examines the benefits and impacts of this work.

The report draws on a survey of project designs, reports and other outputs, as well consultation with the 'knowledge society' - academics and researchers in higher education institutions; archaeological learned societies; archaeological officers in local authorities; those who conduct fieldwork, as well as interested members of the public. These are the groups that both generate and put new knowledge to work – planning and managing archaeological issues with the aggregates industry, engaging communities in history and environmental issues and training future archaeological and historic environment specialists.

Impact

The ALSF programme has resulted in the development of reliable and cost-effective techniques of mapping and survey and a body of baseline knowledge about the location, nature and quality of archaeological resources that could not have otherwise been gained. It has assisted the aggregates industry, together with archaeological and environmental planners, to determine how to avoid many areas of important remains in terrestrial and marine contexts as well as valuable historic landscapes and to mitigate the impact where needed.

A number of projects have focussed on the particular topographic contexts or landscape units that yield aggregates and minerals, such as coastal areas, the seabed or extensive river valley systems. They have helped the management of extraction but they have also provided unrivalled opportunities - in their scale, use of techniques and exploration of topics - for adding substantially to the understanding of these contexts, which are often unique in their nature and have hitherto been little understood. The projects have provided surprises and new knowledge about the evolution and the way in which these contexts and deposits vary.

Other projects have been concerned with individual or groups of sites or monuments for which aggregates extraction is a particular challenge to long-term protection. Using survey as well as historical and specialist studies, they have resulted in management and conservation plans and strategies, reconciling competing interests and providing the way forward for managers and local communities.

With the aim of developing comprehensive baseline information and understanding of particular regions or resource types affected by aggregates extraction, a number of projects have analysed data

and synthesised large bodies of information from work and investigations undertaken in previous decades. Often drawing on a variety of evidence such as museum collections, documents and maps, as well as previous excavation, this work has resulted in new interpretations and knowledge of archaeological material. Without the ALSF much of this data may have lain inaccessible for several more decades and these projects have ensured that previous work is not wasted but enlisted to modern needs.

A few projects have consisted of the excavation and investigation of archaeological sites for which planning permission had been granted prior to the current planning regime and which therefore could not directly be funded by the relevant aggregates companies. These were important sites and the ALSF has ensured that the information derived from them has been properly analysed and published, adding to the general body of archaeological knowledge.

The archaeology and history of aggregate and quarry industries themselves are increasingly being recognised as important components of our present historic landscape. A number of projects have focussed on these monuments and remains, using survey and resulting in the development of management strategies. They are often valued by communities and tourists and a number of projects have used oral history and other innovative techniques to develop interpretation and bring these sites to life for modern audiences.

Recognition

It is clear from consultation that, over the lifetime of the ALSF, the appreciation of the importance of research has increased within the aggregates industry, as it has provided tools for planning and environmental management.

Local authority historic environment officers are aware and recognise the benefits of the ALSF research projects. They too have been provided with new tools for planning aggregates extraction, but they also see how the enhanced knowledge through synthesis of data and analysis of information from previous investigations have added to their ability to manage and communicate the wider historic environment resource within their authority area.

Universities and academic specialists have been very engaged in research projects, contributing to and often leading the research and development of new techniques. However many also recognise that the fund has provided rare opportunities to look at landscapes, contexts, deposits and topics, particularly of the Palaeolithic and early prehistoric periods, that would be otherwise unavailable.

Communication and dissemination

A key element of almost all projects has been the aim to disseminate the benefits and findings of research. The results of this dissemination work are best seen in the way the research is put to use by the wider "knowledge society". Techniques for prospecting, survey, analysis and mitigation developed by individual projects are often used in other regions or by other companies.

The way in which research proposals and designs build on established wider research agendas, and how the synthesises and baseline data generated by ALSF projects in turn stimulate and contribute to new agenda and frameworks, demonstrate the extent to which the archaeological community share and disseminate this information and ensure that it is put to use.

Data and information from many ALSF projects have helped to reconstruct past environment and provided the basis of interpretation - stories for school children, adult learners and tourists, engaging communities in the understanding, enjoyment and care for their history and archaeology.

Lessons and pointers to the future

If there is a common thread running through the impacts and benefits of the very wide range of projects within the research projects, it is that

they bring often disparate things together - partnerships and stakeholders; universities, planning authorities and the aggregates industry; generations and communities; techniques and professional disciplines; landscapes and regions; and artefacts, ecofacts and archaeological deposits.

Within environmental issues, promoting the value of a research project is often challenging, when compared to, for example the development of a nature reserve. Projects which have engaged a range of stakeholders and their interests from the outset have increased over recent years and it is one of the success factors in ensuring and communicating benefits.

The concern to ensure that projects and results are of recognisable benefit to the aggregate industry as well as the historic environment sector seems generally to have ensured that the programme has resulted in little 'dead-end' knowledge. Rather the knowledge seems to have been readily taken up, used and put into action by all sectors.

Specific recommendations for future work include:

Funding

1. Continue to provide explanation of the purpose and hypothecated nature of the fund.

2. Maintain funding of last resort projects to ensure investigation and research of significant sites and landscapes insufficiently protected, or entirely unprotected, by planning conditions.

Research areas

3. Continue to develop research in priority areas for aggregates extraction. In particular, to develop baseline evidence of the historic environment at sea and aggregates landscapes resource assessments in priority terrestrial areas.

4. Explore the potential for making the case that some interpretive 'social' projects are as valid and relevant to the archaeological management and aggregates sectors as methodological and information-gathering projects.

5. Explore the potential for the development of an ALSF Research Council, in consultation with the aggregates industry, to develop and disseminate a strategic plan for the fund, to ensure that the programme continually benefits from an up-to-date overview of the research sector, and to assist in the identification of gaps in knowledge and new routes of enquiry, as well as the determination of funding applications.

6. Continue to consider the needs of the aggregates industry and archaeological and knowledge communities at the outset of all projects, but further explore how to ensure that projects which attempt to meet all these interests do not fail to quite satisfy any of them.

7. Capitalise on the innovative and productive partnership approach to research engendered by the ALSF and widen it to encompass natural, cultural and historic landscapes.

8. Allied to this, further encourage cross-disciplinary and inter-disciplinary research projects to enhance knowledge transfer.

9. Develop better mechanisms to ensure projects match local and regional historic environment research frameworks as well as ALSF priorities and objectives.

Access and dissemination

10. Improve access to, and sign-posting of, research outputs, and improve speed of dissemination and publication.

1 BACKGROUND & CONTEXT

The Aggregates Levy Sustainability Fund (ALSF) was introduced in 2002, initially as a two-year pilot scheme, to provide funds to relieve the environmental impacts of aggregate extraction; past, present and future. Following a three-year second round of the Fund, a further one year extension to the scheme was announced by the Chancellor of the Exchequer in the pre-Budget Statement on 6th December 2006.

THE ALSF DISSEMINATION PROJECT 2002-2007

The ALSF is distributed on behalf of Defra (the Department for Environment, Food and Rural Affairs) by, amongst other bodies, English Heritage, who allocate funds against key ALSF Objectives. Of Defra's four current objectives, objectives 1 and 2 have been in place since 2002. In March 2005 the wording of Defra's third objective 'To reduce the local effects of aggregate extraction' was changed and a fourth objective added, as below

- Objective 1: To minimise the demand for primary aggregates
- Objective 2: To promote environmentally friendly extraction and transport
- Objective 3: To address the environmental impacts of past aggregate extraction
- Objective 4: To compensate local communities for the impacts of aggregates extraction

The core objective of the English Heritage ALSF programme has always been the reduction of the impact on the historic environment of aggregate extraction, both terrestrial and marine, and to support projects that deliver against ALSF Objectives 2 and 3. During the second round of the Fund, the focus of English Heritage became established:

- developing the capacity to manage aggregate extraction landscapes in the future
- delivering to public and professional audiences the full benefits of knowledge gained through past work in advance of aggregates extraction
- reducing the physical impacts of current extraction where these lie beyond current planning controls and the normal obligations placed on minerals operators
- addressing the effects of old mineral planning permissions
- promoting understanding of the conservation issues arising from the impacts of aggregates extraction on the historic environment

Over the last six years, through English Heritage, the ALSF has funded over 250 projects involving archaeology and the historic environment to a total value of over £23.75m.

In 2007 Defra commissioned a project to bring together and disseminate the results of all research funded by the ALSF during the six years between 2002 and 2007. This is the ALSF Dissemination Project, focusing on four core themes, each of which has up to four distinctive sub-themes.

The Heritage theme has been subdivided into three linked projects, each with specific aims and target audiences.

Sustainable Heritage – Aggregates extraction and management of the historic environment. The report reviews the impact that ALSF projects aimed at developing new guidance, standards and best practice have had on the aggregates industry, archaeological curators and practitioners. The report provides a critique and summary of the suite of guidance to industry undertaken through the ALSF, placing such guidance in the context of wider research into the historic environment

The Sands of Time – Aggregates extraction, heritage and the public. The report is aimed at the general public and at government, drawing from the 'knowledge pool' and engaging communities with the heritage associated with both current and past aggregate extraction

This report, Rich Deposits – Aggregates extraction, research and the knowledge pool, addresses a specific subset of ALSF funded projects - those which contain significant elements of research and set out to expand our understanding of the historic environment related to aggregates extraction on land and under the sea. The audience for this report is the so-called 'knowledge society' – academics and researchers in higher education institutions; archaeological learned societies; archaeological officers in local authorities (often called curators); those who conduct fieldwork (often in commercial contracting organisations), as well as interested members of the public. These are the groups that both generate and put new knowledge to work – planning and managing archaeological issues with the aggregates industry and engaging communities in history and environmental issues.

Methodology

The project underlying this benchmark report was managed in accordance with the English Heritage (EH) guidance Management of Research Projects in the Historic Environment (MoRPHE). The project involved five stages undertaken across October 2007 to January 2008:

Stage 1: Familiarisation and Project Initiation.
Stage 2: Data Collection, Phase 1 – Projects and Literature.
Stage 3: Data Collection, Phase 2 – Stakeholder Consultations.
Stage 4: Initial Reporting.
Stage 5: Editing and Presentations.

As well as a wide-ranging review of primary and secondary literature produced during the ALSF programme, telephone interviews were undertaken to elicit opinions about the programme of research-focussed projects amongst the key audiences within the academic, learned society, curatorial and contracting environments and the aggregates industry. During the exploration of the case studies discussions were also held with relevant professional and academic peers, as well as project leaders.

THE ALSF PROGRAMME AND THE IMPORTANCE OF KNOWLEDGE AND ARCHAEOLOGICAL RESEARCH

Quarrying and extraction of aggregates on land and at sea can have an effect on buried archaeological remains and the historic landscape. Since 2002, substantial sums of money from the Aggregates Levy Sustainability Fund have been spent on research projects which aim to help the aggregate industry and heritage sector predict where archaeological remains might be and develop ways of mitigating these effects. In this way remains and valuable elements of our landscape are not needlessly lost without record. These projects help to meet ALSF Objective 2: Promoting environmentally-friendly extraction and transport. The dividend has been new knowledge and new ways of exploring, understanding, explaining and challenging our thoughts about our past.

Knowledge is important. It is a tool for action and good management. It stimulates imagination and communication. The best knowledge is never 'dead end' or closes the book on a particular topic. It always leads to new questions, new routes of enquiry, new ways of doing things. This report examines the ALSF programme in this light, critically examining what knowledge has been sought by the programme, what knowledge has been gained and what the benefits and impacts of the new knowledge have been.

In the first two years of the fund, and by the very nature of pilot schemes, English Heritage's focus areas, while similar to the current criteria, were still fluid. In 2002-3 EH broadly supported projects that developed "the knowledge, understanding and appreciation of sites, monuments, buildings and landscapes that have been, or may be in the future, affected by aggregate extraction" (ALSF Annual Report 2002-3). Particularly, they encouraged applications for projects that delivered predictive information and techniques to minimise future impacts of aggregate extraction; that sought to increase understanding and dissemination to both local communities and the wider public and professional audiences of knowledge gained from past work undertaken on aggregate extraction; and that targeted the buying-out of old mineral permissions, while also considering assistance with unforeseen archaeological work in a planning context and encouraging education, outreach and community access. The following year EH particularly encouraged projects to advance knowledge so that future aggregate extraction will have a minimum impact on the historic environment, to secure the conservation of important but vulnerable sites, monuments and landscapes, and to promote better understanding and greater enjoyment of heritage to the broadest possible audiences.

As the ALSF objectives and EH's focus areas have evolved and crystallised, so too there has been some evolution in the nature of projects funded. During the two year pilot scheme, while the opportunity was taken to address long standing issues relating to archaeology at quarries where planning permission was granted prior to PPG16 or where current extraction had revealed more significant archaeological finds than expected, experimental projects exploring innovative ways of understanding sites and landscapes were also funded.

Recording of Devensian fluvial sediments of the River Bain, near Kirkby on Bain, Lincolnshire © Trent Valley 2002 (A. Howard)

Round 2 resulted in a more defined body of projects, with many particularly geared towards sub-regional resource assessment and more synthetic work.

Nonetheless, there are consistent themes and interest areas running throughout the six years of the Fund, and the majority of the projects reviewed in this report fall into one of the following categories:

- research to enhance understanding of the scale and character of the historic environment in current or likely future aggregate producing areas in order to provide the baseline information necessary for effective future management
- threat definition: strategic research on the character, scale, and geographical distribution of the potential impacts of aggregate extraction (including secondary aggregate resources but excluding construction waste) on the historic environment, in particular the collection, mapping, and analysis of data on aggregates permissions and processes
- enhancement of baseline evidence of areas of, and potentially subject to, marine aggregates extraction: baseline information and characterisation of the resource; techniques of prediction and evaluation; mitigation strategies; training, awareness and information exchange
- supporting the operation of the planning system through assistance with excavation, analysis and dissemination of unexpected discoveries, subject to English Heritage's normal conditions (including support for evaluation and survey work on sites with outstanding planning permissions granted before the implementation of PPG16)
- the analysis and dissemination of important data from past work undertaken in response to aggregate extraction

ON LAND

Delivering to public and professional audiences the full benefits of knowledge gained through past work in advance of aggregates extraction: site 'backlog' projects and thematic landscape syntheses

Around 20 projects set out to analyse evidence from previous excavation sites and archive collections to provide a wider thematic synthesis or to improve the accessibility of the historic environment of a particular area.

Many of these site-based projects and thematic syntheses integrated the enhancement of popular understanding and appreciation of the archaeology of a particular area and the need to raise the profile of the historic environment in strategic planning circles, with answering academic research questions. Work to enhance Historic Environment Records (HERs), such as Unlocking the Past: archaeology from aggregates in Worcester HER (4776), also seeks to unlock the potential of local group and museum collections from aggregate production areas, for curators, the aggregates industry and the public alike.

These projects range across a wide time span, such as Cornwall County Council's Gwithian, Cornwall (1949-1963) project (3354) which analysed and disseminated archives of material from the later prehistoric, through Roman, to medieval times. Cambridge Archaeological Unit's recent archive project, Mucking – prehistoric and Roman (5220), addresses the material from the late prehistoric period to the 5th century AD. A number of these projects do focus on particular periods from Neolithic/Bronze Age landscapes and monuments

(Heslerton (3408), Thornborough Henges (3314), Watermead Country Park (3380)), and Iron Age/Roman sites (Piercebridge (4698); Cleveland Farm (3355)), to Anglo-Saxon settlements and cemeteries (West Stow (4770); Wasperton (3682)) and medieval settlement and economic activities (Lydd, Romney Marsh (3295)).

