Data supply and Reconciliation between NRHE and HERs

(EH 6953)

End-of-Project Report

Document-control grid:

Title	Data Supply and Reconciliation between NRHE and HERs – End-of-Project Report
Author(s)	Nick Boldrini, Durham County Council (**E-conference with HER Forum**) Chris Webster, Somerset County Council (**Analysis of sample NRHE and HER data**) Andrew Minting, Wiltshire Council (**Workshop with HER Officers**) Crispin Flower, exeGesIS SDM Ltd (**Suggested methodologies**) Graham Tait, Devon County Council (**Other sections**)
Derivation	From Project Proposal, Project Plan and meeting with Project Team
Origination Date	27th January 2015
Reviser(s)	Graham Tait
Date of last revision	27th February 2015
Version	6.0
Status	Final
Summary of Changes	Incorporating comments from English Heritage.
Circulation	To English Heritage
Required Action	
File Name/Location	Devon County Council file store: P:\Culture\Archaeology\HER\HER development\English Heritage\Data supply and Reconciliation between NRHE and HERs\9. Project Report\Project Report v6.docx
Approval	

Project name:

Data Supply and Reconciliation between NRHE and HERs

Project Closure date:

13th February 2015

Executive Summary

Historic Environment Information is currently held by local Historic Environment Records (HERs) as well as by English Heritage within the National Record of the Historic Environment (NRHE).This project researched and discussed the issues that would be involved in supplying NRHE data to HERs and the reconciliation necessary to achieve this. Wide consultation with HER Officers and other interested parties took place. There was overwhelming support to undertake this process in principle, and a broad consensus on how best to do this (manual accessioning assisted by web-based resources). Concerns were however raised about the resources necessary to undertake this process. A costed Project Design has been written for a potential

second phase of work to develop a working prototype and identify the resources and criteria required to carry out this process.

Introduction

At present, historic environment information about archaeology and buildings is held by local Historic Environment Records (HERs) as well as by English Heritage (EH) within the 'National Record of the Historic Environment' (NRHE).

About HERs

Most local HERs are held by Local Authorities or National Parks. There are currently over 80 HERs in England alone. They often also have their origins in the Ordnance Survey Archaeology Division record cards, and have been updated with the results of archaeological and building recording undertaken as part of development work (including data captured by the Online AccesS to the Index of archaeological investigationS (OASIS) project), as well as other local fieldwork, recording and projects. Nearly all HERs record historic environment Monuments, Events and Sources, and the links between these.

About NRHE

The NRHE is a national record of the historic environment, including archaeological, historic buildings and maritime data. The NRHE event record also contains information on all Aerial Photographic projects (site based and large area National Mapping Programme (NMP) work) carried out by Royal Commission on the Historical Monuments of England (RCHME), EH and NMP contractors. The data is held on the 'AMIE' database, and the information contained within it is available online at www.pastscape.org.uk.

The monument and building data in the NRHE originated from Ordnance Survey Archaeology Division record cards (from the 1950s onwards), National Buildings Record (from the 1940's onwards), RCHME surveys (buildings and archaeology), internal RCHME maritime projects, desk based research within EH/RCHME and other external datasets from projects. It includes information on events including historical archaeological investigations, as well as records of all architectural surveys undertaken by EH/RCHME or deposited in the EH Archive, as well as data captured by the OASIS project.

There is currently no mechanism for English Heritage staff (and contractors working in English Heritage offices) to input monument data or mapping data into HERs.

About the Heritage Information Access Strategy and this project

The Heritage Information Access Strategy (HIAS)[1] is an initiative intended to secure an improved and more cost effective approach to the handling of digital historic environment data by English Heritage and its partners in Local Authority Historic Environment Records. The initiative is intended to resolve long-standing issues of complexity and duplication of effort in the management of and access to Historic Environment Information nationally in order to improve its utility and attractiveness to users and provide enhanced support for the planning system. (A Strategy for Heritage Information Access: a proposal by English Heritage).

In order to begin to develop a strategic approach to this broad vision with the historic environment sector, English Heritage has proposed eight key principles. Principle 1 states that

[1] English Heritage, 2014-2015.

"Local Authority HERs should be the first point of call for and primary trusted source of investigative research data and knowledge"

If this is taken forward, the implication is that HERs should therefore hold and manage information about terrestrial (i.e. on land – as opposed to maritime) undesignated monuments and events (as well as information about designated sites additional to that in the statutory entry), currently contained within the English Heritage 'National Record of the Historic Environment' (NRHE).

The project was funded by English Heritage's National Heritage Protection Commissions Programme. It was managed by Graham Tait (HER Officer, Devon County Council), and the Project Executive was Dr Gillian Grayson (Head of Heritage Data Management, Designation Department, English Heritage, but acting as Convenor of the Forum on Information Standards in Heritage (FISH)).

The Project Team consisted of: Graham Tait (Devon HER), Chris Webster (Somerset HER), Crispin Flower (exeGesIS SDM Ltd), Nick Boldrini (Durham HER), and Andrew Minting (Wiltshire Council Conservation Officer).

Aims and Objectives

The project's aims and objectives were

1. to research and discuss the issues and methodologies that would be involved in the data supply and reconciliation of NRHE data to HERs.
2. to recommend, investigate and test various methodologies.
3. to develop a costed Project Design for the potential second phase of work.

Methodology

The project's approach was to facilitate discussion of issues and possible options between the key stakeholders. The aim was to devise a number of methodologies for data export/import and reconciliation, explore their advantages and disadvantages and agree a preferred approach. To achieve this, the project had a number of stages, numbered as below:

Stage 1. Project Team set-up meeting

The Project Team met on 20th June 2014 to discuss the project, and agree the detailed project methodology. At this meeting, the next project stages were planned in more detail.

Stage 2. Meeting with English Heritage

A meeting with English Heritage was held on 12th September 2014, and was the a first key step in developing a shared understanding of NRHE and HER data and systems and beginning the process of identifying potential methodologies for data import/export and reconciliation.

