NRHE to HERs Research and Development Phase

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Contents

Executive Summary

This project investigated how the Historic England National Record of the Historic Environment (NRHE) could be accessioned to Heritage Environment Record (HER) databases, building upon previous work that suggested that such a process would be beneficial and well supported.

Both this and the previous project contribute to the Heritage Information Access Strategy (HIAS), the Historic England Action Plan and The Culture White Paper. Principle 1 of the Heritage Information Access Strategy, states that "Local Authority HERs should be the first point of call for and primary trusted source of investigative research data and knowledge" and therefore suggests that HERs should hold and manage the non-designated terrestrial heritage data that are currently contained within the NRHE. The Historic England Action Plan aims to "improve access to information through local Historic Environment Records and explore ways of moving towards a single means of accessing historic environment information nationally". The Culture White Paper states that Historic England will be asked to "work with local authorities to enhance and rationalise national and local heritage records over the next ten years, so that communities and developers have easy access to historic environment records".

A prototype website was developed that allowed manual accessioning of the NRHE assisted by web-based resources, which had previously been identified as the favoured method of accessioning. The website was focused upon a map and a list view of the NRHE data. Within this records were tagged based upon: whether they were a Monument or an Event; which HER they were associated with; which county it was within; whether they were in a National Park; and whether or not they had been accessioned. These tags allows for easier filtering of the data.

The website was populated by NRHE data supplied by Historic England. Several issues were found in these data, owing to the complex history of the database and difficulties with data export, but these were largely resolved. This still left some inconsistencies, such as a large proportion of missing Event records (see Appendices A and B), but these were not felt to be significant enough to threaten the success of the project. Full record details could be viewed through the website, presented to facilitate easy accessioning into HER databases. HERs could download record boundaries for use in their GIS.

Once a record was accessioned the HER could use a form on the website to document the accessioning status (i.e. fully, part or not accessioned), the reasons if it was not fully accessioned and cross-references to the relevant HER record. A Q&A facility was available via the website that allowed HERs to query individual records with Historic England.

The website included e-learning, guidance and FAQ pages to support HERs through the accessioning process. Direct support for accessioning was provided by Historic England and facilities were provided via the website to allow progress to be monitored.

The website was tested by HERs with real use across a representative range of data. Three phases of testing were undertaken:

1. Technical testing by the Project Team, to ensure that the website functioned as intended.
2. Testing by the four members of the Project Team and two HERs, during which each tester spent approximately one day accessioning NRHE records in their HER. This identified a number of improvements that were subsequently made to the website, the most significant of which was changes to the accessioning statuses to better suit HER approaches to accessioning.

3. Testing by twenty-five HERs once the above improvements to the website had been made, during which each tester spent approximately two days accessioning NRHE records in their HER. The testers were selected to cover as wide a range of HER structures as possible. Feedback was sought using a web-based questionnaire.

The results of the final phase of testing were analysed, using data on the records accessioned, time taken and responses from the questionnaire. This found no advantage to HERs accessioning using the web map or the list, but suggested advantages to each in different scenarios. The results suggested that the website was appropriate to the task, had sufficient functionality and was responsive enough. No difference in the rate of accessioning could be identified owing to HER systems, such as the software used, the number of monitors or internet speed, suggesting that individual approaches to accessioning had a much greater impact on accessioning rates.

The average accessioning rate from the final phase of testing was approximately six records per hour. This rate does not account for the time that HERs would have spent getting used to the website and approach on the first day or the fact that they were likely to get faster with practice. Feedback from the questionnaire suggested that a rate of over eight records per hour could be achieved.

Based upon the predicted achievable accessioning rate and the number of records within the NRHE it was estimated that full accessioning into HER database would require 42 person years divided between 84 HERs. Whilst the average is therefore six months for one person within each HER, the actual requirements varied greatly, since NRHE records were not divided equally between the HER areas. This may also be an overestimation since the testing did not include the learning period; crude estimates suggest that full accessioning could be achieved in as little as 35 person years. Based upon feedback from Historic England, it was estimated that full accessioning of the NRHE would require 1.4 person years to respond to Q&A enquiries.

The project demonstrated that the NRHE to HER data supply and reconciliation project is achievable and beneficial using the methods and tools developed. It has also received overwhelmingly positive feedback from the HERs involved in the project and has provided an opportunity to inform those HERs not directly involved. However, full HER accessioning of the NRHE is a substantial project requiring careful planning and sustained management, plus the coordinated efforts and commitment of the HERs, central agencies, and a technical and logistical support team.

Recommendations are made concerning the implementation of the NRHE to HER data supply and reconciliation project. Significant recommendations include:

- Review of the NRHE export process for future data supply.
- Improvement of the guidance provided on how to accession and, in particular, when a record can be regarded as completely accessioned.
- Negotiating changes to HER recording policies where NRHE data would otherwise not be accessioned. This would also help to bring all HERs towards a national standard.
- Optional changes to the website, including technology updates, redevelopment and improved hosting arrangements, to provide greater longevity and resilience.
- Several minor functional improvements to the NRHE to HER website to meet Historic England and HER requirements.

An implementation strategy for the project is outlined and a draft project plan suggested. The suggestion is a three-year accessioning project with a two-year contingency period, with HERs starting on a rolling programme. This should start with a preparatory review of HERs and the

creation of the specific "accessioning plan" for each participating HER, plus training to ensure a common approach. Assistance should be provided where required to HERs during the project, including funding to support the accessioning process within HERs or hands-on accessioning assistance from specialists placed within HERs, as appropriate. The project must be promoted by ALGAO and Historic England, particularly highlighting the strategic importance for HER service delivery. A programme of progress reviews and reporting should be implemented to ensure that accessioning is proceeding correctly and the project will complete on schedule.

More far reaching recommendations are made to ensure that the accessioning project is a success and the resulting HER data are publically available. This includes the creation of eligibility criteria that must be met for HERs to participate, and the merging of smaller HERs to ensure some level of dedicated staffing and appropriate technical infrastructure.

Data could also be made available to non-HER record maintainers, such as Parks & Gardens UK, The National Trust, War Memorials Online, The Milestone Society and the Church of England. These organisations maintain databases of monuments relevant to their interests and business requirements. Allowing these organisations to access the NRHE via the same portal would improve their data, and potentially the decisions they make, and provide an opportunity to collect additional concordance or cross-referencing information. However, accessioning by these organisations would not change the accessioning status of an NRHE record in the same way as accessioning by an HER.

The terrestrial data in the NRHE must become read-only at or shortly before the time of data supply in order to ensure that accessioning is complete. The business impacts of this are considered and potential interim and long-term solutions suggested, including improved data flow from Historic England to the HERs. The implications for PastScape is also considered in the light of future data availability through the Heritage Gateway or HER websites.

1 Background

This project builds on the work undertaken by the "Data supply and Reconciliation between NRHE and HERs" project, carried-out under Historic England's National Heritage Protection Commissions Programme (Project Number 6953).

The previous project examined data currently held by Historic England in the NRHE as well as by local HERs. It 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, and a broad consensus on how best to do this.

A range of possible solutions was evaluated, including a) fully automated import, b) managed/supervised import, and c) manual accessioning. The favoured method was manual accessioning assisted by web-based resources. This would enable 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, and each NRHE record would be signed off and correlated with HER record identifiers.

2 Research aims and objectives

The project aimed to answer the following questions:

- What technology is required to deliver a working system that will allow NRHE records to be manually accessioned to HERs?
- What resources are needed to transition the data from the NRHE to HERs?
- What are the user-needs of NRHE and HER data users? Can these be met by the proposed accessioning of NRHE data into HERs? And if not, what is required to do this?

Therefore the projects aims and objectives were to:

- Develop a working prototype to demonstrate a practical working system that will allow NRHE data to be incorporated within HERs via the preferred method (manual accessioning assisted by web-based resources) regardless of their software platform.
- Test the prototype with real use across a representative range of data and HERs in order to identify additions/changes needed for full production use.
- Use the same testing exercise to assess more accurately the resources needed to transition data from the NRHE to HERs.
- Develop recommendations for a subsequent implementation and transition plan.

2.1 Business case

This project supported the delivery of the Heritage Information Access Strategy (HIAS)[1]. This is an initiative intended to secure an improved and more cost effective approach to the handling of digital historic environment data by Historic England 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 heritage data nationally in order to improve its utility and attractiveness to users and provide enhanced support for the planning system.

In order to begin to develop a strategic approach to this broad vision with the historic environment sector, Historic England has proposed eight key principles. Principle 1 states that "Local Authority HERs should be the first point of call for and primary trusted source of investigative research data and knowledge". If this principle is taken forward, the implication is that HERs should hold and manage the non-designated (terrestrial) heritage data that are currently contained within the Historic England 'National Record of the Historic Environment' (NRHE).

The project directly contributes to the delivery of the Historic England Action Plan[2]. Specifically the project contributes to the following Historic England corporate objectives:

- "With our partners, improve access to information through local Historic Environment Records and explore ways of moving towards a single means of accessing historic environment information nationally" (Section 2.6).
- "Work with others to provide time-limited support for local authorities to develop new ways of delivering their heritage advice and services" (Section 4.2).

[1] https://historicengland.org.uk/research/support-and-collaboration/heritage-information-access-strategy/.
[2] https://content.historicengland.org.uk/images-books/publications/he-action-plan-2015-18/he-action-plan-2015-18.pdf/.

The project also contributes to The Culture White Paper[3]. This states that Historic England will be asked to "work with local authorities to enhance and rationalise national and local heritage records over the next ten years, so that communities and developers have easy access to historic environment records". It also states that Historic England will "identify how it can offer more support to local authorities… and encourage new delivery models that make the best use of resources, in the light of the review of local authority archaeological services".

2.2 Project scope

Although this project has delivered a working prototype of the 'NRHE to HERs' system, the project was undertaken to test that this system worked appropriately, and to identify resources required to roll-this-out across England. It was never the intention to undertake the actual work required to ensure that all NRHE data are accessioned into every HER.

2.3 Interfaces

This project supported the delivery of the 'Heritage Information Access Strategy' (HIAS)[1], and was connected with this ongoing work. It is expected that recommendations from this project will feed into the HIAS programme.

The project linked to 'Heritage 2020'[4]. The Heritage 2020 framework sets out how heritage organisations across England can work together in the coming years to add value to the work of individual bodies. The framework follows on from the National Heritage Protection Plan[5] from 1 April 2015. This project forms part of HIAS, which in turn feeds into Heritage 2020.

The project linked to the Historic England Action Plan[6].

2.4 Communications

The project had three Project Team meetings in February 2016, May 2016 and September 2016. Highlight reports were provided after the first and second meetings, and circulated to the Project Assurance Officer, Project Team and the HIAS Programme Board via the HIAS Project Executive.

At key stages, emails were sent to the Project Team, Historic England staff and HIAS Project Executive detailing decisions made and progress with the project:

- After first project team meeting
- After the second project team meeting

The Project Manager contacted the Project Assurance Officer about any problems/issues arising during the project, or any possible requirements to changes methods or outputs.

2.5 Outputs

The project outputs include:

[3] https://www.gov.uk/government/publications/culture-white-paper.
[4] http://www.theheritagealliance.org.uk/historic-environment-forum/heritage2020.
[5] https://historicengland.org.uk/images-books/publications/nhpp-plan-framework/.
[6] https://www.historicengland.org.uk/about/what-we-do/action-plan/.

- Prototype website including the tools for data accessioning and reconciliation.
- Source code for the prototype website in the language in which the software was written, together with all related flowcharts and technical documents, all of a level sufficient to enable Historic England's development personnel to understand, develop and maintain that software.
- Archival database of concordance identifiers between NHRE and HERs (for the records processed in the project) and metadata for the accessioning.
- Enhancement to the HER datasets where they have participated in testing.
- Technical documentation of the prototype website, including a data migration report (including issues encountered and lessons learnt).
- E-learning and guidance in formats and locations accessible from the project website.
- A log of comments/issues raised that are outside the scope of producing the prototype website, such as long term resourcing, national overviews, etc.
- An estimate of the resources, project requirements and time it would take to finalise the prototype and minimum requirements (e.g. HER uptake) to make a country wide project feasible.
- End of project report.
- Project closure report.

2.6 Project review

The project was reviewed at the following points:

- After first project team meeting.
- After the second project team meeting.
- After the third project team meeting.

2.7 Health and safety

The health and safety statement for this project followed the established health and safety policies of exeGesIS SDM Ltd.

2.8 Project Team structure

The composition of the Project Team is shown in Table 1. The project was assured on behalf of Historic England by Sarah MacLean.

Table 1 – Project Team structure

Role	Person
Project Manager	Crispin Flower (exeGesIS SDM Ltd)
Project Executive	Dr. Gillian Grayson (Head of Listing Information Services, Designation Department, Historic England, but acting as Convenor of the Forum on Information Standards in Heritage (FISH))
Project Team	Graham Tait (Coventry HER) Chris Webster (Somerset HER) Nick Boldrini (Durham HER) Ben Wallace (Warwickshire HER)
HIAS Programme Board	c/o Sarah Poppy, HIAS Programme Manager
Historic England Project Lead	Jane Golding

2.9 Methods Statement

The project took the form of ten stages covering:

- The build and testing of the working prototype.
- Trial accessioning of NRHE data to HERs.
- Feedback from HER Officers to examine the resources needed to transition the data from the NRHE to HERs.
- Examination of the user-needs of NRHE and HER data users to ensure these are met by the process of accessioning of NRHE data into HERs.

These stages are documented below.

3 Methodology

3.1 STAGE1: Develop prototype of "NRHE to HERs" website.

The website was developed in accordance with the Project Design.

3.1.1 Data supply issues

Historic England supplied test data for use during this project in three main parts relating to Monuments, Events and associated GIS data. The GIS data provided the spatial elements of the Monuments and Events. Monuments and Events were often linked.

Historic England were aware of inconsistencies, variations in recording practice, changes in scope and remit, and common user and technical errors within the NRHE. They explained that this was due to the long and complex history of the dataset, which included movement from OS cards to Monarch to NewHIS to AMIE, via the RCHME, English Heritage and Historic England. The data were regularly cleaned where errors and anomalies were identified, for example in feedback from the PastScape website and via the Historic England Archive Services, who check data before sending them out to customers, but they did not have the resources to undertake a systematic review of the entire dataset. They also noted that the technology upon with the AMIE is based is now antiquated, though the GIS system used by the NRHE is modern.

Appendix A provides more information on the points raised in this section.

<u>Monuments</u>

Historic England supplied Monument test data in XML format (see Appendix C for further details), split into batches covering geographical units equivalent to regions or counties. This was unavoidable as the tools and resources at Historic England's disposal could not handle the quantity of data represented by the NRHE in a single export. These batches contained duplicates where the records were indexed as falling in more than one exported area, which had to be identified and removed before adding to the website.

In many cases the supplied lines and polygons layers contained multiple features per Monument record. In one case examined (HOB_UID 1577822) this was two superimposed and nearly identical polygons, whereas other records examined (such as HOB_UID 1485945) were genuinely different polygons and represented a multi-element site. The former instance was recognised by Historic England to be an error that would need to be resolved during accessioning as part of the concordance process, as it would not be feasible for Historic England to check every multi-polygon site for errors. However, overlapping features such as the example given could be identified using a suitable query, which could provide a list for more targeted review.

The supplied GIS test data contained a number of records that were not present in the export of non-spatial Monument test data. Most of these were maritime records and would be omitted from any future export, but some were terrestrial and therefore relevant to this project. There were also four Monument records in the non-spatial test data that had no corresponding spatial record in the supplied GIS test data. A review of the mismatches between the spatial and non-spatial test data is recommended so that these can be resolved wherever possible prior to any future export. It may nevertheless not be possible to resolve all data mismatch issues.

The supplied metadata on the Monument records was partial, with most records simply stating that they were created 'prior to 01-APR-1999'. PastScape showed a 'last updated' value that was not present within the supplied XML as it derived from tables not in the NRHE record. Feedback from Historic England stated that they would investigate the feasibility of adding these data to the export.

NRHE recording policy allows Monument records to have no name, but a name was considered essential for inclusion in lists and info popups to ensure clear presentation to HERs. Where these were empty the first 120 characters of the public summary text was used. Historic England made no comment regarding this approach, but suggested that unnamed Monuments could alternatively be displayed as 'Monument No. *n*', in line with PastScape functionality.

Identifiers for some supplied Monument records incorrectly included area statuses that had been populated with the Type 'System_UID'. Historic England confirmed that this was as a result of legacy recording practice and that such area statuses should be omitted from the Identifiers in future data exports.

The descriptive texts within Monument records frequently contained spurious line breaks, possibly as an unresolved legacy from OCR capture or from copying and pasting content (such as HOB_UID 367454). Historic England were aware of this issue, but it was unfeasible to remedy. These line breaks can be removed on a case by case basis during accessioning by the HERs.

The Author/Originator was missing from Monument Sources, which was important enough that its absence was found to compromise accessioning. Historic England confirmed that this field does not occur in the NRHE. These data do appear in the NRHE database as the 'Statement of responsibility' and is therefore visible in the Monument record on PastScape. Historic England will investigate the feasibility of including these data in any future export of the NRHE database, should this project go ahead.

The County, District or Parish (CDP) and grid reference data in the supplied Monument test data were entangled in an erroneous way that resulted in repeated grid references on the website for some records, particularly linear records that span parishes. Historic England explained that this was because each address in the NRHE is treated as a distinct complete entity, so a Monument in two parishes will have two addresses and therefore two grid references, even if these grid references are identical.

The textual representation of spatial data in the supplied Monument test data was not valid Well Known Text (WKT). This had no impact on this project as full GIS test data had also been provided. Historic England confirmed that they would explore this with their Corporate GIS team to determine whether valid WKT can be exported. An example of invalid WKT is included in Appendix A.7.

Monument Actors Organisations appeared to have been automatically set to a fixed value: "HE NRHE Monument Inventory". Historic England confirmed that the organisation cited isn't associated with the Actors and appears to be part of the Monument metadata, so the wrong field was being displayed on the NRHE to HER website. They also noted that some Monuments Actors do not have an associated organisation, so this field may occasionally be blank.

It has been agreed that the export method will be reviewed with the Historic England IMT department before the next round of data supply, as it should be possible to find a method and format that does not introduce the observed data omissions/distortions and does not take up

so much staff time. The method used for this project will be available as a fall-back if no better method can be found, and there may be possibilities to address the recognized issues.

Events

Test data for Events were supplied as a set of CSV files each containing different aspects of the record from the NRHE relational database.

The Events test data in this format were notably easier to import into the NHRE to HER website than the Monuments XML test data.

It was apparent that the Event test data supplied for this trial were not complete, as there were data that could not be linked to any Event as the Event UID did not exist. Historic England confirmed that this was a result of errors made during the data export.

The Event test data incorrectly combined two different sorts of date, with modern dates relating to the activity that took place occurring alongside archaeological periods relating to the Monument. Historic England confirmed that these are displayed separately in the NRHE database and would investigate separating them in future exports.

Some of the entries of People in the supplied Event test data were empty other than a Role (such as Event UID 657086). Historic England confirmed that these Roles actually related to Organisations rather than specific People. People will need to be correctly populated should this project go ahead, either by making changes to the export or by removing People that are empty other than a Role when importing into the website.

There were GIS points in the Event test data that were incorrect and/or of varying degrees of accuracy, such as the centre point for a parish depicted rather than the centre of a site within it. These issues were known by Historic England and would need to be corrected during accessioning.

Three Events records in the test data (Event UIDs 1594052, 1595435 and 1595479) had more than one geometry record in the GIS layer. On examination these turned out to be duplicates in their coordinates and all other attributes, so the extras were manually deleted. Historic England confirmed that they could resolve these prior to any future export of the NRHE database if provided with the relevant UIDs.

The GIS and CSV test datasets supplied for Events contained some duplicated information, including the Name and Type, but with values that were frequently different in the two datasets. The majority of mismatches were because the GIS Name was truncated by being held in a 60-character field. Other mismatches appeared to reflect different people using different names or more fundamental mistakes where the names clearly referred to different locations (such as Event UID 629579). Historic England suspected that this may be due to wider location elements, such as Parish, being recorded as names. Nevertheless there is an issue with storing more than one version of the same information in the NRHE, rather than a single, definitive version, which could be resolved through the accessioning process. See Appendix A.3 for some examples of Events with differing names in database and GIS.

855 Event records in the test data had no record(s) in the GIS layer. These were reviewed and some were found to be Events that covered a region (such as Event UID 1335894), but there was no obvious explanation why many would not have a spatial location (such as Event UID 1334338). Historic England confirmed that it should not be possible to create a record with no spatial depiction, but the evidence suggested that there may have been a technical failure in

the link between AMIE and the GIS that they were unaware of. The affected records are listed in Appendix B, which Historic England have said they will investigate.

782 GIS points in the test data had no matching Event attribute data (Figure 1). These records were excluded from the project, as by definition they could not be accessioned. Other missing Events in the test data were identified when following a link to a 'Related Event', which were subsequently quantified as being in the region of 98,783 records. Historic England indicated that both issues were due to the export process used and confirmed that all records would be included in any future export of the data.

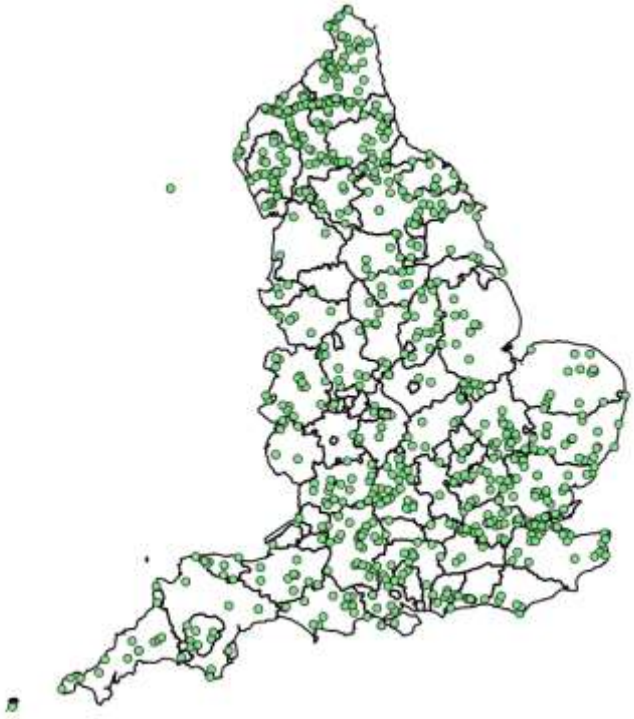


Figure 1 – Event points that had no matching Event attribute data.

It has been agreed that the export method will be reviewed with the Historic England IMT department before the next round of data supply, as it should be possible to find a method and format that does not introduce the observed data losses/distortions and does not take up so much staff time. The CSV method used for this project will be available as a fall-back if no better method can be found, and there may be possibilities to address the recognized issues.

GIS

Spatial information for both Monuments and Events was supplied as four feature classes within an ESRI personal geodatabase. Historic England planned to use the same format in any future data supply, as this was the corporate standard. This process was fully repeatable.

3.1.2 Data processing

The test data supplied by Historic England were migrated into the project SQL Server database. See Appendix A for a more detailed data migration report.

Presentation of the test data to the user in both the maps and as record details was achieved with simple templating for the map popups, and with more complex XSLT for the record details.

For the map popups, the supplied test data were analysed and an outline proposal made on the forums as to which fields may and may not be useful, which elicited no responses. The proposal was therefore implemented, presenting a combination of key record details (ID and Name) and the significant metadata fields. The metadata fields that were either empty or considered not helpful to HER recipients were omitted.

Presentation of record details was intended to lay the provided test data out in as simple a manner as possible, permitting easy copying and pasting while making no substantive alterations. This was relatively simple for Events, as the structure and cardinality of the data was fully understood, having created the XML from "flat" CSV files. For Monuments this was much more complex as no documentation on the original database schema or the process by which this was transformed to XML was provided. Therefore producing an XSLT involved a lot of guesswork, examination of example records, comparing could be seen in the data with what could be seen on PastScape, and predicting where problems might be expected and testing for them.

One example where the first attempt proved to need revision was for the Evidence associated with each Monument Type. There was an awareness that there might potentially be multiples and a record was eventually located that had two Evidence types for one Monument Type, confirming that it was necessary to code for this scenario and output the multiples as a comma-separated list.

Many NRHE Monument records in the test data had no Name value. For clear presentation to users in lists and info popups a name or primary label is essential. Where the Name was empty the public summary text was used instead (the first 120 characters then "…").

A keyword approach was used to optimise simple data retrieval. This involved tagging each record with typed keywords for any desirable selection criteria (Table 2).

Table 2 – criteria and options for tagging NRHE Monument and Event records with keywords.

Criterion	Options
Is the record mapped?	Yes, no.
What is the record type?	Monument, Event.
Which Local Planning Authority is it in?	A list of Local Planning Authorities, which were assigned spatially.
Which HER area is it in?	A list of HER areas, which were assigned spatially for the 79 HERs for which boundaries were available. Each HER area was buffered by 100m for this purpose, to ensure each HER can readily filter to see records within and extremely close to their territory.
Which National Park Authority area is it in?	A list of National Park Authorities, which were assigned spatially. Those outside a National Park were not tagged using this criterion.
Which county is it in?	A list of counties, which were assigned using attributes in AMIE rather than achieved spatially. This list comprised 56 unitary authorities (including the Isles of Scilly), 36 metropolitan boroughs, 27 non-metropolitan counties and the Greater London Authority.

To assist with accessioning, particularly given some of the peculiarities with the supplied test data highlighted in the data migration report, where possible hyperlinks to other online resources for the presented records were included. For Monuments a link to open the

PastScape record was included, where some information is presented more clearly (while some is absent). For Events a link to the ADS Archsearch page for the NMR Excavation Index was included. This did not always find a record, but was helpful in some cases.

3.1.3 The NRHE to HER website

The website design was simple and was focused upon two views on the NRHE test data: a map and a list. The home page where most users were likely to land contained some welcome text and links to register on the website. A contact form was also available for visitors to get in touch with Historic England about the project, which included a CAPTCHA[7] to prevent unwanted emails.

Registration required approval from the Project Team to ensure that only members of the Project Team, Historic England and HERs had access to the site. Once registered and logged in, users were presented with a fuller range of menu items, depending upon whether they were an HER, Historic England staff, etc.

Maps

The main map displayed the NRHE test data on a map of the UK and was available to all registered users. Records were presented in layers and coloured according to their overall accessioning status, which was a combination of the statuses assigned by HERs during the accessioning process; see Section 3.6.1 for details. A map layer menu could be expanded, where records could be hidden or displayed based upon whether they were Monuments or Events and their overall accessioning status. HER and National Park boundaries could also be optionally displayed. In order to make the NRHE data easier to view the transparency of the Ordnance Survey OpenData base mapping could be adjusted using a slider control.

An HER map page was also available to HER users (Figure 2). This had essentially the same functionality as the overview map, but presented records in layers coloured according to their *HER-specific* accessioning status. This HER map was added following Stage 5 testing and the tags are described in Section 3.6.1.

[7] CAPTCHA stands for "Completely Automated Public Turing test to tell Computers and Humans Apart" and is used to determine whether or not the user is human.