Analysis of these sites and landscapes is contributing to understanding of the wider historic landscape and answering current research questions. For example:

- the Anglo-Saxon cemetery at Wasperton, Warwickshire (3681), a rare entirely excavated example of the type, reveals evidence of Saxon burial rites on the western fringe of the main sphere of Saxon burial and the transition from Roman to Saxon burial rites
- the four volume Thames through Time (3263, 3912-3914) project provides a rich synthetic study of the valley, its human settlement and human interaction with nature from earliest occupation to AD 2000

A number of these projects, particularly the thematic syntheses, aim to raise public awareness and understanding. They have developed websites, popular leaflets and glossy publications etc. (e.g. Piercebridge (4698), Understanding East London Gravels (3276)). A popular book has been published by Essex County Council as a key output from their project The Finest Prospect in all England: a history of South Essex from the first peoples to the Saxons project (3297), which sought to enhance popular understanding and to raise the profile of the historic environment in the Thames Gateway area.

Erica Guttmann (university of Cardiff) and Helen Roberts (Aberystwyth University) take samples for geoarchaeological analysis and OSL dating (optically stimulated dating) from sealed Bronze Age landsurfaces in an area (site GMXVII) opened up in June 2005 at Gwithian, Cornwall. © Jacky Nowakowski, Historic Environment Service, CCC

Delivering an enhanced understanding of the aggregates industry and the historic environment to public and professional audiences

A number of research projects have focussed on the quarry and aggregates industry itself, exploring its social and economic history and its archaeological remains, or assessing the impact of the industry on the historic environment.

For example, the Sandhills Project, Alderley Edge (3334) has built on existing landscape and community based projects, applying a range of innovative ethnographic and field techniques to the impact of mineral extraction industries on the natural and cultural landscape at this site from the mid-18th century. The University of Sheffield's Aggregates Industry in the Trent Valley (3350), a synthesis for popular publication, aims to combine new oral histories, with documentary and photographic research, to investigate the significant, yet little researched, history of 20th century sand and gravel extraction industry. Enhancing both popular and academic understanding of the technological history of extraction industries in England, they will counter some negative views of these industries as distasteful or destructive and it is appropriate that ALSF funding is used to explore and humanise this part of our history. The Sandhills project has been presented at several academic conferences and is due for publication as an academic monograph next year, while the popular synthesis of the Trent Valley work is forthcoming.

The University of Exeter project Aggregate Extraction Related Archaeology in England (3550), which gives a wide overview of the industry and archaeology, is due for publication as a monograph while the UCL study of the Impact of Aggregate Extraction on the Historic Environment (3555), the historic sites and buildings of England's villages and towns, is now available on the ADS website.

Reducing the physical impacts of current extraction where these lie beyond current planning controls and addressing the effects of old mineral planning applications

21 projects comprised the provision of financial assistance for archaeological fieldwork, analysis or dissemination in situations where no other funds were available, whether because significant discoveries were unforeseen, because there was a need for investigations on land which had been given permission for aggregates extraction prior to the current planning regulations (pre PPG 16), or because data which had arisen from fieldwork conducted some time ago remained to be analysed or disseminated. ALSF funds have therefore been important in enabling the final phases of recording and post-excavation analysis, and in publication of a range of material that may otherwise have lingered in inaccessible archives, as well as mitigation through excavation, analysis and publication of significant archaeology that would not otherwise have been explored.

Despite their 'backlog' nature these projects aimed to respond and contribute to current local and regional frameworks for research in the historic environment. For example the Fund enabled analysis of the discoveries made during the excavation between 1995 and 1996 at a Middle Iron Age settlement site at Spratsgate Lane (3212) in Gloucestershire, to be completed and published on the ADS website. Analysis of a pottery assemblage (c.3000 sherds) has made a particularly important contribution to understanding of Iron Age pottery in Gloucestershire as a whole. Another example is the new research framework that was developed on the basis of the evidence from excavations at Netherhills Quarry, Frampton-on-Severn, in Gloucestershire (4625, 5171). Several other projects have made particularly significant contributions to our understanding of the historic environment and to current academic research trends. The excavation of unexpected finds at Lynford Quarry (3253) has contributed very significant evidence of Middle Palaeolithic

deposits and palaeochannels, evidence that contributed to the on-going Leverhulme Trust funded Ancient Human Occupation of Britain project. Surrey County Council and Archaeoscape's excavations at North Park Farm, Bletchingly (3710) uncovered rare evidence in the area of a Mesolithic site repeatedly visited over millennia.

Developing the capacity to manage aggregate extraction landscapes in the future

A number of projects can be highlighted to indicate the development of techniques through which baseline information and understanding of the character of specific assets and landscapes have been improved. These techniques and information in turn contribute to broader ALSF funded assessments of the aggregates resource in river valleys and across wider regions. The Thornborough Henges Air Photo Mapping project (3897) carried out by WYAS forms part of English Heritage's ongoing National Mapping Programme and enriches understanding of this significant historic landscape. Several projects in Gloucestershire, including the Scowles Survey (3342) and the LiDAR survey of the Forest of Dean (4798) likewise refine techniques and contribute to wider assessments and plans for management of the resource in the region.

Approximately 20 projects aim to enhance our understanding of the archaeological potential of the sands and gravels of river systems, terraces and floodplains. Some are large multidisciplinary projects, often led by university departments, and including a substantial amount of field work and the application of a range of geotechnical, geoarchaeological, palaeoenvironmental techniques and air photography, in order to understand and model the archaeological and geomorphological evolution of these fluvial areas. One such project, Archaeological Potential of Secondary Contexts (3361) led by the University of Southampton, produced an interpretative framework for fluvial aggregate deposits of river terrace and river floodplain land forms. In addition to characterising the landuse history of particular places and landscapes – some of these projects, such as the Trent Valley Survey (3307) and the Medway Valley Palaeolithic Project (3836) have also led to the development of shared research frameworks, with particular benefits for the curatorial management of Britain's terrestrial aggregate resource and mineral planning strategies.

To this end, several of the projects have a stated aim of contributing the results of their projects to HERs in digestible formats for local authority staff. They assist the county and archaeological unit based projects in assessing the potential and characterising the archaeological resource in their area. During the course of the ALSF programme, the aims and objectives of projects addressing river systems appear to have become increasingly focused on managerial end-users. In addition, many of these projects explicitly aim to build relations with local quarry companies and widen public understanding of the resource, for example the Till Tweed Catchment Aggregates and Archaeology Project industry guidance and outreach work (3325).

Early projects such at the Trent Valley Survey and the Till-Tweed project have also redressed the geographical balance of studies which, until then, had been focussed on the south of England.

The rate of formal dissemination of this research is also good. Most of these projects have good websites, some of which include data archives in a format suitable for HERs, and many have disseminated interim findings to a popular audience through websites, popular publications and/or press coverage. Several project final reports are available on the Archaeology Data Service website (ADS), a number of articles and at least 1 major academic monograph have been published, with another 3 due for publication. An EH monograph bringing together the work that has pushed forward knowledge in the field of Palaeolithic archaeology is also planned and a number of these projects will contribute to that volume. It appears from consultation that

archaeologists at a curatorial level are making use of the published outputs of the Trent Valley survey and it is hoped that as other projects come to publication they will also provide strategic, contextual knowledge for other curatorial work.

Other projects focussing on river systems, such as the Lower Lugg Valley (3336), build on substantial bodies of existing data, with the primary aim of developing GIS tools through which to characterise landscapes, assess potential, and assist curatorial management of important archaeology and alluvial deposits in the context of current and future aggregate extraction. These projects are based less on fieldwork and scientific archaeological techniques and rather more on desk based assessment and GIS modelling of the datasets already available. The output from most of these projects is being disseminated to stakeholders and through outreach work. They contribute to Historic Environment Records and are made available on the ADS website. The review of the current state of knowledge and need that such projects deliver provides a solid framework from which to forge partnerships and propose future research directions.

Following the broad Round 1 year 1 resource assessments, such as the Hertfordshire Mineral Local Plan Review: Historic Environment Assessment (3430), and the Lead Rakes project (3718), at least 13 sub-regional Resource Assessments have been funded since 2004. All have been undertaken by county council historic environment services and are desk based projects that make use of many of the improvements in baseline information, characterisation techniques and technological developments, such as the National Mapping Programme, Historic Landscape Characterisation, and GIS, to produce large-scale synthesis of baseline data in a uniform GIS format. The aim of these projects is to characterise the known resource and to assess the potential impact of aggregates extraction on the historic environment, assisting the development of Mineral Local Plans and Unitary Development Plans, and guiding future management of the historic environment and mitigation of future extraction. Several of these assessments – such as that for Worcestershire (3966), Gloucestershire (3346) and Somerset (3994) – are now accessible online on ADS or the local authority website.

These projects are driven by a need to improve the quantity and quality of data available on the historic environment, in a format familiar to planners and aggregates companies. The outputs comprise synthesises presented in a very formulaic format. Nonetheless, regional resource assessments funded through ALSF are clearly stimulating networking and discussion (for example the River Severn Valley ALSF seminar (3744)), guiding the creation of new research agenda as new projects develop from them and thus shaping the development of innovative research projects of the future.

A number of projects aim to manage particular assets or landscapes in which aggregates extraction is a particular challenge to conservation or protection, resulting in Conservation Management Plans or manifestos for future conservation and management. These projects have been carried out by a diverse range of organisations, including universities, large archaeological units, county councils, heritage trusts and bodies like British Waterways. Most of them use a combination of desk based and on site survey work to understand and assess the significance of a wide range of asset types and historic landscapes, from the Pleistocene collections and limestone landscapes of Cresswell Crags (2175) and the Neolithic/Bronze Age Thornborough Moor and landscape (3845), to the remains of the Peak Districts iron ore mining landscape (Lead Rakes (3718)), features of 18th century inland waterways (Cotswold Canals (3260)) and one of Britain's earliest mineral railways, the Peak Forest Tramway and Cromford and High Peak Railway in Derbyshire (3575).

AT SEA

Developing standards, guidance & databases to support planning related work

Since 1989, it has been a requirement that each marine extraction licence application is accompanied by an Environmental Impact Assessment. The need for improved understanding, protection and management of the historic environment was highlighted in the government's recent Marine Bill White Paper, A Sea Change (March 2007). Our limited understanding of offshore archaeology and the lack of guidelines for archaeologists, planners and aggregates extraction companies working in this environment is widely recognised. A key focus for the ALSF programme has been the enhancement of baseline information on the location and nature of archaeological remains in the seabed and coastal contexts and to improve tools, guidance and standards of assessment. Generally desk-based projects, they include Wessex Archaeology's Artefacts from the Sea (3322) and England's Shipping (3323), On the Importance of Shipwrecks (3767); Enhancing our Understanding: Navigational Hazards (3917) and Identifying Shipwrecks of Historic Importance lying within Deposits of Marine Aggregate (3916)). Some have also aimed to ensure that previously inaccessible artefactual evidence from archives and private collections, and documentary evidence on shipping trade routes, sea battle sites and navigational hazards is submitted to NMR databases.

The aims were practical, focussing on the immediate need to inform the planning process, the industry, its regulators and advisors and empowering archaeologists to provide informed advice on archaeological potential and mitigation strategies related to minerals extraction. However this work is also setting the standards for environmental impact assessment of maritime contexts generally.

Understanding, characterising and managing offshore and coastal landscapes

Approximately 15 research projects aim to understand, model and characterise offshore and coastal landscapes, many of them particularly through refinement of methodological techniques. Some, like the Wrecks on the Seabed project (3877) aim through fieldwork to develop geophysical and geotechnical survey and recording levels to assess offshore archaeology and to inform planning at a strategic level, aiding regulators and aggregates companies in the development of mineral exploitation strategies. Others, following on from the University of Southampton's Re-assessment of the Archaeological Potential of Continental Shelves (3362), are using existing data - geo-archaeological, environmental and 3D seismic – and innovative technologies to reconstruct palaeo-environmental landscapes.

Rather like the scientific study of terrestrial Palaeolithic archaeology, the ALSF is supporting very significant developments in understanding of these landscapes offshore. For example, the 3D Seismic for Mitigation Mapping of the Southern North Sea project (4613) has mapped the previously unknown topography and explored caches of environmental data of Mesolithic landscapes that have been subject to rapid climate change. This project has been featured on the television programme Time Team and a popular book is planned to be published with the CBA, in addition to a forthcoming technical monograph. Southampton University's Re-assessment of the Archaeological Potential of Continental Shelves and Imperial College's Submerged Palaeo-Arun and Solent Rivers: Reconstruction of Prehistoric Landscapes (3277) have recently been accessioned on the Archaeology Data Service website, and the findings of these and other complete project reports are currently being disseminated through seminars and article publications, and are filtering through informal channels into the research work of others.

Coastal projects, for example that run by the University of Durham, in association with a network of other universities (Aberystwyth, Liverpool, Kingston), are similarly using a range of scientific techniques, applying palaeo-environmental and palaeo-magnetic techniques to borehole and hand coring evidence, in order to understand the depositional history of Dungeness Foreland gravel beach complex and the sand and gravel intertidal landscapes of the Port of Rye, Romney Marsh (3279, 3280 & 4521). These projects are exploring the nature and timing of coastal landscapes change (for example from 3000 cal BP to AD1850 for the Port of Rye), and developing macro scale chronologies that can inform models of coastal evolution and human activity and regional chronologies for sea change. The combined findings of this work have recently been published in an Oxbow Books Monograph (2007).

A very different approach to the study of coastal, inter-tidal and marine zones is taken by 4 pilot projects (4728-4731) that are building on Wessex Archaeology's Liverpool Bay study and extending English Heritage's national programme of Historic Landscape Characterisation to the marine environment. Run variously by Cornwall County Council, Museum of London Archaeology Service, Oxford Archaeology and a partnership between Hampshire and Wight Trust for Maritime Archaeology and the University of Bournemouth, these studies extend around UK coastal waters from the Solent and the Isle of Wight, to Southwold to Clacton, to Withernsea to Skegness, to Scarborough to Hartlepool.

Rather like the terrestrial Regional Resource Assessments, this research is driven by a very practical aim: to provide a better-informed framework for managing responses to marine mineral aggregates extraction now and in the future. It set out to integrate existing data regarding the historic dimension of the coastal and marine environment into a GIS-based format familiar to planners and the aggregates industry. At the same time, it is gathering a wealth of information and shaping our understanding of human occupation of multi-period coastal landscapes, from the Teeside industrial centres and seaside resort of Scarborough to the fisheries and oyster cultivation of the Southwold to Clacton coast. These studies, funded since 2005, have supported the engagement of ALSF research with a diverse range of chronological periods and particularly the recent past and provide a common framework within which new research of the historic environment can be pursued. Two of these four pilot studies, as well as the Liverpool Bay work, are available on the ADS website and, as part of a national English Heritage initiative, are also being promoted through EH channels.

2 CASE STUDIES

THE THAMES THROUGH TIME (3912-15)

Background and aggregate link

There has been large scale extraction on the extensive gravel terrace systems of the Upper and Middle Thames and its tributaries since the 19th century. Thus the region has seen some of the most intensive archaeological activity in England. The ALSF has provided the opportunity to review this very large body of data which until now has been dispersed across a diverse range of published and unpublished sources.