Stage 3. Analysis of sample NRHE and HER data

In order to understand the data, their degree of overlap and their differences, a number of members of the Project Team carried-out an analysis of HER and NRHE data. For sample areas, this involved examining the numbers of records, as well as the information contained within the records to see how much and what information would need to be transferred.

Stage 4. Suggested methodologies

Members of the project team devised different methods that could be used to undertake this work. Three methods were suggested.

Stage 5. Workshop with HER Officers

A workshop with HER officers about import and reconciliation of NRHE data into HERs was held on 6th November 2014 in Birmingham. This was undertaken to get a good understanding of the issues involved in this project from HER Officers.

Stage 6. E-conference with HER Forum

In November 2014 an e-conference was held on the HER Forum Email List. This continued the workshop discussion amongst a wider audience; with more HER officers and other interested parties taking part.

Stage 7. Discussion with other projects and organisations

Liaison took place with a number of other organisations and projects, to gain a wider understanding of the issues raised by this project. Discussions with the Association of Local Government Archaeological Officers (ALGAO) UK HER Committee, the English Landscape and Identities Project (EngLaID) and HER Forum all took place over 2014/2015.

Stage 8. Meeting with Project Team

The Project Team met on 26th January to discuss the outcomes of the project and to look at ways of taking this project forward. This included agreement on the contents of this Project Report and discussing the Project Design.

Stage 9. Project Report

This Project Report was written, commented on by the Project Team and revised.

Stage 10. Project Design for the next stage

A Project Design has been written for the next stage.

These stages are described in the following 10 numbered sections.

1 Project Team set-up meeting

The Project Team met on 20th June 2014 to discuss the project, and agree the detailed project methodology. The next project stages were planned in more detail, in particular Stage 2 – meeting with English Heritage, and Stage 3 – analysing sample NRHE and HER data.

2 Meeting with English Heritage

The meeting with English Heritage was a first key step in developing a shared understanding of NRHE and HER data and systems and beginning the process of identifying potential methodologies for data import/export and reconciliation. It was attended by members of the Project Team and colleagues from Designation Department's Heritage Data Management team, Heritage Protection Department and Information Management Technology Department. The meeting involved a series of presentations and discussions and proved invaluable in establishing the common understanding necessary to take the project forward. Notes from the meeting are available and can be accessed alongside this report.

Before the project started, it was assumed that there was much data within the NRHE that was also in HERs (i.e. duplication); but that there was also key data within the NRHE that wasn't contained within HERs. The key action from the meeting was to carry out an analysis of NRHE and HER data, which could then inform discussions at the planned workshop and e-conference. The analysis would investigate how much data was duplicated, and how non-duplicated data could be incorporated within HERs. The results are presented below.

3 Analysis of sample NRHE and HER data

This stage of the project was to compare HER and NRHE data. This part of the project consisted of examining sample areas to study the exact composition of HERs and the NRHE.

3.1 Dataset origins

As described above, both the NRHE and the HERs often have similar origins based on the Ordnance Survey Archaeology Division record cards but have diverged subsequently. The principal causes of this divergence can be characterised by the national/local remit of the records. The NRHE has been enhanced by the addition of RCHME and English Heritage projects (such as the incorporation of the National Buildings Record; survey team projects, both air and ground; and maritime data). The HERs have been enhanced by the addition of evidence collected during development work, local fieldwork, national and local enhancement projects and also from outreach activity and volunteer work. Archaeological events have similarly been accessioned by different routes, NRHE by enhancement of the excavation index and OASIS; HERs by their close connection with the planning process, including OASIS.

Various attempts have been made over the years to 'data exchange' and this has paradoxically increased the complexity of the relationship between the datasets, rather than simplifying it.

3.2 Sample data analysis

Three sample areas, later supplemented by a fourth in Warwickshire, were compared to assess the degree of overlap between the records of the NRHE and the relevant HER. Ten kilometre squares were selected in Devon, Durham and Somerset chosen to cover a variety of landscapes in each case. Monument data for the areas was supplied from the NRHE as Excel spreadsheets for the text and ESRI shapefiles for the geographical information. Event data was obtained from Excavation Index data obtained from the Heritage Gateway website.

All the analyses were considered only in terms of the proposed direction of travel of data, i.e. NRHE to HER.

The Geographical Information System (GIS) data was compared visually and concordances recorded between the national and local datasets. Sites that did not feature in both records were examined to assess the reasons for non-concordance and some additional work was done on the Somerset and Warwickshire datasets to assess the amount of work involved in updating the HER from NRHE data.

The headline results from the concordance exercise are shown in the table below. This shows the total number of Monuments and Events recorded within the four sample areas.

	Devon	**Durham**	**Somerset**	**Warwickshire**
Numbers of Monuments				
HER	1275	353	595	811
NRHE	144	180 (171 mapped)	328 (317 mapped)	241
Cross referenced[2]	97 (7.6%)	78 (22%)	203 (34%)	34 (4.2%)
New to HER[3]	12 (1%)	<77 (22%)	42 (7%)	86 (11%)
Numbers of Events				
HER	42	77	105	282

[2] Cross-referenced percentages are relative to the number of HER records. This was based on direct linkages (the cross-reference stored in the other dataset) and common linking data (principally the Ordnance Survey record card number).
[3] New to HER percentages are relative to the number of HER records.

NRHE	29	64	73	159

The project team also examined the NRHE data in more detail. This showed that the only a small number of NRHE records had HER cross-reference numbers recorded; 3 of the 144 NRHE records in the Devon area, 13 of the 180 records in the Durham area (of which 3 were incorrect – one due to HER changes), and 85 of the 328 in the Somerset area (of which 2 were incorrect in a 10% sample).

3.3 Sample updating of HERs from NRHE data

A sample of the NRHE monuments in Somerset and Warwickshire were examined in more detail to see what information contained within the NRHE record could be transferred to the HER; thereby updating the HER. The results of this are shown below:

3.3.1 Somerset

A 10% random sample (32) of the NRHE monument records from the Somerset sample was directly compared to the Somerset HER to see what information would need to be transferred.