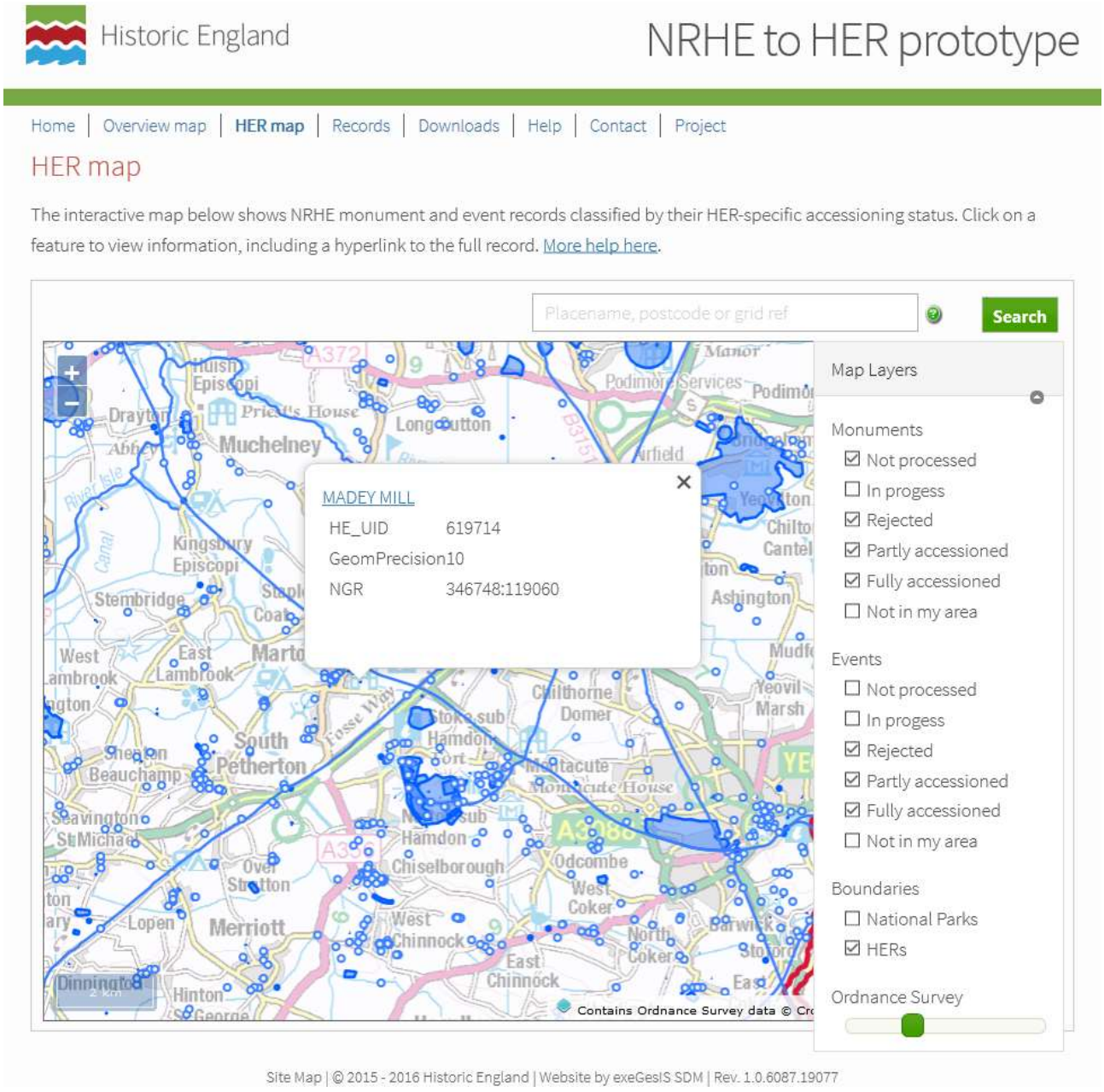


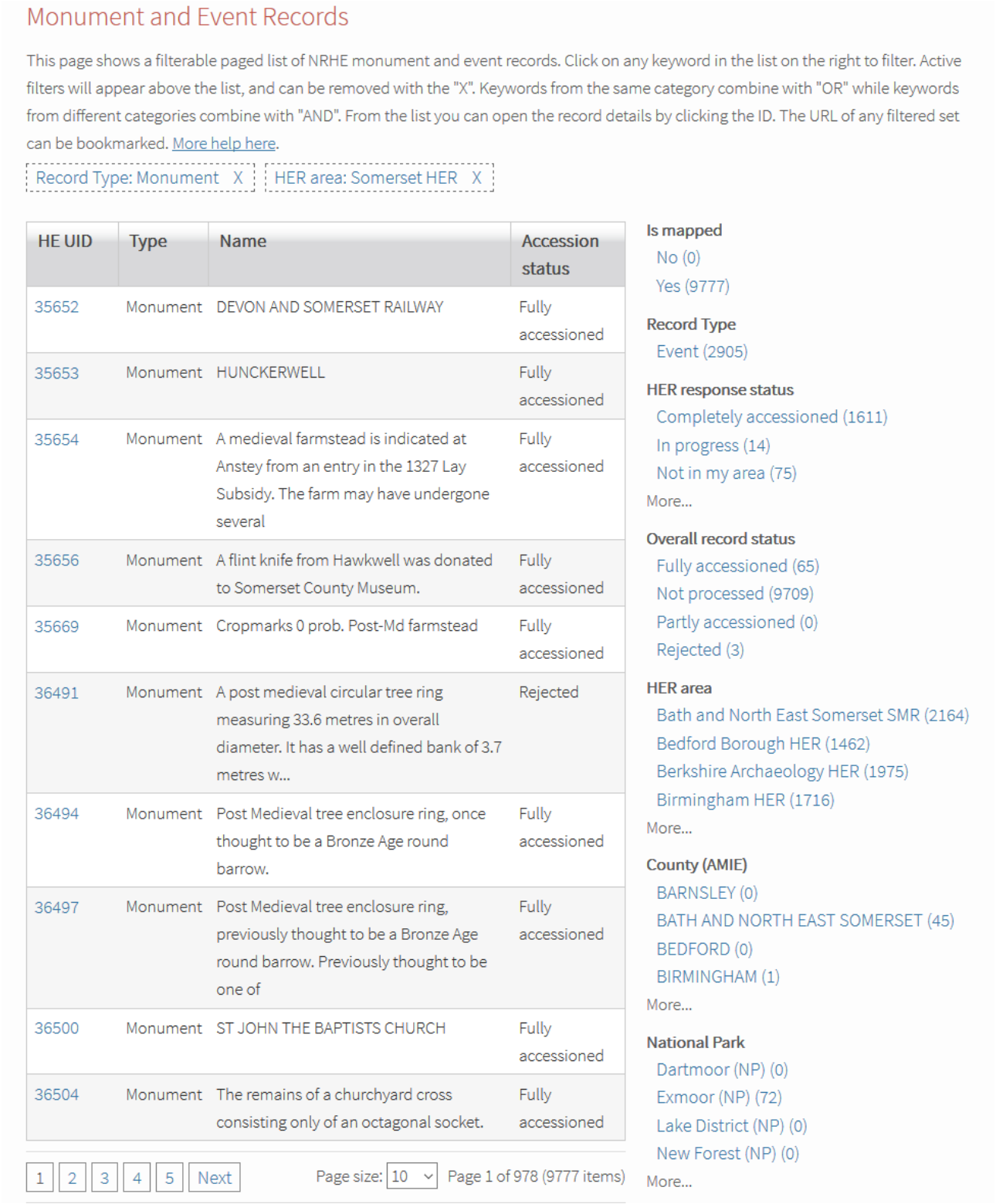
Figure 2 – the HER map page of the prototype NRHE to HER website.

Clicking on a record in either map popped up a dialogue that showed the name of the feature and some basic information (Figure 2). The record details could be accessed by clicking on the feature name.

Records list

The records list page displayed all records from the NRHE test data (Figure 3). Filters could be applied to the records so that the list only displayed records of interest. These filters covered whether the record was mapped, whether it was a Monument or Event, the HER accessioning response status, the overall accessioning status (Section 3.6.1), the HER area it had been assigned to, and the county and, if appropriate, National Park it was recorded as occurring

within. Applied filters were shown at the top of the list, where they could be clicked to remove. The record details could be accessed by clicking on the HE UID.



Monument and Event Records

This page shows a filterable paged list of NRHE monument and event records. Click on any keyword in the list on the right to filter. Active filters will appear above the list, and can be removed with the "X". Keywords from the same category combine with "OR" while keywords from different categories combine with "AND". From the list you can open the record details by clicking the ID. The URL of any filtered set can be bookmarked. More help here.

Record Type: Monument X HER area: Somerset HER X

HE UID	Type	Name	Accession status
35652	Monument	DEVON AND SOMERSET RAILWAY	Fully accessioned
35653	Monument	HUNCKERWELL	Fully accessioned
35654	Monument	A medieval farmstead is indicated at Anstey from an entry in the 1327 Lay Subsidy. The farm may have undergone several	Fully accessioned
35656	Monument	A flint knife from Hawkwell was donated to Somerset County Museum.	Fully accessioned
35669	Monument	Cropmarks 0 prob. Post-Md farmstead	Fully accessioned
36491	Monument	A post medieval circular tree ring measuring 33.6 metres in overall diameter. It has a well defined bank of 3.7 metres w...	Rejected
36494	Monument	Post Medieval tree enclosure ring, once thought to be a Bronze Age round barrow.	Fully accessioned
36497	Monument	Post Medieval tree enclosure ring, previously thought to be a Bronze Age round barrow. Previously thought to be one of	Fully accessioned
36500	Monument	ST JOHN THE BAPTISTS CHURCH	Fully accessioned
36504	Monument	The remains of a churchyard cross consisting only of an octagonal socket.	Fully accessioned

1 2 3 4 5 Next Page size: 10 Page 1 of 978 (9777 items)

Is mapped
No (0)
Yes (9777)

Record Type
Event (2905)

HER response status
Completely accessioned (1611)
In progress (14)
Not in my area (75)
More...

Overall record status
Fully accessioned (65)
Not processed (9709)
Partly accessioned (0)
Rejected (3)

HER area
Bath and North East Somerset SMR (2164)
Bedford Borough HER (1462)
Berkshire Archaeology HER (1975)
Birmingham HER (1716)
More...

County (AMIE)
BARNSLEY (0)
BATH AND NORTH EAST SOMERSET (45)
BEDFORD (0)
BIRMINGHAM (1)
More...

National Park
Dartmoor (NP) (0)
Exmoor (NP) (72)
Lake District (NP) (0)
New Forest (NP) (0)
More...

Figure 3 – the records list page on the prototype NRHE to HER website.

Record details

Clicking on the feature name on either map or the HE UID on the record list brought up a details page for the record (Figure 4). This contained all the information in the NRHE, and therefore everything that needed to be accessioned (Table 3).

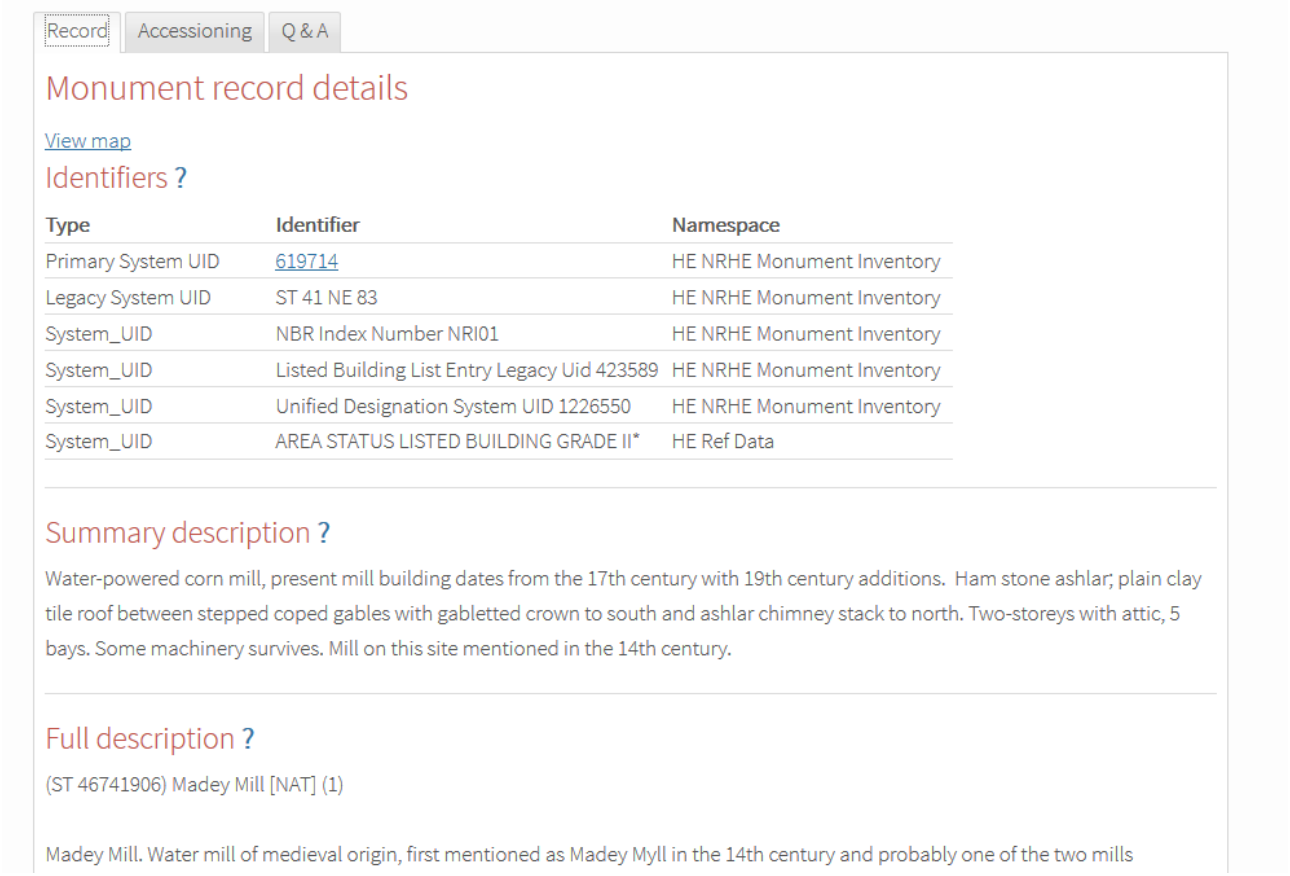


Figure 4 – part of the record details page on the prototype NRHE to HER website.

Table 3 – information contained in record details pages for Monuments and Events.

Monument data	**Event data**
Identifiers. Summary description. Full description. Sources. Location information, including a detailed map. Monument types, periods and evidence. Related Monuments, Events, archives and objects. Monument Actors. Metadata.	Identifiers. Event type. Description. Sources. Location information, including a detailed map. Classifications. Dates and periods. Related Monuments. Event people and organisations.

The record details page contained a tab that summarised both the overall and HER specific accessioning statuses (Figure 5). HERs could use this to add a record when they had accessioned a record by clicking the 'Add response' link. This brought up a form where HERs were asked to record the accessioning status, the HER record identifier, the relationship of the

HER record to the NRHE record and other information (Figure 6). The status recorded on this form by each HER was used to calculate the overall accessioning status on each record (Section 3.6.1).

Figure 5 – the Accessioning tab of the record details pages of the prototype NRHE to HER website.

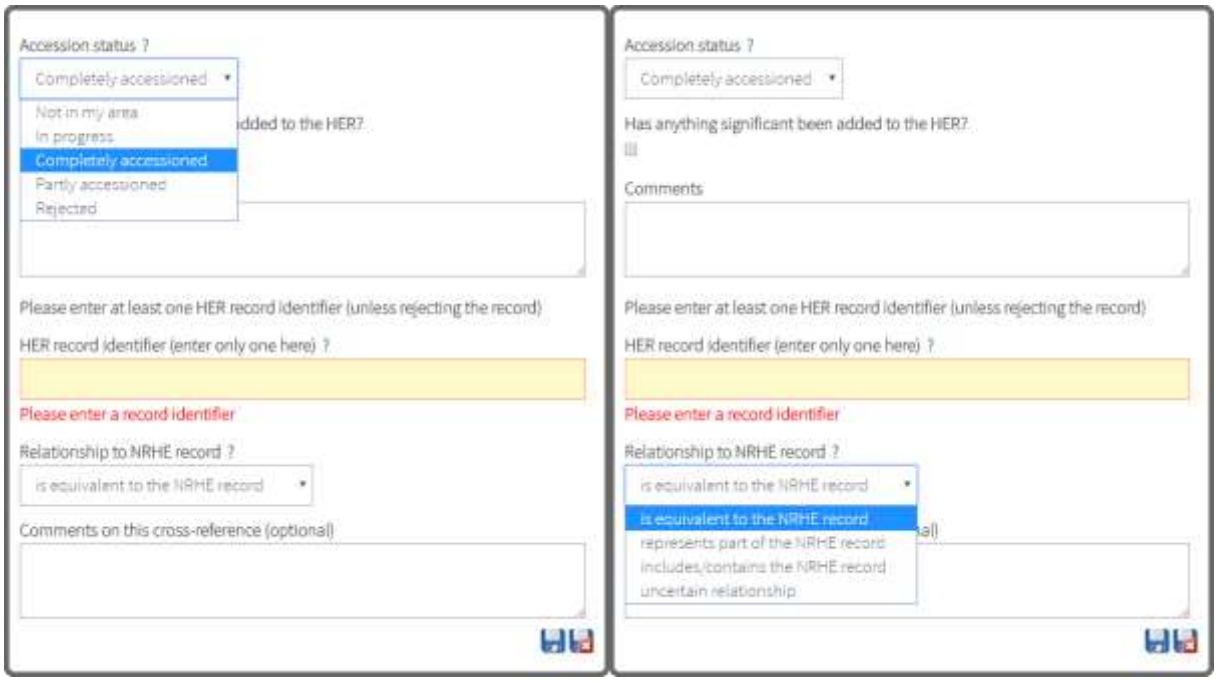


Figure 6 – the HER accessioning status recording form, showing the accessioning status (left) and relationship to NRHE record (right) dropdowns.

HERs could use the Q&A tab of the record details page to enquire about the record (Section 3.1.4).

Download

Functionality was included in the website that allowed HERs to download the NRHE data within their boundary in GIS format as a shapefile. This did not include those records where no GIS features were available. This could be used to assist with accessioning into the HER.

Other pages

The website also included help pages containing guidance on the NRHE and the accessioning process (Section 3.3) and project resources including a forum, progress pages (Section 3.1.5) and organisation management pages.

3.1.4 Historic England accessioning support

The NRHE to HER website included a facility for the HER to ask questions about any individual Monument or Event record, typically where the record details were not sufficiently clear to permit successful accessioning. This delivered a notification (plus hyperlink) to a nominated Historic England email address. Clicking the hyperlink opened the record in question, allowing Historic England to respond, which in turn sent a notification to the enquirer.

3.1.5 Monitoring progress

The website included the following mechanisms to permit Historic England to monitor accessioning progress:

- The interactive overview map showed records by their overall status (Figure 7).
- The Progress page included charts and tables showing a breakdown of accessioned status as assigned by the HERs during the accessioning process, both overall and for individual HERs (Figures 8-10).
- The Manage Organisations page showed a more detailed table of accessioning progress by each HER, along with other details (Figure 11).

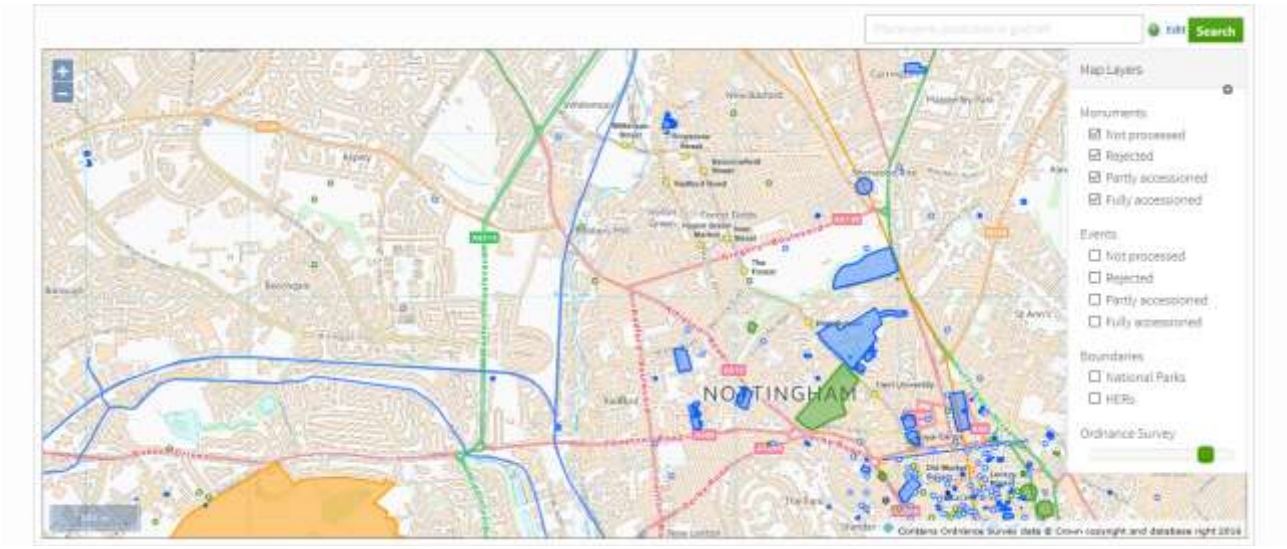


Figure 7 – the overview map on the NRHE to HER website, showing Monuments by status: blue = 'Not processed'; black = 'Rejected'; orange = 'Partially accessioned'; green = 'Fully accessioned'.

Status	Record count
Not processed	397210
Rejected	29
Partly accessioned	183
Fully accessioned	1310

Figure 8 – overall accessioning progress chart and table for Monuments on the Progress page of the NHRE to HER website.

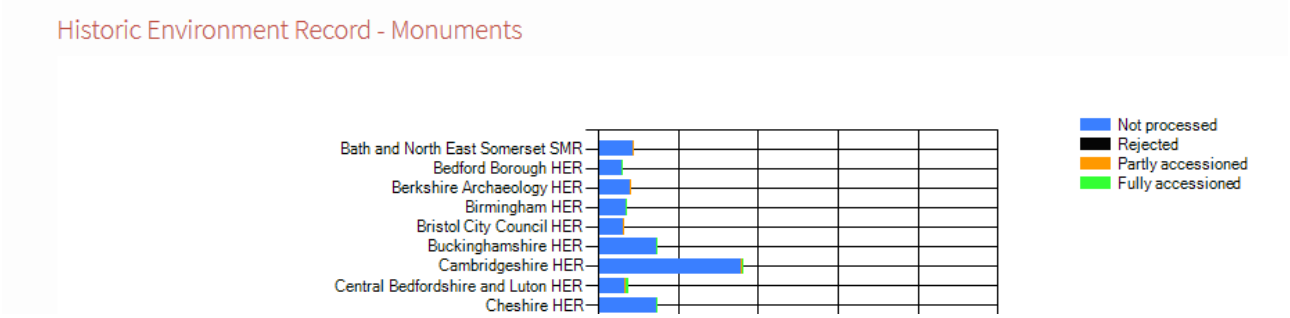


Figure 9 – section of the accessioning progress chart for Monuments by HER on the Progress page of the NHRE to HER website.

Back to top

Name	Not processed	Rejected	Partly accessioned	Fully accessioned
Bath and North East Somerset SMR	2163	0	1	0
Bedford Borough HER	1433	1	12	16
Berkshire Archaeology HER	1974	0	1	0
Birmingham HER	1714	0	1	1
Bristol City Council HER	1540	0	1	0
Buckinghamshire HER	3614	0	5	1
Cambridgeshire HER	5062	2	9	35
Central Bedfordshire and Luton HER	1675	0	29	180
Cheshire HER	3832	0	5	13

Figure 10 – section of the accessioning progress table for Monuments by HER on the Progress page of the NHRE to HER website.

Name	Monument record URL template	Event record URL template	In progress	Partly accessioned	Completely accessioned	Rejected	Not in area	User count	
Bath and North East Somerset SMR	www.heritagegateway....	www.heritagegateway....						2	
Bedford Borough HER	www.heritagegateway....	www.heritagegateway....		3	30	1	2	2	
Berkshire Archaeology HER									
Birmingham HER									
Bristol City Council HER									
Buckinghamshire HER								1	
Cambridgeshire HER	www.heritagegateway....	www.heritagegateway....	6	1	68	2		1	
Central Bedfordshire and Luton HER				14	278	7	3	1	
Cheshire HER	rcp.cheshire.gov.uk/...			7	23			1	

Figure 11 – section of the detailed table of accessioning progress by each HER on the Manage Organisations page of the NHRE to HER website.

3.2 STAGE 2: Technical testing phase of prototype by Project Team, and revisions of website where needed.

Initial testing of the "NRHE to HERs" website functionality was undertaken during Stage 2 by members of the project team: Coventry HER, Durham HER, Somerset HER and Warwickshire HER. They tested all the searching and accessioning operations using all provided tools to identify any issues. The feedback they provided was used to update and improve the website functionality.

This testing resulted in the changes summarised in Appendix C, all of which were relatively minor and require no further discussion.

3.3 STAGE 3: Write e-learning and guidance.

Historic England were responsible for writing e-learning, guidance and FAQs (Figure 12) during this stage. These were reviewed by the project team and, following any necessary amendments, made available in the prototype website. The top level headings of the guidance were:

- Using the Map page
- Using the Records page
- Monument records – provided background on the Monuments records in the NRHE
- Event records – provided background on the Events records in the NRHE
- Accessioning – describes the accessioning process to be used by HERs

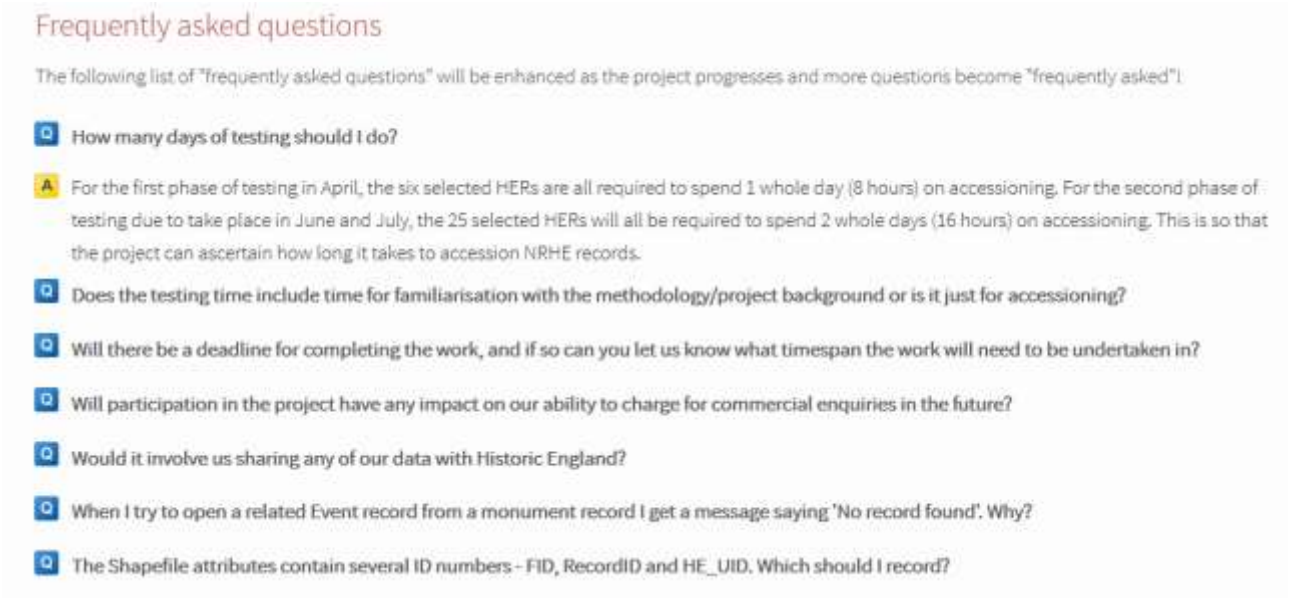


Figure 12 – frequently asked questions on the NRHE to HER website.

Feedback suggested that Historic England found the authoring facilities on the website very easy to access and edit. They felt that the guidance created during this trial was sufficient for the project, but required the continued ability to update the guidance as and when the need arises. They did not receive any queries related to material in the guidance and saw no evidence that users were not following it.

Forums were also provided to allow HERs to ask questions about the process, general data issues and website functionality, rather than individual records. In practice all discussions were started by exeGesIS SDM or Historic England staff, though this may simply be because none of the HERs had anything to post.

3.4 STAGE 4: Provide user helpdesk.

Staff from Historic England provided a user helpdesk to HER Officers involved in testing phases of this project. This formed a question-and-answer support service via record specific enquiries made through the website, email and telephone.

Historic England confirmed that all user helpdesk queries during testing were received via the record-specific Q&A facility and concerned the content of the record. A total of 39 queries were received, some of which required more than one field or fact to be checked.

The total time spent researching and replying to the queries was 10.5 hours, which averages at just over 16 minutes per query, or 16.5 seconds per NRHE record accessioned during testing. Assuming that the rate of enquiries and time required to respond to them remained consistent, then a total of 397 days spent responding to enquiries would be required to complete the accessioning of all NRHE records by the HERs. However, it is expected that, as the project progressed, the frequency of enquiries may decline and Historic England felt that the process did not prove problematic or particularly time consuming when spread across the entire testing period.

They felt that the available help facilities would be adequate and, given that it seemed to be useful to the HERs that utilise it, necessary for the project.

3.5 STAGE 5: First phase of HER testing.

Stage 5 testing of the working prototype website consisted of six HERs each undertaking a day of accessioning NRHE records into their HER systems using the prototype website. The six HERs included the project team and two others:

- Coventry HER
- Durham HER
- Somerset HER
- Warwickshire HER
- Bedford Borough HER
- Cambridgeshire HER

Detailed instructions were sent in an email to all Stage 5 testers (Appendix E). Each HER recorded the time spent. NRHE support was provided by Historic England (Section 3.4) and technical support was provided by exeGesIS. Coventry HER and Somerset HER also acted as mentors for the Bedford Borough HER and Cambridgeshire HER.

Feedback was obtained via the forums on the website and phone conversations with the testers (Appendix F). This covered positive and negative aspects of the experience, but was generally positive about website functionality and the process of accessioning.

Suggested improvements for the second phase of testing were compiled and taken to a project meeting held at the end of Stage 5 testing.