The project

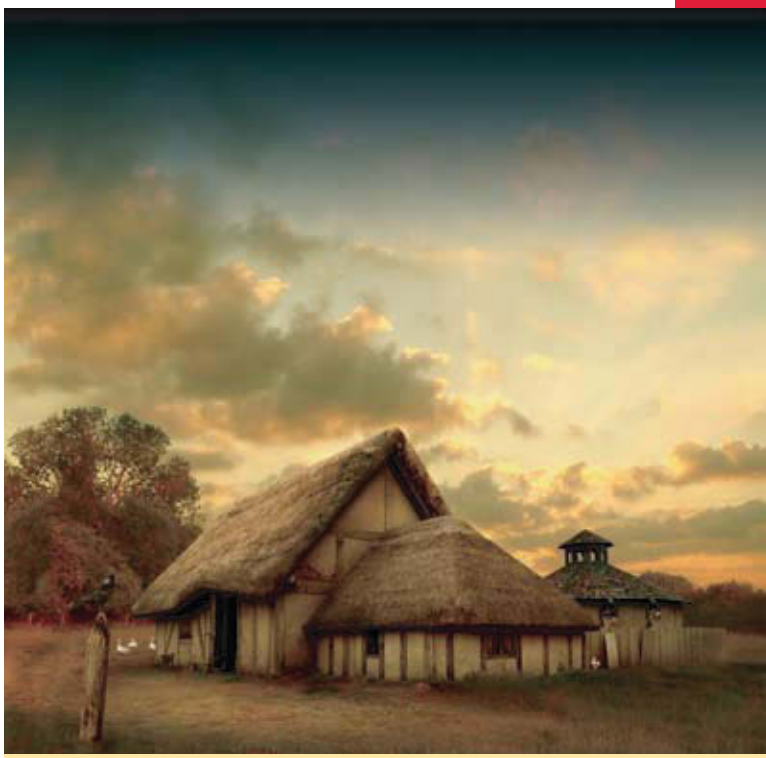
The Thames through Time project, led by Oxford Archaeology, has resulted in an up-to-date synthesis of this valuable data and new interpretations about the landscape and how life was lived in the area, for an impressive 700,000 years of history from the Ice Age to the later 20th century. The project takes an holistic approach to the study of the Valley, integrating archaeological, geological, and palaeontological expertise. The project objectives included:

- Provision of intellectual access to the important results of extensive excavation on the gravels of the Upper and Middle Thames at a level that will provide a resource of substantial benefit within the profession (for the purposes of heritage management and curation, informing professional practice, advancing the research agenda, and supporting the teaching of archaeology)
- Provision of access to these results for the informed non-specialist reader, including especially the voluntary archaeological sector and the many non-archaeological organisations with convergent interests in the protection and management of the river and its environs

The most fundamental aim was to ensure that this very rich and extensive data lead beyond a simple identification of dates and economic conditions, to exploring the social life of the place. Rather than write an enlarged gazetteer, or follow a chronological narrative as many previous period or county based syntheses have done, analysis and interpretation focussed on a number of themes:

- the river regime, changes in the landscape and environment
- patterns of settlement and building
- the people of the Thames Valley – population, migration, lifestyle; cultural identity and perceptions of identity
- production, trade, transport and communication
- ritual and religion: changing beliefs, impact on society
- the archaeology of power and politics: landscapes, boundaries, monuments, status symbols, social hierarchies

For example, key patterns and variations in settlement are explored, revealing intriguing patterns of continuity which must inform future



Reconstruction of the 8th century mid-Saxon settlement at Yarnton, Oxfordshire. © Oxford Archaeology

An adult woman buried in a crouched position in an Anglo-Saxon cemetery, Wally Corner, Berinsfield, Oxfordshire. © Oxford Archaeology

investigation research objectives. Continuities and changes in religious behaviour and burial practices from the Roman to the Anglo-Saxon period were also revealed through the synthesis. Importantly, the project was able to contribute to debates surrounding transformations of the archaeological record in the 5th century. This is one of the most controversial issues in British archaeology. Through the specific presentation of local differences in the environmental and settlement record, exploration of burial practices, a wide range of material culture and agricultural production, and consideration of alternative explanations of the disappearance of Romano-British material culture and more recent theories on material culture and ethnic identity, the volume's authors present a much more complex and nuanced picture of transformations in settlement, culture, religion, production and trade.

Outcomes

A key theme emerging from this synthetic treatment is diversity: between the Upper and Middle Thames, perhaps linked to large scale regional differences in the trajectory of development between the east and west of Southern Britain particularly in the later Roman period. Diversity is also apparent at the local level, for example in the development of the neighbouring villa sites at Thornhill Farm and Claydon Pike Claydon Pike in 2nd century AD. Further detailed examination of individual landscapes will be important and the integration of environmental evidence to elucidate the wider setting of sites and of artefact studies as a guide to the character, status and beliefs of the people who inhabited this area will be fundamental to such studies.

Further work on the role of the river in the context of trade and settlement patterns will be important, for example addressing the apparent lack of Roman strategic interest in the river, reflected in the lack of nucleated settlement there and apparent focus on the road network, in comparison with the medieval focus on the river, already apparent at the end of the first millennium. While rural Roman settlement is more pronounced and dense, the basic problems in identifying structure at most of these settlements needs to be addressed. For the Anglo-Saxon period, a priority must be the reconsideration of the dating of early and mid Anglo-Saxon settlement – the fact that radiocarbon dating has not been routinely used on sites of this period until recently (as at Yarnton), may mean that they have simply been missed and wrongly assigned to an earlier date. While opportunities are minimal, due to on-going and current settlement patterns, opportunities should be taken to understand more about late Saxon settlements. Volume III recommends that these surrounding areas may require positive discrimination in the future. It also suggests greater integration of research-led and development-led approaches to excavation to contribute to understanding of patterns and diversity and to regional research questions, as well as revision of pottery chronologies, and greater integration of radiocarbon dating


Shepperton Ranges, Surrey: gravel extraction revealed yielded Anglo-Saxon and Viking ritual deposits. © Oxford Archaeology

and environmental study into these projects, and highlights the need for further study of comparative valley landscapes.

Aerial photo of the excavations of the Saxon site at Yarnton, Oxfordshire. © Oxford Archaeology

The Thames through Time is comprehensive in scope and ambitious in the topic areas. The synthesis is unmatched by any previous account of the region and it stands as an encyclopaedic work of reference. Feedback from a number of representatives of the 'knowledge society' – from university lecturers to regional curators and contract archaeologists – indicate that the value of the project is widely recognised, providing background context and detail for research and undergraduate teaching, curatorial work, and for contract archaeologists assessing new sites as they are discovered in the development process. The project is contributing to the developing Solent-Thames Research Frameworks project.

The outputs comprise monographs in Oxford Archaeology's Thames Valley Landscape series. Volume III, covering the early historical period, Rome and the Anglo-Saxons, AD1-1000, was published in April 2007. Volumes I and II will be published in 2008. They address the formation and changing environment of the Thames Valley, and early human occupation, up to 1500BC (Vol I), and the transformation of the valley into a cleared and farmed landscape and the evolution of the Thames Valley communities, 1500BC -1BC (Vol II). There are also plans for Volume IV, spanning the evolution of the Thames from the medieval period into the modern world, AD1000-2000. The findings and interpretations have also been disseminated to non-specialists in the region, through talks to local archaeological and historical societies, as well as other interested agencies including the Countryside Agency, English Nature, and the Quarry Products Association.

Late Saxon sword found at Sheperton, a possible ritual deposit. © Oxford Archaeology

The monographs were aimed not only at the professional audience but also the informed public. They include visually attractive inset feature pages. Whilst a laudable ambition, some commentators have suggested that the publications do not quite meet the needs of either audience. Professionals hoped for more technical detail. This issue might be addressed by future publications and the addition of supporting technical data perhaps made available digitally.

From the outset, the project has been very self-aware regarding the limitations of evidence, the problems of patchy archaeological work, the imbalance of the focus on the valley gravel terraces at the expense of the adjacent non-valley areas, the issues in correlating archaeological and historical evidence, the theoretical debates surrounding interpretation of the material, the possibilities of repetition of material due to the thematic approach proposed for the text, and indeed the challenges of attempting a non-chronological narrative or gazetteer based approach. This provides the project with an intellectual integrity that has allowed it not only to provide access to a wealth of valuable information, which illuminates the sheer density and variety of the Thames Valley landscapes, but also to contribute to current debates about its interpretation, which often involves posing questions to push research agenda forward as much as providing answers.

LEAD RAKES (3718)

Background and aggregate link

Lead ore, galena, occurs in the Peak District in veins, the result of mineralising fluids migrating into faults and fissures in the limestone. These veins have been exploited for 2000 years. The mining industry of the Peak district reached its zenith in the 17th and 18th centuries before collapsing in the 19th century and was a vital part of the area's economic survival. The remains of the small scale mines that characterised the lead mining industry of the period, known as 'lead rakes' are considered to be an important aspect of the heritage of the area. The lead rakes are also home to a variety of rare flora, some of which is specific to the Peak's lead mining remains.

In the 20th century, these remains have been threatened, predominantly by reuse of land, either for agriculture, or through reworking of the mining remains to extract non-metals such as fluorspar. In order to get to these minerals, a considerable amount of limestone is extracted which is used as aggregate. It is estimated that only a quarter of the lead rakes that existed at the turn of the 20th century have survived into the 21st.

The project

The Lead Rakes Project is a Peak District National Park Authority (PDNPA) initiative designed to address the heritage of the Lead Rakes, their significance to the Peak District, and the threats facing their survival. The project helps mineral and aggregate planners to take into account the potential influence of Lead Rakes sites on industrial extraction, while answering a need for a deeper historical understanding of Lead Rakes sites on behalf of the local and academic 'knowledge communities'. The project has drawn together diverse studies and initiatives to provide better protection for the Lead Rakes, elements of the Peak District National Park's lead mining history. Its overall aim was to secure the sustainable management of the key landscape and heritage features that are the surface remains of the Peak District's lead mining legacy.

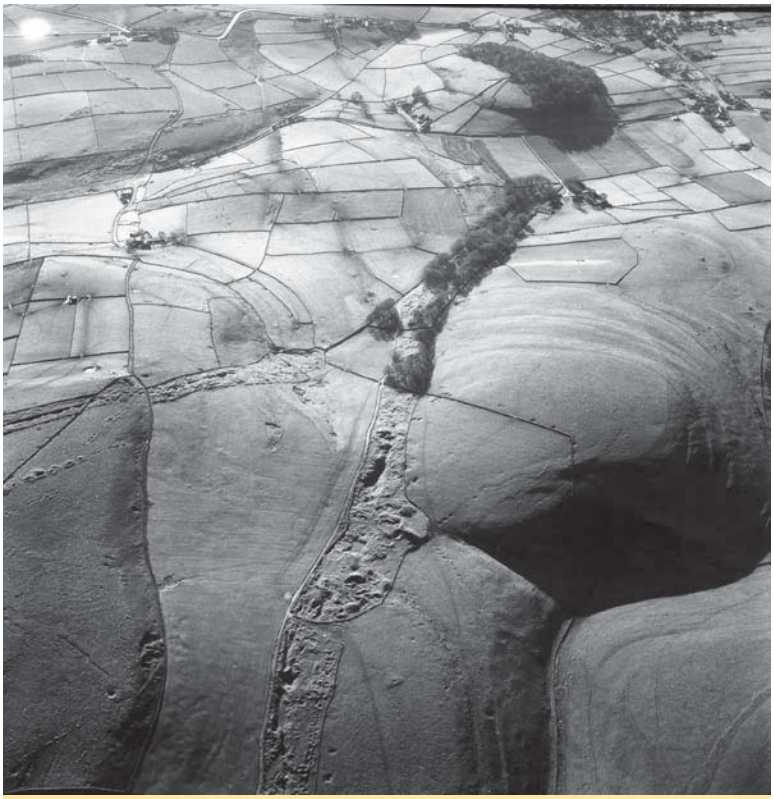
Magpie Mine, near Sheldon, a nationally important site.
©Jon Humble, English Heritage

Outcomes

The project output was a document: The Lead Legacy: The Prospects for the Peak District's Lead Mining Heritage. The authors used the information from surveys and analyses of the leadmine hillocks, with the objective of promoting awareness and understanding of the lead mining remains among a wide range of people – residents, land owners, land managers, extraction companies, visitors, policy makers at local authority, national and regional government level, and contribute to economic diversification, social inclusion and rural recovery strategies, for the benefit of residents and nearby conurbations. As well as a report, educational packs were distributed to local schools, and a public display and talks were taken around the Peak District area.

The report provides a framework for the conservation of Lead Rakes sites, both their ecological and historical significances, and an inventory of all the known remaining sites, their current state, important features, their protected status, their size, and whereabouts, shown on maps of the Peak. It provides the context of the sites alongside the management problems and threats facing them, and provides guidance for the future care and management of the surviving Lead Rakes. The report responds to the greatest threat to

the sites: a widespread ignorance of their importance, and sometimes existence, on behalf of current land owners, users and managers. By setting out the scale and character of the Lead Rakes sites so clearly, the inventory has proved a great boon for PDNPA wardens in the implementation of conservation strategies, and as a tool to win 'hearts and minds'; but also for land managers and extraction companies who have consulted the inventory and made planning decisions based on its contents. PDNPA wardens are able to show owners and managers the sites and the reasons for their importance. It is perhaps inevitable that 'trade-offs' have occurred, sites of particular interest preserved so that lesser sites might be exploited. Regardless, the inventory provides what is essentially an extra layer of detailed historic landscape characterisation that has undoubtedly benefited land owners, managers, extraction companies and local planners in terms of planning for sustainable industry in the Peak, and has also been influential in the industrial heritage/archaeology sector.



Oxlow Rake, with Cop Rake to the left, are highly visible ancient mining sites across the landscape near the Peak Forest © English Heritage/NMR

In the academic community, the report has also been well received, and has been used as an example of good practice in the protection and management of historic mining sites, and as a model for similar sites. It has also been well-received for its thorough study of the surviving Lead Rakes sites, which are for the first time presented in one place – timely given the fast disappearance of Lead Rakes sites, and the rising understanding of the importance of industry in shaping the landscape, especially in the north-west.

The document does not address the social context of the historic sites, an important factor in the landscape development of the Derbyshire Peak. Instead it concentrates its focus on the sites themselves and the particular significance of their individual features. Although this divorces the sites from their local settlements to some extent, in a way that might be considered a missed opportunity, it tips the balance of the report favourably in terms of its usefulness to the industrial sector. By using historic research in the presentation of a management tool, the project addresses the need for serious understanding of the problems facing metal mining landscapes where industrial land use has continued. At the same time, it is thorough enough to provide a starting point for further research projects. The Lead Legacy does not claim to be definitive, and its inventory is continually updated when new sites are found, or old sites are lost and PDNPA wardens and archaeologists have been able to keep an up-to-date record.

The Lead Legacy's wide dissemination has enabled it to be used by its intended audiences – local government, local people, academia, and especially land stakeholders – mineral and aggregate extractors, farmers – and this is perhaps the sign of its success. It has understood a difficult mandate and balanced the needs of industry today with the study of past industries. Although the report can at times seem an uneasy juggling of management objectives, historic background and ecological study, for a management tool based in thorough research, that set an ambitious remit for itself, The Lead Legacy has proved remarkably successful.

TRENT VALLEY PROJECTS (3307, 3495, 3850)

Background and aggregate link

River valleys were favoured places of settlement from the earliest times and their evolution and topography means that they preserve extensive and rich archaeological and environmental evidence. The valley of the River Trent is scheduled to produce a significant proportion of the nation's aggregates over the coming years. Three related projects have been funded by ALSF with the aims of giving the aggregates industry and environmental planners the knowledge to better identify the potential for archaeological remains and to devise strategies for risk avoidance and mitigation. In addition we now have a more accurate and comprehensive understanding of the geo-archaeological, settlement and cultural history, of the valley floor and flood plain of the River Trent and its tributaries. Bringing together aggregates companies, professional archaeologists, geologists, environmental and statutory bodies working within the area, Trent Valley 2002 (3307) provided the platform for the inception of the subsequent projects between 2002 and 2006.

The project

From the outset the project was ambitious, addressing a very large catchment area and involving an extremely wide range of topics and techniques. Trent Valley 2002 included an examination of the efficacy of the LiDAR data for terrain modelling for prospecting in alluvial landscapes, the development of a geomorphological risk map for the valley floor, a review of evaluation techniques in the river valley, and assessment of palaeoenvironmental evidence (pollen, plant, insect and mollusc remains from core sampling). The Trent Valley Palaeolithic Project (3495) focussed on enhancing the local Historic Environment Record with comprehensive and up to date information arising from the previous work, the monitoring of operational gravel quarries recording the archaeological material, and a review of museum collections of artefacts from fluvial sites, which for the first time, enabled their provenance to be located within particular gravel terraces. The Trent Tributaries project (3850) focussed on the Rivers Idle and Dove, using field survey and previous data, and sought to elucidate their geoarchaeological development, and to provide a tool for prospecting and identifying archaeological deposits. It has provided information to assess the impact of their evolution on the main (Trent) valley floor. The project revealed that the two tributary rivers differed in the way they had developed and in their preservation of evidence.