- 5 were identical as they were both National Mapping Project entries
- 20 (63% of the sample) had nothing to add
- 4 (13%) were new and would need to be added to the HER
- 2 (6%) had some information to add to the HER

If the sample is representative, it would suggest that the 13,029 NRHE records in Somerset (this includes the part in the Exmoor National Park HER) would produce 1630 new HER entries and 814 amended entries.

3.3.2 Warwickshire

The entire sample area of NRHE monument records was directly compared to the HER records, which took about 4-5 days. Most of the “new to HER” records were for areas where the HER is known to be weak, such as aircraft crash sites and listed buildings (only the designation is currently in the HER). The NRHE data appeared to record grid references to the centre of the grid square rather than the south-west corner as used by the HER. There also appeared to be discrepancies between supplied NRHE GIS data and previously supplied NMP data, the former appeared to have been degraded from the latter. Overall there were:

- 47 (20% of NRHE data) new records to be added to the HER.
- 130 (54%) records matched but had nothing to add.
- 20 (8%) records that matched and had additional information.
- 5 (2%) records had the wrong location
- 39 (16%) new records were not added to the HER (as Warwickshire HER does not prioritise recording all listed buildings as monuments, instead accessing designations data recorded in the Designations Module of the HER instead)

3.4 Analysis results

The test reconciliation showed that, in the areas sampled, the issue is not the amount of data to be transferred from the NRHE to the HERs, the problem lies in identifying it. There are clear areas where the NRHE data will contain many new records, for instance building records by English Heritage and the former RCHME, and also areas of National Mapping Project where these have not already been accessioned

into the relevant HER. In these areas it might be possible to manage an automatic data transfer, but most records in the NRHE would require individual examination in order to decide the most appropriate data transfer mechanism. A rough up-scaling from the Warwickshire test would suggest that this work would require between 5000-6000 person days to complete for the whole of England.

4 Suggested methodologies

Crispin Flower (exeGesIS SDM) worked with Nick Boldrini (Durham HER and chair of Bespoke HER Users Group) to assess the various technical methodologies that could be employed in transferring and reconciling NRHE data into HER databases. They took into account the various factors affecting those HERs using HBSMR and those with bespoke systems. Options were presented to the Birmingham workshop and the e-conference (see below), in order to help the participants discuss and assess the viability of such a data transfer, and to identify which options merited further investigation.

Three options were suggested:

a) Full automated import

b) Managed/supervised import

c) Manual accessioning

These are explored in more detail below:

4.1 Full automated import (A)

A fully automated import process would require minimal intervention from the HER staff during the import process, then an extended period of manual checking/cleaning. It could work along the following lines:

1. Editing of the terrestrial NRHE stops.
2. The relevant NRHE data is supplied to each HER in an agreed digital format (e.g. Extensible Markup Language (XML)).
3. The HER runs an application that imports all of the supplied data into their database/GIS.
4. Matches with existing records are flagged wherever possible, based on shared identifiers, shared space-time, etc.
5. Imported records are flagged as such.
6. The HER Officer checks and cleans the new data over the subsequent days/months/years.

4.2 Managed/supervised import (B)

A managed/supervised import process would require the involvement of the HER staff in making decisions during a more extended import process, in order to improve the result and reduce the amount of manual checking/cleaning. It could work along the following lines:

1. Editing of the terrestrial NRHE stops.
2. The relevant NRHE data is supplied to each HER in an agreed format.
3. The HER has an application that allows them to preview all of the new data and make decisions about each record, e.g. import or reject.
4. The application allows them to import/push data into their main database/GIS once decisions have been made.
5. Matches with existing records are flagged wherever possible, based on shared identifiers, shared space-time, etc.
6. Imported records are flagged as such.
7. The HER Officer checks and cleans the new data over the subsequent days/months/years.

4.3 Manual accessioning (C)

A manual accessioning approach would require HER staff to add the NRHE data to the HER through their normal user interfaces, copying from a definitive web-based view of the NRHE data. Each NRHE record would be signed off and correlated with HER record IDs.

1. Editing of the terrestrial NRHE stops.
2. The NRHE data is published as GIS layer(s) with a linked web page giving the full data for every record. These are made available as both data files and Open Geospatial Consortium (OGC) web services.
3. The NRHE records are also searchable within the web site, through an interactive map and filtered/pages lists.
4. The HER views the GIS data within their normal GIS interface, with hyperlinks to the relevant web pages.
5. The HER manually imports data from the web page (and GIS dataset) into their database by copying and pasting, and when done they sign the record off and enter their unique identifier(s) on the web page.
6. Signed-off records disappear from the default GIS feed, but can still be accessed if desired.

4.4 Pros and cons of the method options

The following were identified as the advantages and disadvantages of each method:

Method	Advantages	Disadvantages
Full automated import (A)	• Achieves quick transfer of data • All data is accounted for (maybe)	• Creates serious duplication of data within the HER • Technically challenging even for HBSMR • Bespoke systems each need bespoke solution • No national view of progress • Data degradation inevitable • Difficult workflows for data checking and cleaning
Managed/ supervised import (B)	• Achieves quick transfer of data, depending on HER choices • Helps avoid creation of serious duplication in HER • Gives HER Officer more control	• May still create duplication • Even more technically challenging • Bespoke systems each need bespoke solution • Data may be dropped • Relatively slow transfer • No national view of progress • Data degradation inevitable • Difficult workflows for data checking and cleaning
Manual accessioning (C)	• Technically simple to implement for all HERs • Simple workflow for HER staff • Avoids creation of duplication in HER • Gives HER staff full control	• Data may be dropped • Relatively slow transfer

	• National tracking of progress and accountability • Complete concordance established with legacy NRHE records	

5 Workshop with HER Officers

5.1 About the workshop

The next stage in the project was a workshop with HER officers to discuss import and reconciliation of NRHE data into HERs. This was held on 6th November 2014 at the Bond Centre in Birmingham and was attended by 28 people, including the project team and members of English Heritage staff. Of the attendees, 21 were HER officers.

The purpose of the workshop was to consider the implications behind the supply and reconciliation of data between the NRHE and local HERs, with the following specific objectives:

- to decide whether the case for supply and reconciliation was justified
- agree the essential and desirable criteria, and
- identify the most effective and efficient methodology

Notes from the workshop are available and can be accessed alongside this report.