3.6 STAGE 6: Technical work, amending prototype with feedback comments.

The feedback from Stage 5 testing was compiled and assessed to create a list of possible actions for implementation before Stage 7 testing began, which are provided in full in Appendix G. Most feedback and agreed actions were relatively minor, but there a few were more significant and are described in the following sections.

3.6.1 Changes to accessioning status categories

Several items of feedback related to the accessioning status categories. These functioned well for monitoring accessioning progress at a national level, but did not perform well for individual HERs. In particular, it was not possible to set the status to be 'in progress' and records that were outside of the HER's area were set to 'rejected' overall, although they may not have been assessed by the relevant HER. The latter occurred due to the uncertain spatial accuracy of the NRHE data, which meant that records were assigned to multiple HERs where they were close to an HER boundary.

It was therefore decided to split the accessioning statuses into two, so each record had a status for each associated HER and an overall status covering the whole country. The overall status was determined based upon the individual HER accessioning statuses for the record in question.

The following HER specific accessioning statuses were implemented before Stage 7 testing commenced:

- Not processed
- In progress
- Rejected

- Partly accessioned
- Fully accessioned
- Not in my area

The 'Not in my area' status was used to help HERs filter out records that were initially flagged as being in their area but which are not and avoid records being universally rejected. Such records will generally be near the boundary of their HER area.

The ability to filter on the new HER accessioning statuses was added to the HER map and list view, with the list view also displaying the overall accessioning status. Both could be used to filter the records, including in progress records.

Combinations of HER specific accessioning statuses were used to determine the overall accessioning status (Appendix H), which could be:

- Not processed
- Rejected
- Partly accessioned
- Fully accessioned

The guidance on assigning accessioning statuses was updated appropriately. This focused especially on accessioning records that fall in more than one HER area, instructing HERs to give the status as 'Not in my area' should the record be completely outside of their HER boundary and 'Fully accessioned' if they have accessioned all the data relevant to their HER for records that straddle HER boundaries.

3.6.2 Data supply issues

The following issues reported by Stage 5 testers were caused by inadequacies in the method of test data supply for this project:

- Missing Originators in the Sources for Monuments.
- Missing cross-references to statutory designation records for Monuments.
- Monuments with duplicated grid references.
- Monument Actors with the wrong Organisation.
- Nearly 100,000 missing Events.
- Conflation of Event dates and periods.
- Events without GIS records.

It was decided that these issues could not be resolved before Stage 7 testing, but should be addressed in future (see Section 3.1.1).

3.7 STAGE 7: Second phase of HER testing.

A second phase of testing involving a larger set of HERs was undertaken during Stage 7. Twenty-five HERs in total were subjectively selected for testing to ensure that the categories shown in Table 4 were covered by the testing undertaken in Stages 5 and 7 combined. All HERs running systems other than HBSMR were invited to participate in testing, but only seven HERs volunteered. Similarly, only one Urban Archaeological Database, one HER in a National Park, one HER not based within a local authority and two small HERs volunteered for testing, so these were all included in testing. Including both Stage 5 and Stage 7 a total of 31 HERs were included in testing, which covers about 39% of all HERs in England.

Note that the parent sample of 79 HERs from which this selection was drawn, and the set of HER polygon areas to which were records were assigned, do not include all the 86 services/records identified as HERs on the Heritage Gateway. For the purposes of this project only include HERs for which an authoritative boundary could be supplied at the required time could be included. In practice this excluded the following urban records: Colchester, Exeter, Chester, Canterbury, Lincoln, and Oxford. In addition, Redcar & Cleveland, now separately identified as an HER on the Heritage Gateway, was not present in the dataset of HER geographical areas supplied for this project.

Table 4 – number of HERs selected for NRHE to HER testing that fell within each category. The categories were used to guide the selection process, the aim being to get a mix of HER setups. Note that some HERs could not be adequately assigned to these categories and all met multiple categories.

Category	Number of HERs		
	Stage 5	Stage 7	Total
Bespoke HER	2	5	7
HBSMR	4	20	24
Urban	2	6	8
Rural	4	18	22
Unitary	2	6	8
Coastal	2	12	14
Non Local Authority	1	0	1
National Park	0	1	1
Urban Archaeological Database	0	1	1
Small	0	2	2
Large	4	14	18

Each HER selected for Stage 7 testing was asked to complete two days of NRHE to HER accessioning. They were asked to divide their time approximately 2:1 between Monuments and Events, and to try map-based and list-based approaches to accessioning to evaluate which was more efficient:

- Map-based approach - testers were asked to swiftly review the map of Monument and Event records for their HER area in the interactive HER map, or using the appropriate shapefile download. Based on this they were asked to select a test area where the proportion of NRHE records that they already had in their HER appeared typical and that had significant number of both Monuments and Events.
- List-based method - testers were asked to select the Monuments and Events records in their HER area using the Records page, and simply work from the top (sorting and filtering on whatever column and tags they chose).

Detailed instructions were sent in an email to all Stage 7 testers (Appendix I). As with the Stage 5 testing (Section 3.5), NRHE support was provided by Historic England (Section 3.4), technical support was provided by exeGesIS, and Coventry HER and Somerset HER acted as mentors for the testers.

The HERs recorded time taken, and reported on positive and negative aspects of the experience, and suggestions for improvements via an online questionnaire.

3.8 STAGE 8: Capturing costs, resources required and feedback.

The results of the second phase of testing were reviewed and analysed in Stage 8. This section summarises the accessioning, reviews the feedback from the testers and Historic England and makes estimates regarding the total time required to accession all NRHE data into HER databases.

3.8.1 Summary of accessioned data

Twenty-five HERs were involved in Stage 7 testing and accessioned 2,454 NRHE records into their HER database[8]. The overall split between Monuments and Events was approximately 71:29 (Figure 13), which was close to the 2:1 split that each HER was asked to achieve.

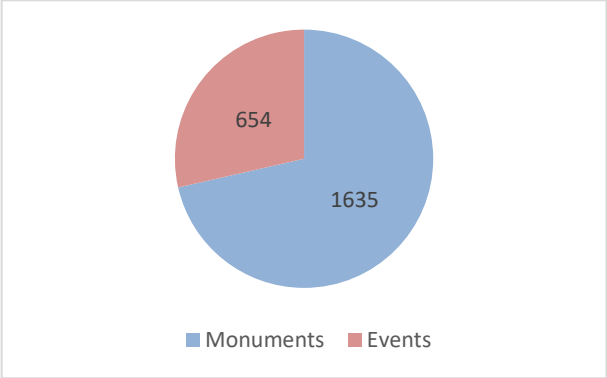


Figure 13 – Monuments and Events accessioned from the NRHE to HER database during Stage 7 testing.

The HERs recorded a total of 375.5 hours, of which approximately 10 hours was self-declared as unproductive. Two HERs did not record the time they spent on accessioning, which was estimated by the authors to be about 6 hours, based on the records accessioned by these HERs and the average rates achieved by other HERs. Those HERs that did record time spent accessioning noted some unrecorded time, which was estimated to be approximately 14 hours.

The total amount of time spent accessioning was therefore in the region of 385.5 hours. Assuming a 7.5 hour day, this was almost exactly the two days each HER was expected to spend accessioning the data, as although some HERs recorded less time accessioning others recorded more time.

3.8.2 Tester feedback

A structured questionnaire was undertaken following Stage 7 testing. Complete responses were received from all but one of the 25 testers, and one response was received from a tester from the Stage 5 testing.

There follows a synthesis of questionnaire responses.

<u>Time spent on Monuments and Events</u>

Testers had been asked to split the proportion of time spent between Monuments and Events by 2:1. The time spent on Monuments ranged from 40% to 100%, averaging at 70%. Five

[8] Note that it would not be appropriate to include the Stage 5 testers in this analysis, as the website was modified following Stage 5, which may have led to an increase or decrease in accessioning speed.

HERs (2, 4, 5, 21 and 24 in Figure 14) were felt to have deviated markedly from the requested ratio.

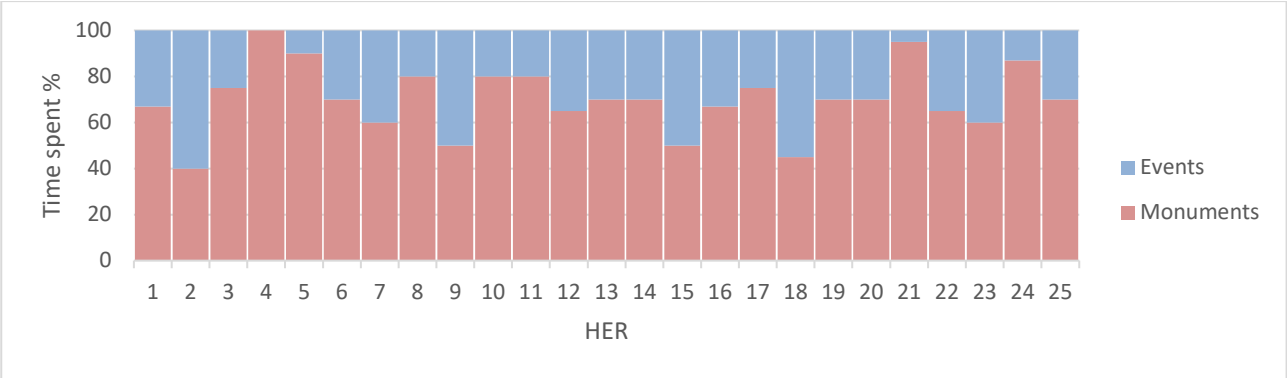


Figure 14 – proportion of time spent on Events and Monuments by each HER. HERs are represented as numbers so that they cannot be identified.

Given that the average ratios of Monuments to Events accessioned and the estimated proportion of time spent on each was approximately 70:30 it can be concluded that Monuments and Events take on average a broadly similar length of time (though see Section 3.8.4 for a finer grained analysis of time taken per record by type).

Unrecorded time

Testers were asked to record all their time, but some did not. In the questionnaire testers were asked how much time may have gone unrecorded. The total of unrecorded time declared in this way was in the region of 14 hours (Figure 15).

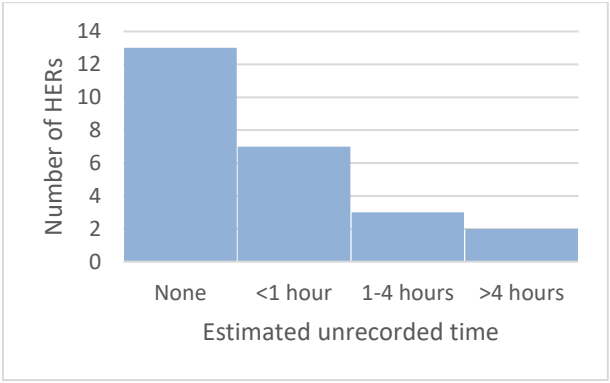


Figure 15 – distribution of unrecorded time by HER (n=25).

Time spent on each accessioning method

Testers were asked what proportion of their time was spent on each primary method of proceeding through the records: web map, shapefile or list. The results are shown in Figure 16. In reality most testers found some combination of approaches most useful.

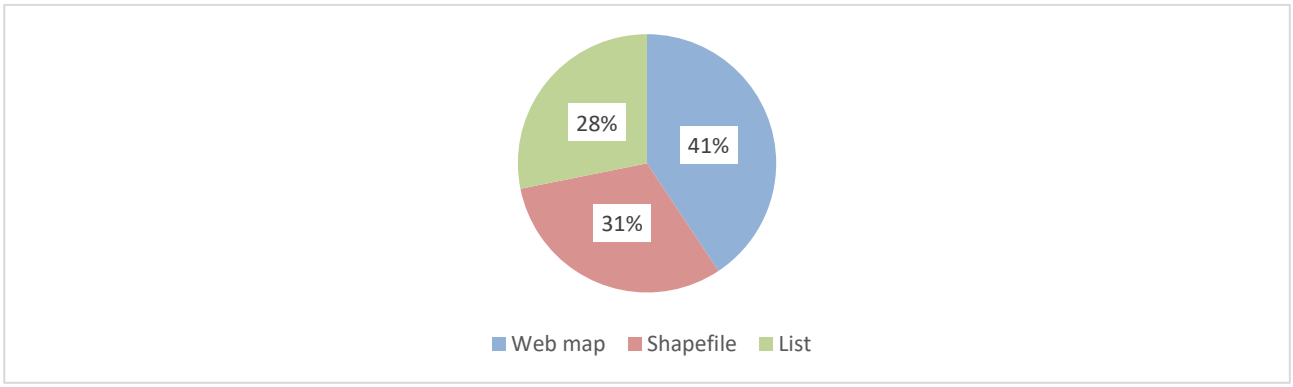


Figure 16 – average proportion of time spent between web map, shapefile and list methods of proceeding through the records (n=25).

Map based accessioning

Those testers who tried working from the HER map were asked whether the area chosen was typical in terms of the ratio of new to existing records (Figure 17). Most felt that it was representative, but just under a third were not sure.

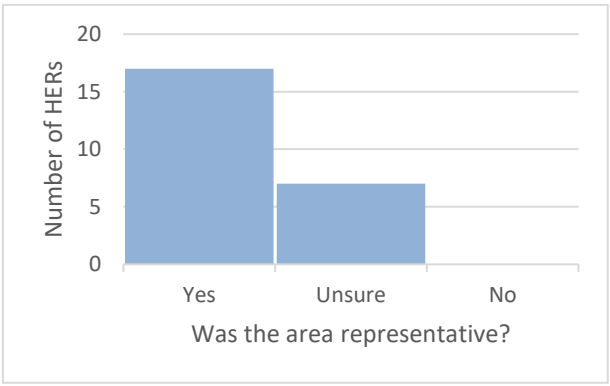


Figure 17 – whether the area chosen for testing was typical in terms of the ratio of new to existing records by the number of HER responses. HERs that said this question was not applicable are excluded (n=24).

Those testers who tried working from the HER map were asked whether it was easy to track progress from the map view. Most felt that it was, though three thought that it wasn't (Figure 18).

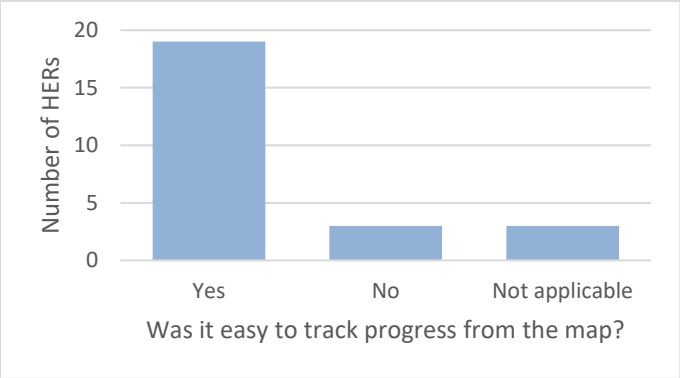


Figure 18 - whether it was easy to track progress when working from the map view by the number of HER responses. HERs that said this question was not applicable are excluded (n=22).

HERs also commented on keeping track of accessioning progress when working through the map view, which are provided in Appendix J.1. Those who felt it was not easy made the following comments:

- "It was fine until I zoomed out and then everything I had done reappeared."[9]
- "Felt in downloading GIS data in to HER it was easy to compare records but not easy to track progress easily. The online map did make it easier to track progress, but obviously less easy to compare against existing HER records."
- "It can be problematic in denser areas. I appreciate a fresh sheet can be downloaded periodically but I then have to convert it to a *.TAB file on each occasion and set up the hyperlinks to your website before I can work with it."

Those testers who tried working from the HER map were asked whether the map was easy to use. Only one thought that it was not easy to use (Figure 19), but they commented that this was due to the speed of the web mapping on their systems, which they felt was a local issue rather than a shortcoming of the web map.

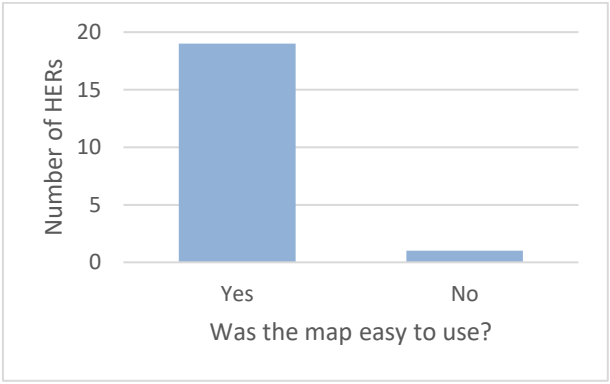


Figure 19 - whether the HER map was easy to use by the number of HER responses. HERs that said this question was not applicable are excluded (n=20).

Those testers who tried working from the HER map were asked whether the map was responsive enough. Two said that it was not (Figure 20), but in both cases the issues were thought to be local to the HER.

[9] This was due to the caching strategy employed within the web map, meaning that status changes took up to two hours to appear in the overview maps.

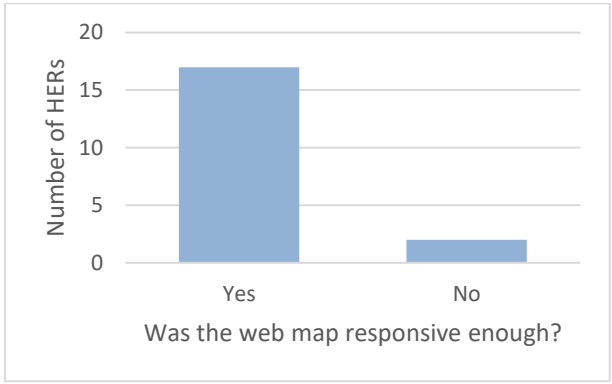


Figure 20 - whether the HER map was responsive enough by the number of HER responses. HERs that said this question was not applicable are excluded (n=19).

Those testers who tried working from the HER map were asked whether the info click popup contained sufficient useful information. The one HER that said that it wasn't gave no reasons (Figure 21), but they were one of the two that had encountered connectivity issues that seemed to be locally caused.

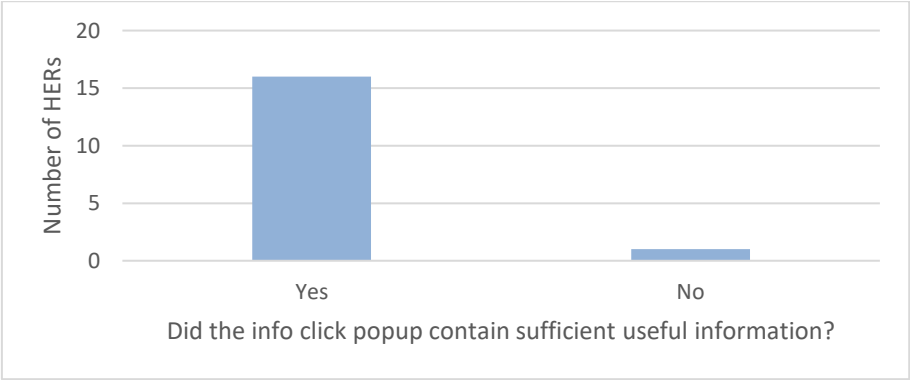


Figure 21 - whether the info click popup on the web map contained sufficient useful information by the number of HER responses. HERs that said this question was not applicable are excluded (n=17).

Those testers who tried working from the HER map were asked whether the base mapping was adequate to permit accessioning. Only one said that it was not (Figure 22), though it was clear from their comment that they were talking about the NRHE GIS data and not the base mapping:

- "The map depiction, being largely only point data, meant that the full extent of Monuments could not be mapped clearly in HER (for example, I am aware of and have GIS polygon and line data for some areas where NMP has been undertaken much of this is only mapped as points on the NRHE website)."

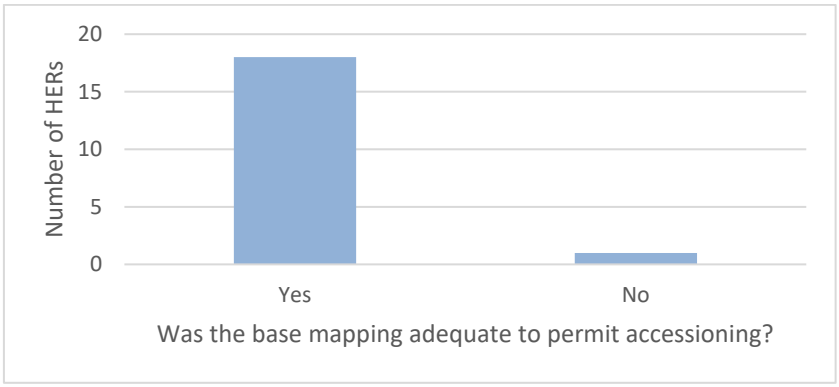


Figure 22 - whether the base mapping was adequate to permit accessioning by the number of HER responses. HERs that said this question was not applicable are excluded (n=19).

Comments on the HER map and suggestions for improvement can be found in Appendix J.2.

Downloaded shapefile based accessioning

Those testers who tried working with the downloaded shapefile were asked whether the attributes included were useful and sufficient. All 17 that said this question was applicable thought that they were useful.

Those testers who tried working with the downloaded shapefile were asked whether it was useful. Two said that it was not useful (Figure 23), though one was clearly commenting on the NRHE data rather than the shapefile itself:

- "In very many cases the locations of Events and Monuments was very wrong and so I did not use the shapefiles because I found them unreliable."
- "I did download the shapefile, but I found that I didn't use it at all."

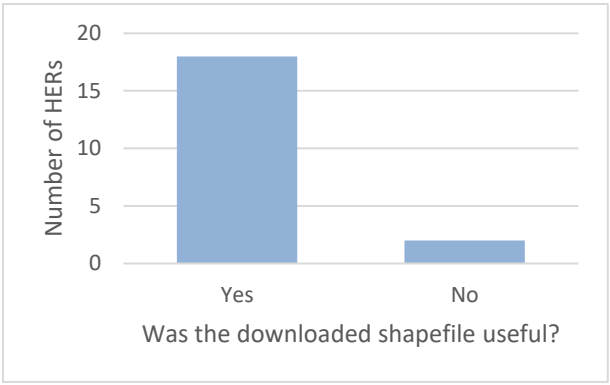


Figure 23 - whether the downloaded shapefile was useful by the number of HER responses. HERs that said this question was not applicable are excluded (n=20).

Comments on the shapefile download and suggestions for improvement can be found in Appendix J.3.

Record list based accessioning

Those testers who tried working from the record list were asked whether it was easy to use. Three felt that the record list was not easy to use, but it is hard to determine from their comments precisely why. Interpreting the various comments (Appendices J.4 and J.5) it would

seem that they would require additions to the tags or filtering to better suit their individual approach to accessioning.

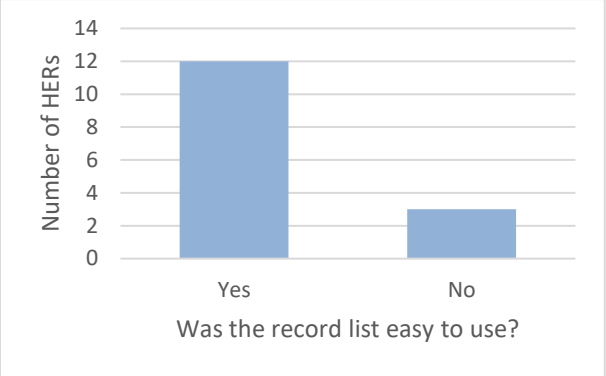


Figure 24 - whether the record list was easy to use by the number of HER responses. HERs that said this question was not applicable are excluded (n=15).

Those testers who tried working from the record list were asked which fields/columns they had used to sort the data. Status and HE UID were the most frequently used fields/columns (Figure 25). Six HERs tried sorting using multiple fields/columns.

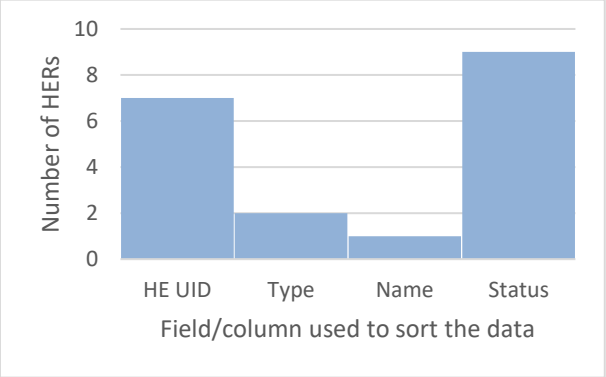


Figure 25 – the number of HERs that sorted the data in the record list using each field/column. HERs that said this question was not applicable are excluded (n=25).

Those testers who tried working from the record list were asked whether they felt other sort options were needed. Exactly half of those that responded thought that other sort or filtering options were required (Figure 26), suggestions for which included: map sheet, grid square, parish, Monument type, originating project, NRHE date created, HER UID and HER status. Only the ability to sort or filter by map sheet was requested by more than one tester and it is not clear what was meant by 'HER status'.

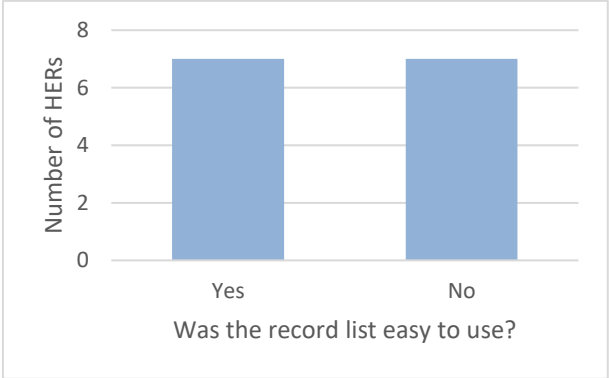


Figure 26 – whether other sort options were needed by the number of HER responses. HERs that said this question was not applicable are excluded (n=14).

Those who tried working from the record list were asked whether the tag-based filtering was useful. All 17 that said this question was applicable thought that tag-based filtering was useful.

Comments on the record list and suggestions for improvement can be found in Appendix J.5. One of the problems noted was due to one person that managed two HERs that were shown separately.

HER system setup

Testers were asked how many monitors they were using during testing, as it was anticipated that the use of two monitors would promote faster accessioning. This did not appear to be the case (Table 5), but the difference in rate was shown to be non-significant (Mann-Witney U test). It may be that the small sample size is masking any trend and that, on the whole, the speed of the individual accessioning the data has a greater impact on rates. One tester who worked with both one and two monitors did comment that for them it was faster with two.

Table 5 – the number of HERs using one or two monitors and the average accessioning rate achieved by each group, given in records per hour (rph).

Number of Monitors	Number of HERs	Avg. rate (rph)
1	5	7.06
2	20	5.83

Testers were asked to describe the speed of their HER/GIS and internet connection, as it was anticipated that system speed would affect accessioning speed. The accessioning speeds actually appear to show the opposite (Tables 6 & 7). However, assessments of speed are highly subjective and few of the individuals involved can compare their systems with those of others, so these assessments may be unreliable. The observed results could be produced if those who were accessioning more rapidly were more likely to describe their system as slow because they were making greater demands of it.

Table 6 – HER/GIS speed as rated by each the HER and the average accessioning rate achieved by each group, given in records per hour (rph).

Speed	Number of HERs	Avg. Rate (rph)
Poor	5	6.63
Moderate	9	6.42
Good	11	5.54

Table 7 – HER internet connection speed as rated by each the HER and the average accessioning rate achieved by each group, given in records per hour (rph).

Speed	Number of HERs	Avg. Rate (rph)
Poor	3	7.20
Moderate	9	7.92
Good	13	4.53

Response form

All testers were asked whether the accessioning response form was easy to use, and whether the accessioning response statuses made sense and were adequate. In both cases most felt that it was and none felt that it wasn't (Figure 27).

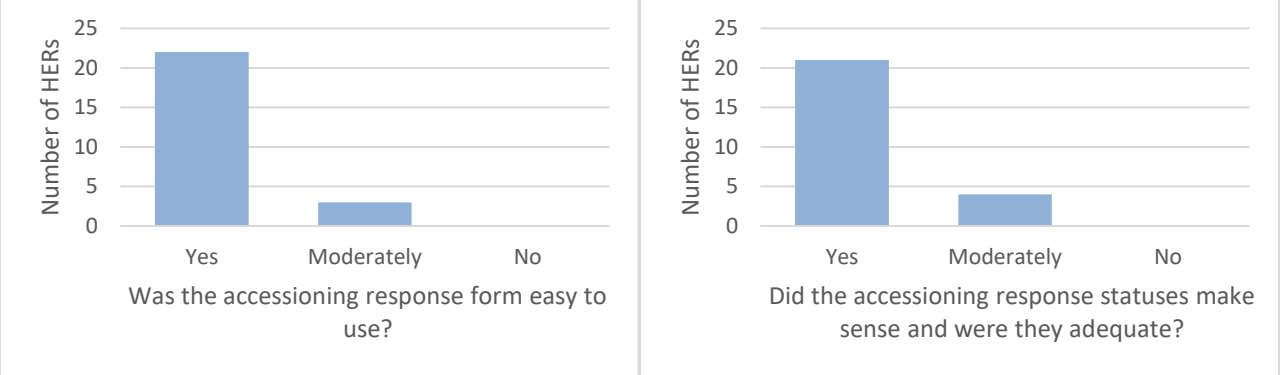


Figure 27 - whether the accessioning response form was easy to use (left) and whether the accessioning response statuses made sense and were adequate (right) by the number of HER responses (n=25).