Cover of Trent Valley Through Time - popular publication produced as part of the Trent Valley Palaeolithic project. © Trent Valley Palaeolithic (A. Howard)

Trent Valley Geoarchaeology was founded in 2001 to bring together the interest groups concerned with the study of the geology and archaeology

of the area and the need to measure and mitigate the impact of aggregates extraction. It anticipated many of the core objectives of the ALSF begun a year later. The Trent Valley projects built on this established partnership and the archaeological knowledge gained from previous work in the region. It remains a dynamic and evolving project whose aims, objectives and perspectives were explicitly formulated within well-established frameworks for archaeological investigation within the Trent Valley with the need to manage the environmental issues associated with aggregates extraction. The results contributed to the development of the Regional Archaeological Research Agenda and in turn, new strands of work and routes of enquiry resulted in further projects. A possible future project might be a programme of 'rescue' investigations in areas of the Idle Valley which are known to be both rich in palaeoenvironmental resources but highly vulnerable to extraction.

Outcomes

The project produced a large bundle of outputs including reports, mapping from air photographs of palaeochannels of the river system in GIS format, a searchable bibliographic database, and popular publications. The monograph publication Trent Valley Landscapes provided a synthesis of two decades of previous work on the natural and cultural landscape of the area from the prehistoric to the medieval periods – knowledge and new interpretations that otherwise would have lain inaccessible in archives.

Small scale quarrying for aggregate during excavation of a drainage pond near Norton Disney, Nottinghamshire. © Trent Valley (A. Howard)

The project has substantially increased the capacity of local authority archaeological officers to provide reliable guidance and advice to the minerals industry when planning extraction. A benchmark has been set with these projects (notably Trent Valley 2002) for the investigation and management of the archaeological resource of river valleys – of great benefit to both the aggregates and archaeological communities – and already being put to use in Worcestershire, Herefordshire and the Severn Valley.

The 'component' structure adopted for the management of the initial project enabled such a wide ranging and comprehensive programme to be tackled. The structure not only meant that a large number of organisations and individuals could contribute to a common goal but also that rapid dissemination of the outputs to stakeholders and the public was facilitated. It also meant that problems and stumbling blocks within individual components did not compromise others, nor hinder the whole project. The component structure also provided clarity on next steps and fruitful routes of enquiry.

The Trent Valley projects brought a great deal of disparate information together, enabling a new, valuable and holistic view of archaeological resource, the likely impacts of aggregate extraction and a common approach to mitigation. Our understanding of human activity and settlement on the Trent Valley landscape from the Palaeolithic through to the modern period has been substantially enhanced as a result of these projects and the methodologies that were employed.

Photograph of Dark Age Building 2 © Woodbridge/ Cheviot Quarry Project

Carpenter Pete Stapley creating a mortise-and-tenon joint to connect the timber uprights with the lintels. © Woodbridge/Cheviot Quarry Project

Thatching, using a technique known as "fleeking" in progress.. © Woodbridge/Cheviot Quarry Project

The reconstructed Dark Age hall. © Woodbridge/ Cheviot Quarry Project

WOODBRIDGE/CHEVIOT QUARRY (4642)

Background and aggregate link

At Cheviot Quarry in Northumberland, the remains of a Neolithic settlement were believed to be located on the sand and gravel terrace overlooking an area of wetland. Part of the site had been excavated some years previously in advance of aggregates extraction – extraction which continues to date. The quarry area also includes the former site of RAF Milfield, a WWII training airfield, which had played a role in the Allied advance into Europe. As mitigation of the environmental effects of further quarrying, more of the site needed to be excavated. This provided the opportunity to integrate past and present information for a site believed at the time to be the largest known Neolithic settlement site in northern England, which had considerable potential to inform current debates and thinking about the Neolithic period.

The project

Phase 1 (4642) of the project, begun in 2006, comprised fieldwork and the analysis of the results in synthesis with the evidence of previous work, and Phase 2 (4843) consisted of public outreach elements, although some tasks of each phase were conducted concurrently. In parallel Tarmac, the quarry operators, also contributed funds to the establishment of a war memorial on the nearby Maelmin Heritage Trail. This had been preceded with a site open day and surveys of visitors to the Trail to determine how interpretation here could include the discoveries made at Cheviot Quarry and what provision would be appropriate.

The fieldwork uncovered the remains of two roundhouses with porches, hearths and pits and three rectangular post-built structures. The botanical macrofossil evidence, together with residues within pottery vessels, was clear evidence for arable and pastoral agriculture in a small farming settlement. These findings were shared with the community and the wider public soon after they were made. Leaflets were produced and open days held. Television and press features announced the discovery of a Neolithic settlement site of international importance.

However, the post-excavation assessment phase, when elements of the data were selected as most fruitful for further analysis, led to a number of surprises. Radiocarbon dating of the structural remains indicated that the rectangular structures did not belong to the Neolithic after all. It was apparent that assumptions had been made about the date of the newly found evidence based on its association with material found in previous work. The material and the site needed to be reinterpreted. Full analysis concluded that the roundhouses at Cheviot Quarry dated in fact to the Late Bronze Age, providing the first evidence of settlement of this period in lowland Northumberland. The rectangular buildings belonged to the post-Roman 'Dark Age' period, of the 5th to 6th century, filling a regional gap in archaeological evidence for this period.

The results of the excavations were valuable and significant, and they were put to very effective use. The archaeological results are due to be published in The Archaeological Journal. They have contributed significantly to the development of the Regional Research Framework for the North East and have been the catalyst for the synthesis and publication of material from the wider Milfield Plain area. Subsequent benefits to visitors and the community include the reconstruction of one of the 5th /6th century buildings erected at the Maelmin Heritage Trail and the erection of a plaque to the war dead who served at RAF Milfield. With the aid of sponsorship by Tarmac, visitor numbers to Maelmin Heritage Trail increased dramatically over the last year.

Cheviot Quarry is a good example of a project which benefited both the 'knowledge' and lay communities through the drawing together of a range of organisations, including Northumberland County Council, the voluntary contribution of Tarmac, and the archaeological contractors Archaeological Research Services Ltd.

As far as the revision of the dating is concerned, the project was to some extent a victim of its own success. The fieldwork began in earnest and proceeded quickly, informed by the depositional sequence identified in the earlier work. The outreach activities were initiated early and integrated fully into the research elements, capturing the public imagination (see the Outreach benchmark report). However, all of this left little time to check the results of previous work and new excavations, before using and disseminating what, it became clear, was inaccurate interpretation. The resulting story was just as important for British archaeology, but it was not the one initially told. This is not simply an issue of embarrassment. It is about earning and keeping the trust of the ultimate beneficiaries of all archaeological endeavour – the public. It is a lesson which can be learnt by all in the archaeological research and interpretation sector, and those developing project programmes within short-term funding cycles.

Mike Young (Tarmac) and Clive Waddington (ARS Ltd) at the new installments at the Maelmin Heritage Trail.. © Woodbridge/Cheviot Quarry Project

Diver returning to dive vessel © Wessex Archaeology

WRECKS ON THE SEABED (3324/3877)

Background and aggregate link

The start of the ALSF in 2002 coincided with the transfer of responsibilities for the historic environment in England's coastal waters to English Heritage. Following the development of new marine and maritime heritage guidance, the ALSF has funded a number of projects that aim to provide an improved baseline understanding of the marine historic environment and it's potential. New techniques, protocols, guidance and management tools are needed to evaluate, assess, and provide mitigation advice in the offshore development process as marine exploitation increases. With the government Marine Bill White Paper published in March 2007, these projects could not be more timely.

The project

The Wrecks on the Seabed project, led by Wessex Archaeology, began during Round 1 of the ALSF (3324) and was developed further during Round 2 (3877). At the time, beyond the imposition of exclusion zones in development-led marine contexts, no methodologies existed for proper evaluation of shipwrecks. The existing or potential aggregate extraction fields off the coasts of Hampshire and Sussex were selected for the practical testing of a range of methodologies for assessment, evaluation and recording of wreck sites to assist with understanding the effects of marine aggregate dredging on shipwrecks. In all, 20 wrecks were investigated and data collated on their extent, character and importance.

Three types of wreck investigation were tested – field assessment, non-intrusive site evaluation and rapid in situ recording. A range of geophysical techniques including sidescan sonar, multibeam sonar, magnetometer and sub bottom profiler were applied to produce baseline data for 17 known and targeted wreck sites between the Solent and Eastbourne. 9 sites were subsequently dived using an integrated underwater acoustic tracking and purposely designed recording system, video and a digital stills camera. Further in situ recording was carried out on 3 sites. A second stage of the project addressed issues of equipment and infrastructure that had hampered Round 1 investigations and explored the application of geophysical and ROV (remote operated vehicle) techniques to deep water sites, following feedback from the aggregates industry about the possibility of expanding its activities into deeper water in the future.

Surface supplied diver showing the umbilical, which supplies the diver with air, a communication line, video line to his/her camera, depth gauge, acoustic tracking and safety line. © Wessex Archaeology

Outcomes

Methodological lessons learnt included the time and cost benefits of using a larger support vessel and experienced crews for archaeological diving and ROV surveys, and the need to phase ROV and diver surveys to elicit broad and detailed data, as well as techniques for managing the obstacles of visibility, tidal current, access and marine growth. The success of the geophysical investigation techniques also highlighted the continued need for experienced geophysicists. This work informed the development of a framework for investigation and guidance on methods of wreck site survey required as part of the environmental assessment needed for obtaining or renewing dredging licences for an aggregate extraction area.

Wrecks on the Seabed has also enhanced baseline information and generated knowledge on the extent, nature and importance of wreck sites, and enabled some evocative stories

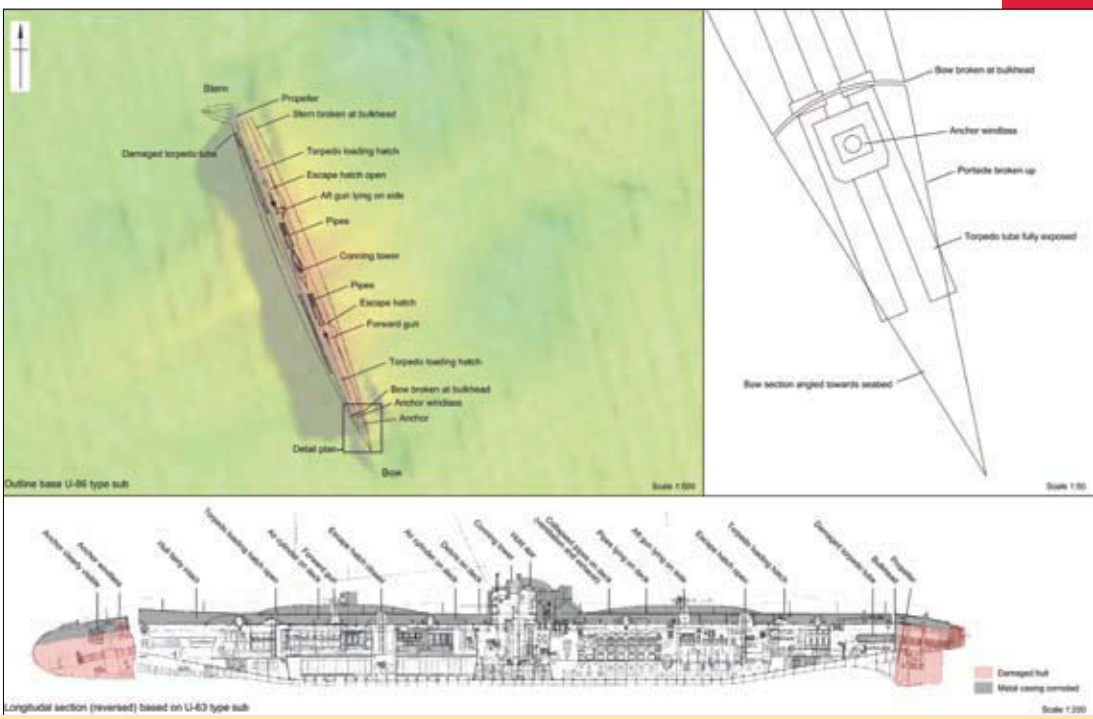
Cargo from the 'Bottle Wreck': a plate produced c.1830 with a brown Bombay Japan transfer print. © Wessex Archaeology

to emerge. Site WA1001, investigated through geophysical and ROV survey, comprised the remains of a probable WW2 B-24 Liberator bomber. The site is protected under the Protection of Military Remains Act and, although none were found, the possibility of human remains gives the site status as a war grave leading the US Joint POW/MIA Accounting Command in Hawaii (JPAC) to initiate investigations with the aim of identifying the aircraft.

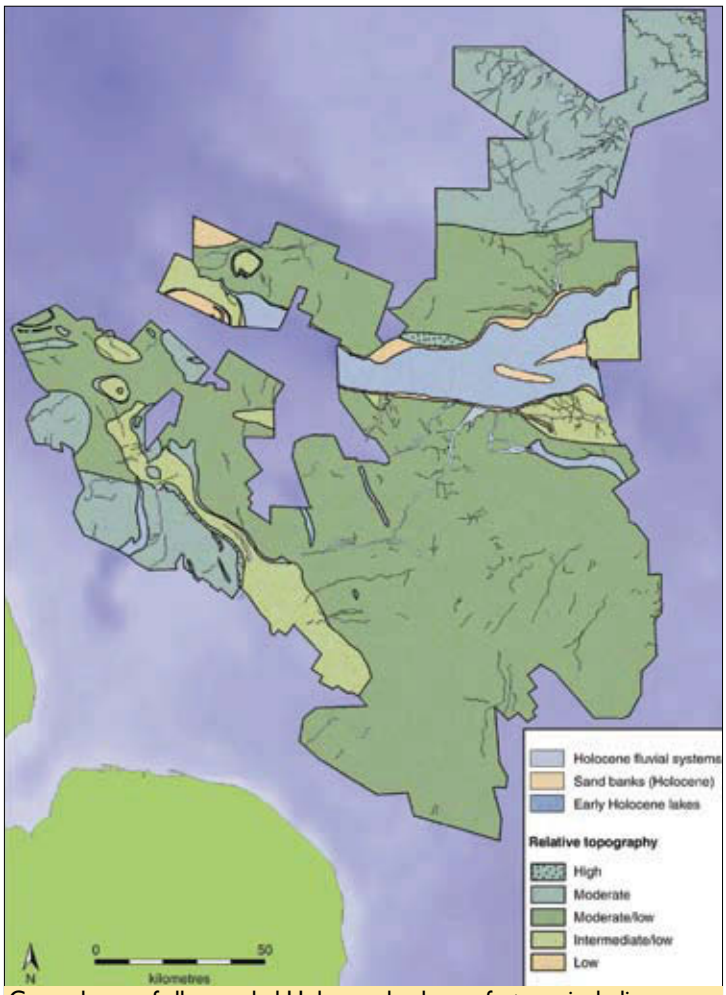
Site WA1003 was identified as an ocean-going German attack U-boat dating to the First World War. Further study indicated that it was the U-86, the U-boat responsible for the sinking of numerous Allied ships around Britain's waters, including the British hospital ship Llandovery Castle, one of the worst war crimes of the First World War. The U-86 is particularly well preserved and is the only one of the 6 U-81 series U-boats in the world to have been located and identified.