5.2 What led us to this point? and How do things work at the moment?

The workshop commenced with talks by EH staff to provide context for the project. Gill Grayson (EH) discussed the background of the project and the Heritage Information Access Strategy (HIAS). Martin Newman (EH) gave a history of the NRHE, then described the technical challenges facing the current system and the need for change, and provided a demonstration of the AMIE database. Chris Webster (Somerset HER) summarised the results of the data concordance exercise carried out by Devon, Durham, Somerset and Warwickshire, described in 'Analysis of sample NRHE and HER data' (above).

5.3 Good idea or not?

Brief table discussions were held and recorded to assess initial reactions to the proposal, and to answer the question – 'Was it a good idea or not?' The discussions included concerns about resources for implementation, praise for the reduction in duplication of effort, and a belief that the project would raise the profile of HERs. Several questions were also asked regarding communication of HIAS.

A second discussion session concluded the morning, with each table tasked with a different issue to assess by Strengths, Weaknesses, Opportunities, Threats (SWOT) analysis on the principle of 'supply and reconciliation'. These were 'Audiences', 'Managing Organisations', and 'The Safety and Integrity of the Data'. Tables each recorded several items under each heading, and those considered to be the most important are listed below.

5.4 SWOT results – Audiences:

Strengths: • Data all in one place • No duplication of effort/data	**Weaknesses:** • Variability in accessibility
Opportunities: • One stop shop for access to local HER data (e.g. through Heritage Gateway) • To promote & reinforce status of HERs	**Threats:** • Local service resources and capacity • Some HERs may not get around to reconciliation of data

SWOT results – Managing Organisations:

Strengths: • Reduction of effort over time • Clarifies responsibilities	**Weaknesses:** • Cost (resources & human time/effort) • Current Information technology (IT) infrastructure inadequate
Opportunities: • Dataflow improvements • Stimulus towards improved IT infrastructure	**Threats:** • Current climate – lack of resources

5.5 SWOT results – Safety and Integrity of the Data:

Strengths: • Data into planning process • HER becomes more important nationally, strengthens role	**Weaknesses:** • Time and effort taken to transfer data • Variability of local policies
Opportunities: • Better opportunity for local knowledge and custodianship • Opportunity for 'open' data	**Threats:** • Variable state of HERs • Copyright/rights management issues with NRHE

5.6 Other comments:

- There would be benefits for HERs and also for their audiences. The participants were very keen that audience needs should not be forgotten.
- There was an opportunity to address some of the current weaknesses, but there would be real challenges and difficulties in getting there.
- The level of detail accessible to users needs to be looked-at. This had implications for the Heritage Gateway in terms of the level of detail accessible and the HIAS proposal to redesign the Heritage Gateway website.

5.7 What are the implications of not doing it?

Discussions then focused on the implications of not proceeding with the project, with the unanimous response that the existing problems and issues would deteriorate and audiences would become increasingly dissatisfied. The critical opportunity to improve the profile of HERs, especially within their local authorities, would be missed and the potential for gaining statutory status might be weakened. However, concerns were widely raised regarding the timescales anticipated for implementing the project and the resources available to make this possible.

A show of hands demonstrated overwhelming support for the project proceeding.

5.8 Essential and desirable criteria

The next session sought views from the three tables on a prepared list of 23 criteria. These criteria were principles or tasks that needed to be undertaken if this project went-ahead.

Feedback on this section of the workshop showed that while some of the criteria were clear, others were more nuanced and due to how they were interpreted different answers were given.

The following criteria and tasks to be met were supported by all groups:

- Consultation with all HERs about an achievable timescale and requirements for this project.
- Identification and provision of resources to support the project.
- HERs need to be considered the first point of call for, and primary trusted source of investigative research data and knowledge[4]
- The national overview should continue to be delivered online through the Heritage Gateway.
- English Heritage should, on behalf of the nation, ensure that a security copy of all such data exists.
- English Heritage should stop adding or amending terrestrial NRHE records (otherwise HERs that have already imported the NRHE data would need to do this process again).
- All HERs should include all terrestrial NRHE records in one form or another.
- All HERs should reconcile and merge all terrestrial NRHE records with existing HER records.

5.9 Potential methods for proceeding with the project

Three potential methods were outlined by Crispin Flower and Nick Boldrini, followed by group and table discussions. The three options are fully described above (see section 4, Suggested methodologies):

a) Full automated import
b) Managed/supervised import
c) Manual accessioning

At the workshop the merits of each option were discussed, and whether there were any other options to consider. It was agreed that these three options were valid alternative approaches, though it was also noted that that some hybrids may be possible; for example, adoption of a “manual accessing” model would not prevent individual HERs from doing an automated import if digital data supply or suitable web services were added to the chosen solution.

[4] For terrestrial undesignated historic environment information – as well as information about designated sites additional to that in the statutory entry.

5.10 Preferred method for proceeding with the project

Options A and B both raised significant concerns, especially with regard to the technical complexity of the task of automating data imports to the variety of database systems in use in HERs nationally, the associated risks to data quality (based on previous experience and concerns regarding current data integrity), and the necessary resources to deliver this. It was noted that there would still need to be an element of manual checking of data for both of these options.

Option C was strongly preferred by the majority of participants in the workshop, for several reasons. Its relative simplicity, the level of control it offers, the ability to track progress, and the cross-platform nature was particularly welcomed. Although option C was felt to be viable, many participants pointed out that this would require additional resources to be successful.

With the benefit of the various discussions and feedback received it has become possible to refine option C as follows.