HERs also commented on and made suggestions regarding the accessioning process, which are provided in Appendix J.6. Those who felt the accessioning response form was only moderately easy to use or that the accessioning response statuses only moderately made sense and were adequate made the following comments:

- "More subtlety and the space for multiple HER entries would be good."
- "Again, connectivity issues probably made the process much more challenging than it should have been."
- "Being able to search for a record number on the list screen would help."

Accessioning speed

Testers that had tried both were asked whether working from the HER map or list was faster. Though there was no obvious preference, the map based approach was felt to be faster by slightly more HERs (Figure 28). Testers were also asked for further comments on working from the HER map and list, which are provided in Appendix J.7. It seems clear that both approaches are considered to be valuable.

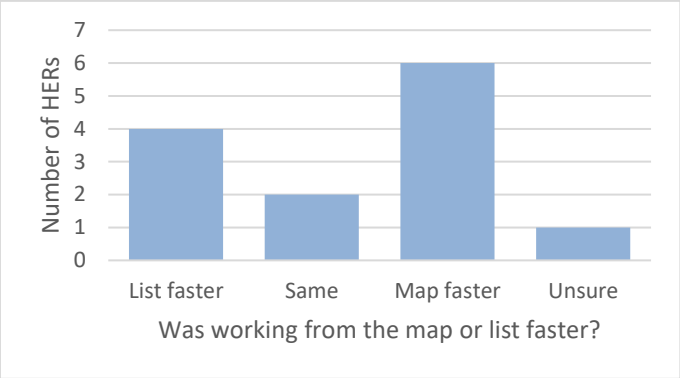


Figure 28 – whether HERs thought that working from the HER map or list was faster by the number of HER responses. HERs that said this question was not applicable are excluded (n=13).

How much faster could it be?

All testers were asked how much faster they thought accessioning would become once a routine had been established. Most thought that it would become a bit faster (Table 8), with further comments and suggestions in Appendix J.8. There is nevertheless an interesting correlation between the achieved accessioning rate expected speed increase, with faster testers expecting to get much faster. This is likely to be due to the differences in approach; apparently anomalous testing was noted from the tester that said accessioning would get more than twice as fast.

Table 8 – how much faster HERs thought accessioning would become once a routine had been established and the average accessioning rate achieved by each group, given in records per hour (rph).

How much faster	Number of HERs	Avg. rate (rph)
No faster	4	5.02
A bit faster	14	5.76
50% faster	3	7.42
Twice as fast	3	6.22
More than that!	1	10.25

Accession linked records

Testers were asked whether they had followed links to related records and accessioned those, or ignored them. The results suggest that doing this may result in a slight increase in speed (Table 9), but this was found to be not statistically significant[10]. When the testers were asked they gave no clear consensus on whether following linked records was more or less efficient (Figure 29).

Table 9 – whether HERs followed links to related records and accessioned these at the same time or ignored them, and the average accessioning rate achieved by each group, given in records per hour (rph).

Accessioned linked records	Number of HERs	Avg. rate (rph)
Yes	5	6.18
Sometimes	13	6.21
No	7	5.74

[10] Tested using linear regression by treating whether testers accessioned linked records as an ordinal variable.

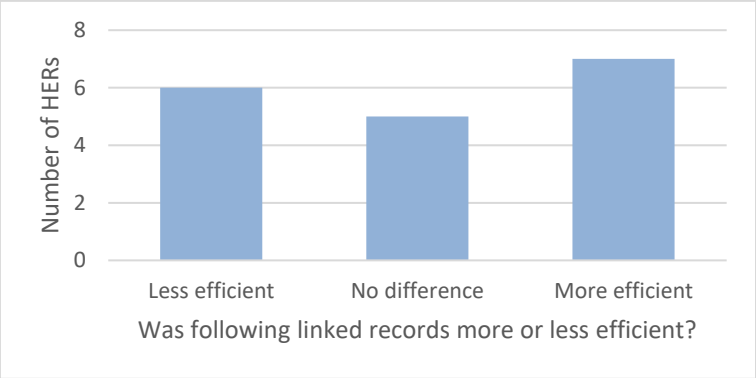


Figure 29 – whether HERs thought that working from the HER map or list was faster by the number of HER responses. HERs that said this question was not applicable are excluded (n=18).

Approach to accessioning Sources

Testers were asked which approach to accessioning Sources they followed. Unsurprisingly simply adding a reference to the NRHE had the quickest average rate, but it is not clear why those testers that used both approaches were faster than those that ensured each Source listed in the NRHE was in the HER (Table 10).

Table 10 – whether HERs followed links to related records and accessioned these at the same time or ignored them, and the average accessioning rate achieved by each group, given in records per hour (rph).

Approach to accessioning Sources	Number of HERs	Avg. rate (rph)
Added a reference to the NRHE	3	6.84
Ensured each Source listed in the NRHE was in the HER	9	5.45
Both	13	6.33

Testers were also asked whether they looked up the (missing) Source Originator in PastScape. Unsurprisingly those that did not achieved a quicker accessioning rate (Table 11).

Table 11 – whether HERs looked up the (missing) Source Originator in PastScape and the average accessioning rate achieved by each group, given in records per hour (rph).

Looked up Source Originator	Number of HERs	Avg. rate (rph)
Yes	5	5.65
Sometimes	9	4.60
No	11	7.47

Anything that could not be accessioned?

Testers were asked whether they found information that they were unable to accession and to explain the reasons. The results are shown in Figure 30, but it is clear from the comments (Appendix J.9) that these figures falsely include records that were not in the HER area and therefore weren't relevant. It also seems that testers felt they had not fully accessioned where NRHE information was simply less good than the information already in the HER, such as a point grid ref in the NRHE where the HER already has polygon.

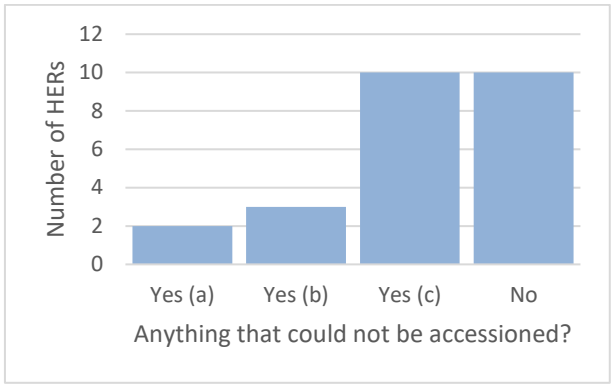


Figure 30 – whether HERs found any information that they were unable to accession. Where they answered 'Yes' the following reasons were given: (a) = 'things that don't fit our recording policy'; (b) = 'incorrect information'; (c) = 'multiple/other reasons' (n=25).

One HER subsequently noted that they had accessioned personal information from the NRHE, but their recording policy is not to do this.

Any other problems or suggested improvements?

Testers were asked to report any problems not otherwise covered by the questionnaire. The responses are provided in Appendix J.10.

Guidance and mentors

Testers were asked whether the guidance provided before testing and within the website was sufficient. Most felt that it was (Figure 31), though given the observed variation in accessioning approaches and the comments made by testers (Appendix J.11) it is clear that either the guidance should be improved or not all testers were adhering closely to it. This suggests that other ways of ensuring a consistent approach to accessioning should be considered, such as HER training, worked examples and short term placement of experts within HERs to spread knowledge.

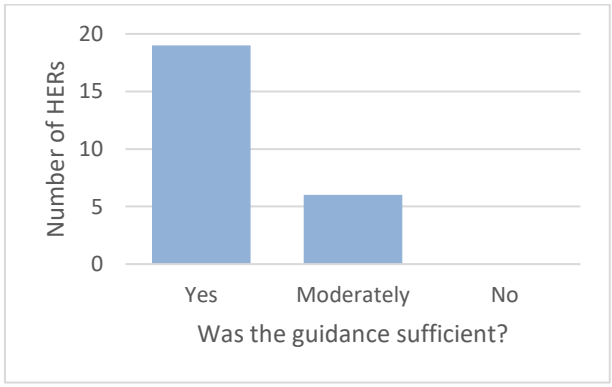


Figure 31 – whether HERs thought that the guidance provided before testing and within the website was sufficient (n=25).

Testers were asked whether they posted questions on individual records, and if so whether they found the functionality useful. 56% of testers posted questions, of which only one thought it was not useful and one had mixed results (Figure 32). The one that thought it was not useful commented that they had no timely response other than an acknowledgement.

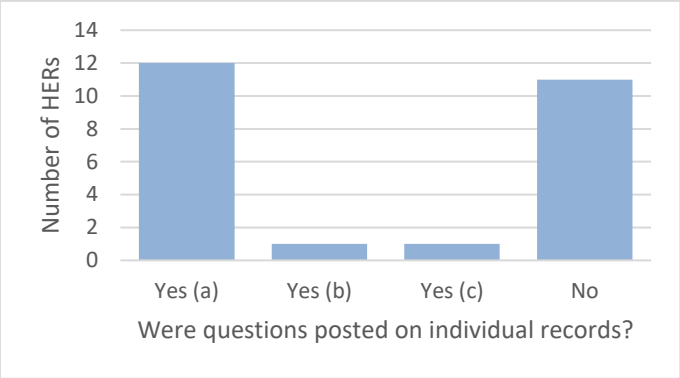


Figure 32 – whether HERs posted questions on individual records, and if they did whether they found this useful: (a) = it was useful; (b) = mixed results; (c) = it was not useful (n=25).

Testers were asked whether they contacted the designated "mentors", and if so whether they found this useful. Most had not contracted the mentors, but the three that had all found it useful (Figure 33).

It seems to be that the three testers that indicated that they had not known about the mentors were not the primary point of contact and the work had been delegated to them. These also include testers that recorded their time strangely and accessioned in unusual ways. This demonstrates the importance in ensuring that guidance gets to those actually undertaking the work and suggest that spot checks should be implemented to pick up on potential issues.

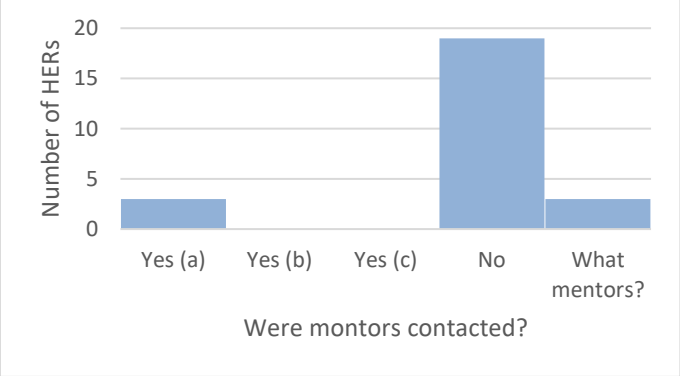


Figure 33 – whether HERs contacted the designated "mentors", and if they did whether they found this useful: (a) = it was useful; (b) = mixed results; (c) = it was not useful (n=25).

Other comments

Testers were invited to provide general comments on the testing exercise. The responses were largely positive and suggest that there is enthusiasm for the project among HERs but there are some small changes that could improve the experience (Appendix J.12).

3.8.3 Historic England feedback

Historic England were given the opportunity to provide feedback. This was structured using a questionnaire to prompt feedback in specific areas.

Monitoring accessioning

Historic England provided feedback on the tools on the website to monitor accessioning progress. The requests for functionality improvements have been included in the costed recommendations for website enhancements (Section 5.5).

Historic England liked that the records on the overview map were styled according to their overall accessioning status (Figure 7), but would welcome a key or legend incorporated into the map. This could be achieved by incorporating the styling into the map layers selection menu.

Historic England found the charts and tables in the Progress page (Figures 8-10) useful for presenting visual aids in meetings and presentations. They would like to see an additional set of graphs that only showed those records with statuses of 'Fully accessioned', 'Partially accessioned' and 'Rejected'.

Historic England did not comment on the monitoring functionality on the Manage Organisations page (Figure 11).

Breakdown of time spent

Historic England provided a breakdown of the time spent by them on tasks associated with Stage 7 testing (Table 12). It should not be necessary to repeat the time spent writing the e-learning, guidance and FAQs, as the existing text will be applicable should the project go ahead, but some time may be required to update or enhance the text.

Table 12 – time spent by Historic England on tasks associated with Stage 7 accessioning testing. The time spent on data supply includes an estimate of the time input from Historic England IMT, as the precise figures were not available at the time of writing.

Task	**Hours spent**
E-learning, guidance and FAQs	50
User helpdesk and Q&A	10.5
Total for data supply:	48
**Monument text files creation*	*9*
Manage overnight generation of XML	*9 × 1*
GIS export (Monuments and Events)	*9*
Events text csv export creation	*21*

3.8.4 Accessioning rates and support time

Three Stage 7 testers recorded less than the expected two days. In one case it is thought that the tester may have completed the full two days of testing, but did not submit any time records. The other two testers were considered unlikely to have completed testing, based upon the number of records accessioned. One of these had recorded no time, whilst the other had recorded what was thought to be the correct amount of time for the records accessioned.

The data from these testers are excluded from the analysis in this section.

Accessioning rates

The average number of Monument and Event records accessioned from the NRHE to HER per hour was calculated from the time spent, proportion of time spent on each and number of records accessioned for all HERs (Table 13). This shows that Monuments were slightly quicker to accession than Events, but that the rate averages to approximately 6 records per hour.

Table 13 – the amount of time spent accessioning Monuments and Events, total number of records accessioned and the record accessioning rate. Estimated time spent on Monuments and Events is based upon the estimated proportion of time spent on each and the total amount of time recorded. Accessioning rate, recorded in records per hour, is calculated by dividing the number of records accessioned by the estimated time spent. Based upon the twenty-three Stage 7 testers that recorded their time and the estimates for the two that did not (Section 3.8.1).

	Monuments	Events	Total
Estimated proportion of time spent	70.17	29.83	100
Estimated time spent	270.49	115.01	385.5
Number of records accessioned	1,635	654	2,289
Accessioning rate (rph)	6.04	5.69	5.94

Anticipated increase in speed

Testers were asked in the questionnaire how much faster they thought accessioning would become with practice. Based upon their answers (Section 3.8.2) and using appropriate multiplication factors it is possible to calculate the anticipated increase in speed (Table 14). This predicts that an average accessioning speed of 8.19 records per hour could be achieved.

Table 14 – predicting the achievable accessioning rate, based upon Stage 7 testing. The first two columns of data are duplicated from Table 8, to which appropriate factors have been assigned to each predicted speed category. The factor for all HERs was calculated by averaging the product of the number of HERs and factor for each category. The predicted rate is the achieved rate for Monuments and Events (Table 13) multiplied by the factor, and is given in records per hour (rph).

Predicted speed	Number of HERs	Factor	Predicted rate (rph)		
			Monuments	Events	Total
No faster	4	1	6.04	5.69	5.94
A bit faster	14	1.25	7.56	7.11	7.42
50% faster	3	1.5	9.07	8.53	8.91
Twice as fast	3	2	12.09	11.37	11.88
More than that	1	2.5	15.11	14.22	14.84
All HERs	**25**	**1.38**	**8.34**	**7.85**	**8.19**

This was an assessment against the rate the testers were achieving at the end of the two days of testing. The two days of recorded time also included the HERs start-up time, when they were working out what to do and getting familiar with the system, which will not be part of future testing. Assuming that the rate achieved on the second day of testing was higher than that achieved on the first day then actual improvement may be significantly greater than 8.19 records per hour.

Variability in accessioning rates

A great variability was present in the observed accessioning rates (Figure 34). The lowest accessioning rate in the Stage 7 testing was 1.20 records per hour, while the highest was 15.42.

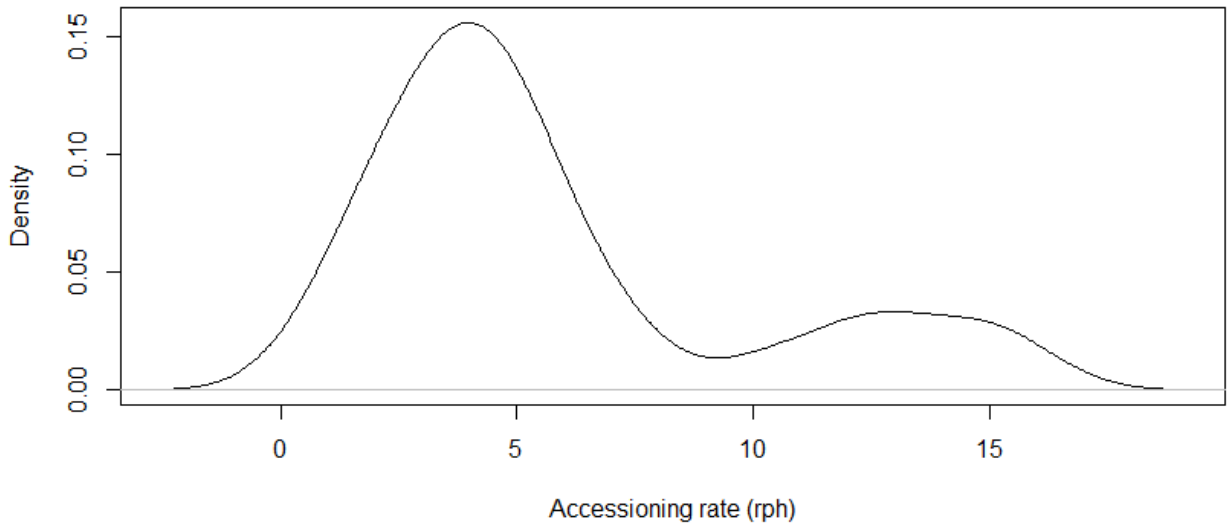


Figure 34 – kernel density plot of observed accessioning rates recorded during Stage 7 testing (n=25).

The reasons for this variability are not clear or quantifiable. Analysis of the questionnaire responses (Section 3.8.2) has shown that many of the assessed factors did not influence rates to the extent expected (e.g. monitors, system speed). There was an apparent difference in accessioning speed between users of HBSMR and bespoke software (Table 15), but this was shown to be non-significant (Mann-Witney U test), indicating that the relatively small sample size and small number of bespoke HERs included led to misleading results. This is supported by examination of the results, as both the lowest and highest rates were achieved by testers using HBSMR, whilst the accessioning speed of testers using bespoke systems ranged from 4.06 to 6.69.

Table 15 – average accessioning rate in records per hour (rph) recorded by HERs using different software. The only tester using HEROS had not recorded that any hours had been spent accessioning at the time of writing, so the accessioning rate could not be calculated.

Software	Number of HERs	Accessioning rate (rph)
HBSMR	19	6.16
Bespoke	4	4.94
HEROS	1	?

From the complete range of recorded data, questionnaire responses and comments, the four most important factors affecting recorded rates are considered to be:

1. The nature of the relationship between the existing HER data and the NRHE data (the greater the divergence, the longer the time required).
2. The complexity of the records being worked on.
3. The approach adopted to "full accessioning" (NRHE actors, Sources, People and Organisations, pers. comm. references, etc).
4. The approach adopted to record enhancement (some regarded this as essential to accessioning, others did none). There is some evidence from comments and measured rates that slower rates went hand in hand with a more holistic review and re-working of existing HER information, often with reference to Sources other than the NRHE.

Factors #1 and #2 are conditions that cannot be altered, but may have been affected by the sample of HERs and records accessioned during testing. Based upon the results of the HER map and list based testing (Section 3.8.2) it is not clear that the testing undertaken during this project covered a truly representative range of these conditions.

Factor #3 can be controlled, as it can be influenced by guidance, training and support to ensure sensible and consistent practice. It can also be influenced by the decisions on the roadmap for the NRHE data from this point forwards, in particular how it will be archived, supplied to or made accessible to HERs in future.

Factor #4 is also controllable to a degree, though depending how this project proceeds it may be an area where it is desirable to permit significant freedom, albeit with an understanding that this will influence overall rates of progress. This must be considered within the context of a limited timescale, as HERs cannot be allowed to enhance records endlessly at the expense of undertaking the basic accessioning of the majority of NRHE records. Regular progress checks will be required to ensure that full accessioning is likely to be achieved before the project is due to be completed, with action taken if an individual HER is falling behind schedule.

Predicted time required to complete accessioning

Table 16 shows the predicted time required to complete accessioning of the NRHE into local HERs. The estimated 42 person years divided between the 86 HERs equates to one person in each HER accessioning NRHE records full time for six months. The actual time required will vary by HER, as NRHE records are not evenly divided between the HERs (Appendix K).

Table 16 – estimated time required to complete accessioning of the NRHE into local HERs. The number of Monuments in the NRHE was calculated in summer 2015. The number of Events in the NRHE was estimated and includes field observations. The predicted rates are taken from Table 14.

		Monuments	Events	Total
Number in NRHE		398,932	c.250,000	c.648,932
Predicted rate (rph)		8.34	7.85	
Estimated time required	Hours	47,825	31,857	79,683
	Days	6,377	4,248	10,624
	Years	25.3	16.9	42.2

Predicted support requirements

Table 17 shows the predicted time required to respond to Q&A requests, based upon information provided by Historic England (Section 3.8.3) and the number of Monument and Event records accessioned. Records accessioned during both Stage 5 and Stage 7 testing were included, as both stages were covered by the time recorded by Historic England.

It is possible that the number of Q&A requests will actually increase during the course of the project, as HERs get used to the process and start to make maximum use of the facility. The 358 days of Historic England time required to respond to Q&A requests over the project timescale may therefore be an underestimate.

Table 17 – includes the records accessioned and rejected during both Stage 5 and Stage 7 testing. Time spent on responding to Q&A requests from Table 12.

Time spent (hours)		10.5
Number of records accessioned		2,536
Time per record (seconds)		15
Number of records in the NRHE		c.648,932
Estimated time required	**Hours**	2,687
	Days	358
	Years	1.42

3.9 STAGE 9: Presentation to all HERs

The prototype NRHE to HER website was presented to the HER Forum Summer Meeting in London on 5th July.

This presentation occurred before the second phase of testing, so it was not possible to present any conclusions. Instead the presentation focused upon the aims of the project and the development and functionality of the website.

No feedback was received as a result of this presentation. This was possibly because HERs had heard about the project before and there was not much to add to what they knew as the testing had not been completed.

3.10 STAGE 10: Write end-of-project report.

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

- Crispin Flower
- Mike Lush

4 Lessons learned and project evaluation

4.1 Strengths

The project demonstrated that the chosen accessioning methodology is viable and accessible to all HERs.

By implementing a prototype toolkit for accessioning, then undertaking iterative rounds of testing and revisions, the project identified and ironed out a few sub-optimum design issues. Most importantly this process allowed the list of accessioning statuses to be improved, and to implement the HER map page giving each HER a view of the records according to their response statuses.

The prototyping and testing approach has identified a series of recommendations for minor enhancements that will further enhance the success of the full-scale accessioning project when it proceeds. These recommendations are expanded on below.

The proposed data supply and reconciliation project could not proceed successfully without "buy-in" from the HER community, and to this end this project has served to inform and engage the HER community. Twenty-six HERs have now had extensive hands-on involvement with the opportunity to give detailed feedback and shape the development of the tooling and processes. This group has been overwhelmingly positive about the experience, while clearly aware of the magnitude of the task.

These HERs have also broadcast information and opinion about the project to the majority of the HERs that were not directly involved, through regional HER meetings and professional/ personal contact networks.

4.2 Weaknesses

Issues around the supply of test data compromised some aspects of the display of NRHE data and the accessioning process, slowing down progress (to an unquantifiable extent). These issues have been discussed in Section 3.1.1 and mitigation measures identified.

The most significant weakness in the project methodology was that it was not possible to exclude the "learning period" from the collected data on accessioning rates. Feedback suggests that most testers began slowly, taking some time to read background information and familiarise themselves with the website and downloads. However, there was no means of quantifying this, and no means of excluding work done in the early time period from analysis. With the benefit of hindsight, a discrete familiarisation period could have been added, during which all testers learned the system, with time spent on this phase separately demarcated from the subsequent phase of "real" accessioning.

The impact of this weakness is that the projected accessioning rates are too slow, because they include this learning period, and because this learning period made up some significant proportion of the two days sent overall. A crude estimate of this effect might suggest that testers did (in effect) nothing for the first quarter day, then worked at half speed for the next quarter, then worked steadily from that point forwards. This would imply that the recorded rate underestimated the steady rate by 18.75%. This has not been factored into projections, but it should be borne in mind.

The project failed to obtain complete data and feedback from three of the testing HERs, two of which had to be excluded from the analysis as insufficient clear information was forthcoming

regarding amount of time spent. This failure was considered unsurprising, given that testing was being undertaken at a time of exceptional pressure on HER services from the agri-environment consultations. It was agreed by the Project Team that the overall body of test results was not significantly undermined by these omissions. It is important to note that these testers did successfully accession records, and the omissions were in the area of overall time spent and in the administration.

4.3 Implications

The two main implications from this project are:

a) The NRHE to HER data supply and reconciliation project is achievable and beneficial using the methods and tools developed during this prototyping project.
b) The NRHE to HER data supply and reconciliation is a substantial project requiring careful planning and sustained management, plus the coordinated efforts and commitment of the HERs, central agencies and a technical and logistical support team.

The recommendations from this project should be adopted to improve the efficiency and success of the full project.

5 Recommendations

The following section discusses and where necessary justifies the recommendations made.

5.1 Future data supply

Test data from the NRHE were successfully supplied for this prototyping project. However, the tools used for this purpose within Historic England turned out to be partial and imperfect, and this took excessive staff time and resulted in a number of problems in the supplied data that adversely affected the accessioning experience (see Section 3.1.1 and Appendix A).

The agreed recommendation is to reconsider the data supply methods with Historic England IMT and data management staff, looking at all available options. This should take into consideration the desirability of achieving a suitable format for archiving as well as supplying data for NRHE to HER. Alternatively, the database could simply be exported in its entirety, as import will be most accurate if the data are as close to the source database as possible. If no better solution can be identified then a repeat of the same process is recommended.

The previous method could be used again as a fall-back, if no better solution is found. A re-supply of data in a different format will permit some of the data issues in the prototyping project to be resolved, but it will in turn require re-writing some of the presentation components of the website.

Some noted data issues arose from data content within the NRHE rather than the method of export. Remedial actions are possible, and would benefit the NRHE to HER process, so they are included in Table 18.

Table 18 – suggested remedial actions to data issues within the NRHE. Estimations of the resource requirements have not been included for all items. MoSCoW is a way of prioritising and stands for "Must have", "Should have", "Could have" and "Won't have for now".

Suggested action	Resource requirement (days)	MoSCoW
Discussions with Historic England ICT and Listing Information & Spatial Analysis staff, design of new data transfer method.	8	M
Include full record audit information in Monuments data supply, at least as shown in PastScape.		S
Amendment of data presentation components to publish data from new revised supply.	3	M
Data: add NMP outline Monument polygons to NRHE GIS dataset		S
Data: Address issue of near duplicate polygons in Monuments data		S

It is not possible to estimate the time required from Historic England for the supply of data, as the method used is likely to be different from that used this time. However, if the previous method were reused it is reasonable to assume that the time required may be quicker than the c.20 days recorded for this project (Table 12), as it will be possible to draw upon lessons learnt to speed up the process.

5.2 Accessioning approach(es) to implement

The analysis in Section 3.8.2 identified no clear preference between online map-based, downloaded shapefile, and online list-based accessioning approaches. The results of the questionnaire suggest that a combination of all three is beneficial, with different approaches having advantages in different situations. It is therefore not possible to recommend one main accessioning approach over another. Instead HERs should be expected to use whichever approach is most efficient for them and the data they are accessioning.

Similarly, there appeared to be no statistically significant advantage in speed to following linked records. This approach can be described in the guidance, but it is not appropriate to recommend or enforce it.

Nevertheless there are aspects of accessioning where a clear approach would be preferred. These are discussed below as recommendations.

5.2.1 Accessioning Sources

Sources should be dealt with at the time of accessioning each Monument or Event, as there is a risk that these data could otherwise be lost. Referencing the NRHE as the sole source is not recommended, as the NRHE and the Sources data it contains will in time cease to be available. The recommended approach should be for HERs to fully accession all Sources referenced by the NRHE records, as well as referencing the NRHE as a Source in its own right.

The precise manner of incorporating these referenced Sources may legitimately vary according to the amount of information available from the NRHE, as many Source references were found to be partial or brief, and the HER's recording practice. For example, it is felt to be acceptable to include references to additional Sources that the HER staff have not themselves accessioned in descriptive text, an approach that requires far less time than creating fully structured source records.

5.2.2 Personal data

One of the testers identified during testing that some NRHE records contain personal data, and that HERs do not tend to include such information, or may store this in the parts of the record that may become visible to end users. We are unable to supply examples of affected records as this information was not supplied by the tester.

This issue had not been recognized in the guidance drafted during this project, and should be covered in future.