A range of university, aggregates industry, Defra, EH and ALGAO representatives were on the project's Steering Group and so were engaged with the development and implementation throughout. Methodological developments on the project have also contributed to subsequent ALSF projects carried out by Wessex and others, such as the Importance of Shipwrecks. Outputs consisted of a series of reports, appendices and 2D and 3D figures, made available on the ADS website. A range of seminar presentations have also been held, in the UK and abroad, public lectures given to local historical and archaeological societies, and popular articles published in archaeological, aggregate and diving newsletters.

With hindsight and the knowledge of six years of funding, the project could have been structured differently: an umbrella project with more discreet packages of work – methodological, interpretation, outreach – might have worked more effectively to ensure that the 'softer' side of this project was developed as thoroughly as the fieldwork and methodological side. However the practical benefits of lessons learnt on these projects are clear, contributing daily to Wessex Archaeology's own practices and informing the development of marine historic environment policy at a national level. Although potential audiences in the knowledge community may be small, they are leaders in what is a highly influential field already filtering into national policy and guidance protocols.



Plan of the U-86 site plan. © Wessex Archaeology



General map of all recorded Holocene landscape features including general topographic interpretation. © North Sea Palaeolandscapes Project (V. Gaffney)

3D SEISMICS FOR MITIGATION MAPPING OF THE SOUTHERN NORTH SEA (4613)

Background and aggregate link

While previous researchers have recognised that the British continental shelf would have been extensively populated by humans until it was rapidly inundated during the Mesolithic period, as recently as 2004 the Late Quaternary and Holocene landscapes of the Southern North Sea were described as essentially terra incognita. In the 3D Seismics Mitigation Mapping of Southern North Sea project, the University of Birmingham completed one of the largest analyses of remotely sensed data ever attempted for archaeological purposes, to provide extensive deposit mapping of the Southern North Sea, an area valuable for aggregate extraction and one of the most extensive and best preserved prehistoric landscapes in Europe.

The project

A range of techniques borrowed from marine geophysicists working in oil and gas exploration, specialist software to analyse data and technologies to integrate and visualise spatial data were innovatively applied to existing 3D seismic data originally gathered for hydrocarbon exploration. This enabled the project to map an extensive area of the Holocene and Late Quaternary Southern North Sea, including the location of major landscape features. Data from existing shallow boreholes, seabed samples and bathymetry (depth measurement) were then integrated into these palaeogeographic reconstructions in order to produce a detailed framework that provides an assessment of the resource potential for the region, and to inform the direction and requirements for future data collection to develop work in this field.

Although led by landscape and palaeoenvironmental archaeologists and specialists in basin dynamics at the University of Birmingham, this project relied on partners for a range of information and technological support, including Petroleum Geo-Services, Mercury Computer Systems, Tigress, HP Invent and ESRI. It also benefited from an advisory committee that included representatives from PGS, English Heritage, BMAPA, the School of Ocean and Earth Sciences, University of Southampton, and the National Oceanographic Centre, Southampton.

An atlas of the palaeolandscapes of the Southern North Sea provides a series of maps showing landscape and topographic features of 'Doggerland', which once would have linked Britain with continental Europe. The project recorded and mapped an extensive archaeological landscape, observing 691km of coastline length, 1791km^2 of marine area, 309 km^2 of salt marsh, 293km^2 of intertidal zone area, 24 lakes/wetlands, 1612km of fluvial stream length, 305 fluvial related features in a total area covered by fluvial features of 526km.

Landscape characterisation and interpretation using the available data was attempted, with maps and figures indicating topographic and economic zones. 'Red flag mapping' was also made of the potential of the data

for assessing archaeological preservation and for the development of mitigation mapping, taking into account the level of certainty about the resource and the level of threat to it. This characterisation and assessment provide the building blocks for a more developed management response to this newly discovered internationally important landscape.

Outcomes

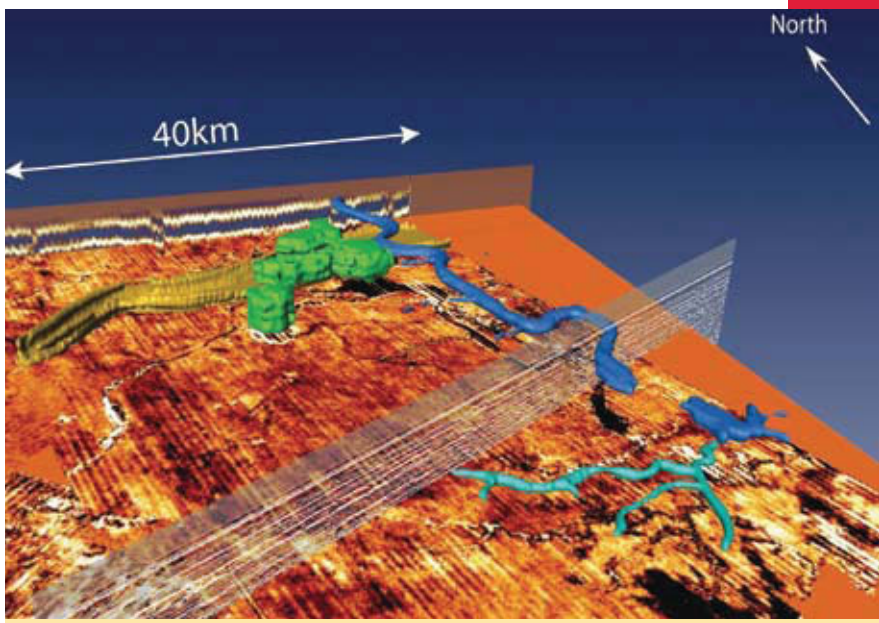
For prehistorians the emerging evidence challenges conventional interpretations of early Mesolithic populations in England and it may be that the contemporary occupants of 'Doggerland' lived a much more settled and complex lifestyle than previously thought. The project has stimulated recommendations for future research and the creation of modelling techniques using proxy data from terrestrial sites, new data from coring where possible and computer modelling to predict where people lived on this landscape and to refine our concepts of land use and character.

Many lessons were learnt, including the challenge of acquiring data from the disparate sources – offshore operators and academic institutions – and the need to augment the low resolution of 3D seismic data with higher resolution seismic reflection data, bathymetry, seabed samples and shallow core data.

In addition to the provision of tools for the management and mitigation of the impact of aggregates extraction, the project has had a significant impact in many spheres of academic research, with papers presented in Quaternary Science, and conference presentations made to the Geological Society Petroleum Group, the Geological Society Environmental and Industrial Geophysics Group (2004), and to the Quaternary Research Association Annual Discussion Meeting (2005). It is also probable that archaeologists engaged in the study and management of comparable resources internationally (e.g. in the Black Sea, the Florida Gulf, the Gulf of Arabia) may consider replicating the methods trialled by this project to understand their own submerged but once inhabited landscapes.

Academics with relevant maritime archaeology specialisms were represented on the advisory committee, and the research has been presented to wider interested archaeological audiences at the Theoretical Archaeology Group (2005) and the Annual Meeting of the Association of Environmental Archaeologists (2005), and a paper published in the proceedings of the 5th International Congress on Virtual Reality, Archaeology and Cultural Heritage (2004). There has also been wider media coverage, from a Time Team television programme to articles in Vanity Fair and German Vogue.

In common with Wessex Archaeology's Wrecks on the Seabed project, 3D Seismics focused on methodology and the issues for the historic environment in the aggregate development context, and also produced significant research dividends. Wrecks on the Seabead produced detailed information on particular wrecks and 3D Seismic Mapping led to potentially perception-shifting implications for the study of prehistory in north-west Europe. Although the potential interest group in the academic community may be small at this time, this research dividend remains highly influential outside the immediate target group, with implications for cultural archaeologists on one side, and for the aggregate industry, and planners on the other.



Visualisation of landscape features with solid modelling software. © North Sea Palaeolandscapes Project (V. Gaffney)

THE SANDHILLS PROJECT, ALDERLEY EDGE (3334)

Background and aggregate link

Alderley Edge, Cheshire, is today known as a place of leisure, relaxation and affluence, with fine views across the Cheshire Plain. However, from prehistoric to recent times, the Edge has been a place of industrial toil, exploiting the rich copper resources that are concealed in the sandstone of the Edge itself. While archaeologists have been investigating the prehistoric caves and the mining industry of the area for some time, little study has been made of Alderley Edge's more recent heritage. Still rarer is the exploration of the domestic remains, and social and home lives of people in the 18th – 20th centuries.

The ALSF funded Alderley Sandhills Project selected the site to address this industrial history in a new way. 'Sandhills', Alderley Edge, is so named because of the enormous deposits of sand, a by-product of the mining in the area that was used in the 20th century as aggregate. A pair of cottages, known as 'the Hagg', were built in Sandhills in the 18th century for farm workers and later modified for mine workers. They were lived in until the 1950s, when the subsidence caused by the sand deposits and extraction led to their abandonment and later, demolition. The cottages thus witnessed the transformation of the economy and character of the Alderley Edge from rural agricultural, through the industrial tumult of the 18th and 19th centuries to the emergence of the service sectors of today.

The project

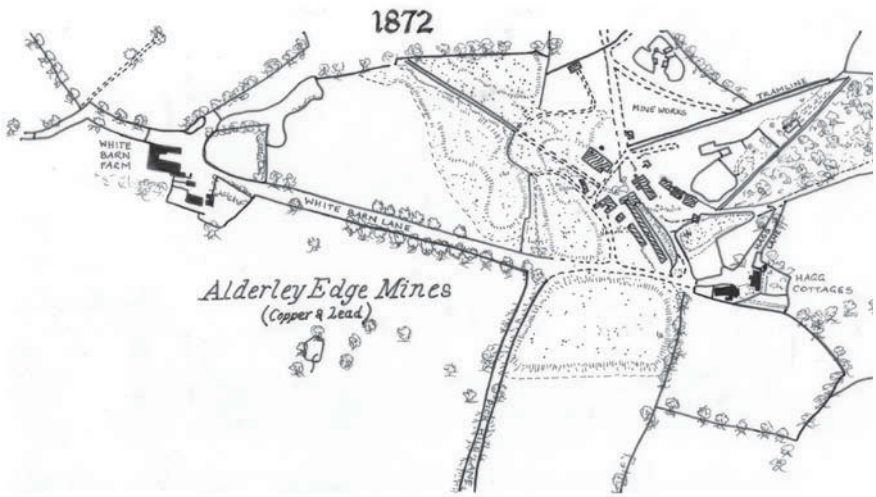
The remains of the demolished cottages were excavated by archaeologists from Manchester University, and to add to this evidence and to better understand how people lived in the houses, former residents - three people who had grown up in the cottages, at that time part of the estate of the local aristocratic family, the Earls of Stanley – were interviewed. These oral histories became integral to the project, even determining where the team dug their trenches, as the interviewees remembered (and sometimes mis-remembered) where different rooms were, or events had occurred. They even helped to identify objects found in the excavation, as many of the students digging could not recognise items that had been in use more than seventy years before.

Over the summer of the excavation, students, many of whom had never experienced digging 'post-Medieval' remains before, learned the techniques necessary for an industrial, historical site, collecting finds from each archaeological layer excavated. Gradually a picture of the houses emerged, that was embellished by the

Sandhills circa1955, during aggregate removal. Photograph courtesy of M. Pitcher

Bisque porcelain doll's head
© Alderley Sandhills Project 2003

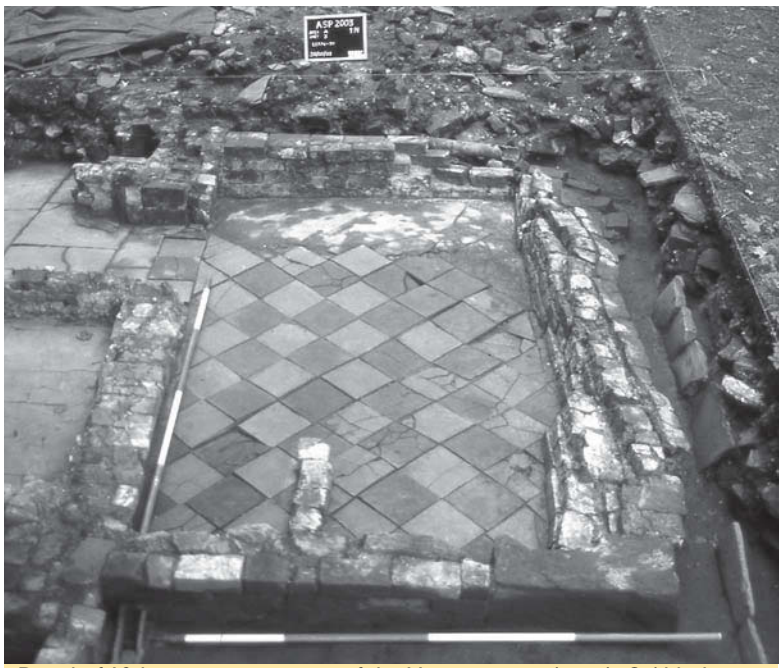
memories of the people that had lived in them. Leaflets and a web log kept real and virtual visitors to the site regularly updated. Those passing by, enjoying Alderley Edge's beauty, could be treated to a guided tour of the site, and it was sometimes from these quarters that identification of mysterious objects, or enlightenment over particular aspects of pre-war life would come.



Barn Farm (after the Ordnance Survey map of 1872)

Outcomes

The excavation at Sandhills provided an important addition to the archaeological resource. In Britain, although a few studies have been undertaken on slum housing in Sheffield and London for example, there has been very little study of peoples' homes. The project has had an international impact. Archaeologists who study the same period, colonial and post-colonial archaeology in North America and Australia often look to British 'assemblages', collections of artefacts from the heart of the British Empire, in order to understand where artefacts have come from or the way they were made. This information helps archaeologists understand how trade and colonial expansion influenced the way people lived and the materials they used. As a domestic assemblage from this important period, the finds from Sandhills can now be compared with those from sites of a similar period in other countries. A monograph, The Alderley Sandhills Project: An archaeology of community life in (post-)Industrial England, by Eleanor Conlin Casella and Sarah Croucher will be published by Manchester University Press in 2008.



Detail of 19th century extension of the Hagg cottages, Area A. © Alderley Sandhills Project 2003

Alderley Sandhills was undertaken in the 1st round of ALSF projects, when the strategic direction and objectives of the programme of the research projects were still in development. It was innovative - in the subject matter, in the combination of archaeology, ethnography, oral history and in the success in capturing and enlisting the imagination of the local community. While further rounds of ALSF should continue to meet the needs of the aggregated and planning sectors, Alderley Sandhills highlights the need to ensure that occasional similarly experimental projects continue to be undertaken.

GWITHIAN, CORNWALL: EXCAVATIONS 1949-1963 (3354)

Background

Coastal dunes are now regarded as areas rich in landscape and cultural distinctiveness and so today few are being exploited for sand aggregate. Gwithian, on the coast of Cornwall, an area of former extraction, is being restored and converted to a nature reserve by Cornwall County Council. It is also the site of archaeological excavations of remains of an extensive and long-lived Bronze Age settlement, carried out in the 1950s and 1960s. The records and material from the excavation – the archive – were held privately and had never been fully analysed nor disseminated. In connection with the development of the nature reserve, an ALSF funded research project focussed on the need to bring the discoveries to modern audiences and ensure that Bronze Age studies of today could be enriched by the important data from Gwithian.

The project

The project was a combination of very practical tasks, academic analysis and outreach. The records, artefacts and environmental evidence were audited, listed, re-packaged and deposited in appropriate conditions in the Royal Cornwall Museum, Truro. A security copy was made and digital records were submitted to the Cornwall Historic Environment Record. The archive was also synthesised and assessed, selecting the material which would be suitable and relevant to answer research themes and topics in the light of later excavations and present day thinking on Bronze Age material. The work shed new light on how life was lived in Gwithian. Archaeological material ranged from the Mesolithic to the Roman periods, some of which is important. But Gwithian's particular significance lies in the Bronze Age. Farming here began at about 1800BC and three major phases of Bronze Age activity were identified, separated clearly by layers of windblown sands. Famously, Bronze Age ploughmarks were found here, preserved in the sand. Environmental analysis demonstrated barley and cereal cultivation, with seaweed being used as fertiliser, as well as evidence of a small-scale leatherworking industry. There were wooden and stone buildings, including dwellings and a granary, all indicating the industry and sufficiency of the site. But Gwithian was not isolated. Some artefacts found at Gwithian can now be matched to items found in more recently excavated sites further afield, such as shale bracelets from Kimmeridge in Dorset, revealing trade links that could not have been appreciated without the ALSF study.