The option C methodology includes:

1. ***Data freeze.*** Stopping editing the relevant terrestrial records in AMIE at an agreed time. AMIE could continue to function as a decision-support tool, and potentially for editing other records.
2. ***Data transfer.*** The relevant AMIE data would be made visible to the HERs on a dedicated web site to support the transfer process, including the following functionality.
    a. Interactive map of all records with simple navigation tools, plus simple filtered list views, leading to record details laid out in a manner suitable for copying and pasting.
    b. The record details pages would contain only the transferable data, presented as clearly as possible.
    c. The record details pages would include a mechanism for signing off each record, with categorisation of outcomes (e.g. fully accessioned, part accessioned, not accessioned), feedback notes, the HER ID(s), automatically logging who accessioned the record and when.
    d. A mechanism for seeking clarification about NRHE information from EH staff during the accessioning process (it is expected that lots of questions arise, both general and about specific records).
    e. Map and list views of un-accessioned records, to help assess national progress, and to help HERs quickly identify new information and prioritize efforts.
    f. Overview statistics on progress, e.g. percentages accessioned and rates of progress per HER.
    g. (Optionally) provide web services to allow data access and sign-off to be carried out by remote systems.
    h. (Optionally) provide structured digital data in addition to the above, for those HERs who wish to follow a technical import process and use the web services to sign-off accessioned records.
3. ***Support.*** It would be necessary to support the process of data transfer through measures including training, advocacy, grant assistance, telephone support, staff resources, etc. Other forms of assistance may be appropriate to ensure all HERs can make core HER data available online.
4. ***Professional access.*** New solutions would be investigated and provided for professional users of AMIE and PastScape during the transition phase. The majority of these users would require read-only access to data, in which case AMIE, PastScape and the Heritage Gateway would continue to provide the

required access, with online access to HER datasets playing an increasingly important part. Users who would normally enter data into the effected parts of AMIE would require new solutions, and/or changes in working methods, perhaps involving enter the data into the relevant HER or a suitable intermediate interface. Minor modifications to AMIE would be required to ensure that new data was not entered into the areas under data freeze.

5. ***Public access.*** Minor modifications to PastScape would be required. Throughout and after the accessioning phase, the main PastScape website could remain available, with visible indications that the data is not being updated. As soon as correlated IDs are entered for a record, the PastScape record page would either redirect users to the related online HER page (which could be on the Heritage Gateway), or provide hyperlinks for users to follow if they wish. Following the transition, PastScape could be taken offline at some point, though the complete set of redirections should continue to be published for as long as possible.
6. ***Archiving.*** The superseded AMIE data along with the concordance information would be archived in a suitable digital repository.

5.11 Resourcing

Attention quickly turned to resource requirements of this approach. Some figures were presented for discussion:

The NRHE contains on average 5,000 monument records per HER (based on reference figures from PastScape: 10,000 for Oxfordshire, 5,000 for Staffordshire, 3,600 for Leicestershire, 2,000 for City of York). It may take on average 10 minutes to accession each record (some thought this too low, some thought it too high). These figures suggest the manual accessioning approach would require about 111 person days per HER, working a 7.5 hour day. Or one day per week for 2.5 years.

Clearly there are major uncertainties in these figure, as well as huge variability between HER areas. Events were not included in this estimation exercise, but it is known that the volumes are relatively small.

At first sight this seems to be a significant resource requirement for this option. However it was felt that the amount of time needed for manual checking under options A and B would not be dissimilar, and that it would be a mistake to imagine that any automated import could result in a dataset that was fit-for-purpose.

Questions and issues raised in the discussions included:

- How and where data would be visible during the transition phase, i.e. at what point would it be removed from the NRHE?
- What period of time is envisaged for completion? Without a fixed end-date the process could be endless.
- How would EH/HE update the NRHE data, during and after the data migration?
- What were the implications for the NRHE database of a long transition?

5.12 Summing-up

Dave Batchelor gave a presentation on the HER Outcomes Framework, and Graham Tait concluded the day with a brief summary of the initial conclusions from the workshop, and outlined some of the anticipated future steps of the project, including the e-conference to be held with the HER Forum in November (see below).

6 E-conference with HER Forum

Following on from the Birmingham workshop, an e-conference was held on the HER Forum Email List in November 2014. The purpose of the e-conference was to allow wider discussion with the HER community than the workshop permitted, around the same topics. With that in mind, the e-conference mirrored the workshop day, in that it was focussed around the same three main questions

- Is it a good idea?
- What criteria are essential or desirable for the project to proceed?
- What is the most efficient method to achieve the aims?

These main questions were discussed over three separate days, and were framed by an introductory day and an “Any Other Business” day, intended to give background to the project and allow discussion of emerging issues.

The conference was successful, in that a number of HER officers, and others, contributed to the discussions.

In total some 30 HERs’ staff input to the discussion, to a lesser or greater extent, representing 10 Bespoke HERs and 20 HBSMR using HERs. This represents approximately 36% of all HERs, 43% of Bespoke HERs and 33% of HBSMR using HERs. It is likely that more HERs were also aware and possibly following the discussion, but does suggest there is a significant number of HERs who have not yet fully engaged with the project.

In addition, a number of EH staff contributed to discussion, as did a more limited number of commercial contractor archaeologists. It was suggested that as EH staff may be most impacted by the retiring of AMIE that more consultation with them regarding their needs for future workflows should be carried out. It has been suggested that similar consultation amongst the commercial contractor and other users-groups should also be considered.

There was an average of 38 posts per day, ranging from 24 on the quietest day to 67 on the busiest.

The e-conference was the subject of Summary report, produced in December 2014, which looked at each day in turn, summarised the discussions, and created links back to the original online emails. This is available and can be accessed alongside this report.

The key questions and other themes or issues that emerged were:

6.1 Is it a good idea?

The overwhelming conclusion of the e-conference was that yes, this is a good idea. Various concerns were raised about how this would work, how long it might take etc., but no participant said it was a bad idea, or that it should not proceed.

6.2 What criteria are essential or desirable for the project to proceed?

The conclusions of the e-conference regarding this issue were less clear cut. The HIAS Principles were posted for discussion, but the conversation drifted away from these, so there was no overall agreement on even a basic core of these posted principles.

That said, over the course of the e-conference, a number of points and issues were raised, and it might be assumed that satisfactory solutions to the raised issues could be considered as criteria.

However, what is obvious is that further work will be needed to define the criteria for proceeding.

6.3 What is the most efficient method to achieve the aims?

As in the workshop, 3 methods were presented, and overwhelming preference was given to Option C – Manual Accessioning.