5.2.3 HER recording policies

During testing some situations arose where HERs found that NRHE data did not fall within their recording policy. Where these conflicts occur, it may be appropriate to negotiate a change to the recording policy with the HER, as this would be likely to bring them closer to the national standard.

Where recognized in advance, this issue can be addressed within the HER's Accessioning Plan (see Section 5.4).

5.2.4 HER data enhancement

It's clear that some HERs took the opportunity to make more general enhancements to the data in their databases while accessioning. This is clearly beneficial overall, but should not be

allowed to interfere with an HER's ability to accession all relevant NRHE data within the project timescale. It is therefore recommended that guidance should advise HERs not to undertake wider enhancement during accessioning, unless that enhancement is a pre-requisite for the accessioning.

It should be clear that wider enhancement is not eligible for support, and that the priority is the completion of the NRHE accessioning. Records identified as requiring wider enhancement should be flagged as such.

5.3 Guidance improvements

The responses to the HER questionnaire (Section 3.8.2) and observed variation in accessioning approaches suggested that either guidance improvements were required in some areas, or not all testers were adhering closely to it. Clearer guidance should help to resolve both issues, so it is recommended that the guidance is reviewed and improved to make it more readable, more comprehensive and avoid discrepancies.

A minor discrepancy occurred between the guidance and the instructions that were disseminated by email at the start of the testing. The email stated that all Sources needed to be accessioned in order to qualify for a 'fully accessioned' status, but the guidance web page stated that it was acceptable to simply link to the NRHE as a Source. Should this project go ahead, it is important that communications are consistent with the agreed approach.

Another example of an area of uncertainty arose around the "Actors" recorded against NRHE records. Monument records often contained Actors named "Compiler" or a "Heritage Protection Adviser" from the Organisation "HE NRHE Monument Inventory". Whilst other Monument Actors contained valuable information, these were essentially metadata about the addition of the record to the NRHE and therefore had little value outside of the NRHE. This caused confusion amongst the testers, as it was not clear whether this information should be accessioned in order to regard the record as completely accessioned. The guidance should therefore contain specific guidance on which Monument Actors must be accessioned and which need not.

The guidance needs to be disseminated to those that are doing the work, which may not be the primary contact within the HER (Section 3.8.2). For this reason part of the guidance should be that all HER staff are instructed to read the guidance before and refer to it throughout accessioning. This should help to avoid nonstandard approaches to accessioning and accessioned data.

We recommend that the general guidance is supplemented with a specific "accessioning plan" for each participating HER – see Section 5.4 below.

It is recommended that the online guidance is thoroughly reviewed in the early phases of the full project. The revised guidance should be clear and succinct, and describe correct and incorrect accessioning. They should detail exactly which data must and need not be accessioned.

It is also clear that the guidance must not be static and will need updating as the project proceeds, to address areas of uncertainty and questions arising. The NRHE to HER website should continue to allow guidance to be changed as the need arises.

5.4 Accessioning Plan for each HER

It is recommended that the general guidance is supplemented with a specific "accessioning plan" for each participating HER. Based on a common template, this should be refined with each HER during the induction period, and should define precisely where each unit of NRHE information will be stored with the receiving HER's system.

The (tabular) template should itemise each unit of information in the NRHE Monument and Events records (cross-referencing the relevant online guidance page), and for each it should define where and how that information will be transferred to.

This template should be drafted in the early stages of each project, then should be completed with each HER taking specific consideration of their recorded system and policies. The finished Accessioning Plan should become essential guidance for the individuals undertaking the accessioning in each HER, but should also form an important part of the overall project documentation. It is suggested that the agreed Accessioning Plans are made available within the NRHE-to-HER website.

For HERs using the same system, e.g. HBSMR, it is likely that little or no variation will be needed between HERs.

5.5 Website functionality improvements

The areas of change and improvement in Table 19 were discussed and agreed by the Project Team. Priorities have been assigned using a MoSCoW[11] classification, because although all were agreed to be desirable, there are variable cost-benefits and some are more fundamental ("M") than others.

It has also been acknowledged that new lessons may be learned on making the transition from testing through to live accessioning for extended periods. A full review after twelve months is therefore recommended, by which time the first group of HERs will have undertaken significant accessioning work. If enhancements can be identified at this stage, then making changes could make a major difference to subsequent costs and efficiency. A contingency development budget has therefore been recommended for possible changes following this review.

Table 19 – proposed areas of change and improvement for NRHE to HER website functionality. MoSCoW is a way of prioritising and stands for "Must have", "Should have", "Could have" and "Won't have for now".

Item	Resource requirement (days)	MoSCoW
Set-up a duplicate of the site for training and testing purposes	1	M
Incorporate legend into the map layer selection menu system.	1	S
Add additional set of graphs to show only statistics on records with statuses of 'Fully accessioned', 'Partially accessioned' and 'Rejected'.	1	M
Add MapInfo tab download functionality	2	S

[11] MoSCoW is a way of prioritising and stands for "Must have", "Should have", "Could have" and "Won't have for now".

Item	Resource requirement (days)	MoSCoW
Add new reporting of progress showing rates of accessioning by each HER and overall through time (e.g. by Month/Quarter)	3	M
Filtering of record list by map quarter sheet (in HERs own area)	3	C
Filtering of record list by Parish (in HERs own area)	3	C
Adapt site to work with non-HERs (see below for explanation and detail)	7	C
Adaptations to website following twelve-month review	8	S

5.6 Hosting

The hosting platform used for this project proved sufficient for the testing phase. The site was running on a shared Windows Server 2008R2 server, with its database on a shared SQL Server 2014 database server. This web server will need to be retired at some point during the project lifecycle[12], so continuation with the current hosting arrangement for the whole of the project would not be possible.

Moving the website onto a server running Windows Server 2012 is recommended before commencing NRHE to HER. Further changes to the hosting platform may be needed through the lifetime of the project following annual review, so the project should include contingency to cover this.

The prototype site performed reasonably well under test conditions, running on a shared server. Anticipated load under "live" conditions will be higher, but still moderate overall (up to 50 active users at any one time might be expected).

Having a dedicated server running on the NRHE to HER website would provide greater resilience, as the server would not be running other systems that might compromise the resources available to the NRHE to HER site and there would be a lower risk of accidental change. It would be easier to scale the server resource to demand on a dedicated server. However, dedicated servers have a higher cost than shared servers.

Both dedicated and shared web servers for seven years are presented as options in Table 20, this being considered as the time needed for preparatory phases, revisions, testing, training, then a five year overall program of accessioning (three year main phase and two year contingency).

Table 20 – options for long term hosting of the NRHE to HER website. Estimated costs for 1 and 7 years have been provided. Estimated costs for 7 years include an anticipated 14% discount.

Option	Estimated Cost	
	1 year	7 years
Dedicated Windows Server 2012, 8GB RAM, 2 CPU, 120 GB disk, HTTPS certificate installation/maintenance. 2 x SQL Server database[13] on	£2,500	£15,000

[12] Windows Server 2008R2 operating system reaches the end of extended support in January 2020.
[13] Covering both production and staging systems.

shared SQL Server 2014 including offsite backup. 10GB of offsite file backup with 30 day retention. 1st April 2017 to 31st March 2024.		
Shared Dedicated Windows Server 2012 web server, HTTPS certificate installation/maintenance. 2 x SQL Server database on shared SQL Server 2014 including offsite backup. 10GB of offsite file and database backup with 30 day retention. 1st April 2017 to 31st March 2024.	£1,250	£7,500

5.7 Technology platforms

The NRHE to HER project will be implemented over a period of several years. During this period there will be significant changes to the full range of technologies in use, any of which could potentially compromise the functionality of the systems involved and so undermine progress. It is therefore necessary to review whether technology platforms used in the prototype are likely to be sufficiently future proof, and identify any risk areas and possible mitigation.

This report only considers the centralised website and server technologies. Clearly there may also be significant change at the HER end as well that may affect progress, but that is addressed elsewhere by the review processes (Section 5.8.9).

The current NRHE to HER website uses the range of technologies shown in Table 21, each of which is assessed for lifecycle issues in relation to a seven-year project, with proposals for mitigation.

Table 21 – technologies used by the NRHE to HER website, with an assessment of any lifecycle issues for a seven-year project and proposed mitigation.

Component	Lifecycle/issues	Mitigation proposal
Windows Server 2008 R2 server operating system	Extended support ends Jan 2020.	Move to Server 2012, for which no end date for extended support has yet been set (Section 5.6). Annual review needed.
mojoPortal Content Management System (open source, C#)	Active development has stopped recently, other than security patches. mojoPortal should continue to be functional and secure for the coming few years but there is no certainty that it will be so until 2024.	Consider pre-emptive redevelopment of NRHE to HER within a more future-proof CMS platform and language (e.g. .NET Core and MVC, all of which are open source). 20 days development + 5 days testing required for this re-write. Annual review needed.
ASP.Net WebForms and .Net Framework version 4.5	.NET 4.5 is not the latest release, and the .NET 4.* family will become unsupported within the project lifecycle.	
SQL Server 2014 database server	No issues; no end date for extended support has yet been set.	Migration to SQL Server 2016 (or future version) may be advisable within the project lifecycle, and should pose no issues. Annual review needed.

GeoServer 2.7.2 (open source)	GeoServer has recently released version 2.9 and continues to develop.	Migration to latest version of GeoServer advisable before project start. Annual review needed.

5.8 Implementation strategy

In this section the various areas that need to be tackled as part of a complete implementation strategy for the NRHE to HER project have been considered, culminating in a proposed timetabled project plan.

5.8.1 Timescales for accessioning

Timescales for the accessioning project need to be realistic – neither overly ambitious nor overly relaxed. There must be a sense of imperative from the beginning, but equally enough time for the accessioning of large County datasets at manageable rates, and for assisting less well-resourced HERs through the process. A three-year accessioning project, plus a two-year contingency period, is recommended based upon the calculated rates.

This should be designed as a rolling program, with HERs beginning accessioning when the necessary preparatory arrangements and training/review have been completed, and at a time when any agreed assistance can be provided (see Section 5.8.3).

It is suggested that the HERs should be divided into a small number of groups (perhaps four), with each group commencing (and ideally completing) accessioning through defined (but overlapping) chronological phases. The group schedule should be designed to accommodate the negotiations through the application process, to permit effective hands-on training and review in the start-up phase, and to facilitate the allocation of assistance in an effective manner without becoming over-stretched.

It would be prudent to ensure that larger HERs can commence accessioning as early as possible, particularly those with more than one full time equivalent year of projected work, so these should be included in the groups scheduled to commence work early in the overall timetable.

Equally it would be prudent to seek early engagement with those HERs that might present challenges, whether through extreme under-resourcing or a history of non-engagement.

5.8.2 Ensuring quality and completeness of accessioning

Four factors determine the quality and completeness of accessioning:

1. The software system/application presenting the information for accessioning.
2. The software system/application into which the information is being transferred.
3. The decisions taken by the individual undertaking the accessioning.
4. The time that can be devoted to the task.

These are discussed in the following sections.

<u>The software system/application presenting the information for accessioning</u>

This has been developed and tested through this project, and found to be fit for purpose with some minor amendments proposed (see Section 5.5).

The software system/application into which the information is being transferred.

Recipient HER database and GIS applications need to be capable of accessioning all of the information contained within an NRHE Monument or Event record, to avoid data being dropped or de-graded in the transfer.

HERs using HBSMR are known to be compliant in this respect. For bespoke HERs or those using HEROS this is less straightforward to assess without a detailed review of each system (which was beyond the scope of this project). Testers were asked whether there were any data that they could not accession, and to give reasons. All the reasons given related to difficulties with the quality and completeness of the NRHE data, or matters of recording policy. No questionnaire response indicated any technical or structural reason preventing accessioning any data, but from separate information it was known that one bespoke HER could not directly record GIS lines or polygons at the time of testing. There were indications too that the recording of Actors and Roles was problematic for some; for example, one reported that they had to accessioning the Director of Fieldwork as an External reference in Events as there was no capability for recording this kind of Actor/Role information.

There are likely to be some issues in this area that have not yet been recognized. It is possible that an independent review of the manner of recording in some of the test group HERs might not agree that it fully preserved the integrity of the NRHE data. Equally it is likely that there will be issues in the HERs outside the test group. This will only be known by undertaking a review of systems and recording/accessioning methods with each participating HER.

In addition to their functional specifications, recipient systems need to be reliable and responsive enough to permit efficient working. Required rates of progress will not be met where systems are affected by significant downtime or excessively slow performance.

If issues are found in the areas described above, they should be resolved as a matter of priority, or accessioning within that HER are may be compromised. Possible solutions will include:

1. Explore other modes of recording ("workarounds") within the existing HER software. This is likely to resolve some issues.
2. Extend or adapt the existing HER software. This may be possible where software is developed in-house and the HER is able to undertake or request development.
3. Replace the HER software. This should be recommended and supported where issues are identified and cannot be resolved by #1 or #2. Replacement of HER software can be achieved in as little as 1-2 months if a cloud-provided model is followed, but could take significantly longer for an in-house model (typically 6-18 months).
4. Arrange for joint working with an adjacent HER service with a more suitable software, and merge datasets and responsibilities. This is likely to take from 6 months to two years to achieve.

Where issues are found in this area it would suggest the HER is not currently managing a MIDAS compliant system and dataset, so this should be seen as an opportunity to provide guidance and assistance to deliver an overall improvement in the network of HER services.

The decisions taken by the individual undertaking the accessioning.

As mentioned above, the feedback from testers showed that some encountered NRHE data that they could not accession or chose not to accession during the trial. The reasons given for this fell into two areas:

1. Incomprehensible, missing or incorrect data from the NRHE. Testers remarked that many records, particularly Events but also some building records, could not be understood sufficiently well to create an HER record, or were known to be incorrect/inadequate in relation to information already held in the HER. As a variant of this, some aspects of certain records were found to be incoherent, so were omitted from a record that was otherwise fully accessioned. This should not be seen as a significant problem, as by definition these are low (and sometimes zero) value records, but it is desirable to achieve common approaches. This issue can be addressed through guidance and examples of how best to incorporate and reference partial NRHE records, and by encouraging the HER to use the Q&A mechanism to seek clarification (which was found to resolve many such issues during testing).
2. HER recording policy precluding certain records, or parts of records. For example an HER recording policy might say that a record must have data for fields A, B and C, but no value for C was present in the NRHE. More significantly, a recording policy might exclude whole classes or periods; the only example of this seen during this project was an HER that didn't record ridge and furrow "within the HER… relying instead on NMP coverage"). In these cases, it is recommend that the HER should be encouraged to adapt their recording policy for the purposes or NRHE to HER accessioning, and to flag these records as requiring enhancement if they do not meet normal recording standards.

The time that can be devoted to the task.

NRHE to HER accessioning will require significant time input from HER staff. Estimates of time required per HER have been presented in Appendix K, and range from around 7 days' work to over 500 days. While it is anticipated that real work accessioning rates may end up faster than this, when staff become well practised, it is important to recognize that there are no shortcuts. Failure to input this time will result in failure to complete accessioning. How can this input of time be guaranteed?

An assessment of HERs is therefore recommended to understand how much time they can allocated to NRHE accessioning. Due to the fast-changing circumstances within HER services this should be undertaken shortly before the accessioning project commences, so that the data are up to date. The suggested format is a short telephone interview covering the time the HER could allocate with and without compensation. Support requirements can be informed by this assessment.

It is unrealistic to expect an HER service with no dedicated HER staff resource to undertake NRHE to HER accessioning (e.g. using staff who normally work only on casework) – to do so would be inefficient, as these staff are not skilled and experienced in HER work even if they use the HER systems in a decision-support capacity. Arguably the work could be implemented entirely through externally-provided assistance (Section 5.8.3), however this would be far from ideal for a number of reasons, and may miss an opportunity to promote more sustainable solutions. There is therefore a case for making the guaranteed provision of a defined level of dedicated HER staff resource a condition for participation in NRHE to HER.

5.8.3 Assistance (strategic and direct)

NRHE to HER cannot happen without central coordination and assistance. This divides into two main areas: strategic assistance and direct assistance.

Strategic assistance

Strategic assistance for NRHE to HER covers a wide variety of responsibilities across a time period of up to 6 years. Some of the will be the responsibility of Historic England, some can be delivered effectively with partners, some may be completely outsourced if desired. Identified responsibilities include:

- Managing the design of new data supply methods and implementation of this work in agreed time frames.
- Managing the transition to a read-only terrestrial NRHE.
- Running and supporting the NRHE to HER website with sufficient reliability and uptime throughout the project lifecycle.
- Communication with stakeholders in advance of the project.
- Organising the application and sign-up process for HERs.
- Compiling the Accessioning Plan for each signed-up HER.
- Organising the allocation of direct assistance to HERs.
- Organising the sign-up of non-HERs.
- Monitoring progress towards sign-up criteria by HERs and negotiating direct assistance.
- Providing suitable training through regional open sessions.
- Preparing the Accessioning Plan with each HER and providing direct hands-on training.
- Operating the Q&A facility to provide rapid responses to record-specific questions.
- Operating a general support service to answer questions about the accessioning process, improve guidance and documentation in the light of questions arising.
- Managing technical changes in the NRHE to HER system where real-world changes in HER services affect the NRHE to HER process (e.g. service boundary changes affecting tagging).
- Monitoring accessioning progress overall and by HER, reporting, identifying the need for remedial measures.
- Undertaking the 12-month review of progress and deciding on remedial actions if required.
- Managing the transition of PastScape to become a pointer to online HER and non-HER resources, ultimately retired once all redirections are possible.

Direct assistance

It's clear that successful and timely completion of the NRHE to HER accessioning will require some form of direct assistance to be provided to some proportion of the HERs. The shorter the timetable for completion, the more assistance is likely to be required.

At current staffing/resource levels, some proportion of HERs might find it possible to undertake the entire accessioning process without assistance, given sufficient time. It is not possible to establish precisely which HERs might fall into this bracket, but a formula might be derived from a) the number of records to be accessioned and b) the number of FTE staff working on the HER (as opposed to Development Control or other casework). Assuming a single full-time HER Officer could devote 0.5 days per week to accessioning without impacting other priority areas of service delivery then they could accession 6,500 to 7,000 records over five years without assistance, but this is likely to be a big assumption.

The mean number of Monument plus Event records per HER at the time of this project was just under 7,000, and 48 HERs had fewer than 7,000 records in total to accession (31 HERs having more than 7,000 NRHE records). However, while the level of dedicated HER staffing across the range of HER services is not known to this project in detail, it is possible to be sure that the majority of these smaller service do not have 1 FTE or even close to that figure. Even if they did, accessioning at such a slow overall rate is likely to be less efficient than a more concerted

effort, and relying on such gradual "voluntary" rates could be highly risky to the overall chances of successful completion.

To help understand resource requirements, work out a more detailed implementation plan and reduce the uncertainties in this area, a review of the availability of HER staff resources within every HER is recommended. This review should aim to establish a) the quantify of dedicated HER resource, drawing on existing information from HER Audit process and the Computing Surveys, and b) estimates of the proportion of this resource that could be devoted to "NRHE to HER" without unacceptable impact on overall service delivery. This review would require direct consultation with each HER.

A program of assistance is therefore needed, going beyond the guidance, documentation and support already discussed. The greatest factor influencing successful completion of accessioning is the availability of appropriately skilled practitioner time. This resource could be provided in a number of ways:

- As funding to the HER service that can be used to support the accessioning programme however they see fit. This mechanism was predominantly used for the initial creation of a fit-for-purpose SHINE dataset.
- As hands-on assistance drawn from a retained team of specialists. These specialists could be Historic England staff, could be self-employed, or could be contracted from other providers, or some combination of these.

Allocation of the assistance could be determined by:

a) Negotiation with each HER.
b) Establish a framework for HERs to apply formally to participate in NRHE to HER, and optionally to seek support.
c) Allocate support according to formulae based on numbers of records and availability of in-house HER staff resource.

The recommendation is a combination of all three. a) and b) should be used to engage HERs with the process. b) will be necessary as the conditions for eligibility for both participation and funding can be clearly stated in this context. Option c) alone may not result in targeting assistance where it is most needed to achieve successful accessioning, but it could be used to define reasonable and appropriate scales of assistance based on such formulae.

Structural and technical change may also be required, or highly beneficial, in some HERs before effective participation can be realised. Particular benefits would be gained from promoting the merging of smaller HERs such that none exists without some level of dedicated staffing and with appropriate technical infrastructure. The detailed means of promoting such arrangements are beyond the scope of this project, but the NRHE to HER project provides a unique opportunity to influence arrangements and drive improvements, so measures along the following lines are tentatively suggested.

Eligibility for participation in NRHE to HER and the ability to bid for assistance should be clear, and should include commitments to a) provide an acceptable level of dedicated, competent staff resource, b) provide an operational MIDAS-compliant information system with acceptable levels of information security, and c) provide satisfactory levels of access to HER information, including online access or a coherent plan to establish this within acceptable timescales. These suggestions are expanded on below.

Where eligibility criteria are not readily met, a process of negotiation should commence regarding how to achieve the requirements. The authors of this report suggest that HERs should be assessed against the requirements for an HER and the results clearly (and publicly) published. For each HER this should itemise each requirement and show whether it is or is not met. The report will also show which HERs do not meet all of the eligibility criteria for "NRHE to HER" and thus require development and assistance to make progress towards these standards. The recommendation that this information is shared and published is felt to be crucial in allowing all involved to work openly towards improvement.

It would be reasonable to ask why any given Local Authority HER service would participate in a process that might result in them being identified as falling short of required service standards. The incentives should be overwhelming, and the consequences of non-participation explained. It must be promoted as a clear expectation by ALGAO and Historic England that participation is expected, and that the transition to the new arrangement will be supported. There should be clear explanation and promotion of the understanding (already shared by most if not all HER Officers) of the strategic importance of NRHE to HER in providing a sounder footing for local/regional HER service delivery, but also the increased expectations that accompany this.

5.8.4 Succession strategy for NRHE data editing

For a transfer of data from the NRHE to the HERs to be effective, it has been strongly argued by participants in this project that the NRHE records must not be dynamic during the process. These records must be frozen at (or shortly before) the time of data supply, or the receiving HER will not know whether the job has been finished. So the terrestrial data within the NRHE should become read-only before the extraction of the dataset that will be used for accessioning, while the maritime data will continue to be maintained.

The terrestrial NRHE dataset is at present being actively maintained and enhanced. This programme is undertaken due to current needs and business purposes within Historic England. Stopping this programme will clearly provide both a resource saving and also a business impact. Evaluation of Historic England's business requirements was out of scope for this project, but if Historic England will retain any role in creating and enhancing terrestrial Monument and Event data, then clearly alternative methods for managing and accessing this information will be needed if the data are not to be entered into the NRHE.

The results of such work by Historic England should in future be made available to those involved in heritage protection casework by the most rapid means possible. While further discussion and recommendations in this area are outside the direct scope of this project, analysis by the Project Team determined that the NRHE-to-HER website and tools could themselves present part of the solution, operating alongside the Heritage Gateway, HER systems and OASIS. Further discussion of this area is therefore included as Appendix L.

5.8.5 Succession strategy for data access

As well as being responsible for the creation and curation of new information, Historic England staff also use the NRHE for internal research and decision support. Any change to the functionality of these systems needs to meet these business needs. In addition, NRHE information is made available to external users through the PastScape website.

Evaluation of Historic England's internal business requirements was out of scope for this project, but clearly access to information needs to be retained after the terrestrial NRHE becomes read-only or unavailable.

It is suggested that PastScape should remain online for several years displaying its full payload of terrestrial and marine data - probably beyond the end of the NRHE to HER accessioning process. When the terrestrial data behind it becomes read-only, it is suggested that the site needs to feature a prominent statement to this effect, linking off to clear information about the roadmap for the information systems involved.

The collection of concordance information throughout the NRHE to HER process will logically permit links to be added to PastScape pages directing users on to new live resources published either through the Heritage Gateway or HER websites, or both. PastScape pages could therefore make a transition from showing the full NRHE information to showing partial information and pointers. However this would require a) development of PastScape, and b) feeding information back into it from the NRHE to HER database – two factors that may rule out this proposal.

If the current PastScape site itself cannot be efficiently adapted in this way, PastScape record *URLs* could, at a future point in time, be redirected to new pages housed alongside the NRHE to HER website to provide the pointers to successor web pages (Box 1). Such a notice would be simple to generate from the concordance data collected during the NRHE to HER accessioning process.

Box 1 – example PastScape redirect notice

PastScape record URLs could redirect to successor web pages. For example, http://www.pastscape.org.uk/hob.aspx?hob_id=110725 could load a page which, instead of the current record data, showed something like the following, but with full styling and supporting information:

5.8.6 Archiving the NRHE

When the terrestrial NRHE becomes read-only as described in Section 5.8.4, and depending on whether plans for its incorporation into the Archive can be realised, this may be an appropriate time to ensure a complete archive is made. Ideally the data prepared for supply to the NRHE to HER process will also be suitable for archiving, as it will be in non-proprietary structured text-based formats. Further discussion of archiving is outside the scope of this project.

5.8.7 Online access to HERs

The model of sustaining data access described above requires effective access to HER records to be delivered in parallel with the accessioning project. A full analysis of current online access to HERs, and how to achieve full coverage, was beyond the scope of this project and is being considered by other HIAS Heritage Gateway work package. However, this matter is clearly of great importance to the long-term success of "NRHE to HER" for the sector as a whole, so merits some attention.

54 HERs are already available online through the Heritage Gateway (i.e. 68% of the HERs as defined for this project). Some HERs that are not currently available on the Heritage Gateway are separately available through their own web interfaces (e.g. Hampshire, Northamptonshire), either with full searchable records or through the inclusion of HER data within Local Authority web maps.

If NRHE to HER proceeds broadly as recommended in this report, with the ultimate withdrawal of PastScape from active service, an HER that cannot be accessed online at that time would represent a step backwards in terms of public access to information on the historic environment. It may also represent a deterioration in access to this information among heritage professionals, e.g. heritage protection teams in Historic England. These negative outcomes should be avoided where possible.

As recommended in Section 5.8.3 it should be made clear to participating HERs that there is a clear expectation to deliver online access to Monument (and probably Event) records within the NRHE to HER project timescales. It could be imposed as a requirement for participation, or for obtaining access to NRHE to HER support, that a coherent Online Access Plan is submitted, agreed and published.

Some HERs are currently unable to make such commitments, at least in the short term. It is likely that this position will align with difficulties in meeting other aspects of the requirements for participating in NRHE to HER, including the information systems they run, and/or their ability to guarantee dedicated staff resource on the HER. Remedial approaches have been suggested elsewhere in this report, including recommending and supporting the sharing of service arrangements with adjacent HERs in order to create a service with sufficient combined critical mass to meet the requirements of NRHE to HER.

5.8.8 Non-HER Record Maintainers

The main priority of NRHE to HER is clearly to achieve the efficient and complete transfer of NRHE data to the appropriate actively curated and accessible HER (as defined by the HER Guidance Document forthcoming from ALGAO and Historic England).

It has also been recognized by the Project Team that there would be great strategic value in reaching out to other organizations that actively maintain records of the historic environment. Examples might include Parks & Gardens UK, The National Trust, War Memorials Online, The Milestone Society, the Church of England and other similar record-holders. These organizations actively maintain databases of Monuments relevant to their interests and business requirements, all overlapping to some degree with records that have been curated in the NRHE. At present there is inadequate integration of these records into the overall information landscape, which could be addressed by inviting them to accession whatever information from the NRHE is of interest to them, and to enter their concordance/cross-referencing information in return. This would allow the evolving PastScape successor web pages to include pointers to these online resources in addition to the online HER record details, for the great benefit of researchers and historic environment professionals alike.

These organizations would not participate in the same manner as HERs. Their actions would not be able to change the overall record status: when the National Trust accessions a record, that record will not become “Fully Accessioned” until it has been accessioned by a registered “HER”. The value in this participation would be that the cross-references to the online information from these other record-holding bodies would be captured through the accessioning process, thus hugely enriching the information landscape overall.

There would be no need to consider providing assistance to non-HER participants other than to ensure they could attend open training Events and gain access to the online supporting information. It would be desirable if they could make use of the same Q&A facilities as the HER participants.

To enable the participation of non-HER record maintainers the actions and changes in Table 22 would be required.

Table 22 – actions and changes required to enable the participation of non-HER record maintainers.

Item	Resource requirement
Extend the registration screen in the NRHE to HER system to accommodate non-HER organisations	1 day
Identify possible record-maintainers and consult with them on participation	1 day
Ensure communications regarding training included non-HER participants	0.5 days
Amend the accessioning logic so that accessioning by non-HER participants does not influence overall record status.	1 day
Configure the NRHE to HER website so that non-HER participants see appropriate pages (e.g. a page similar to the "HER map" but with different name and explanatory text)	0.5 days
Amend the progress reporting to present information on the progress/actions of non-HER participants separately from HER participants.	1 day
Amend the "Accessioning" tab on record details to include a new section showing the responses from non-HER participants.	1 day
OPTION: Amend the Downloads page functionality to permit non-HER participants to download shapefiles of all Monuments / Events. It may be preferable not to provide this functionality, though it is considered important for accessioning the GIS information.	1 day

5.8.9 Review and reporting

With a project of this scale, review and reporting are crucially important to prevent problems escalating and impacting on overall progress and costs.