Aerial view of Gwithian Towans and mouth of Red River as it feds into the sea taken in 1987. Centre picture sand extraction working. Major excavations at Gwithian (1956-1962) took place in area to extreme right of picture on north side of Red River. BWF 12-149-585-4 © Steve Hartgroves, Historic Environment Service, CCC

Outcomes

Outputs comprise a number of data reports, providing 'remote' access to the archive, as well as articles in popular archaeological journals. There have also been public and academic lectures about

June 2005 site GMXVII. Joanna Sturgess and Professor Charles Thomas cleaning up the Bronze Age cultivation horizon with well-preserved ploughmarks. Professor Bernard Wailes, a member of the original 1950s excavation team looks on. © Jacky Nowakowski, Historic Environment Service, CCC

the archaeology of Gwithian, as well as guided walks of the site. The Gwithian archive still has a great deal more information and interpretations to yield. The most recent output is a Project Design with a programme for the analysis and final publication of the material yet to be completed. This will include a popular illustrated booklet, detailing the history of the Gwithian landscape, two academic monographs: Gwithian in the 2nd Millennium BC, and in the post-Roman era, and separate papers on the excavation at Gwithian Barrow, to be published in Cornish Archaeology, and the rounds at Gwithian, also to be published in Cornish Archaeology.

The benefits to a modern academic audience of this 'back-log' project are already being felt. Gwithian is a site of international importance and one of Britain's most foremost coastal archaeology sites. The ALSF has effectively reopened the site, for wider and more comprehensive study. It now forms a major contribution to the study of coastal settlement for the Bronze Age and post Roman periods. Impacts include advances in regional and national chronologies for the Bronze Age and post Roman periods, the updating of existing knowledge about a unique landscape, and new information about continuity and the varied character of settlement, lifestyle, craft specialisation, agrarian and subsistence practices and local economies during the 2nd Millennium BC and the post Roman periods in South-West Britain. Professor Martin Bell of Reading University is using Gwithian for comparison with work he is undertaking in the Severn Estuary and in connection with other ALSF research projects.

Uniquely preserved post-Roman buildings found sealed beneath sand and midden layers at site GMI in 1957-58. © Ian Cossar, Gwithian Archive

Another outcome has been the appreciation of sand dunes as very rich in early archaeological and environmental resources and their potential for the understanding of long development sequences. This has caused a reappraisal of the management of dune landscapes, forging links between natural and cultural heritage bodies and influencing the protection of similar sites in Cornwall, not least the dunes at Hayle, adjacent to Gwithian, and part of the Cornish Mining Heritage World Heritage Site.

3 PRINCIPAL ISSUES - THE VIEWS OF THE 'KNOWLEDGE SOCIETY'

Familiarity with ALSF research

All of the consultees were aware of the Aggregates Levy Sustainability Fund and were familiar with specific projects that were of particular relevance to their research and or teaching interests. It is clear that through the internet, journals or monograph published material, as well as informal networks, this material is beginning to reach an academic audience. Some are also involved as advisers to ALSF funded projects.

Local authority and historic environment teams are also clearly familiar with ALSF funded research, primarily through their own projects or knowledge of projects run by others in their area. These projects included assistance with the excavation of unexpected discoveries, high level asset management projects, river valley projects, and regional resource assessments with associated National Mapping Programmes. Two of the curators interviewed also pointed out their awareness of their natural environment and landscape colleagues' projects, which have been funded through different ALSF delivery partners (e.g. Natural England).

Views on knowledge generated

There was general agreement amongst academic researchers based in higher education institutes that the ALSF is funding important and useful research. However, opinions, varied between academic specialisms, on how timely and dynamic the new knowledge is. Amongst specialists in the prehistoric periods, the ALSF is perceived to have had a significant impact on the study of Palaeolithic archaeology, both in terrestrial and maritime environments and is the funds' most significant contribution to archaeological research. One noted that this research builds on earlier EH funded English Rivers Survey (e.g. Rivers of South West Britain project), has contributed to on-going academic interests of the Leverhulme Trust funded Ancient Human Occupation of Britain project (e.g. the Lynford Quarry project), is the basis of the forthcoming Palaeolithic Research Framework (currently out for consultation), and has raised awareness of the significance of British Palaeolithic archaeology at an international level. Consultees also pointed to terrestrial research that has enhanced our understanding of the later prehistoric landscapes. The extensive areas covered by extraction have provided an unprecedented opportunity to study very large areas and particularly to build an understanding of the scale and nature of mid-to-late Bronze Age landscape divisions. This work is not only answering research questions, it is setting them.

Among LA archaeological officers there was a generally positive perception of the research generated by ALSF projects and that the results have a significant impact on their work, enabling them to do their job better. These curators feel that the ALSF has funded work that upgrades the information base and enhances the intellectual mandate with which they can make decisions and manage changes to the historic environment. Many believed that the fund has also enabled strategic level thinking about archaeological resources and management of them that contribute to and underpin regional research agenda, meeting corporate and national partners' objectives, fitting with wider NMP, Historic Landscape Characterisation approaches, and crucially contributing to the HER that is the basis of all their work. However some curators

felt that the positive impact would have been greater if the findings were disseminated to themselves, mineral planners and the aggregates industry in a more digestible, distilled and familiar format.

A further benefit of ALSF funded research was noted by one curator in terms of capacity building: a collaborative project in their region has brought university and contracting archaeologists together, with the former sharing geo-archaeological skills with the latter.

Among archaeological contractors while there was a view that in places the fund was clearing old (back-log) work rather than pushing forward new fieldwork, their own desk based work was directly benefiting from the ALSF synthetic works that are bringing backlog to publication and pulling together a wide range of material. They cited The Thames through Time as a good example of such a project that is giving a sound context to their work, and a good underpinning for more popular publications.

Views on audiences, outputs & dissemination

There is general confidence that research is being adequately disseminated within the academic community, not least because it is a relatively small group in which people tend to be familiar with current research in their field. One consultee did question how far Extract, the EH Annual Report on the ALSF programme, is circulated in academic circles. Another questioned whether or not academics would always be conscious of the fact that material they were reading was ALSF funded, although a third noted that they felt this was always very clearly flagged at least in a conference setting. One noted the trend from the early years of the programme when research was primarily communicated through inter-professional contacts, to the present in which information is available through conference publications, articles, and electronic resources (such as the ADS portal), all of which academics are very used to consulting. Given the general timescales for academic publishing, formal dissemination of research appears to be happening at a reasonably good pace and it is not worrying that more works await final publication.

Amongst local authority officers, there is clearly an appetite to benefit from the ALSF research-based projects. However some interviewees particularly felt that more needs to be done to disseminate the findings of academic research to their community, in an accessible format but which contains more substance than headline findings. A more central, national co-ordination of dissemination, through detailed but digestible summary reports or guidance notes, or an EH-led publication that promotes the range of topics and link up similar projects making them easily accessible as a set of research, would be useful. A number had never accessed the EH ALSF website and are unfamiliar with the report search facilities.

Like the academics consulted, the archaeologists working for a contracting unit within a university context felt very positive about the rate of publication and dissemination of information via the ADS website, academic journals and monographs, and about the success of approaches disseminating research to quarry managers and the public. They felt that the ALSF has fostered good working partnerships and academic networks and has successfully raised awareness across a range of audiences. However they also suggested that more should be done to promote the successes of and standards set by ALSF funded research to a global audience, particularly given that many of the aggregate companies operating in England are internationally owned. One archaeologist from a contracting unit expressed a preference for thoroughly refereed conventional publications over too much reliance on pdfs on the internet as a means of dissemination.

There did not seem to be a view within any parts of the archaeological community that the ALSF research based projects are, or should be, simply conducted by and for the archaeologists. While academics, - British archaeologists in general, and specialists in specific periods in particular (Palaeolithic, late prehistoric) - are clearly a significant audience, there is a desire that, mineral planners, the aggregates industry and the general public should benefit. All of the curators were concerned about the extent to which the benefits of this research are being disseminated to the aggregates industry and the dangers to the reputation of the archaeological community and the ALSF programme of failing to engage this group. Many interviewees were unsure as to whether this happened, however, and believed that more effort is needed to disseminate to these other audiences. working more closely with schools and museums. One academic cited The Ice Age project as successfully reaching wider audiences, demystifying literature, and proving that there is a wider appetite for Palaeolithic archaeology. Some local authority archaeologists emphasised their own efforts to involve mineral planners, aggregates representatives, and Defra representatives in their own projects.

Views on ALSF objectives

The academics with a specialist interest in prehistory felt that EH's objectives for ALSF projects are very good, suitably broad and have allowed for funding of a diverse and exciting range of research projects over the last 5 years. They stressed that the ALSF has opened up a new funding opportunity for maritime and terrestrial Palaeolithic archaeology and scientific research – research councils are now appreciating the value of this. One also commented that the ALSF has addressed the need for provision of high quality interpretation and synthesis beyond that which site level funding allows for. An academic with particular interests in landscape archaeology suggested that a slightly broader interpretation of the objectives might allow for more research projects that asked wider questions about historic places and landscapes in aggregates areas too.

One consultee commented that they were gratified to see that the sector had devised such a good system for distribution of research funds - a system which compliments PPG16 funding, responding to a sector-specific threat rather than site-specific threat and funding projects on the basis of their academic merit. One academic however did suggest that, in line with research councils, EH might consider the involvement of more external peer reviewers in the process of considering projects and applications for funding.

Two of the curators felt that the objectives set were commendably broad based, while the other felt that there might be more scope to interpret these more loosely, in terms of the types of extraction covered and of the nature of the relationship of the project to aggregates areas, to ensure that these parameters do not become blocks to progress and valuable, innovative research. Two were pleased that over the five years, balance appears to have been increasingly achieved between purely academic research projects and those more focused on contributing to resource management.

The contractors interviewed also felt that in general the EH objectives are right. One did echo comments from the academic and curatorial consultees that interpretation of them could perhaps, at times, be less restrictive.

Views on future research

One academic commented that future research will depend on the direction of policies regarding aggregates extraction - maritime archaeology will continue to be an important area if offshore extraction continues. There are also terrestrial areas earmarked for extraction that will need to be surveyed. Another noted that

while prehistoric archaeology has already benefited immensely from the ALSF, there is still much to discover about the Mesolithic period in aggregate extraction areas.

The landscape archaeologist suggested that more wider academic research on places and landscapes could be very fruitful; another academic particularly suggested that there is much more to be gained from research that celebrates the history of the aggregates industry itself, contributing to post-medieval archaeology, addressing negative views about the industry, promoting relationships between the industry and archaeology, and celebrating the local history and identity of particular places. One academic consultee also noted that, while projects like the National Ice Age Network have been very effective in their dual role of carrying out scientific research and raising community and industry awareness, splitting the research/awareness-raising into two separate briefs might allow for both to be carried out more effectively.

Amongst curators' suggestions for future directions for the fund were more co-sponsoring of research projects and partnerships between archaeologists and quarry companies; EH facilitating communication between similar projects, as well as communication between project PMs and potential data providers (particularly HERs) to ensure availability of resources to the time scales set; a looser interpretation of objectives and broader remit for research projects; a greater focus on community involvement and outreach work.

Suggestions made for the future by contractors include: more synthetic work for which alternative funding is rare; more strategic research and predictive modelling work; more significant new fieldwork projects; more knowledge transfer to the aggregates industry and more public outreach work. One echoed the comments made by academics regarding time scales and the funding cycles – if these were longer cycles, say 3 years, this would allow for more thinking time, the possibility of building in PhD studentships etc., all of which is likely to have a direct and positive effect on the richness of the research outputs.

4 RECOMMENDATIONS

Broad conclusions and pointers to the future

There are some clear conclusions arising from general consultations with a sample of the key users, practitioners and audiences in the archaeological and historic environment sector.

- The ALSF has opened up a source of funding and is pushing forward the research agenda in particular areas, enhancing baseline data and techniques, and approaches to archaeological resource management. Significant success stories mentioned by many consultees include Palaeolithic offshore projects, quarries like Lynford, Trent Valley, Rivers of South West; syntheses such as Thames through Time; as well as networks like The Ice Age Network.
- There is greater scope for new academic research and synthetic publications on places and landscapes, beyond the prehistoric period and the history of the aggregates extraction industry could be addressed in more detail
- Concerns focus more on the dissemination of research than the quality of it, although some individuals believed that longer time scales for some projects might yield even greater benefits
- Communication within each sector works well, with overlaps, transfer of skills and much partnership working. However it seems there is still more to be done through partnership and or dissemination of published material between the sectors
- The creation of networks and dissemination at academic level has been successful and with more forthcoming articles and monographs
- There is a greater variety of views on benefits within the contracting organisations and this variety is particularly associated with where they are located geographically and institutionally
- Curators firmly believe that they are benefiting from the regional boosting of baseline data. However there is more to be done to disseminate this strategic material down to this curatorial group. In general this group believes there would be further benefits and good outcomes from academic and strategic research if it was presented in a more accessible form
- There is a need to improve general accessibility to and promote the existence of web-based availability -ADS and the EH ALSF; but not at the expense of conventional publication
- As a whole, this 'knowledge society' is very aware of their relationship with wider audiences and their obligation and the benefits of sharing research with them, in particular the aggregates industry and local communities

The programme of research projects associated with the ALSF has evolved. In the early years, in addition to 'backlog ' publication and being the 'fund of last resort' for the excavation of threatened important sites in aggregates area, a generally fluid range of projects were undertaken. More recently the scope of this programme has become more defined, with greater emphasis on a clear link between the purposes of the aggregates industry and the outcomes and benefits of the research. In general, projects now look to the future, with the development of methods, synthesis, and the gathering of baseline information - all to aid prediction and management. This has countered some early concerns that the fund was disproportionately directed towards the academic and university sector, or that ALSF funds were being spent by, and largely for, the archaeological community.

Clarity regarding the scope of the funding programme has also contributed to the success of so many of the projects, resulting in not only clearer objectives and methods, but also the integration of the interests of the aggregates industry and the public at the development and inception stages of projects. The research projects have developed and assessed many new techniques, delivered a great deal of new information about the historic environment resources in aggregates areas and assisted the efficient and cost-effective management of assets and landscapes.

If there is a common thread running through the impacts and benefits of the very wide range of projects within the research projects, it is that they have brought disparate things together - partnerships and stakeholders; universities, planning authorities and the aggregates industry; generations and communities; techniques and professional disciplines; landscapes and regions; and artefacts, ecofacts and archaeological deposits; and old and new knowledge. However, although not a fundamental problem, there is a concern that some very ambitious projects which have aimed to be attractive to a number of sectors have failed to quite meet the needs of any of them. For example, The Thames Through Time project appears to be slightly too technical for a popular audience but provides too little detailed information for a technical audience.

While some projects have yet to be completed and published, and it is difficult to determine the real impacts of an initiative for some years afterwards, it is clear that benefits of the funding programme and research projects have already been wide and, in places, substantial. The new techniques and baseline information continue to inform the management of resources beyond aggregates areas – for whole regions or other landscape or asset types. Some projects have critically examined the efficacy of particular techniques such as the technique of seabed grab sampling. Other projects have resulted in good news stories for the aggregates industry, such as the UCL work on impact of extraction on built historic environment, which shows that impact is negligible. The concern to ensure that projects and results are of recognisable benefit to the aggregate industry as well as the historic environment sector seems generally to have ensured that the programme has resulted in little 'dead-end' knowledge. Rather the knowledge seems to have been readily taken up, used and put into action by all sectors, although some individuals in local authorities would like information to be disseminated to them in a more accessible form. Much new knowledge about the environment and how life was lived in the past has been created, forming the basis of publications, popular booklets, even television programmes, inspiring the public, communities and academia to ask new questions of archaeological material and landscapes.