This was explicitly stated in a number of replies, but the dialogue also proceeded in directions which focussed more on how Option C might work, where correspondents may not have explicitly expressed support, but seemed to be implicitly supporting Option C.

Importantly, some options not presented were also raised and discussed, and these are summarised below.

A national online database – this was suggested to be on a similar model to the Portable Antiquities Scheme (PAS) database and structure – i.e. locally placed recorders adding to it but also the ability for central staff to edit and query it.
This was suggested by EH staff, and seen to be an answer to an issue they perceive with the project i.e. how will they continue to be able to edit records distributed in varying HERs? The suggestion was that local HER staff could input into it as well. In ICT terms it was suggested this could be a massive cost saving, as ICT costs could be centralised. At the same time, concerns about the success of national ICT initiatives were raised, and the ability to react to local requirements of HERs.
An advantage of a national database is that this would deal with the issue of gaps in HER coverage. However, various HERs in particular questioned if this might not lead to Local Authorities threatening posts, and creating more gaps if it was perceived that EH would do this work.

A second proposal was to use ***Open Data and Linked Data*** models to manage data. In the context of this proposal, though, it should be noted that the correspondent who suggested this still supported the reconciliation of data project, but appeared to be proposing that such methods be useful ways to share data and deal with issues such as e.g. EH staff having to edit HER records. As such, it is suggested that this model does not need to be considered as part of this project in particular, but should feed into the wider HIAS.

6.4 SWOT analysis

A number of other topics were raised over the conference and have been grouped together as part of a SWOT analysis (analysing Strengths, Weaknesses, Opportunities, Threats). The results of these were similar to the results from the workshop (see above).

6.4.1 Strengths

Remove duplication of effort – having one location for data prevents different groups inputting the same data in different systems. It was pointed out that EH/ALGAO agreements should prevent this in theory, but the overwhelming view was that it still happens in practice.

Remove need for contractors to reconcile for each project – it was pointed out that each time the data from NRHE and HERs is queried for projects, then it has to be reconciled for that project. However, any concordance is not recorded and is lost, so this needs to be done anew each time. A once and for all reconciliation would solve this.

Single point of access – being able to get the relevant historic environment data from one source was pointed out as being a major benefit of such a project. In practice, some datasets would still exist elsewhere (e.g. PAS, OASIS, NHLE), and may need investigating further as part of HIAS. Work streams are already looking at the better integration of OASIS data, and suggestions for NHLE have emerged from this project (e.g. trying to make it available as a web mapping service).

6.4.2 Weaknesses

Not all HERs online – this was raised as a significant issue, in that currently the NRHE data is available via PastScape, but if it is passed to HER's, as not all are online this would actually be a reduction in service. Whilst recognised as a weakness, obvious solutions include making this (i.e. getting these HERs online through Heritage Gateway) one of the criteria. There was also a suggestion that this lack of online capacity meant HERs were less accessible, but this was challenged on the grounds that many HER users don't use the internet to access HERs, and also from a contractor perspective, it was suggested online access was a lesser priority than reconciling the data.

EH ability to deal with national coverage projects – the point was made that EH currently have good access to AMIE and use it for national projects and also to look at national planning issues, and with (potentially) lesser access then this would affect service delivery. EH is aware that the NRHE is only strong in some subject areas, and they appropriately caveat enquiries and consult HERs to assist their work. Therefore accessioning NRHE records will make things easier as there will be no need to reconcile records. Similarly, there are technological solutions to this issue (e.g. web mapping) which could be deployed. However, it has been noted that this is a key issue that needs resolving.

EH editing data – a related issue to the point above which was raised was the ability of EH staff to directly edit records with the results of their research. It was suggested that EH staff could pass the records to HERs for inclusion, which raised the point that this would just add to HERs workloads. Again, this is a key issue that needs resolving.

6.4.3 Opportunities

Higher status for HERs – it was suggested that making the HER the main point of access for data would raise its status and make it harder for Planning Authorities to try and do without one. It would also strengthen the case for Statutory HERs.

Clarification of roles – it was suggested that the devolving of functions more clearly would help clarify roles.

Improve data quality – the reconciling of data would overall improve data quality, as it would involve the merging of data from two systems into one place and the process chosen would essentially involve enhancing the HER records.

Ongoing issue – the point was made that this issue has been known about and discussed for a number of years, and never been dealt with. The suggestion was that if it is not dealt with now, it would just come up again in the future.

OASIS/HERALD diversion – there was a slight meander into discussion of OASIS and HERALD, which are out-with this project. However, this did help to highlight that there are still work-flow issues for other data sets, and a potential role for linking data, and that this project could help in understanding some of the issues around them.

6.4.4 Threats

No HER cover in places – in a number of locations in England, there is limited or unknown HER cover. This is a critical threat to this project, as there is, in effect, nowhere for the NRHE data to go. Resolution of this is vital for the project's success.

Resources – this issue was raised a number of times on different days and in different ways. It was noted that without additional resources, HER's would not be in a position to carry out the project in a reasonable timescale, or in some cases at all. It was also noted during the discussion, that some HERs struggled to engage with the

e-conference due to time and resource pressures. As such it may be that only the better resourced HERs were commenting, giving an unbalanced view.

ICT issues of Bespoke HERs – the different technical capabilities of Bespoke HERs ICT systems was highlighted as an issue. Their ability to actually deal with the data might be limited by the design and set up of their system. Again this could critically threaten the project delivery.

Data/copy rights – as NRHE data is Copy and Database right of EH, this would need to be looked at to determine how the rights would need to be passed on. This is a potential threat to the process if it can't be agreed, but previous NMR/HER licences have been negotiated, so it is not felt this is a serious threat.

6.5 Other issues

A few miscellaneous issues were also raised, which don't fit easily into the SWAT structure, or could arguably fall into more than one category.

EH Archives – the question of whether any transfer of data would include transfer of archives was also raised. This was deemed to outside the projects remit, as this is just about digital data; but that if provision of links to English Heritage archives are required, this needs to be built-into the data to be accessioned into HERs.