The tools within the prototype website permitted reporting on the current accessioning position overall and per HER. Additional visualisation of rates of progress through time that should help to highlight any problems is recommended. These reports will be visible to the project delivery team, including those involved in accessioning.

A strategic annual review is recommended, involving senior staff representation, which will consider the following main items:

- Sign-up of HERs – current progress against expectations, and allocation to testing groups.
- Application for direct assistance – current status of applications and allocations against projections; consideration of resource availability against demand.
- HERs considered as failing entry criteria – current status and proposed actions.
- Accessioning rates: actual against projected, and consideration of remedial actions needed.
- Procedure and functionality: consideration of any issues arising and any required changes to systems, training, guidance.
- Technology review and consideration of required remedial actions.

5.8.10 NRHE to HER draft project plan

The project plan in Tables 23 & 24 has been drafted to bring together the many recommendations made above. Assembling the project delivery team, including external project/technical delivery partners where needed, must be undertaken *before* the commencement of this project delivery plan.

Table 23 – proposed plan for year 1 of the NRHE to HER project.

Task	Month								
	0	1	2	3	4	5	6	9	12
Project start-up meetings with relevant stakeholders to clarify roles									
Prepare information for HERs and non-HERs									
Publicise through appropriate channels									
Plan data supply									
Open application process for participation and assistance									
Implement data freeze on terrestrial NRHE									
Implement archiving of terrestrial NRHE and/or potential incorporation into the Historic England Archive									
Implement changes to PastScape to clarify read-only status of terrestrial records									
Implement data supply									
Implement changes to website interfaces									
Option: implement and test monument submission mechanism within NRHE to HER site and/or Heritage Gateway									
Build a staging copy of the website, for use in training and testing									
Validate and load supplied data (+ possible iterations of re-supply)									
Review and enhance online guidance									
Prepare Accessioning Plan template									
Decide on participating Group 1 HERs and assistance measures for initial phase									
Decide on participating non-HERs for initial phase									
Continue review of applications, negotiation and allocation of HERs to groups, and planning provision of assistance									
Continue review of applications from non-HERS									
Deliver regional training seminars									
Undertake hands-on training and prepare bespoke Accessioning Plan for each Phase 1 HER									
Commence accessioning by Group 1 HERs									
Commence provision of assistance to some Group 1 HERs									
Commence accessioning by eligible non-HERs									

Task	Month								
	0	1	2	3	4	5	6	9	12
Review progress by Group 1 HERs									
Undertake hands-on training and prepare bespoke Accessioning Plan for each Phase 2 HER									
Commence accessioning by Group 2 HERs									
Further changes to achieve deprecation of PastScape (to incorporate pointers to new online records or redirect URLs to equivalent pages with NRHE to HER website)									
1st annual review									

Table 24 – proposed plan for years 2 to 5 of the NRHE to HER project.

Year	2		3		4		5	
Quarter / Task	Q1 Q2	Q3 Q4	Q1 Q2	Q3 Q4	Q1 Q2	Q3 Q4	Q1 Q2	Q3 Q4
Contingency actions arising from 1st annual review, potentially including changes to website functionality and/or accessioning guidance and methods								
Undertake hands-on training and prepare bespoke Accessioning Plan for each Phase 3 HER								
Commence accessioning by Group 3 HERs								
2nd annual review								
Undertake hands-on training and prepare bespoke Accessioning Plan for each Phase 4 HER								
Commence accessioning by Group 4 HERs								
3rd annual review, potential completion; or proceed into year 4								
4th annual review, potential completion; or proceed into year 5								
5th annual review (& final reporting)								

5.8.11 Delivery team options

A project delivery plan has been drafted above, within which the responsibility for some tasks is clear. Others could be delivered in a variety of ways, with different cost-benefit profiles.

The most important of these is the overall strategic management and responsibility for delivery. Ultimately this responsibility lies with Historic England and ALGAO, but it could be delivered either by Historic England staff (seconded to the project) or by a contracted delivery partner. In either case the project manager or management team should report to a Steering Group comprising representation from Historic England and ALGAO.

Besides this overall project management, the project will involve various forms of direct and indirect assistance to the HERs and the accessioning process. Manning the "help desk" for Q&A purposes was successfully delivered by Historic England staff within this prototyping project, and it is recommended that this model should not be changed, as first-hand access to the

primary records and archives is required. It has been estimated above that this form of support might amount to around 360 days' work.

Regional training seminars, and the direct training of HERs, including negotiating and preparing their Accessioning Plan, will amount to around 100 days' work. This could be delivered by Historic England staff or by a contracted delivery partner, potentially in turn using regionally-based contract staff with the necessary HER expertise.

Direct assistance with accessioning could be provided by Historic England staff or by a contracted delivery partner, potentially in turn using regionally-based contract staff with the necessary HER expertise.

Technical support for the project from the data supply phase through to the ongoing maintenance of the accessioning website should ultimately reside with the programmers of the web-based tools, though a front-line helpdesk could be provided by Historic England or a contracted delivery partner.

The archiving of the terrestrial NRHE, and the succession strategy for PastScape will need to be delivered by Historic England (including IMT).

The succession strategy for NRHE editing (and use in decision support) will similarly need to be orchestrated with Historic England. One area in which external support may be beneficial is in providing a new means for Historic England staff to record and communicate new information related to Monument records, for which a suggestion has been made above.

5.9 Summary of recommendations

Table 25 summarises the key recommendations made in this report. Reference should be made to the relevant sections, as removal of Table 25 from the report could result in misrepresentation of the recommendations.

Table 25 – a summary of key recommendations made in this report, with cross references to full descriptions and justifications.

Recommendation	Cross reference
Review method of NRHE data export with Historic England IMT	Section 5.1
Investigate the Event records in the test data that had no record in the GIS layer	Section 3.1.1
Include full record audit information in Monuments data supply, at least as shown in PastScape	Section 5.1
Amendment of data presentation components to publish data from new revised supply	Section 5.1
Add NMP outline Monument polygons to NRHE GIS dataset	Section 5.1
Address issue of near duplicate polygons in Monuments data	Section 5.1
Sources should be dealt with at the time of accessioning each Monument or Event	Section 5.2.1
Update accessioning guidance to account for the presence of personal data	Section 5.2.2
Change HER recording policies where required to ensure NRHE data are fully accessioned	Section 5.2.3
Make clear that wider data enhancement is not eligible for support	Section 5.2.4
Review and improve accessioning guidance	Section 5.3
Ensure guidance is disseminated to those undertaking accessioning	Section 5.3

Recommendation	Cross reference
Create an "accessioning plan" for each participating HER	Section 5.4
Set-up a duplicate of the website for training and testing purposes	Section 5.5
Incorporate legend into the website map layer selection menu system	Section 5.5
Add additional set of graphs to show only statistics on records with statuses of 'Fully accessioned', 'Partially accessioned' and 'Rejected' to website	Section 5.5
Add MapInfo tab download functionality to website	Section 5.5
Add new reporting of progress showing rates of accessioning by each HER and overall through time (e.g. by Month/Quarter) to website	Section 5.5
Add filtering of record list by map quarter sheet (in HERs own area) to website	Section 5.5
Add filtering of record list by Parish (in HERs own area) to website	Section 5.5
Adapt website site to work with non-HERs	Section 5.5
Review and adapt as required website after first 12 months of use	Section 5.5
Move the website onto a dedicated server running Windows Server 2012	Section 5.6
Upgrade website technologies to ensure they are sufficiently future proof	Section 5.7
Implement a three-year, rolling accessioning program, plus a two-year contingency period	Section 5.8.1
Ensure that larger HERs can commence accessioning as early as possible	Section 5.8.1
Seek early engagement with those HERs that might present challenges	Section 5.8.1
Ensure recipient HER database and GIS applications are capable of accessioning all of the information contained within an NRHE Monument or Event record	Section 5.8.2
Assess the capacity of individual HERs for accessioning	Sections 5.8.2 and 5.8.3
Provide a range of strategic assistance to HERs to assist with NRHE accessioning	Section 5.8.3
Provide some form of targeted direct assistance	Section 5.8.3
Establish eligibility criteria for participation in the NRHE accessioning program, and work to ensure that all HERs meet these criteria	Sections 5.8.3 and 5.8.7
Freeze the NRHE at or shortly before the time of data supply	Section 5.8.4
Retain the online presence of PastScape, probably beyond the end of the NRHE to HER accessioning program	Section 5.8.5
Allow non-HER record maintainers to accession NRHE data	Section 5.8.8
Undertake a strategic annual review of NRHE to HER accessioning progress	Section 5.8.9

6 Conclusion

It is important to emphasize that this project was not tasked with evaluating whether "NRHE to HER data reconciliation and supply" *should* proceed, but with testing and refining the recommended approaches defined from previous phase of research and consultation, and establishing whether and how it *could* proceed using these approaches.

The project demonstrated that the prototype accessioning methodology and tools were fit for purpose. Testers found it straightforward and efficient to accession data and to record the outcomes and concordance as required. Crucially the exercise was felt to deliver an immediate enhancement to the HER even within the short testing period, with real positive impacts on protection of the historic environment through development control and other casework.

Minor issues were encountered with the initial supply of test data from the NRHE, largely due to the use of inappropriate tools. These issues should be addressed by involving appropriate teams in the planning and execution of the next data supply, with the existing approach as a fall-back position.

Various test data content issues with the NRHE were identified. Some of these could be addressed in advance of accessioning, but this should not be seen as a critical dependency.

Some valuable enhancements to the NRHE to HER user interfaces have been proposed and scoped as a result of the extensive testing undertaken by a wide range of participants.

Significant strategic benefit could be achieved by widening the scope of the accessioning to other "non-HER" maintainers of Monument and Event records, without detracting from the main aims of the project. This enhancement has been evaluated, scoped, and factored into the proposed timetable, and will enhance the overall network of heritage information access.

The most significant concerns around NRHE to HER are that the NRHE and PastScape might be retired without putting something equivalent or better in their place, due to the incomplete and partially under-resourced network of HER services. While most the country is served by competent, committed and capable HER services with appropriate ICT systems and support, it is undeniable that this is not a universal position. It has been suggested in this report that this project provides a unique opportunity to address this situation by: using the entry process for NRHE to HER as a means of highlighting the need for change; working alongside the existing HER Audit process; and using the NRHE to HER engagement and support processes as a mechanism for delivering transformation to the overall network of HER service provision. It is proposed that the NRHE to HER project will, if implemented successfully, deliver the complete online "virtual national historic environment record" within the project timetable.

Parallel concerns exist regarding the role of the NRHE, AMIE and PastScape as sources of information to various Historic England teams, and the implications of their retirement on the functioning of these processes. While not within the core scope of this project, we have suggested above that a re-alignment of the information handling and workflows in these areas will bring overall benefits to the sector, as existing practices have resulted in significant (and often unrecognized) information deficits. Alongside the aforementioned imperative to develop the virtual national HER information network, the development of a new method of submitting interpretative information on Monuments from Historic England to HERs and related organisations has been recommended.

NRHE to HER data supply and reconciliation undoubtedly represents a substantial undertaking. Our estimates above suggest that fully accessioning the data will require up to forty-two

person-years of effort in direct accessioning, with another five to ten person-years of project management, technical implementation and support. Furthermore, in any project requiring technical support and services of an advanced nature there is a likelihood that the scale of requirement for these services will be underestimated, particularly if requirements are likely to change during the project lifecycle. Yet the risk of the resource requirements escalating during NRHE to HER is extremely low – in fact the opposite is likely, as many factors suggest that the estimates derived from this project may be overly pessimistic, rather than the opposite. There is some small scope for technical demands to increase during the project, for example if HER boundaries change frequently, or if web browsers change rapidly and require frequent code changes, but it is expected these will be roundly offset by reductions in the requirement of time for accessioning.

Overall this project has demonstrated not only that the NRHE to HER programme is achievable, but also that it will bring significant strategic benefit to the delivery of historic environment data access and services in England.

Appendix A Data Migration Report

A.1 Data supply and preliminary analysis

Test data were supplied over a few weeks in Summer 2015.

GIS data were supplied as ESRI personal geodatabase AMIE_Spatial_Extract_23June2015.mdb. No documentation was supplied. The MDB contained 4 feature classes:

- AMIE_Event_Points
- AMIE_Monument_Points
- AMIE_Monument_Lines
- AMIE_Monument_Polygons

Monuments test data were supplied as XML in batches covering geographical units equivalent to region/county. No documentation was supplied but the data were said to be MIDAS XML and therefore documented by reference to MIDAS Heritage. Preliminary analysis showed these datasets did not match a MIDAS XML schema, and contained duplicates where records were indexed as falling in more than one exported area.

Events test data were supplied as a set of CSV files each containing different aspects of the record from the relational database. These data were simple to process and import. When Historic England were asked for documentation or explanation the following response was obtained: "we don't have a set of recording guidelines for Events the way we do with Monuments, so it's difficult to provide documentation or a data dictionary". The majority of the supplied data were self-explanatory, though some areas of difficulty are noted below and one table proved unusable.

The provided grid references were not coherent. The easting and northing were given as integers, but did not behave correctly as such. For example 383,218 would be close to the origin of the national grid if handled as integers, which was clearly not the case; it was more likely to be 383000,218000, but it could equally be 383000,21800 or 38300,218000, etc.

In explanation of some of the issues, Historic England said "It should be noted that the exports have mostly been created *ad hoc* purely for the purposes of providing data to this project as we don't generally need to export it."

Documentation/analysis of supplied GIS feature class attributes

Table	AMIE_Event_Points		**Record count**	142,792
Field name	**Type**	**Size**	**Statistics**	
OBJECTID	Number (Autonumber)	4	Null value count: 0 Minimum value: 1 Maximum value: 142,792 Maximum length: 6	
ACT_UID	Number (Long)	4	Null value count: 0 Minimum value: 377 Maximum value: 1,596,056 Maximum length: 7	

Table	AMIE_Event_Points	**Record count**	142,792

Field name	Type	Size	Statistics
NAME	Text	60	Null value count: 0 Zero-length string count: 0 Minimum value: BANSTEAD DOWNS GOLF CLUB Maximum value: ZOUCH ROAD Maximum length: 60
ACTIVITY_TYPE	Text	20	Null value count: 0 Zero-length string count: 0 Minimum value: AER Maximum value: WAT Maximum length: 3
DESCRIPTION	Memo	0	Null value count: 13,187 Zero-length string count: 84,113 Maximum length: 2,000
COORDINATE_SYSTEM	Text	60	Null value count: 0 Zero-length string count: 0 Minimum value: 100 KM Maximum value: NGR Maximum length: 8
MON_PRECISION	Number (Double)	8	Null value count: 22 Minimum value: 0 Maximum value: 10,000 Maximum length: 5
CAPTURE_SCALE	Text	15	Null value count: 0 Zero-length string count: 0 Minimum value: 1:10000 Maximum value: Unknown Maximum length: 7
CURRENT_BASE_MAP	Text	240	Null value count: 51,145 Zero-length string count: 0 Minimum value: UNKNOWN Maximum value: UNKNOWN Maximum length: 7
CREATED_BY	Text	25	Null value count: 0 Zero-length string count: 0 Minimum value: DATACLEANSE Maximum value: rpage Maximum length: 15
CREATED_DATE	Date/Time	8	Null value count: 0 Minimum value: 19/01/2004 Maximum value: 23/06/2015 11:40:09 Maximum length: 19
UPDATED_BY	Text	25	Null value count: 142,404 Zero-length string count: 0 Minimum value: dhilton Maximum value: tduane Maximum length: 11
UPDATED_DATE	Date/Time	8	Null value count: 142,404 Minimum value: 14/12/2005 15:36:37 Maximum value: 17/06/2015 15:57:32 Maximum length: 19

Table	AMIE_Event_Points	Record count	142,792

Field name	Type	Size	Statistics
AUTHORISED_BY	Text	25	Null value count: 50,949 Zero-length string count: 0 Minimum value: dhilton Maximum value: tduane Maximum length: 11
AUTHORISED_DATE	Date/Time	8	Null value count: 50,949 Minimum value: 07/12/2005 15:27:42 Maximum value: 17/06/2015 15:57:32 Maximum length: 19
NGR	Text	15	Null value count: 0 Zero-length string count: 0 Minimum value: 029118:008900 Maximum value: 674870:312250 Maximum length: 13
NOTES	Text	240	Null value count: 142,792 Zero-length string count: 0 Minimum value: Maximum value: Maximum length:
SHAPE	OLE object	0	Null value count: 0 Zero-length string count: 0 Maximum length: 28

Table	AMIE_Monument_Points	Record count	207,052

Field name	Type	Size	Statistics
OBJECTID	Number (Autonumber)	4	Null value count: 0 Minimum value: 1 Maximum value: 207,052 Maximum length: 6
HOB_UID	Number (Long)	4	Null value count: 0 Minimum value: 6 Maximum value: 1,596,059 Maximum length: 7
NAME	Text	60	Null value count: 138,361 Zero-length string count: 185 Minimum value: Maximum value: ZYMOTIC HOSPITAL Maximum length: 60
DESCRIPTION	Memo	0	Null value count: 21 Zero-length string count: 86 Maximum length: 2,000
PARENT_UID	Number (Long)	4	Null value count: 194,975 Minimum value: 9 Maximum value: 1,593,604 Maximum length: 7
COORDINATE_SYSTEM	Text	60	Null value count: 0 Zero-length string count: 0 Minimum value: LAT/LONG Maximum value: NGR Maximum length: 8

Table	AMIE_Monument_Points	**Record count**	207,052

Field name	Type	Size	Statistics
AMIE_SHAPE	Number (Long)	4	Null value count: 0 Minimum value: 1 Maximum value: 6 Maximum length: 1
MON_PRECISION	Number (Double)	8	Null value count: 0 Minimum value: 0.1 Maximum value: 10,000 Maximum length: 5
CAPTURE_SCALE	Text	15	Null value count: 2 Zero-length string count: 0 Minimum value: 1:10000 Maximum value: Unknown Maximum length: 7
CURRENT_BASE_MAP	Text	240	Null value count: 19,966 Zero-length string count: 0 Minimum value: 10000 Maximum value: UNKNOWN Maximum length: 7
CREATED_BY	Text	25	Null value count: 0 Zero-length string count: 0 Minimum value: DATACLEANSE Maximum value: tduane Maximum length: 16
CREATED_DATE	Date/Time	8	Null value count: 0 Minimum value: 20/09/1999 Maximum value: 23/06/2015 11:51:20 Maximum length: 19
UPDATED_BY	Text	25	Null value count: 17,206 Zero-length string count: 13672 Minimum value: Maximum value: vhearfield Maximum length: 12
UPDATED_DATE	Date/Time	8	Null value count: 30,878 Minimum value: 02/01/2000 Maximum value: 10/06/2015 12:54:30 Maximum length: 19
AUTHORISED_BY	Text	25	Null value count: 17,242 Zero-length string count: 0 Minimum value: DHarrison1 Maximum value: vhearfield Maximum length: 11
AUTHORISED_DATE	Date/Time	8	Null value count: 17,242 Minimum value: 07/12/2005 15:19:24 Maximum value: 10/06/2015 12:54:30 Maximum length: 19
NGR	Text	15	Null value count: 0 Zero-length string count: 0 Minimum value: 050110:046320 Maximum value: 737070:255870 Maximum length: 14

Table	AMIE_Monument_Points	Record count	207,052

Field name	Type	Size	Statistics
NOTES	Text	240	Null value count: 207,027 Zero-length string count: 19 Minimum value: Maximum value: Epoch 3 Maximum length: 34
SHAPE	OLE object	0	Null value count: 0 Zero-length string count: 0 Maximum length: 124

Table	AMIE_Monument_Lines	Record count	6,512

Field name	Type	Size	Statistics
OBJECTID	Number (Autonumber)	4	Null value count: 0 Minimum value: 1 Maximum value: 6,512 Maximum length: 4
HOB_UID	Number (Long)	4	Null value count: 0 Minimum value: 336 Maximum value: 1,578,330 Maximum length: 7
NAME	Text	60	Null value count: 3,526 Zero-length string count: 0 Minimum value: ABBEY WALL Maximum value: ZEAL REAVE Maximum length: 60
DESCRIPTION	Memo	0	Null value count: 0 Zero-length string count: 0 Maximum length: 1,999
PARENT_UID	Number (Long)	4	Null value count: 4,975 Minimum value: 2,260 Maximum value: 1,564,967 Maximum length: 7
COORDINATE_SYSTEM	Text	60	Null value count: 0 Zero-length string count: 0 Minimum value: LAT/LONG Maximum value: NGR Maximum length: 8
AMIE_SHAPE	Number (Long)	4	Null value count: 0 Minimum value: 1 Maximum value: 6 Maximum length: 1
MON_PRECISION	Number (Double)	8	Null value count: 0 Minimum value: 1 Maximum value: 1,000 Maximum length: 4
CAPTURE_SCALE	Text	15	Null value count: 0 Zero-length string count: 0 Minimum value: 1:10000 Maximum value: Unknown Maximum length: 7

Table	AMIE_Monument_Lines	**Record count**	6,512

Field name	Type	Size	Statistics
CURRENT_BASE_MAP	Text	240	Null value count: 110 Zero-length string count: 0 Minimum value: 10000 Maximum value: UNKNOWN Maximum length: 7
CREATED_BY	Text	25	Null value count: 0 Zero-length string count: 0 Minimum value: dhilton Maximum value: tduane Maximum length: 12
CREATED_DATE	Date/Time	8	Null value count: 0 Minimum value: 20/09/1999 Maximum value: 07/01/2015 10:40:42 Maximum length: 19
UPDATED_BY	Text	25	Null value count: 0 Zero-length string count: 134 Minimum value: Maximum value: vhearfield Maximum length: 12
UPDATED_DATE	Date/Time	8	Null value count: 134 Minimum value: 08/12/2000 Maximum value: 24/02/2015 15:29:58 Maximum length: 19
AUTHORISED_BY	Text	25	Null value count: 0 Zero-length string count: 0 Minimum value: dhilton Maximum value: vhearfield Maximum length: 11
AUTHORISED_DATE	Date/Time	8	Null value count: 0 Minimum value: 07/12/2005 15:20:50 Maximum value: 24/02/2015 15:29:58 Maximum length: 19
NGR	Text	15	Null value count: 0 Zero-length string count: 0 Minimum value: 088090:012150 Maximum value: 652689:301299 Maximum length: 13
NOTES	Text	240	Null value count: 6,508 Zero-length string count: 1 Minimum value: Maximum value: This is only the general direction of the line and may not be entirely accurate Maximum length: 79
SHAPE	OLE object	0	Null value count: 0 Zero-length string count: 0 Maximum length: 31,716
SHAPE_Length	Number (Double)	8	Null value count: 0 Minimum value: 1.29132036004053 Maximum value: 409009.524672103 Maximum length: 16

Table	AMIE_Monument_Polygons	**Record count**	230,479

Field name	Type	Size	Statistics
OBJECTID	Number (Autonumber)	4	Null value count: 0 Minimum value: 1 Maximum value: 230,479 Maximum length: 6
HOB_UID	Number (Long)	4	Null value count: 0 Minimum value: 9 Maximum value: 1,596,054 Maximum length: 7
NAME	Text	60	Null value count: 140,227 Zero-length string count: 30 Minimum value: Maximum value: ZWANENBURG Maximum length: 60
DESCRIPTION	Memo	0	Null value count: 7 Zero-length string count: 49 Maximum length: 2,000
PARENT_UID	Number (Long)	4	Null value count: 213,977 Minimum value: 6 Maximum value: 1,594,244 Maximum length: 7
COORDINATE_SYSTEM	Text	60	Null value count: 0 Zero-length string count: 0 Minimum value: LAT/LONG Maximum value: NGR Maximum length: 8
AMIE_SHAPE	Number (Long)	4	Null value count: 0 Minimum value: 1 Maximum value: 6 Maximum length: 1
MON_PRECISION	Number (Double)	8	Null value count: 0 Minimum value: 0.1 Maximum value: 1,000 Maximum length: 4
CAPTURE_SCALE	Text	15	Null value count: 7 Zero-length string count: 0 Minimum value: 1:10000 Maximum value: Unknown Maximum length: 7
CURRENT_BASE_MAP	Text	240	Null value count: 49,977 Zero-length string count: 0 Minimum value: 1000 Maximum value: UNKNOWN Maximum length: 9
CREATED_BY	Text	25	Null value count: 0 Zero-length string count: 0 Minimum value: a1frogga Maximum value: vhearfield Maximum length: 15

Table	AMIE_Monument_Polygons	Record count	230,479

Field name	Type	Size	Statistics
CREATED_DATE	Date/Time	8	Null value count: 0 Minimum value: 18/08/1999 Maximum value: 23/06/2015 10:53:50 Maximum length: 19
UPDATED_BY	Text	25	Null value count: 4,581 Zero-length string count: 3,527 Minimum value: Maximum value: vhearfield Maximum length: 12
UPDATED_DATE	Date/Time	8	Null value count: 8,108 Minimum value: 26/09/2000 Maximum value: 23/06/2015 10:55:38 Maximum length: 19
AUTHORISED_BY	Text	25	Null value count: 5,054 Zero-length string count: 0 Minimum value: a1frogga Maximum value: vhearfield Maximum length: 11
AUTHORISED_DATE	Date/Time	8	Null value count: 5,054 Minimum value: 07/12/2005 15:23:49 Maximum value: 23/06/2015 10:55:38 Maximum length: 19
NGR	Text	15	Null value count: 0 Zero-length string count: 0 Minimum value: 044300:038100 Maximum value: 721090:239800 Maximum length: 14
NOTES	Text	240	Null value count: 229,908 Zero-length string count: 6 Minimum value: Maximum value: The polygon was drawn according to map Epoch 1 Maximum length: 53
SHAPE	OLE object	0	Null value count: 0 Zero-length string count: 0 Maximum length: 78,236
SHAPE_Length	Number (Double)	8	Null value count: 0 Minimum value: 7.59152038021892E-02 Maximum value: 95688.9777994606 Maximum length: 20
SHAPE_Area	Number (Double)	8	Null value count: 0 Minimum value: 4.39999864846469E-05 Maximum value: 25130806.0083442 Maximum length: 20

A.2 Data import and processing

GIS feature classes

Data from the supplied GIS feature classes were imported into SQL Server using GISquirrel, producing the following tables.

The DESCRIPTION field was dropped from the Monument GIS tables, as it was clearly derivative.