The clearer definition of the scope of the programme has led some to comment that the objectives should be widened to incorporate a greater range of topics, period, asset types and methods. There is perhaps a need to provide a clearer explanation of the hypothecated nature of the funding and that the ALSF is not a fund for general archaeological research derived from a levy.

However, there is a more fundamental point relating the focus and direction of the research projects. While a general 're-loosening' of the scope and objectives would undermine many of the achievements of the programme, it may be that the clarity of focus, particularly related to prediction and methodology, has been at the expense of some of the more interpretative projects of the early days. Perhaps it is time to explore again whether there is a place in the programme for projects such as Sandhills, which generated little or no new baseline information nor developed new technological methods but instead explicitly used archaeological and other material to look at the social and domestic past, in this case, of a particular community. Clearly this may present challenges in 'making the case' to some ALSF stakeholders, particularly the aggregates industry. Yet, as some of the projects have demonstrated, very many quarry and aggregates workers have been involved and been fascinated by the archaeological material and stories that can emerge from the land that they work.

Specific recommendations

A number of specific recommendations can be made:

Funding

1. Continue to provide explanation of the purpose and hypothecated nature of the fund.
2. Maintain funding of last resort to ensure investigation and research of significant sites and landscapes insufficiently protected, or entirely unprotected, by planning conditions.

Research areas

3. Continue to develop research in priority areas for aggregates extraction. In particular, to develop baseline evidence of the historic environment at sea and aggregates landscapes resource assessments in priority terrestrial areas.
4. Explore the potential for making the case that some interpretive 'social' projects are as valid and relevant to the archaeological management and aggregates sectors as methodological and information-gathering projects.
5. Explore the potential for the development of an ALSF Research Council, in consultation with the aggregates industry, to develop and disseminate a strategic plan for the fund, to ensure that the programme continually benefits from an up-to-date overview of the research sector, and to assist in the identification of gaps in knowledge and new routes of enquiry, as well as the determination of funding applications.
6. Continue to consider the needs of the aggregates industry and archaeological and knowledge communities at the outset of all projects, but further explore how to ensure that projects which attempt to meet all these interests do not fail to quite satisfy any of them.
7. Capitalise on the innovative and productive partnership approach to research engendered by the ALSF and widen it to encompass natural, cultural and historic landscapes.
8. Allied to this, further encourage cross-disciplinary and inter-disciplinary research projects to enhance knowledge transfer.
9. Develop better mechanisms to ensure projects match local and regional historic environment research frameworks as well as ALSF priorities and objectives.

Access and dissemination

10. Improve access to, and sign-posting of, research outputs, and improve speed of dissemination and publication

APPENDIX

APPENDIX A1 - ROUTE MAP TO WEB RESOURCES

General information

ALSF Projects OnLine provides access to details of all projects funded by English Heritage through its Aggregates Levy Sustainability Fund (ALSF) scheme. There are currently nine reports available which can be searched for information by individual project, geographical location, site type, period, research theme or year of funding. Each report will generate a list of projects. From these you can access further details of each project. These in turn will provide access to more detailed project summaries and external websites where they exist. ALSF OnLine can be accessed at:
http://hec.english-heritage.org.uk/admisremote/ALSFOnline/HOME.ASP
Project summaries of many of the EH ALSF projects can be accessed directly at:
http://www.english-heritage.org.uk/server/show/nav.1320
Information on some EH ALSF projects can also be found in English Heritage's ALSF Annual Report, Extract at: http://www.english-heritage.org.uk/server/show/nav.1321

The Archaeology Data Service (ADS) is currently undertaking a year–long project to disseminate Aggregates Levy Sustainability Fund information on the web. The aim of the project is to disseminate and secure for the long term a key set of research and management documents produced for English Heritage by a wide range of ALSF funded projects. The ADS can be accessed at:
http://ads.ahds.ac.uk/catalogue/projArch/alsf/index.cfm

ALSF projects

The following list provides further details and links, where available, to information about the projects reviewed in the overview in this report (as 21/01/08). This is not a full list of all projects funded by the English Heritage ALSF over the last 6 years.

Terrestrial

Delivering to public and professional audiences the full benefits of knowledge gained through past work in advance of aggregates extraction

Site 'Backlog' projects

1499 Berinsfield, Mount Farm: Oxford Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.5202; http://thehumanjourney.net/ for details of forthcoming publication, Lambrick, G., Neolithic to Saxon social and environmental change at Mount Farm, Berinsfield, Dorchester-on-Thames

3212 Beckford, Worcestershire: Gloucestershire County Council Archaeology Service:
http://www.english-heritage.org.uk/server/show/ConWebDoc.6277;
http://www.gloucestershire.gov.uk/index.cfm?articleid=1949; monograph forthcoming.

3682 Wasperton Anglo-Saxon cemetery, Warks: York University: http://www.english-heritage.org.uk/server/show/ConWebDoc.4855; Wise, P.J., "Wasperton" in Current Archaeology (1991), no. 126, pp 256-9; monograph forthcoming.

3993 Weston Wood, Albury, Surrey: Surrey Archaeological Society: http://www.english-heritage.org.uk/server/show/ConWebDoc.6219

4698 Piercebridge Roman Site, County Durham: Durham County Council: http://www.english-heritage.org.uk/server/show/ConWebDoc.6876; http://www.durham.gov.uk/durhamcc/usp.nsf/pws/32CABFE608666A28802572FA003E56E9?opendocument

4770 West Stow, Lackford Bridge, Suffolk: Suffolk County Council: http://ads.ahds.ac.uk/catalogue/archive/weststow_eh_2007/

5220 Mucking – Prehistoric and Roman: Cambridge Archaeological Unit: http://www.english-heritage.org.uk/server/show/ConWebDoc.12455

5246 Blackstone, Worcestershire: Worcestershire County Council Historic Environment and Archaeology Service: http://www.english-heritage.org.uk/server/show/ConWebDoc.12342; journal article forthcoming.

Thematic landscape syntheses

3295 Lydd, Romney Marsh, Kent: Archaeology South East: http://www.english-heritage.org.uk/server/show/ConWebDoc.5232; http://www.archaeologyse.co.uk/index.htm for details of forthcoming publication Barber, L and Priestley-Bell, G. forthcoming Medieval Adaptation, Settlement and Economy of a Coastal Wetland: The Evidence from around Lydd, Romney Marsh, Kent.

3314 Thornborough N. Yorks: Neolithic and Bronze-Age monument complex: Newcastle University: http://thornborough.ncl.ac.uk/fieldwork_projects_2003.htm

3354 Gwithian, Cornwall: Excavations 1949-1963: Cornwall County Council Historic Environment Service: http://www.english-heritage.org.uk/server/show/ConWebDoc.5095; recently accessioned at: http://ads.ahds.ac.uk/catalogue/projArch/alsf/ search_list.cfm; Nowakowski. J.A., 'Life and Death in a Cornish Valley', British Archaeology, August 2006; article forthcoming Nowakowski, J et al., 'Return to Gwithian: Shifting the Sands of Time', Cornish Archaeology

3355 Cleveland Farm, Ashton Keynes, Wiltshire: Wessex Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.5189; http://ads.ahds.ac.uk/catalogue/archive/cleveland_eh_2007/

3380 Watermead Country Park, Birstall, Leicestershire: University of Leicester Archaeological Services: http://www.leics.gov.uk/country_parks_watermead; http://www.english-heritage.org.uk/server/show/ConWebDoc.5248; publication forthcoming.

3408 Neolithic and Bronze Age Landscape of Heslerton: Landscape Research Centre: http://www.english-heritage.org.uk/server/show/ConWebDoc.5398; journal article forthcoming.

3860 Archaeological cropmark landscapes of the Magnesian Limestone of South and West Yorks: Archaeological Services WYAS: http://www.english-heritage.org.uk/server/show/ConWebDoc.4931; http://www.arch.wyjs.org.uk/mlalsf/index.html

3276 Understanding the East London Gravels: Museum of London Archaeological Services: http://www.english-heritage.org.uk/server/show/ConWebDoc.5394; http://www.molas.org.uk/pages/projectsELG.asp; publication forthcoming.

3297 The finest prospect in all England: a history of South Essex from the first peoples to the Saxons: Essex County Council: http://www.english-heritage.org.uk/server/show/ConWebDoc.5392; http://www.finestprospect.org.uk/; Brown, N. & Massey-Ryan, R., "The Finest Prospect": The Archaeology of South Essex (Essex County Council, 2004)

3374 Archaeological Survey of Mineral Extraction Sites around the Thames Estuary: Essex County Council & Kent County Council: http://www.english-heritage.org.uk/server/show/conWebDoc.4145; http://www.finestprospect.org.uk/Finest%20Prospect/Finest%20Index.htm; http://ads.ahds.ac.uk/catalogue/archive/thamesagg_eh_2007/

3912 Thames through Time: Oxford Archaeology: -15 http://www.english-heritage.org.uk/server/show/ConWebDoc.5534; Booth, P. et al., Thames through Time: The Archaeology of the Gravel Terraces of the Upper and Middle Thames Valley: The Early Historical Period: AD1-1000 (Oxford Archaeology Thames Landscape Series, 2007); on forthcoming volumes see: http://thehumanjourney

Making existing finds accessible

5247/4776 Unlocking the Past: archaeology from aggregates in Worcestershire – HER: Worcestershire County Council Historic Environment and Archaeology Service: http://www.english-heritage.org.uk/server/show/ConWebDoc.6277; http://www.worcestershire.gov.uk/home/tourism/wcc-archaeology-agg

5825 Somerset Aggregates Lithics Assessment (SALsA): Somerset County Council Historic Environment Service: http://www.english-heritage.org.uk/server/show/ConWebDoc.4925; http://www.somerset.gov.uk/somerset/cultureheritage/heritage/projects/salsa/

Delivering an enhanced understanding of the Aggregates Industry and the Historic Environment to public and professional audiences

3334 Sandhills Project, Alderley Edge, Cheshire: University of Manchester: http://www.english-heritage.org.uk/server/show/ConWebDoc.5243; http://www.alderleyedge.manchester.museum/index.html; monograph forthcoming, Conlin Casella, E. & Croucher, S., The Alderley Sandhills Project: An archaeology of community life in (post-) Industrial England (Manchester University Press);

3350 Aggregate Extraction Related Archaeology in England: A Survey: University of Exeter: http://www.english-heritage.org.uk/server/show/ConWebDoc.5204; monograph forthcoming.

3555 Impact of Aggregate Extraction on the Historic Environment: University College London: http://www.english-heritage.org.uk/server/show/ConWebDoc.4952; http://www.ucl.ac.uk/sustainableheritage/aggregates.htm; http://ads.ahds.ac.uk/catalogue/archive/impagg_eh_2007/

3964 Aggregates Industry in the Trent Valley: A History and Archaeology: ARCUS, University of Sheffield: http://www.english-heritage.org.uk/server/show/ConWebDoc.5682; recently accessioned at: http://www.shef.ac.uk/arcus/index.html; http://ads.ahds.ac.uk/catalogue/projArch/alsf/search_list.cfm

4767 Quantifying past rescue excavations on aggregate sites: ARCUS, University of Sheffield: http://www.shef.ac.uk/arcus/index.html

4794 Isle of Portland Industrial Archaeology Survey: AC Archaeology

Reducing the physical impacts of current extraction where these lie beyond current planning controls and the normal obligations placed on minerals operators

2506 Scorton Quarry, Catterick: Northern Archaeological Associates: publication forthcoming.

2511 Flixton, Suffolk: Suffolk County Council: http://www.english-heritage.org.uk/server/show/ConWebDoc.5249;
http://www.suffolk.gov.uk/Environment/Archaeology/MineralsAndArchaeology/

2517 Willington, Derbyshire: University of Leicester Archaeological Services:
http://www.eng-h.gov.uk/archcom/projects/summarys/html98_9/cc2517.htm; journal article forthcoming.

2658 Cossington, Leicestershire: University of Leicester Archaeological Services: http://www.english-heritage.org.uk/server/show/ConWebDoc.10048; publication forthcoming.

3170 North Park Farm, Bletchingley: Surrey County Council:
http://www.english-heritage.org.uk/server/show/ConWebDoc.5618;
http://www.surreycc.gov.uk/sccwebsite/sccwspages.nsf/LookupWebPagesByTITLE_RTF/A+Mesolithic+site+at+North+Park+Farm+Quarry+Bletchingley?opendocument; monograph forthcoming.

3253 Lynford Quarry: Norfolk Archaeological Unit: http://www.english-heritage.org.uk/server/show/conWebDoc.3892; Boismier, W.A., 'A Middle Palaeolithic Site at Lynford Quarry, Mundford Norfolk: Interim Statement', Proceedings of the Prehistoric Society, vol. 69, 2003, p315ff.

3331 Southworth Hall Farm, Southworth, Cheshire: National Museums & Galleries, Liverpool:
http://www.english-heritage.org.uk/server/show/ConWebDoc.5396; journal article forthcoming.

3465 Lodge Farm, St Osyth, Essex: Essex County Council: http://www.english-heritage.org.uk/server/show/ConWebDoc.5250; Germany, M. et al, 'Neolithic and Bronze Age Monuments and Middle Iron Age Settlement at Lodge Farm, St. Osyth, Essex', East Anglian Archaeology, Report no.117 (Essex County Council, 2007)

4534 Town Quarry Farm, Burlescombe, Devon: Exeter Archaeology: journal article forthcoming.

4642 Woodbridge/Cheviot Quarry, Northumberland: Excavation and Interpretation: Archaeological Research Services Ltd: http://www.english-heritage.org.uk/server/show/ConWebDoc.5857; http://www.archaeologicalresearchservices.com/content/projects/ cheviotquarry.htm; article forthcoming, Johnson, B & Waddington, C., 'Prehistoric and Dark Age Settlement Remains from Cheviot Quarry, Milfield Basin, Northumberland', Archaeological Journal.

5171 Netherhills Quarry, Frampton-on-Severn, Glos: Gloucestershire County Council Archaeology Service: http://www.gloucestershire.gov.uk/index.cfm?articleid=13687; journal article forthcoming.

5379 Clifton Quarry, Clifton, Worcestershire: PPG16 Assistance: Worcestershire County Council Historic Environment and Archaeology Service: http://worcestershire.whub.org.uk/home/wcc-arch.htm; journal article forthcoming.

Addressing the effects of old mineral planning permissions

2590 Wellington Quarry, Marden, Herefordshire: Worcestershire County Council Historic Environment and Archaeology Service: http://www.english-heritage.org.uk/server/show/ConWebDoc.9303; http://worcestershire.whub.org.uk/home/wccindex/wcc-arch/wcc-arch-research/wcc-arch-surv/wcc-arch-surv-wellington.htm; monograph forthcoming.

3126 Hartshill, Berkshire: Cotswold Archaeological Trust: http://www.english-heritage.org.uk/server/show/ConWebDoc.5393; http://www.cotswoldarch.org.uk/annual_review_15/hartshill.htm; Collard, M. et al., 'Ironworking in the Bronze Age? Evidence from a 10th century BC settlement at Hartshill Copse, Upper Bucklebury, Proceedings of the Prehistoric Society, vol. 72, 2006.

3213 Spratsgate Lane, Somerford Keynes, Gloucestershire: Gloucestershire County Council Archaeology Service:http://www.english-heritage.org.uk/server/show/ConWebDoc.5427; http://ads.ahds.ac.uk/catalogue/archive/spratsgate_eh_2007/

3289 Bestwall Quarry, Dorset: AC Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.5207; http://www.bestwall.co.uk/ for details on project and publications; publication forthcoming Excavations at Bestwall Quarry, Wareham 1992-2005 (Dorset Natural History & Archaeological Society).