Designation data duplication – The issue of duplicated designation records was raised. The point was made that many HERs held additional information to the designation information, and they would still like to record this. However, it was also suggested that the core designation record could be made available using linked-data principles, e.g. via web mapping, allowing them to be kept up to date in real time, but also allowing HERs to record their additional information against them.

Maritime – The issues around maritime data were explored, but no firm conclusions were reached. The principle that HERs should stop recording these and leave it all to the national record was discussed. It was suggested that it would be hard to enforce this as some HER's are involved in processes where they need the data. However, this is in essence the reverse, but same, issue of how EH staff would access HER data, and a solution for one might also solve the other. There was also some discussion about how Maritime records would be defined, but no firm conclusions.

6.6 E-conference lessons learnt

Overall, the e-conference contributed successfully to the aims of the project and gave a number of clear pointers regarding certain issues. It also raised or highlighted other issues which need to be resolved if the project to go ahead.

What is notable, and perhaps of note for further such e-conferences, is that simple, clear questions (e.g. is it a good idea? What method should we use?) lead to clear indications of support. But more discursive questions (i.e. the criteria) lead to less firm conclusions, probably due to their very nature but also potentially due to how they were posed.

7 Discussion with other projects and organisations

Liaison took place with a number of other organisations and projects. Discussions with the ALGAO-UK HER Committee, the English Landscape and Identities Project (EngLaID) and HER Forum all took place over the course of the project in 2014/2015. This allowed the Project Team to gain a better understanding of the relationship between NRHE and HER data, to provide a solid evidence-base, and to discuss the aims and objectives of this project further.

7.1 English Landscape and Identities Project

A number of other organisations and projects have looked at data contained within HERs and the NRHE, and the relationship between these datasets. Most notably, the English Landscape and Identities Project (EngLaID) (see http://englaid.com/) has recently been looking at using both NRHE and HER data for trans-regional research. Since August 2011 the EngLaID project has been engaged in a process of gathering and analysing data relating to England's landscape from 1500 BC to AD 1086.

Part of the EngLaID project has been to look at datasets including HERs and NRHE, and report on their accessibility, their format and the relationship between these datasets.[5]

The character and degree of overlap between HER and NRHE records (along with other datasets such as Archaeological Investigations Project (AIP), Portable Antiquities Scheme (PAS) and Early Medieval Coin Corpus (EMC) data) was tested within 35 HERs that coincided spatially with the EngLaID project's case study areas. The aim of this experiment was firstly to establish the potential for integrating fully the various datasets within case study areas, and also allowed the study of the relationship between HER and NRHE datasets. Within each case study area, one 10 km by 10 km square was studied.

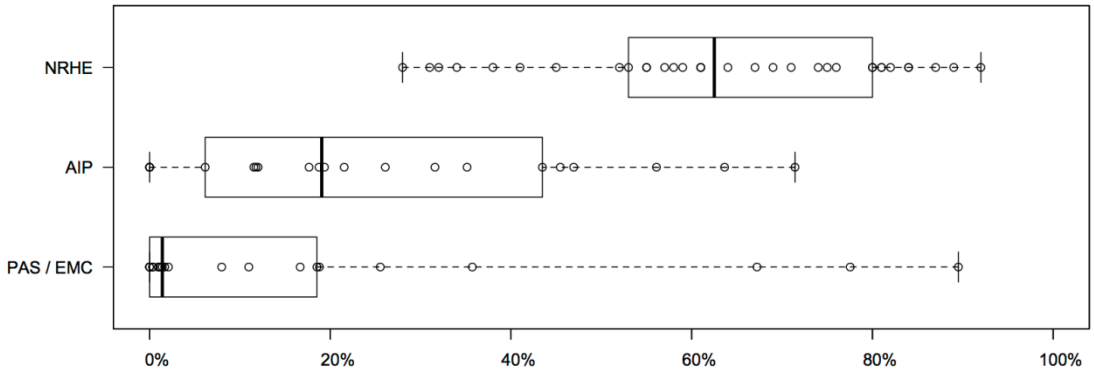

Figure 1 Overlap of HER data with NRHE, AIP and PAS data. These are shown as 'box and whisker' plots (a form of statistical representation which shows differences between populations without making assumptions about their underlying statistical distribution) showing the numerical distribution of percentage overlaps between the 35 different individual sample sets of HER records and: NRHE records, AIP records, and PAS / EMC records. The circles show actual data values for each test area.

The EngLaID project found a low degree of overlap between HER and AIP, and between HER and PAS data. However, the overlap between HER datasets and NRHE/AMIE records was varied overall. The degree of overlap, was typically more substantial (between 50 and 90%) than with other datasets.(See Figure 1).

In addition, the EngLaID project noted that "there was sometimes a surprisingly large spatial discrepancy between records in different datasets that clearly related to the same archaeological entity". The project also observed that "there was a discrepancy in the way that HERs and NRHE typically recorded findspots with poor spatial resolution: HERs tend to locate such findspots at the *SW corner* of the relevant 1km map grid square; NRHE records the equivalent findspots at the *centre* of the relevant 1km map grid square."

[5] Kamash, Z., Cooper, A., Green, C., ten Harkel, L. and Morley, L., 2013. *Trans-Regional Research Using National Datasets.* School of Archaeology, University of Oxford: Unpublished.

The EngLaID project also noted that except in a few cases where HERs recorded identifiers used in other datasets, any identification of equivalent records represented in multiple databases has had to be undertaken manually.

The analysis of the sample NRHE and HER data carried out earlier in the project (see above) are therefore shown to broadly align with the findings from this part of the EngLaID project. These show that the overlap between HER datasets and NRHE records is fairly substantial (particularly compared with other national historic environment datasets).

7.2 ALGAO-UK HER Committee

The Project Manager (Graham Tait) gave an overview of this project to the ALGAO-UK HER Committee. The project received the support and endorsement of the ALGAO-UK HER Committee at the project proposal stage and the committee was kept up-to-date with progress of the project as it progressed.

7.3 HER Forum Winter Meeting

The Project Manager (Graham Tait) gave a presentation to the HER Forum in Birmingham on 9th December 2014. This kept a broad range of HER Officers informed about the project, and allowed discussion about the project. Much of this discussion was around resourcing the project, particularly with reference to areas where HER coverage is lacking[6].