Events

Feature Class definition	
Name	AMIE_Event_Points
Database	NRHEtransfer
DataSourceSchema	Dbo
DataSource	AMIE_Event_Points
DataSourceType	Table
GeometryColumn	Geom
IdColumn	Id
GeometryType	Multipoint
SpatialReference	British_National_Grid

Features stored in feature class	
Total number of features	142,792
By geometry type	MultiPoint: 142,792
By spatial reference	27700: 142,792
XMin	29,117.999999
YMin	4,579.999999
XMax	674,870.000001
YMax	655,529.999999

Monument Points

Feature Class definition	
Name	AMIE_Monument_Points
Database	NRHEtransfer
DataSourceSchema	dbo
DataSource	AMIE_Monument_Points
DataSourceType	Table
GeometryColumn	geom
IdColumn	id
GeometryType	Multipoint
SpatialReference	British_National_Grid

Features stored in feature class	
Total number of features	207,052
By geometry type	MultiPoint: 207,052
By spatial reference	27700: 207,052
XMin	50,109.999999
YMin	-17,101.000001
XMax	737,070.000001
YMax	669,283.999999

Monument Lines

Feature Class definition	
Name	AMIE_Monument_Lines
Database	NRHEtransfer

DataSourceSchema	dbo
DataSource	AMIE_Monument_Lines
DataSourceType	Table
GeometryColumn	geom
IdColumn	id
GeometryType	Polyline
SpatialReference	British_National_Grid

Features stored in feature class	
Total number of features	6,512
By geometry type	LineString: 3 MultiLineString: 6,509
By spatial reference	27700: 6,512
XMin	88,000
YMin	12,080
XMax	654,777.867
YMax	646,620

Monument Polygons

Feature Class definition	
Name	AMIE_Monument_Polygons
Database	NRHEtransfer
DataSourceSchema	dbo
DataSource	AMIE_Monument_Polygons
DataSourceType	Table
GeometryColumn	geom
IdColumn	id
GeometryType	Polygon
SpatialReference	British_National_Grid

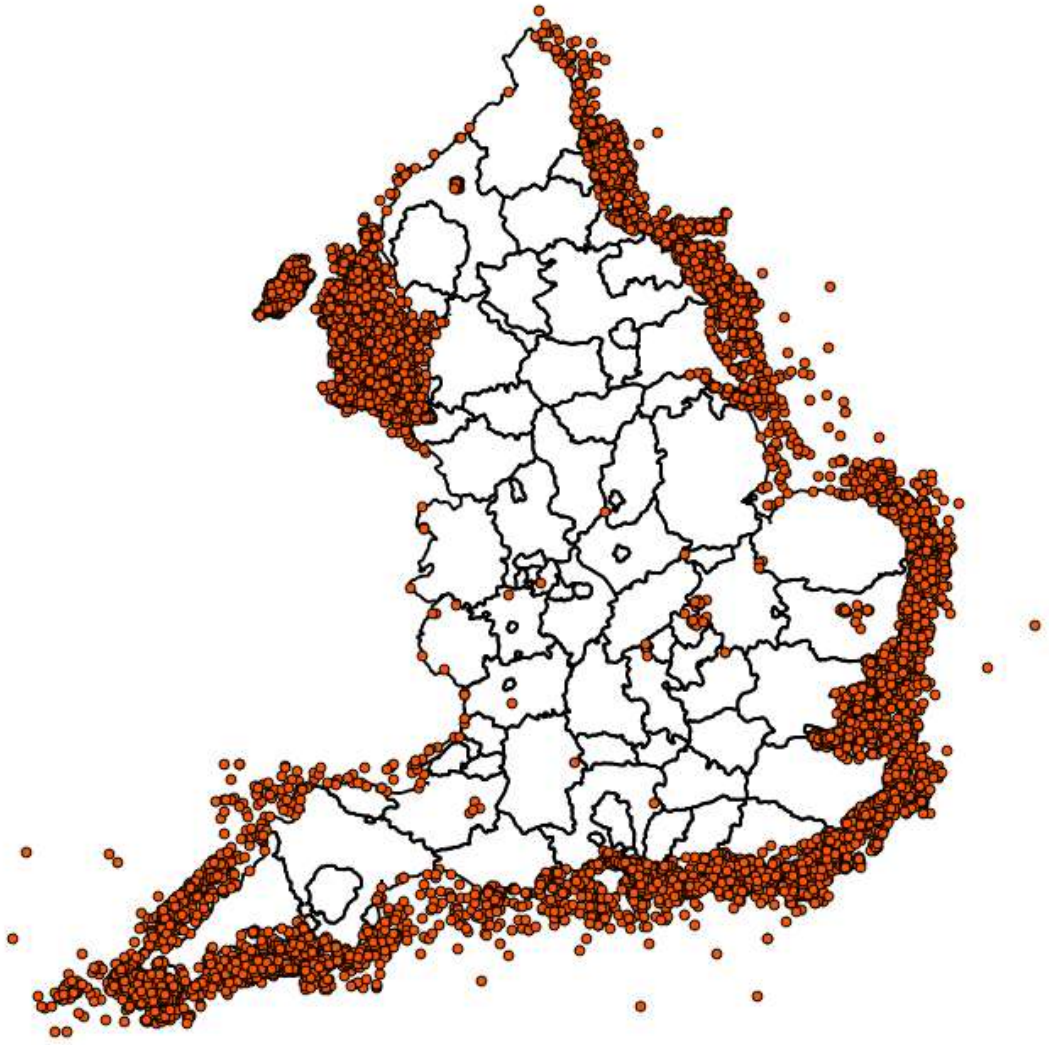
Features stored in feature class	
Total number of features	230,479
By geometry type	MultiPolygon: 230,479
By spatial reference	27700: 230,479
XMin	44,290
YMin	-13,314.9560000002
XMax	721,590
YMax	664,640.055

Mismatches between spatial and non-spatial data

The Monument GIS test datasets contained records not present in the textual data.

	Monument		
	Points	**Lines**	**Polygons**
Number of features without matching data	12,233	5	22,799
Number of features with matching data	194,819	6,507	207,680

A significant proportion (but not all) of the excess points were maritime records:



These features were deleted from the dataset as by definition they could not be accessioned.

Four monument records in the supplied data were found to have no spatial record in the GIS datasets.

To facilitate display at small scales each Monument record was assigned a single point at the centre of its point, line or polygon geometries. This was thought to be useful for overall progress maps where line or polygon detail is irrelevant, though in the future it would be work evaluating whether it was really needed. It was achieved by first aggregating all geometries into one table, averaging the envelope bounds as follows and creating point geometry from the result:

```
geom.STBuffer(1).STEnvelope().STPointN(1).STX +
geom.STBuffer(1).STEnvelope().STPointN(3).STX) / 2 AS X,
(geom.STBuffer(1).STEnvelope().STPointN(1).STY +
geom.STBuffer(1).STEnvelope().STPointN(3).STY) / 2 AS Y
```

Unexplained multiple geometries

The Monument Lines and Polygons layers contained multiple features per "HOB_UID" (Monument record) in many but not all cases. A random dip into the test data caused concern.

HOB_UID 1577822 had two superimposed and nearly identical polygons. The attributes of the spatial records were nearly but not entirely identical. The same applied to 1577153. In the third case examined, 1481767, the one polygon entirely contained the other, with one being a regular diamond shape the other being what looks like a full building outline.

It appeared that the supplied test dataset contained current and superseded polygons. This was not universal however, as one other record examined (1485945) appeared to present four genuinely different polygons.

Three Event records had more than one geometry record in the GIS layer AMIE_Event_Points. On examination these turned out to be duplicates in their coordinates and all other attributes, so the extras were deleted.

Monuments XML

The supplied XML were processed into the SQL Server XML datatype, splitting the supplied files to create one Monument per Monuments/Monument node and suppress duplicates. 398,932 Monuments records were created from the supplied regional files, within which many Monuments were included in more than one file.

The HOB_UID was extracted from this XPath: appellation/identifier[@type='Primary System UID']. The Monument record XML did not include a "Name" for each Monument in any expected MIDAS XML location (i.e. <appellation>), but it was deduced that names were included at this XPath[14]:

```
<characters>
  <character>
    <spatial>
      <place>
        <address status="Primary">
          <streetaddress_name>STONEHENGE</streetaddress_name>
```

For Monuments a Name field was populated from the GIS layers. This provided the option of using either that or the above XML node in the actual presentation.

Events CSVs

Test data from the supplied CSV files were imported into SQL Server via Microsoft Access, with the data cleaned through a variety of steps, then converted into an XML field in the same manner as for Monuments.

Cleaning processes included:

- UNIX paragraph(s) converted
- Multiple spaces / tab(s) converted to single spaces

There were areas of mismatch between the supplied tables, e.g. EI_Associated_People contained 904 records that ref to an Event UID that does not exist in the main table. These started at 1596917 while the supplied data ended at 1596901. This suggests not all the Event records were supplied, as other possible explanations such as that these are orphans left after deletion of Event records were considered to be less likely. These records were deleted.

[14] Whether these values are the same as the names in the GIS data has not been tested.

The provided grid references were not coherent. The easting and northing were given as integers, but did not behave correctly as such. For example 383,218 would be close to the origin of the national grid if handled as integers, which was clearly not the case; it was more likely to be 383000,218000, but it could equally be 383000,21800 or 38300,218000, etc.

Examples like 18251,6304 where the easting and northing were different lengths were also found. The correct easting and northing was not clear in these situations. This situation was queried at the time of data supply, but no clarification was forthcoming and it was advised that all Events would have a point in the GIS dataset, so these problematic grid reference data were excluded.

Analysis and cleaning of Events tables

The following processes were used to analyse and clean the Event tables:

Table	Process
EI_Activity_Name_and_Type	Verified that [Event uid] contained unique values. Added Description field – see below. Renamed fields to standard pattern. Renamed table to [Event] (for XML root element).

EI_Activity_Description	Appended the descriptions into one table:
	
	`INSERT INTO EI_Activity_Description_1 ( [Event uid], Description )`
	`SELECT EI_Activity_Description_2.[Event uid], EI_Activity_Description_2.Description`
	`FROM EI_Activity_Description_2;`
	`INSERT INTO EI_Activity_Description_1 ( [Event uid], Description )`
	`SELECT EI_Activity_Description_3.[Event uid], EI_Activity_Description_3.Description`
	`FROM EI_Activity_Description_3;`
	
	This resulted in 142862 records in the descriptions table.
	Cleaned the description fields using our "data processing toolkit" using default settings for memo text; this was a typical result for a record:
	
	UNIX paragraph(s) corrected (pattern "^\x0A|([^\x0D])\x0A" first found at 73).
	
	Multiple spaces / tab(s) converted to single spaces (pattern "[\f\t\v]{2,}" first found at 126).
	
	25174 records had empty Descriptions. Deleted this with:
	
	`DELETE EI_Activity_Description_Clean.*, EI_Activity_Description_Clean.Description FROM EI_Activity_Description_Clean WHERE (((EI_Activity_Description_Clean.Description)="NULL")) OR (((EI_Activity_Description_Clean.Description) Is Null)) OR (((EI_Activity_Description_Clean.Description)=""));`

	Verified that there was not more than one resulting description per [Event uid], and added this data to the core table EI_Activity_Name_and_Type. `UPDATE EI_Activity_Description_Clean INNER JOIN EI_Activity_Name_and_Type ON EI_Activity_Description_Clean.[Event uid] = EI_Activity_Name_and_Type.[Event uid] SET EI_Activity_Name_and_Type.Description = [EI_Activity_Description_Clean].[Description];`
EI_Alternate_Names	105981 blank records deleted. No indication of meaning of codes in [Alternate Name Type]. Renamed fields to standard pattern.
EI_Associated_Monuments	94364 empty records deleted. Renamed fields to standard pattern.
EI_Associated_Organisations	Deleted 6908 blank records. Renamed fields to standard pattern.

EI_Associated_People	Appended EI_Associated_People_2.csv into EI_Associated_People_1.csv
	
	`INSERT INTO EI_Associated_People_1 ( [Event uid], [Role Type], [Role Description], Salutation, Forenames, Surname, Initials )`
	`SELECT EI_Associated_People_2.[Event uid], EI_Associated_People_2.[Role Type], EI_Associated_People_2.[Role Description], EI_Associated_People_2.Salutation, EI_Associated_People_2.Forenames, EI_Associated_People_2.Surname, EI_Associated_People_2.Initials`
	`FROM EI_Associated_People_2;`
	
	Deleted 1318 blank records.
	
	Renamed fields to standard pattern.

EI_CDP	Renamed fields to standard pattern.
EI_Classifications	Renamed fields to standard pattern.
EI_Dates_Periods	Attempted importing [Start date] and [End date] as date fields failed for many records, so imported these values as text. Deleted 16 blank records. Renamed fields to standard pattern. There appear to be two different sorts of data incorrectly combined here. Example rows: "Event uid","Start Date","End date","Display Date","Period" 625549,"01-JAN-1954","31-DEC-1955","NULL","IRON AGE" 625549,"01-JAN-1954","31-DEC-1955","NULL","MEDIEVAL" 625549,"01-JAN-1954","31-DEC-1955","NULL","POST MEDIEVAL" 625549,"01-JAN-1954","31-DEC-1955","NULL","ROMAN"

	The StartDate and EndDate are presumably of the Event/activity, while the DisplayDate and Period are apparently related to the period of the archaeology under investigation. It appears that the start/end dates may be arbitrarily repeated where there is more than one culture-historical period, as in this example, but this has not been confirmed by H.E when we put this question to them.
EI_OS_Sheet	This table had no more than one value per [Event uid]. Checked data for bad characters etc – all good. Renamed fields to standard pattern.
EI_Other_IDs	No bad data values observed in [Other Identifiers] or [Other Identifiers Value]. Deleted 47347 blank records. Renamed fields to standard pattern.
EI_Sources	Cleaned the [Description], [Source Title] and [Statement of Responsibility] fields in EI_Sources, using the option to also remove blank lines and replace all paragraphs as some false ones were observed at the end of the real content. Renamed fields to standard pattern.
EI_Grid_Refs	The provided grid references were not coherent – see above.

The following standard processes were undertaken on all tables.

All "NULL" text values were removed, replacing them with an empty string. Because these data are for on screen presentation only, there was no need to worry about whether this was a database null value or a zero length string. The following functions were used:

```
Public Function RemoveNULLstringsFromAllTables()
Dim tbl As TableDef
  For Each tbl In CurrentDb.TableDefs
    If tbl.Updatable And Left(tbl.Name, 1) <> "~" And Left(tbl.Name, 4) <>
"MSys" Then
      RemoveNULLstrings (tbl.Name)
    End If
  Next
End Function

Public Function RemoveNULLstrings(sTableName)
Dim fld As Field
Dim sFldName As String
Dim n As Long
Dim rsProcessing As Recordset
Dim sSQL As String
  Set rsProcessing = CurrentDb.OpenRecordset(sTableName, dbOpenDynaset,
dbSeeChanges)
  If Not rsProcessing.EOF Then
    ' loop over fields, and if text or memo, replace "NULL" with zls
    For Each fld In rsProcessing.Fields
      sFldName = rsProcessing.Fields(n).Name
```

```
      If rsProcessing.Fields(n).Type = dbText Or rsProcessing.Fields(n).Type =
dbMemo Then
        sSQL = "UPDATE [" & sTableName & "] SET [" & sFldName & "] = '' WHERE ["
& sFldName & "]='NULL';"
        CurrentDb.Execute sSQL
      End If
      n = n + 1
    Next
  End If
  rsProcessing.Close
  Set rsProcessing = Nothing
End Function
```

FK relationships from all tables to the core Event table were created as this was required for nested XML export.

Data were then exported to a single nested XML file using:

```
Public Function Export_EventsXML()

    Dim objOtherTbls As AdditionalData

    On Error GoTo ErrorHandle
    Set objOtherTbls = Application.CreateAdditionalData
    objOtherTbls.Add "EI_Alternate_Names"
    objOtherTbls.Add "EI_Associated_Monuments"
    objOtherTbls.Add "EI_Associated_Organisations"
    objOtherTbls.Add "EI_Associated_People"
    objOtherTbls.Add "EI_CDP"
    objOtherTbls.Add "EI_Classifications"
    objOtherTbls.Add "EI_Dates_Periods"
    objOtherTbls.Add "EI_OS_Sheet"
    objOtherTbls.Add "EI_Other_IDs"
    objOtherTbls.Add "EI_Sources"

    Application.ExportXML ObjectType:=acExportTable, _
      DataSource:="Event", _
      DataTarget:="D:\Projects\EnglishHeritage_DataSupplyNRHE_CF_2014-
2015_P2998\Data\EventsFromAMIEAugust2015\EI_Events.xml", _
      AdditionalData:=objOtherTbls
Exit_Here:
        MsgBox "Export_EventsXML completed"
        Exit Function
ErrorHandle:
        MsgBox Err.Number & ": " & Err.Description
        Resume Exit_Here
End Function
```

The XML <Event> nodes were written to a new SQL Server table using:

```
Public Function ProcessEventsXMLintoTable() As Long
Dim source As New DOMDocument60
Dim list As IXMLDOMNodeList
Dim node As IXMLDOMNode
Dim i As Long
Dim rsEventsTable As Recordset
  ' Load data.
```

```
  source.async = False
  source.Load "D:\Projects\EnglishHeritage_DataSupplyNRHE_CF_2014-
2015_P2998\Data\EventsFromAMIEAugust2015\EI_Events6.xml"
  If (source.parseError.errorCode <> 0) Then
    MsgBox ("Error loading source document: " & source.parseError.reason)
    Exit Function
  End If
  Set list = source.selectNodes("//Event")
  Set rsEventsTable = CurrentDb.OpenRecordset("EI_Events", dbOpenDynaset,
dbSeeChanges)
  For Each node In list
    rsEventsTable.AddNew
    rsEventsTable("TheXML") = node.XML
    rsEventsTable("RecordType") = "Event"
    rsEventsTable("HE_UID") = node.childNodes(0).Text
    rsEventsTable.Update
    i = i + 1
  Next node
  rsEventsTable.Close
  ProcessEventsXMLintoTable = i
End Function
```

[Name] was added to the SQL Server table and populated from the main Event table above.

Some records would not insert with message:

[Microsoft][ODBC SQL Server Driver][SQL Server]The text, ntext, or image pointer value conflicts with the column name specified.

This seems to be caused by very large XML failing to insert, and on inspection this was caused by long lists of related monuments. The affected UIDs were 1360986, 1362224, 1444724 and 1463376. We inserted the XML for these four records with UPDATE statements in SSMS after manually adding four records to the table. The end result was 142,862 records imported as XML into SQL Server.

A.3 Events relationship with GIS data

Three records had more than one geometry record in the GIS layer AMIE_Event_Points. On examination these turned out to be duplicates in their coordinates and all other attributes, so the extras were deleted. None of the multipoints contained more than one point (this can be checked by querying for records WHERE geom.STGeometryN(2).STX IS NOT NULL).

The GIS and CSV datasets supplied contained some duplicated information, including the Name and Type. A comparison was run to see whether these fields contained additional data or could be dropped. It was clear that they should have contained the same information, but in reality they did not. In 3,026 the Names did not match, examples of which are provided in the table below. The majority of mismatches were because the GIS Name was truncated by being held in a 60-character field. But other mismatches were inexplicable, and appeared to reflect different people editing the data and making different choices, e.g. “WEST MILL, ASKRIGG” and “WEST SAW MILL, ASKRIGG”. Some appear to reflect more fundamental mistakes, e.g. 629579 is both “MAIDEN'S GRAVE LA TENE CEMETERY” and “BURTON FLEMING”. The Type was found to be mismatched for 67 records, and the CSV information was assumed to be better.

Event UID	Activity Name	NAME
629540	"MAKESHIFT" LA TENE CEMETERY	MAIDENS GRAVE, ARGAM LANE END
629579	MAIDEN'S GRAVE LA TENE CEMETERY	BURTON FLEMING
630681	ROXBY	WEST OF WINTERTON ROAD
632928	BEACONSFIELD FARM (GREAT TEW ROMAN VILLA)	BEACONSFIELD FARM (GREAT TEW RO VILLA)
632962	TATTERSHALL COLLEGE	CROMWELL'S COLLEGE
632974	WOODHALL SPA	TOWER ON THE MOOR
635651	HEWORTH, FOSS ISLANDS RAILWAY	HEWORTH RAILWAY STATION
644937	PARSONS PENNING/LOCKERIDGE DOWN (OD II & OD III)	PARSONS PENNING
1379032	LAND OFF EASTRY HIGH STREET	LAND OF EASTRY HIGH STREET

The remaining fields provided in the AMIE_Event_Points GIS layer were retained.

855 Event records had no record(s) in the GIS layer AMIE_Event_Points (see Appendix B). From a review of the Event names, some of these are regional, e.g. 1335894 NONCONFORMIST CHAPELS IN CORNWALL. But for many others there was no obvious reason why there would be no geolocation, e.g. 1334338 2-6 PARK STREET/ 9 SOUTH STREET. There was some numerical clustering of the records, suggesting some failure in systems or processes leaving records without a GIS record (e.g. the sequence 1436539 to 1436552). Furthermore it appeared the extract of the GIS data was done shortly after 23/06/2015 11:40:09, while the attributes were provided on 24th August 2015, so newer records in the latter would be expected to have no GIS data. This time difference accounted for nearly half the mismatches. These records were included in the website but not on the map.

782 GIS points had no matching Event attribute data (see Figure 1). Given the different dates of supply a handful might be expected, for example if records had been deleted in the EI, but there was no obvious explanation for such a large number. This mismatch may exist in the Historic England datasets from which the data were extracted. These records were not included in the prototype website under this project, as by definition they could be accessioned.

A.4 Optimising data for searching

A keyword approach was used to optimise simple data retrieval. This involved tagging each record with typed keywords for any desirable selection criteria, including:

- Is the record mapped? Yes/No
- Record type: Monument/Event
- Local Planning Authority: list of Local Planning Authorities. This was achieved spatially.
- HER area: list of HER areas. Each HER area was buffered by 100m for this purpose, to ensure each HER could readily filter to see records within and extremely close to their territory.
- National Park area: list of National Parks. This was achieved spatially.
- County: list of counties. This came from the AMIE data, rather than being achieved spatially.

The following method was used to create keywords from the AMIE Counties for Monument records:

```
INSERT INTO [dbo].[esdm_KeywordLUT] (KeywordType, Keyword)
SELECT DISTINCT 3, County = s.c.value('.', 'nvarchar(MAX)')
FROM (SELECT TheXML from [dbo].[esdm_AMIE_Records] WHERE RecordType=1) AR
CROSS APPLY thexml.nodes('//spatial/place/namedplace/location[@type="county"]') AS s(c);
```

Then method of creating the record+keywords for these Counties:

```
INSERT INTO [dbo].[esdm_AMIE_RecordKeywords] ([RecordID],[KeywordID])
SELECT ARC.RecordID, K.KeywordID
FROM (SELECT * FROM [esdm_KeywordLUT] WHERE KeywordType=3) K
JOIN
(SELECT DISTINCT AR.RecordID, County = s.c.value('.', 'nvarchar(MAX)')
FROM (SELECT RecordID,TheXML from [dbo].[esdm_AMIE_Records] WHERE RecordType=1) AR
CROSS APPLY thexml.nodes('//spatial/place/namedplace/location[@type="county"]') AS s(c)) ARC
ON K.Keyword = ARC.County
```

The following method was used to create keywords from the AMIE Counties for Events:

```
INSERT INTO [dbo].[esdm_AMIE_RecordKeywords] ([RecordID],[KeywordID])
SELECT ARC.RecordID, K.KeywordID FROM
(SELECT * FROM [esdm_KeywordLUT] WHERE KeywordType=3) K
JOIN
(SELECT DISTINCT AR.RecordID, County = s.c.value('.', 'nvarchar(MAX)')
FROM (SELECT RecordID, TheXML from [dbo].[esdm_AMIE_Records] WHERE RecordType=2) AR
CROSS APPLY thexml.nodes('//EI_CDP/County') AS s(c)) AS ARC
ON K.Keyword = ARC.County
```

The following example shows how keywords were added for National Parks. This particular query is for polygon geometries, and presumes the keywords have already been created for each National Park name:

```
INSERT INTO [dbo].[esdm_AMIE_RecordKeywords] ([RecordID],[KeywordID])
select distinct M.recordID, K.KeywordID from [dbo].[AMIE_Monument_Polygons] M
JOIN (SELECT * FROM [dbo].[esdm_Area] WHERE AreaSubType='NP') A
ON
M.geom.STIntersects(A.Geom)=1
JOIN (SELECT * FROM [esdm_KeywordLUT] WHERE KeywordType=5) K ON K.Keyword = A.Name
LEFT JOIN [esdm_AMIE_RecordKeywords] RK ON RK.[RecordID]=M.RecordID AND RK.[KeywordID] =
K.KeywordID
WHERE RK.[RecordID] IS NULL
```

A.5 Empty names

Many records had no Name value. For clear presentation to users in lists and info popups a name was essential. Where the Name was empty the public summary text has been used instead (i.e. the first 120 characters, then "…").The following expression returns the first 120 characters from the XML Summary value for the record:

```
LEFT(CAST(thexml.query('monument/description/summary/text()') AS nvarchar(MAX)),120)
```

A.6 Presentation of data

Presentation mechanisms

Having migrated the data into a suitable database platform for the website the presentation of the data to the user in both the map and as full record details needed to be configured. This was achieved with simple templating for the map info popups, and more complex XSLT for the record details.

For the map popups, the supplied data were analysed and an outline proposal was made on the forums as to which fields may and may not be useful, which elicited no responses. As a result the proposal was followed, presenting a combination of key record details (ID and Name) and the significant metadata fields. The metadata fields that were either empty or considered not helpful to HER recipients were omitted.

Presentation of full record details was intended to lay the provided data out in as simple a manner as possible, permitting easy copying and pasting while making no substantive alterations. This was relatively simple for Events, as the structure and cardinality of the data were fully understood, having created the XML from "flat" CSV files. For Monuments this was much more complex as no documentation of the original database schema or the process by which this was transformed to XML was provided. Therefore producing an XSLT involved a lot of guesswork, examination of example records, comparing what we could see in the data with what we could see on Pastscape, and predicting where problems might be expected and testing for them.

One example where the first attempt proved to need revising was for the Evidence associated with each Monument Type. The requirement to code for multiples was only demonstrated by http://www.pastscape.org.uk/hob.aspx?hob_id=1030591 "Roman road running from Tadcaster to York", which had two Evidence types for one Monument Type.

Links to other online resources

To assist with accessioning, particularly given some of the peculiarities with the supplied data highlighted above, hyperlinks to other online resources were included in the presented records wherever possible. For Monuments a link to open the PastScape record was included, where some information was presented more clearly.

For Events a link to the ADS Archsearch page for the NMR Excavation Index was included. This did not always find a record, but may have been helpful in some cases. For example it did show a grid reference, which as noted above is absent from the supplied data for this project, though the grid references may also be problematic (e.g. the "dot" was in the sea for the record cited above and for some but not all others that were checked).

A.7 Data problems

While designing the presentation templates, a number of issues became apparent with the supplied data. Some undoubtedly originated in the parent database (AMIE), others undoubtedly crept in during the conversion to XML, and others were of uncertain origin. There may of course be other problems caused by omissions of important data that could not be seen – this would become clearer when people with an intimate knowledge of the contents of the NRHE review the records in the NRHE to HER site.

Metadata

Record metadata was partial, and most records simply said they were created "prior to 01-APR-1999". PastScape showed a "LAST UPDATED:" value, but there was no sign of this in the supplied XML. Useful information could sometimes be found in the "Actors".

Monument identifiers and statutory designations

The monument record identifiers were a mixed bag. The "Type" attribute had been populated with "System_UID" for most records, but was clearly inappropriate for values like "AREA STATUS SCHEDULED MONUMENT" and "AREA STATUS LISTED BUILDING GRADE II". Nevertheless, for the most part the values were usable.

Where the identifiers suggested that the monument was covered by some statutory designation, it appeared that one or more legacy identifiers has usually been supplied, but no current identifier that could be used to link to a record in the NHLE. It was possible to search the NHLE using legacy identifiers, as well as name, etc., but this was relatively laborious. If this data was stored in the NRHE, or could be included in the data supply by extracting some cross-referencing from the NHLE database, that could greatly enhance the value to the HERs.

Descriptive text formatting

Descriptive texts frequently contained spurious line breaks, possibly as an unresolved legacy from OCR capture or from copying and pasting content. See for example the Full Description on https://nrhe-to-her.esdm.co.uk/NRHE/RecordDetail.aspx?pageid=8&recordid=191782.

Missing Events

Testers observed that some links to "Related Events" opened an empty page, i.e. a missing record from the provided data or an erroneous cross-reference. Historic England responded as follows:

> *"The irretrievable Event records were missing from the export we provided as they don't have a Parent Record of Excavation Index and should do. They do seem to be earlier records, so this might have been down to legacy recording practice, or just poor indexing. This is the sort of data issue we thought might arise and so we will crack on with quantifying the number of records affected and rectifying this for future exports."*

On 18th March an update was provided:

> *"Having done some investigation into the number of Event records gone walkabouts, I can reveal that the absentees total somewhere in the region of ... 98,783. When we exported the test data we provided the Excavations Index, not realising this wouldn't include over 96,000 Field Observations. The rest of the missing records are things like internal thematic recording projects, aerial reconnaissance investigations etc. Needless to say, by the time we come to provide the final export before it all goes live we will insure everything, all 245,000 or so records, is present."*

Monument Sources missing Originator

Monument Sources were missing the Originator, and potentially other attributes. For example on http://www.pastscape.org.uk/hob.aspx?hob_id=1030591 the source was rendered as:

> **(1) Ivan D Margary 1973 Roman roads in Britain**
> 1973 Page(s)416-7

Whereas the data supplied had the author/originator missing:

```
<reference linkref="1">
  <referencetitle>
    <appellation>
      <name>Roman roads in Britain</name>
    </appellation>
  </referencetitle>
  <referenceextent type="Pages">416-7</referenceextent>
  <referenceextent type="Volume Number">1973</referenceextent>
  <description />
</reference>
```

The author was an important item of information and its absence could compromise accessioning.

CDP and grid reference duplication

County, District or Parish (CDP) and grid reference data had become entangled in an erroneous way. The main symptom was that for records within more than one parish, the grid reference information appeared to have been repeated for each parish. This resulted in repeating grid references in the presentation of data for some records, particularly linear records that spanned parishes.

Badly formed WKT spatial data

The textual representation of spatial data was invalid. The following example is the geometry information for the Roman road mentioned above with the invalid WKT in italics:

```
<geometry>
  <spatialappelation>
    <entity namespace="HE Monument GIS" spatialtype="Linear" uri="1030591">
      <wkt srs="EPSG:27700">LINEAR(4489 4436)</wkt>
      <storedprecision units="m">100</storedprecision>
      <deliveryprecision units="m">100</deliveryprecision>
    </entity>
    <entity namespace="HE Monument GIS" spatialtype="Linear" uri="1030591">
      <wkt srs="EPSG:27700">LINEAR(4602 4539)</wkt>
      <storedprecision units="m">100</storedprecision>
      <deliveryprecision units="m">100</deliveryprecision>
    </entity>
  </spatialappelation>
</geometry>
</spatial>
```

Well Known Text is an Open Geospatial Consortium (OGC) specification for the textual representation of geometry data, but the supplied WKT did not match the OGC specification and so was unusable. For records with GIS features this did not matter, it was not suggested that effort should be expended in resolving this for the benefit of this particular project, but it may affect the usefulness of this type of export for other purposes. This information was included within the monument presentation, as there may be records where this added value beyond the basic grid references and GIS features.