3369 Land south-west of Ripple, Worcestershire: Worcestershire County Council Historic Environment and Archaeology Service: http://www.english-heritage.org.uk/server/show/ConWebDoc.5401; http://ads.ahds.ac.uk/catalogue/archive/ripple_eh_2007/

3371 Retreat Farm, Grimley, Worcestershire: Worcestershire County Council Historic Environment and Archaeology Service: http://www.english-heritage.org.uk/server/show/ConWebDoc.5403; http://worcestershire.whub.org.uk/home/wcc-arch-field-retreat; http://ads.ahds.ac.uk/catalogue/archive/retreat_eh_2007/

3556 Coln Gravel, Fairford, Gloucestershire: Oxford Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.5824; http://ads.ahds.ac.uk/catalogue/archive/colngravel_eh_2007/; journal article forthcoming.

3694 Latton Lands Gravel Pit, North Wiltshire: Oxford Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.5827: journal article forthcoming.

4620 Valdoe Quarry, Sussex: University College London: http://www.english-heritage.org.uk/server/show/ConWebDoc.5827; http://matt.pope.users.btopenworld.com/boxgrove/valdoehome.htm; publication forthcoming.
Developing the capacity to manage aggregate extraction landscapes in the future Specific assets & landscapes

3342 Scowles Survey, Forest of Dean, Gloucestershire: Gloucestershire County Council Archaeology Service: http://www.english-heritage.org.uk/server/show/conWebDoc.4325; http://www.gloucestershire.gov.uk/index.cfm?articleid=3994;
Recently accessioned at: http://ads.ahds.ac.uk/catalogue/projArch/alsf/search_list.cfm

3897 Thornborough Henges: Air Photo Mapping: Archaeological Services WYAS: http://www.english-heritage.org.uk/server/show/nav.10712; http://ads.ahds.ac.uk/catalogue/archive/thornborough_ap_eh_2006/

4798 Forest of Dean Archaeological Survey: LiDAR Survey: Gloucestershire County Council Archaeology Service: http://www.gloucestershire.gov.uk/index.cfm?articleid=2446

River systems and associated landscapes

3282 Mapping the sub-surface drift geology of Greater London gravel extraction areas (Lea Valley): Museum of London Archaeology Service: http://www.english-heritage.org.uk/server/show/ConWebDoc.4951; http://www.molas.org.uk/pages/projectsLeaValley.asp; MoLAS publication forthcoming.

3307 Trent Valley Survey 2002: Trent Valley Geoarchaeology: http://ads.ahds.ac.uk/catalogue/archive/palaeo_eh_2006/; http://www.tvg.org.uk/; Knight, D. & Howard, A. Trent Valley Landscapes (Heritage Marketing & Publications Ltd, 2004); Baker, S., 'The Palaeochannel Record in the Trent Valley UK: contributions towards cultural heritage management', Internet Archaeology, vol. 20, 2007

3310 Middle Thames Northern Tributaries: Essex County Council http://ads.ahds.ac.uk/catalogue/archive/mtnt_eh_2007/

3325 Till-Tweed Catchment Aggregates and Archaeology Project: Newcastle University & Archaeological Research Services: http://www.ncl.ac.uk/till-tweed/main/; monograph forthcoming.

3333 Late Quaternary Landscape History of the Swale-Ure Washlands: University of Durham & Lower Ure Conservation Trust: http://www.english-heritage.org.uk/server/show/ConWebDoc.5226; http://www.geography.dur.ac.uk/projects/swale-ure; http://www.luct.org.uk/swale.asp; monograph forthcoming.

3349 Where Rivers Meet: Landscape, Ritual, Settlement and the Archaeology of River Gravels: University of Birmingham: http://www.english-heritage.org.uk/server/show/ConWebDoc.6894; http://ads.ahds.ac.uk/catalogue/archive/where_rivers_meet_eh_2006/; monograph forthcoming.

3361 Archaeological potential of secondary contexts: University of Southampton:
http://www.english-heritage.org.uk/server/show/ConWebDoc.5229;
http://www.arch.soton.ac.uk/Research/Aggregates/arch-intro.htm;
http://ads.ahds.ac.uk/catalogue/archive/apscontexts_eh_2007/index.cfm?CFID=19846&CFTOKEN=79828884
for report, article and full list of publication and dissemination activity.

3495 The Lower & Middle Palaeolithic occupation of the Middle & Lower Trent catchment: University of Durham:
http://www.english-heritage.org.uk/server/show/ConWebDoc.4956;
http://www.tvg.bham.ac.uk/palaeolithic/index.html;
Recently accessioned at: http://ads.ahds.ac.uk/catalogue/projArch/alsf/search_list.cfm; monograph forthcoming.

3850 Trent Valley Geoarchaeology: University of Birmingham:
http://www.english-heritage.org.uk/server/show/ConWebDoc.6800;
http://www.tvg.bham.ac.uk/; journal article forthcoming.

3836 Medway Valley Palaeolithic Project: Southampton University:
http://www.english-heritage.org.uk/server/show/ConWebDoc.8753;
http://ay-dehus.soton.ac.uk:8080/MedwayValley/welcome/index.php;

3847 Palaeolithic Rivers of South-West Britain: University of Exeter & University of Reading:
http://www.english-heritage.org.uk/server/show/ConWebDoc.4953;
http://www.personal.rdg.ac.uk/~sgs04rh/SWRivers/arch-intro.htm;
Recently accessioned at: http://ads.ahds.ac.uk/catalogue/projArch/alsf/search_list.cfm

4771 Suffolk River Valleys and aggregate extraction: Suffolk County Council:
http://www.suffolk.gov.uk/Environment/Archaeology/MineralsAndArchaeology/SuffolkRiverValleysProject.htm;
monograph forthcoming.

4814 Late Quaternary Environmental and Human History of the Lower Tees: University of Durham

5266 Lower and Middle Palaeolithic of the Fenland Rivers of Cambridgeshire: University of Durham

3336 Lower Lugg Valley Archaeology and Aggregates Resource Assessment, Herefordshire:
http://www.english-heritage.org.uk/server/show/ConWebDoc.9805;
http://ads.ahds.ac.uk/catalogue/archive/lugg_eh_2007/

3928 Aggregate Extraction and the Geoarchaeological Heritage of the Ribble Valley: Oxford Archaeology North & University of Liverpool: http://www.liv.ac.uk/geography/research/ribble/index.htm;
http://ads.ahds.ac.uk/catalogue/archive/ribble_eh_2007/

3453 Nene Valley: Archaeological and Environmental Synthesis: Northamptonshire Archaeology (Northamptonshire County Council): http://www.english-heritage.org.uk/server/show/ConWebDoc.4937

4831 Colne Valley Park Historic Landscape Characterisation: Groundwork Thames Valley: http://www.english-heritage.org.uk/server/show/ConWebDoc.9464; http://ads.ahds.ac.uk/catalogue/archive/colne_eh_2007/

4832 NMP: Leadon and Severn Valleys: Gloucestershire County Council Archaeology Service: http://www.english-heritage.org.uk/server/show/nav.17640

5301 Severn bank-side and foreshore rapid survey: Worcestershire County` Council Historic Environment and Archaeology Service: http://www.english-heritage.org.uk/server/show/ConWebDoc.12339

3041 Vale of York Assessment of Alluviated Landscapes: York Archaeological Trust: http://www.english-heritage.org.uk/server/show/ConWebDoc.8736; articles forthcoming.

3409 Characterising, modelling and managing the buried landscape in the Vale of Pickering: Landscape Research Centre: http://www.english-heritage.org.uk/server/show/ConWebDoc.5227; http://www.landscaperesearchcentre.org/AB%20Tier%202%20Project%20Parent%20Pages/3409.htm

Sub-regional aggregate resource assessments

3346 Gloucestershire – assessment of archaeological resource in aggregate areas http://www.gloucestershire.gov.uk/index.cfm?articleid=7795

3430 Hertfordshire Mineral Local Plan Review: Historic Environment Assessment: Hertfordshire County Council: http://www.english-heritage.org.uk/server/show/ConWebDoc.5247

3966 Worcestershire Resource Assessment: Worcestershire County Council Historic Environment & Archaeology Service and Cotswold Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.4926; http://worcestershire.whub.org.uk/home/wcc-archaeology-aggregates; http://ads.ahds.ac.uk/catalogue/archive/worcsagg_eh_2007/;

3987 Suffolk – assessment of archaeological resource in aggregates areas: Suffolk County Council: http://www.suffolk.gov.uk/Environment/Archaeology/MineralsAndArchaeology/ Monograph forthcoming.

3994 The Aggregate Landscape of Somerset: predicting the archaeological resource: Somerset County Council: http://www.english-heritage.org.uk/server/show/ConWebDoc.4925; http://ads.ahds.ac.uk/catalogue/archive/somersetaggs_eh_2007/

4633 Lincolnshire – assessment of archaeological resource in aggregates areas: Lincolnshire County Council: http://www.lincolnshire.gov.uk/section.asp?catid=12119&docid=50917

4681 Warwickshire – assessment of archaeological resource in aggregate areas: Warwickshire County Council: http://www.english-heritage.org.uk/server/show/ConWebDoc.6253; http://www.warwickshire.gov.uk/Web/corporate/pages.nsf/Links/8D5B48D69F4E05D4802571940055981E

4766 Hampshire- assessment of archaeological resource in aggregates areas: Cornwall County Council, Historic Environment Service: http://www.english-heritage.org.uk/server/show/ConWebDoc.6222

4778 Durham – an assessment of archaeological resource in aggregates areas http://www.durham.gov.uk/durhamcc/usp.nsf/pws/9086033D77F63941802572AC002F63FB?opendocument
4828 East Riding of Yorkshire – assessment of archaeological resource in aggregate areas: Humber Archaeology Partnership: http://www.english-heritage.org.uk/server/show/ConWebDoc.12416

5229 Aggregate Landscapes of Derbyshire and the Peak District: Managing the Archaeological Resource: Derbyshire County Council & Archaeological Research Services Ltd: http://www.archaeologicalresearchservices.com/

5241 Norfolk – Assessment of Archaeological Resource in Aggregate Areas: Norfolk County Council: http://museums.norfolk.gov.uk/default.asp?Document=600

5288 Potential aggregates, palaeoenvironmental and archaeology of the Vale of Pickering: The Landscape Research Centre: http://www.landscaperesearchcentre.org/

5319 East Sussex – assessment of archaeological resource in aggregate areas: East Sussex County Council

Conservation management planning

3260 Cotswold Canals Restoration project Heritage Survey: British Waterways: http://www.english-heritage.org.uk/server/show/ConWebDoc.5241;http://www.cotswoldcanalsproject.org/general.asp?pid=2&pgid=169

3575 Peak Forest Tramway and Cromford and High Peak Railway Derbyshire: Heritage Audit: ARCUS University of Sheffield: http://www.english-heritage.org.uk/server/show/conWebDoc.4078

2175 Creswell Crags: Management of Pleistocene Archives and Collections: Cresswell Heritage Trust: http://www.eng-h.gov.uk/archcom/projects/summarys/html98_9/cc2175.htm; http://www.creswell-crags.org.uk/CHT/The_Trust/Current_projects.htm#Pleist; http://ads.ahds.ac.uk/catalogue/archive/creswellcrags_eh_2006/

3426 Creswell Crags Limestone Heritage Area – Management Action Plan: Creswell Heritage Trust: http://www.english-heritage.org.uk/server/show/conWebDoc.4112; http://www.creswell-crags.org.uk/index.html

3718 Lead Rakes: Peak District National Park Authority: http://www.peakdistrict.org/index/looking-after/bap/lead.htm Barnatt, J. & Penny, R., The Lead Legacy: The Prospects for the Peak District's Lead Mining Heritage (PDNPA, 2004)

3719 Breedon-on-the-Hill: Conservation Plan: Leicestershire County Council: http://www.leics.gov.uk/index/community/community_services/environment_and_heritage/hne_team.htm

3844 Titterstone Clee Project, Shropshire: University of Birmingham: http://www.iaa.bham.ac.uk/staff/white.htm

3845 Thornborough Moor & Landscape: English Heritage (Yorks Region): http://www.english-heritage.org.uk/server/show/nav.10712; http://wwwtest.northyorks.gov.uk/m403_0.pdf

3895 Kendall Fell quarry, Kendall Cumbria: Oxford Archaeology North: http://ads.ahds.ac.uk/catalogue/archive/kendal_eh_2007/

5324 RAF Hornchurch, Hornchurch Country Park and Ingrebourne Valley Reserve: Havering Borough Council: http://www.rafhornchurch.thehumanjourney.net/index.htm

Maritime

Developing the capacity to manage offshore and coastal aggregate extraction landscapes in the future

Developing Standards, guidance & databases to support planning related work

3322 Artefacts from the Sea: Wessex Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.5671; http://www.wessexarch.co.uk/projects/marine/alsf/artefacts_sea/artefacts_sea.html; http://ads.ahds.ac.uk/catalogue/archive/artefactssea_eh_2007/

3323 England's Shipping: Wessex Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.5672; http://www.wessexarch.co.uk/projects/marine/alsf/englands_shipping/index.html; http://ads.ahds.ac.uk/catalogue/archive/englandship_eh_2007/

3767 On the importance of shipwrecks: Wessex Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.4959; http://ads.ahds.ac.uk/catalogue/archive/shipwrecks_eh_2006/

3968 Severn Estuary: assessment of sources for appraisal of impact of maritime aggregate extraction: Museum of London Archaeology Service: http://ads.ahds.ac.uk/catalogue/archive/severnaggregate_eh_2007/

4740 Assessment of Archaeology within Marine Aggregate Environmental Statements: Hampshire & Wight Trust for Maritime Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.6475; http://ads.ahds.ac.uk/catalogue/archive/aama_eh_2007/

3916 Enhancing Our Understanding: Identifying Shipwrecks of Historic Importance lying within Deposits of Marine Aggregate: Bournemouth University: http://www.english-heritage.org.uk/server/show/ConWebDoc.5825 http://ads.ahds.ac.uk/catalogue/archive/understanding_eh_2007/

3917 Enhancing Our Understanding: Navigational Hazards: University of Bournemouth: http://www.english-heritage.org.uk/server/show/ConWebDoc.5426; http://ads.ahds.ac.uk/catalogue/archive/navigation_eh_2007/

Understanding, Characterising and managing the marine historic environment

3277 Submerged Palaeo-Arun & Solent Rivers: Reconstruction of Prehistoric Landscapes Pt2: Imperial College London: http://www.english-heritage.org.uk/server/show/ConWebDoc.5426; Recently accessioned at: http://ads.ahds.ac.uk/catalogue/projArch/alsf/search_list.cfm; articles including Gupta, S. et al., 'Catastrophic flooding origin of shelf valley systems in the English Channel', Nature 448, 342-5.

3362 Re-assessment of the archaeological potential of continental shelves: University of Southampton: http://www.english-heritage.org.uk/server/show/ConWebDoc.5231; http://www.arch.soton.ac.uk/Research/Aggregates//shelve-intro.htm; Recently accessioned at: http://ads.ahds.ac.uk/catalogue/projArch/alsf/search_list.cfm; publication forthcoming.

3876 Seabed Prehistory R2: Wessex Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.11150; http://www.wessexarch.co.uk/projects/marine/alsf/seabed_prehistory/index.html

3877 Wrecks on the Seabed R2: Wessex Archaeology: http://ads.ahds.ac.uk/catalogue/archive/wrecks_eh_2006/; http://www.wessexarch.co.uk/projects/marine/alsf/wrecks_seabed/index.html

4600 Happisburgh/Pakefield exposures: Wessex Archaeology: http://www.english-heritage.org.uk/server/show/ConWebDoc.5820

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