7.4 Interoperability of HERs and Local Authority Planning Systems

As part of the English Heritage Developing Historic Environment Records for the 21st Century (HER21) programme, a report titled “Interoperability of HERs and Local Authority Planning Systems”[7] was produced. This project looked at a number of issues that are also identified in this project and provided some possible solutions. These included:

- That HERs must become the primary source of information on the Historic Environment and to proactively produce information.
- A central service should be developed to provide access to a national set of Heritage Asset information. This new service may form a natural extension to the existing Heritage Gateway, and act as a pull factor to encourage existing HERs to subscribe.

8 Meeting with Project Team

The Project Team met on 26th January 2015 to discuss the outcomes of the project and to look at ways of taking this project forward. This included agreement on the contents of this Project Report and discussion about the Project Design.

9 Project Report

This document is the product of the report-writing stage of this project. The report was written by:

- Nick Boldrini, Durham County Council (**E-conference with HER Forum**)

[6] Davis, N. (2015). *HeritageGateway - News Story*. [online] Heritagegateway.org.uk. Available at: http://www.heritagegateway.org.uk/gateway/news/detail.aspx?ctid=102&id=5168 [Accessed 10 Feb. 2015].

[7] Chell, B. (2011). Interoperability of HERS and Local Authority Planning Systems. EH Project 6035. [online] helm.org.uk. Available at http://www.helm.org.uk/understanding-and-recording/historic-environment-records/developing-historic-enviroment-records-for-the-21st-century/ [Accessed 27 Feb 2015].

- Chris Webster, Somerset County Council (**Analysis of sample NRHE and HER data**)
- Andrew Minting, Wiltshire Council (**Workshop with HER Officers**)
- Crispin Flower, exeGesIS SDM Ltd (**Suggested methodologies**)
- Graham Tait, Devon County Council (**Other sections**)

This project report will be accessible on the Historic England website (once the new website is launched).

10 Project Design for the next stage

A Project design for a 2nd stage of this project has been prepared by the Project Team. This has been submitted to the HIAS Board, and the project team is expecting the HIAS Board to take forward the 2nd stage of this project.

Lessons learned and project evaluation

This project has received good feedback about the following, and these are deemed a success:

- The level of consultation with HER officers – which has proved invaluable to taking forward a project that affects HERs.
- The Workshop was well attended, and proved to be a useful method to discuss issues raised by this project. Comments included
    - *"Good practical session."*
    - *"Let's do it now! Really hope this goes somewhere! Best workshop I've been to in ages."*
    - *"Useful and positive, though challenges ahead."*
    - *"Useful and productive. Very good facilitation."*
    - *"Very enlightening – feel like there is a way forward!"*
    - *"Very useful and good to see progression on the subject."*
    - *"Very positive! Really feels like progress has been made on a very long standing issue! Hope the momentum carries forward!"*
- The facilitation at the workshop was useful, and the pre-planning meeting allowed the project manager to think closely about how to structure the workshop to get the best use of the day.
- The e-conference continued the discussion amongst many more HER staff and others with an interest in HERs, and highlighted a number of new ideas. Participation was high, with 193 posts, representing approximately 36% of all HERs.

The project could have done the following things better:

- Assigned more time for project management.
- Allowed more time for the project to report and for writing the project design.
- Allowed more budget for the workshop.
- Discursive questions about criteria (for example) led to less firm conclusions. This could have been better if this was realised in the planning stage.

These lessons will be disseminated as part of this project report, and the Project Team will take on board these lessons learnt with any future projects.

Recommendations

This project recommends a second stage of this project is carried out that will:

- develop a working prototype to test "methodology c" – to allow manual accessioning of NRHE data to HERs.

- examine the user-needs of EH staff, HERs and current users of NRHE and HER data, to ensure requirements and criteria are captured.
- examine the resources needed to transition the data from the NRHE to HERs.

This project examined the criteria (e.g. the principles or tasks) that needed to be undertaken if this project went-ahead. Feedback from the HER community indicated that should be support for the following criteria and tasks:

- consultation with all HERs about an achievable timescale and requirements for this project.
- identification and provision of resources to support the project.
- HERs need to be considered the first point of call for, and primary trusted source of investigative research data and knowledge.
- the national overview should continue to be delivered online through (an improved) Heritage Gateway.
- there needs to be a mechanism so that users outside HERs (e.g. at English Heritage) can add and amend historic environment information (with a process of validation for HERs).
- English Heritage should, on behalf of the nation, ensure that a security copy of all such data exists.
- English Heritage should stop adding or amending terrestrial NRHE records.
- all HERs should include all terrestrial NRHE records in one form or another.
- all HERs should reconcile and merge all terrestrial NRHE records with existing HER records.
- a decision should be taken on who is responsible to be the first point of call for and primary trusted source of an historic environment maritime record.

Conclusion

The Project Proposal's aims and objectives were to:

- Research and discuss issues in data supply and reconciliation between NRHE and HERs
- Provide recommendation, investigation and testing of various methodologies

The meetings, workshop and e-conference have researched and discussed the issues, and these are highlighted in the report (above). Various methodologies have been investigated and tested at the workshop and e-conference, and recommendations have been made.

This project has shown that there is much support to supply NRHE data to HERs and reconcile this. Among HER staff, there is overwhelming support for the project proceeding and strong support for one methodology to achieve this – manual accessioning assisted by web-based resources to manage this process. Concern about this process has largely been around resourcing – in ensuring support is available for HERs to reconcile NRHE data; particularly in HERs that are currently very under-resourced.

When asked about the implications of not proceeding with the data supply and reconciliation, HER Officers gave the unanimous response that the existing problems and issues would deteriorate and audiences would become increasingly dissatisfied if this was not carried out.

This project recommends that a second stage occurs that develops a working prototype and examines the resources and criteria required to carry out this process.

If you require an alternative accessible version of this document (for instance in audio, Braille or large print) please contact our Customer Services Department:
Telephone: 0370 333 0607
Fax: 01793 414926
Textphone: 0800 015 0516
E-mail: customers@HistoricEngland.org.uk