Monument Actors' Organisations

These appeared to have been automatically set to a fixed value, so we find that John de Villula and George Gilbert Scott both belonged to the organisation "HE NRHE Monument Inventory", according to https://nrhe-to-her.esdm.co.uk/NRHE/RecordDetail.aspx?pageid=8&recordid=423295

Event dates/periods

As noted above, the supplied Event dates and periods contained two different sorts of chronological information. The StartDate and EndDate were presumably of the Event/activity, while the DisplayDate and Period were apparently related to the period of the archaeology under investigation. It appeared that the start/end dates may be arbitrarily repeated where there was more than one culture-historical period, as in this example https://nrhe-to-her.esdm.co.uk/NRHE/RecordDetail.aspx?pageid=8&he_uid=625549.

There also appeared to have been some possible degradation in the information about periods and types. For example compare the above record with the Excavation Index page here http://archaeologydataservice.ac.uk/archsearch/record.jsf?depositorId=625549&collectionId=304.

Note that the Excavation Index page lists "IRON AGE - FOGOU , ROMAN - FOGOU" but no other types or periods, where the NRHE page list types of:

MONUMENT TYPE	FOGOU
OBJECT MATERIAL	POTTERY
OBJECT TYPE	VESSEL

and dates/periods of:

Start date	End date	Display date (monument)	Period (monument)
01-JAN-1954	31-DEC-1955		IRON AGE
01-JAN-1954	31-DEC-1955		MEDIEVAL
01-JAN-1954	31-DEC-1955		POST MEDIEVAL
01-JAN-1954	31-DEC-1955		ROMAN

This suggests one of two things. Either these records were out of sync between the Excavation Index and the supplied test data, or (much more likely) the primary data contained relationships between types and periods that had been dropped in the test data supply, and that the Excavation Index web page simply did not display OBJECT TYPE and MATERIAL data (or the associated periods). The dates of the fieldwork have been misleadingly duplicated simply by structuring the export incorrectly.

Event People

Some of the People records were empty other than a role, e.g. see https://nrhe-to-her.esdm.co.uk/NRHE/RecordDetail.aspx?pageid=8&recordid=620529.

A.8 Stage 6 changes following first round of testing

Following the first round of testing we added more attributes to the map layer (info popup) for Events, specifically:

- EventType (using the supplied TypeDescription)

- StartDate (the earliest calendar StartDate date in the supplied EI_Dates_Periods data)

These were added by querying the values from the XML data. If and when this exercise is repeated, it will be more efficient to add these fields and populate them during the migration.

6.1.2 Event coordinate data check

The following query was used to test that the Events GIS points were created from database coordinates, following assurance from Historic England that they were:

```
SELECT  [ACT_UID]
         ,RIGHT('000000' + CAST(CAST([geom].STPointN(1).STX AS Int) AS varchar(10)),6) + ':'
+ RIGHT('000000' + CAST(CAST([geom].STPointN(1).STY AS Int) AS varchar(10)),6) AS
NGRfromGeom
       ,[NGR]
  FROM [dbo].[AMIE_Event_Points]
  WHERE RIGHT('000000' + CAST(CAST([geom].STPointN(1).STX AS Int) AS varchar(10)),6) + ':' +
RIGHT('000000' + CAST(CAST([geom].STPointN(1).STY AS Int) AS varchar(10)),6)
   <> [NGR]
```

This identified 46 records where the actual point coordinate differed from the value in the "NGR" field, but visual inspection suggested that the differences were only one metre. For example:

1502724	582677:109722	582678:109723
1441756	595336:195608	595337:195608
1458327	543339:324800	543340:324801

This was further tested with the following query:

```
  SELECT [id], [NGR], CAST(LEFT([NGR],6) AS int) AS CoordX, CAST(RIGHT([NGR],6) AS int) AS
CoordY FROM [dbo].[AMIE_Event_Points]
  WHERE CAST(LEFT([NGR],6) AS int) - CAST([geom].STPointN(1).STX AS Int) > 1
  OR
  CAST(RIGHT([NGR],6) AS int) - CAST([geom].STPointN(1).STY AS Int) > 1
```

This query yielded no results, confirming the visual impression. There had clearly been some minor changes in the spatial positions, as the dataset had gone through various transformations, but none greater than a metre.

Appendix B Records present in supplied CSV data but not in GIS data

The following list gives the UIDs of the 855 Event records that were present within the supplied CSV data but not in the GIS data.

651163, 653575, 657138, 907185, 917793, 917811, 917824, 917827, 917830, 917842, 917852, 917855, 917856, 917859, 917865, 917917, 917932, 917940, 918119, 918126, 918136, 918138, 918140, 918147, 918150, 918153, 918157, 918174, 918175, 918215, 918228, 918249, 918251, 918259, 918262, 918288, 927111, 939076, 939094, 939115, 939117, 939120, 939121, 939123, 939125, 939126, 939217, 941170, 941829, 942990, 971712, 1051971, 1053685, 1059646, 1065523, 1074287, 1159582, 1206972, 1234066, 1246801, 1301837, 1304436, 1304524, 1304573, 1304581, 1305929, 1306102, 1308544, 1308566, 1308953, 1309023, 1309091, 1309291, 1310551, 1311065, 1312414, 1313023, 1314540, 1316246, 1317446, 1317919, 1318440, 1319602, 1320813, 1321657, 1321878, 1322048, 1322594, 1323199, 1324861, 1325493, 1325499, 1325930, 1327533, 1327563, 1327782, 1327785, 1328002, 1328222, 1329146, 1330461, 1330508, 1330823, 1330849, 1330856, 1330924, 1330974, 1331566, 1332242, 1332354, 1332433, 1332894, 1333449, 1333680, 1333707, 1333979, 1334325, 1334338, 1334497, 1334656, 1334695, 1335658, 1335869, 1335871, 1335894, 1336972, 1341246, 1342334, 1343678, 1345786, 1346889, 1347700, 1348175, 1351500, 1354087, 1356084, 1356218, 1356219, 1356624, 1361388, 1363041, 1363263, 1368648, 1368729, 1369332, 1372389, 1378558, 1378567, 1379611, 1386433, 1388559, 1388889, 1388983, 1389418, 1389456, 1389835, 1390015, 1390044, 1391701, 1392404, 1393333, 1395974, 1396472, 1397331, 1397858, 1398230, 1399724, 1400454, 1401323, 1401488, 1401709, 1402788, 1402794, 1402795, 1402852, 1403051, 1403552, 1403568, 1403570, 1403586, 1403634, 1403636, 1404208, 1404455, 1404457, 1404903, 1405051, 1405193, 1405669, 1408830, 1409289, 1409297, 1409298, 1410465, 1429989, 1430166, 1434175, 1435289, 1435610, 1435676, 1436442, 1436525, 1436526, 1436527, 1436528, 1436529, 1436531, 1436532, 1436533, 1436534, 1436535, 1436536, 1436537, 1436539, 1436540, 1436541, 1436542, 1436543, 1436544, 1436545, 1436546, 1436547, 1436548, 1436549, 1436550, 1436551, 1436552, 1436556, 1436557, 1436559, 1436560, 1436561, 1436562, 1436563, 1436564, 1436568, 1436569, 1436571, 1436572, 1436573, 1436575, 1436577, 1436581, 1436583, 1436586, 1436588, 1436589, 1436593, 1436594, 1436595, 1436596, 1436598, 1436599, 1436600, 1436601, 1436602, 1436605, 1436607, 1436608, 1436609, 1436610, 1436616, 1436617, 1436618, 1436619, 1436621, 1436623, 1436624, 1436625, 1436626, 1436627, 1436628, 1436630, 1436632, 1436634, 1436635, 1436639, 1436640, 1436641, 1436642, 1436644, 1436645, 1436647, 1436649, 1436651, 1436652, 1436653, 1436654, 1436656, 1436659, 1438409, 1438882, 1439283, 1439289, 1439888, 1441602, 1442426, 1442429, 1442456, 1443302, 1443442, 1443587, 1443588, 1444724, 1444786, 1448079, 1448090, 1449600, 1449946, 1450031, 1450307, 1450591, 1450670, 1450823, 1451543, 1452006, 1453129, 1453757, 1454420, 1454733, 1459186, 1459441, 1460974, 1460984, 1462095, 1463215, 1463376, 1463588, 1463672, 1466931, 1467169, 1468173, 1468764, 1470476, 1470501, 1470960, 1479350, 1482037, 1482446, 1484432, 1490642, 1490647, 1490650, 1490651, 1490652, 1490653, 1490654, 1490657, 1490658, 1490661, 1490663, 1490664, 1490666, 1490667, 1490669, 1490670, 1490671, 1490672, 1490673, 1490674, 1490675, 1490676, 1490678, 1490680, 1490683, 1490684, 1490685, 1490686, 1490687, 1490688, 1490689, 1490690, 1490691, 1490698, 1490702, 1490735, 1496551, 1496698, 1496784, 1497333, 1502145, 1502488, 1504290, 1504293, 1504294, 1504298, 1504300, 1504304, 1504307, 1504655, 1506522, 1506530, 1506542, 1507963, 1508802, 1508803, 1509628, 1509633, 1509638, 1509639, 1510566, 1510567, 1511585, 1514158, 1514556, 1515586, 1516747, 1516748, 1516749, 1517143, 1517617, 1519438, 1519440, 1519444, 1519445, 1519446, 1519448, 1519451, 1519453, 1519456, 1519459, 1519460, 1519461, 1519462, 1519464, 1519467, 1520267, 1522477,

1524494, 1525286, 1528278, 1531938, 1531970, 1533911, 1538919, 1539778, 1539779, 1539780, 1540768, 1541038, 1542395, 1542396, 1542397, 1545881, 1548358, 1548360, 1548362, 1548363, 1548367, 1550901, 1551800, 1552908, 1552911, 1552912, 1552941, 1552942, 1552943, 1552944, 1565733, 1566570, 1569069, 1570622, 1572473, 1573572, 1575684, 1579616, 1580587, 1582286, 1583164, 1584095, 1587627, 1588320, 1589127, 1589848, 1590903, 1590913, 1591640, 1591641, 1591689, 1591966, 1592540, 1595156, 1595978, 1596057, 1596060, 1596062, 1596066, 1596067, 1596068, 1596070, 1596072, 1596073, 1596078, 1596080, 1596081, 1596085, 1596086, 1596089, 1596090, 1596091, 1596092, 1596093, 1596095, 1596096, 1596097, 1596098, 1596101, 1596102, 1596104, 1596107, 1596109, 1596110, 1596112, 1596114, 1596115, 1596116, 1596117, 1596118, 1596119, 1596120, 1596122, 1596125, 1596126, 1596127, 1596128, 1596129, 1596130, 1596132, 1596134, 1596135, 1596136, 1596137, 1596138, 1596139, 1596140, 1596141, 1596142, 1596143, 1596144, 1596147, 1596148, 1596150, 1596151, 1596152, 1596155, 1596158, 1596159, 1596160, 1596161, 1596165, 1596167, 1596168, 1596169, 1596170, 1596171, 1596172, 1596173, 1596174, 1596175, 1596176, 1596177, 1596178, 1596179, 1596180, 1596181, 1596182, 1596183, 1596184, 1596185, 1596186, 1596187, 1596188, 1596189, 1596190, 1596191, 1596192, 1596193, 1596194, 1596195, 1596196, 1596197, 1596198, 1596199, 1596200, 1596201, 1596202, 1596203, 1596204, 1596205, 1596206, 1596207, 1596208, 1596209, 1596210, 1596211, 1596212, 1596213, 1596214, 1596215, 1596216, 1596217, 1596218, 1596219, 1596220, 1596221, 1596222, 1596223, 1596224, 1596225, 1596226, 1596227, 1596228, 1596229, 1596230, 1596231, 1596232, 1596233, 1596234, 1596235, 1596236, 1596241, 1596242, 1596243, 1596244, 1596245, 1596246, 1596247, 1596248, 1596254, 1596255, 1596256, 1596257, 1596258, 1596259, 1596260, 1596261, 1596262, 1596263, 1596264, 1596265, 1596266, 1596267, 1596268, 1596269, 1596270, 1596271, 1596272, 1596274, 1596277, 1596279, 1596286, 1596288, 1596293, 1596295, 1596299, 1596300, 1596302, 1596311, 1596312, 1596313, 1596316, 1596317, 1596319, 1596320, 1596321, 1596322, 1596324, 1596325, 1596326, 1596332, 1596335, 1596343, 1596344, 1596345, 1596346, 1596347, 1596348, 1596349, 1596350, 1596351, 1596352, 1596353, 1596355, 1596356, 1596357, 1596358, 1596359, 1596360, 1596361, 1596362, 1596363, 1596364, 1596366, 1596367, 1596369, 1596371, 1596373, 1596376, 1596377, 1596380, 1596384, 1596385, 1596387, 1596390, 1596391, 1596392, 1596393, 1596394, 1596395, 1596410, 1596417, 1596418, 1596419, 1596420, 1596423, 1596424, 1596429, 1596431, 1596434, 1596435, 1596436, 1596437, 1596438, 1596439, 1596440, 1596442, 1596443, 1596444, 1596445, 1596446, 1596447, 1596448, 1596450, 1596451, 1596453, 1596454, 1596455, 1596456, 1596457, 1596458, 1596459, 1596460, 1596462, 1596464, 1596465, 1596467, 1596468, 1596469, 1596470, 1596471, 1596472, 1596473, 1596474, 1596475, 1596476, 1596477, 1596478, 1596480, 1596485, 1596487, 1596532, 1596533, 1596534, 1596535, 1596536, 1596537, 1596540, 1596544, 1596549, 1596551, 1596557, 1596558, 1596559, 1596560, 1596562, 1596563, 1596564, 1596566, 1596567, 1596569, 1596570, 1596572, 1596573, 1596574, 1596576, 1596577, 1596578, 1596582, 1596585, 1596591, 1596592, 1596593, 1596594, 1596595, 1596596, 1596597, 1596598, 1596603, 1596604, 1596605, 1596606, 1596607, 1596608, 1596609, 1596610, 1596611, 1596612, 1596613, 1596614, 1596616, 1596618, 1596622, 1596628, 1596634, 1596642, 1596709, 1596710, 1596711, 1596712, 1596713, 1596714, 1596718, 1596719, 1596720, 1596724, 1596728, 1596729, 1596730, 1596731, 1596733, 1596735, 1596737, 1596759, 1596760, 1596761, 1596762, 1596763, 1596766, 1596768, 1596770, 1596772, 1596785, 1596870, 1596871, 1596872, 1596873, 1596874, 1596875, 1596876, 1596878, 1596880, 1596881, 1596883, 1596885, 1596901

Appendix C Data export Schema Mapping Report

The following is the Schema Mapping Report that was used to create the XML schema used for the export of Monument data from the NRHE.

PROJECT DOCUMENTATION

PROJECT REPORT

Mapping of MIDAS XML to AMIE tables

Release: Draft
Date:07/10/2013

PRINCE 2

Author: Phil Carlisle

Owner: Phil Carlisle

Client: Martin Newman

Document Number:

Project Plan History

Document Location

This document is only valid on the day it was printed.
The source of the document will be found on the project's PC in location

Revision History

Date of this revision:
Date of Next revision:

Revision date	Previous revision date	Summary of Changes	Changes marked
12/05/2015		Modifications to more accurately represent other identifiers	Highlighted in red and commented
07/10/2015		Additional elements for AMIE XML export	Highlighted in red

Approvals

This document requires the following approvals.
Signed approval forms are filed in the Management section of the project files.

Name	Signature	Title	Date of Issue	Version

Distribution

This document has been distributed to

Name	Title	Date of Issue	Version
Gillian Grayson	Head of Heritage Data Management		
Kieran Byrne	Data Training and Documentation Supervisor		
Martin Newman	Head of Datasets Development		

Project Report

Description

This report details the mapping between the Archives and Monuments Information for England (AMIE) database and the FISH XML schema developed as part of the FISH toolkit.

The report is intended to inform the functional specification an XML import/export tool which is being developed to allow data exchange between the NMR and other cultural heritage bodies.

Only the monuments and events modules of the AMIE database have been mapped.

Background

The XML schema developed for the FISH toolkit project were used as the basis for the mapping.

The latest versions of the schema which were used for the mapping project can be found at:

http://www.heritage-standards.org.uk/midas/schema/2.0/

midas_monument.xsd
midas_event.xsd
midas_reference.xsd
midas_actor.xsd

Methodology

The mapping report follows the layout of the forms used to record monuments and events in AMIE. Each set of mappings is preceded by a set of mappings recording the metadata for the whole dataset. This outlines the spatial coverage, temporal coverage, details of ownership and access rights.

Each individual field on the AMIE forms has been mapped to the most likely element within the appropriate schema. However, at times it has been necessary to concatenate two or more AMIE fields to fit the structure of the schema and as such any future revision of the FISH Toolkit XML schemas should aim to include additional elements to allow a more complete mapping.

The nature of the database structure has also meant that many fields which do not appear in the forms have had to be mapped. These are mainly internal system identifiers (UIDs) used to link tables. Where appropriate, SQL statements have been included to provide examples.

Detailed Mapping Report Table

AMIE Recording Form	AMIE Field Name	AMIE Table.column	Xpath to MIDAS XML	Notes, examples, conditions and Issues	Comments
N/A	N/A		Metadata fields	These metadata fields refer to the dataset as a whole	
	N/A		Monuments/meta/title	<title> English Heritage National Monuments Record Monument Inventory </title>	User input from a form eg 'Arundel Parish'
	N/A		Monuments/meta/subject N.B. need to be able to record the source of the keyword used in the subject field eg. IPSV, UKAT etc.	<subject>archaeology, architecture</subject>	Hardcoded as 'Heritage'
	N/A		Monuments/meta/keywords	<keywords>buildings, monuments, events, archaeological sites</keywords.	Hardcoded as 'Heritage, Monuments, Historic Environment'
	N/A		Monuments/meta/contacts/contact/name/title Monuments/meta/contacts/contact/name/firstname Monuments/meta/contacts/contact/name/surname Monuments/meta/contacts/contact/name/othername	The contact details for the owner/producer of the dataset. <title>Mr</title> <firstname>Martin</firstname> <surname>Newman<surname>	First name and last name only - automatically populated from database
	N/A		Monuments/meta/contacts/contact/organisation	<organisation>English Heritage</organisation>	Hardcoded as 'English Heritage'
	N/A		Monuments/meta/contacts/contact/role	<role>Head of Datasets Development</role>	Hardcoded as 'Publisher'
	N/A		Monuments/meta/contacts/contact/address/streetaddress Monuments/meta/contacts/contact/address/streetaddress Monuments/meta/contacts/contact/address/city Monuments/meta/contacts/contact/address/adminarea Monuments/meta/contacts/contact/address/postcode Monuments/meta/contacts/contact/address/country	<streetaddress>Engine House</streetaddress> <streetaddress>Fire Fly Avenue</streetaddress> <city>Swindon</city> <adminarea>Wiltshire</adminarea> <postcode>SN2 2EH</postcode> <country>United Kingdom</country>	Hardcoded (without adminarea)

	N/A		Monuments/meta/contacts/contact/phone Type = “Business”	<phone type = “business”>01793 414700</phone>	**Not required**
	N/A		Monuments/meta/contacts/contact/fax	<fax>01793 414701</fax>	**Not required**
	N/A		Monuments/meta/contacts/contact/email	<email>hdminfo@english-heritage.org.uk</email>	Automatically populated from database
	N/A		Monuments/meta/rights/copyright/holder Monuments/meta/rights/copyright/year Monuments/meta/rights/copyright/statement		
	N/A		Monuments/meta/rights/accessrights/grantedto Monuments/meta/rights/accessrights/conditions Monuments/meta/rights/accessrights/datefrom Monuments/meta/rights/accessrights/dateto Monuments/meta/rights/accessrights/statement	<datefrom>01-JAN-2009</datefrom> <dateto>31-DEC-2010</dateto> <statement>The information is available for the duration of this project and remains the property of EH and may not be changed</statement>	
	N/A		Monuments/meta/rights/reproductionrights/statement Monuments/meta/rights/reproductionrights/contact Monuments/meta/rights/reproductionrights/fees		
	N/A		Monuments/meta/source/statement		National Record of the Historic Environment’
	N/A		Monuments/meta/creation/createdon Monuments/meta/creation/query N.B. This will be the SQL query used to extract the data	<createdon>01-JAN-2009</createdon> <query>select * from monuments……</query>	Current date Query drawn from the databasae

	N/A		Monuments/meta/coverage/spatial/place/namedplace/location Type = “country” N.B. For AMIE this will default to ENGLAND not UK		
	N/A		Monuments/meta/coverage/spatial/geometry/bounding box Srs = spatial referencing system. EPSG idenitifiers should be used and OS GR are always 27700 Minx Miny Maxx Maxy The bounding box defines the bounding polygon covering the whole area of the dataset		
	N/A		Monuments/meta/coverage/temporal/span/display/appellation Type = “period”	<display> <appellation>Palaeolithic, Mesolithic, Neolithic etc </appellation> </display>	
	N/A		Monuments/meta/coverage/temporal/span/start/appellation Type = ”period”	<start> <appellation>PALAEOLITHIC</appellation> </start>	
	N/A		Monuments/meta/coverage/temporal/span/end/appellation Type = ”period”	<end> <appellation>21ST CENTURY</appellation> </end>	
	N/A		Monuments/meta/coverage/temporal/span/duration/length Units = “years”	<length units = “years”>700,000</length	
	N/A		Monuments/meta/abstract		User input from a form
			Monument Metadata fields		
			Monument/recordmetadata/created/createdon		OK
			Monument/recordmetadata/created/createdby/appellation/name		Non-Midas mapping. Holds EH recording role
Monument Details	hob_uid	MONUMENTS.HOB_UID	Monuments/monument/appellation/identifier Type = “Primary System_UID”		OK

			Namespace = “English Heritage National Monuments Record Monument Inventory”		
	nmr_number	MONUMENTS.NMR_NUMBER_CAT || MONUMENTS.NMR_NUMBER_SERIAL	Concatenate to Monuments/monument/appellation/identifier Type = “Legacy System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	<identifier type = “Legacy system_UID” namespace = “English Heritage National Monuments Record Monument Inventory”>NT 70 NE[single space]35</identifier>	OK
	parent_uid	MONUMENTS.PARENT_UID	Monuments/monument/related/has_monument Namespace = “English Heritage National Monuments Record Monument Inventory” reltype = “has parent”		OK
Monument Addresses	name	MONUMENT_ADDRESSES.NAME	Monuments/monument/appellation/name Type = “current” Preferred = “true”		OK (holds multiple AMIE alternate names)
Recording Details	role	MONUMENTS.RE_R_T_UID	Monuments/monument/actor/role Type = “recording role type”	“Inventory” most common select recording_role_type.description from recording_role_type r, monuments m where m.re_r_t_uid = r.re_r_t_uid	OK (but actor’s role eg Compiler, not EH recording role eg Inventroy)
	standard	MONUMENTS.REC_ST_UID	Monuments/monument/actor/role Type = “recording_standard”	Should default to “NMR” select recording_standards.name from recording_standards, monuments where monuments.rec_st_uid = recording_standards.rec_st_uid	**Not required**
		MONUMENTS.DERIV_LB_GRADE		Redundant – not populated	**N/A**
		MONUMENTS.LB_GRADE_ASSIGNER		Redundant – not populated	**N/A**
Date of Loss	status	MONUMENTS.STATUS	Monuments/monument/appellation/identifier Type = “maritime_status” Namespace = “EH_LUT _classid_104”	‘Casualty’ is most common where this field is populated. select l.char40_value from look_up_table l, monuments m where l.char10_value = m.status	OK

				and l.class_uid = 104	
	min_date	HOB_LOCATIONS.MIN_DATE	Monuments/monument/characters/character/type/annex/craft/lastjourney/dateofloss	select min_date from hob_locations hl, monuments m where hl.monume_uid = m.hob_uid	Non-Midas mapping. Monuments/monument/characters/character/type/annex/craft/lastjourney/dateofloss/temporal/span/start
	max_date	HOB_LOCATIONS.MAX_DATE	Monuments/monument/characters/character/type/annex/craft/lastjourney/dateofloss		Non-Midas mapping. Monuments/monument/characters/character/type/annex/craft/lastjourney/dateofloss/temporal/span/end
Monument Details	summary	MONUMENTS.DESCRIPTION	Monuments/monument/description/summary Source = "long text" Preferred = "true" Audience = "public"	Need to define a look-up list for the audience, to include 'Public' and 'Internal' as a minimum.	OK (but source = "summary")
		MONUMENTS.VALIDATED_FLAG		Redundant – approximately half of the records in AMIE have this	N/A
		MONUMENTS.VALIDATED_DATE		Redundant – approximately half of the records in AMIE have this	N/A
		MONUMENTS.USERR		Redundant – not populated	N/A
		MONUMENTS.HSIS_STATUS		Redundant – not populated	N/A
Monument Addresses		MONUMENT_ADDRESSES.HOB_UID	Monuments/monument/appellation/identifier Type = "System_UID" Namespace = "English Heritage National Monuments Record Monument Inventory"	Used to link a monument to an address select * from monument_addresses ma, monuments m where ma.hob_uid = m.hob_uid	**Not required**
		MONUMENT_ADDRESSES.MON_AD_UID	Monuments/monument/appellation/identifier Type = "System_UID" Namespace = "English Heritage National Monuments Record Monument Inventory"	Unique Identifier for this address	**Not required**
		MONUMENT_ADDRESSES.ADM_LO_UID	Monuments/monument/appellation/identifier Type = "System_UID" Namespace = "English Heritage National Monuments Record Monument Inventory"	Link to ADMIN_LOCATIONS and CDP_FLAT tables	**Not required**
	county/district/parish	ADMIN_LOCATION.NAME	Monuments/monument/characters/character/spatial/place/namedplace/location Type= "county" or "district" or "parish"	select name from admin_locations al, monument_addresses ma, monuments m where al.loc_uid= ma.adm_lo_uid	Not Midas compliant. MIDAS doesn't allow place to repeat but we have repeated place to keep addresses with CDP data and to allow addresses to repeat. MIDAS doesn't allow more than one address

				and m.hob_uid = [hob_uid for this record] and adln_type = [county, district or parish] Repeat for different adln_types	and CDPs (location) should thus repeat within namedplace
	for non-parished areas	MONUMENT_ADDRESSES.NON_PAR_LOC_UID	Monuments/monument/appellation/identifier Type = “Non Parish Area UID”	select non_par_loc_name from non_parish_locations nl, monument_addresses ma, admin_locations al where nl.non_par_loc_uid =ma.non_par_loc_uid and al.loc_uic=ma.non_par_loc_uid and al.npl_flag is not null	**Not required**
	(address) status	MONUMENT_ADDRESSES.STATUS	Monuments/monument/appellation/identifier Type = “Address_statuses” Namespace = “EH_LUT _classid_1”	‘P’ is most common select l.char1_value from look_up_table l, monument_addresses ma where l.char10_value = ma.status and l.class_uid = 1	Not Midas compliant. Shown as “status” attibute of address element. Monuments/monument/characters/character/spatial/place/address status="Primary"
		MONUMENT_ADDRESSES.PRIMACY		Not mapped as field redundant. Primacy can be deduced from STATUS.	**N/A**
	area	MONUMENT_ADDRESSES.AREA	Monuments/monument/characters/character/spatial/place/namedplace/location Type = “area”		OK
		MONUMENT_ADDRESSES.MON_AD_NUMBER MONUMENT_ADDRESSES.STREET	Concatentate to Monuments/monument/characters/character/spatial/place/address/streetaddress	<street address>24-26 Even[single space]Bridge Street</streetaddress>	Not Midas compliant. We have used Monuments/monument/characters/character/spatial/place/address/streetaddress_name Monuments/monument/characters/character/spatial/place/address/streetaddress_number Monuments/monument/characters/character/spatial/place/address/streetaddress_roadname
	role	MONUMENT_ADDRESSES.RE_R_T_UID	Monuments/monument/actor/role Type = “recording role type”	select recording_role_type.description	**Not required**

				from recording_role_type r, monument_addresses ma where r.re_r_t_uid = ma.re_r_t_uid	
		MONUMENT_ADDRESSES.SIDE_OF_STREET		Not mapped as field not used in Monuments or Events	**Not required**
		MONUMENT_ADDRESSES.NUMBER_QUALIFIER		Not mapped as field not used in Monuments or Events	**Not required**
	parent_uid	MONUMENT_ADDRESSES.PARENT_UID	Monuments/monument/related/has_monument Namespace = “English Heritage National Monuments Record Monument Inventory” reltype = “has parent”	This is the UID of the parent monument record not the address record.	**Not required** (but see under monument details above)
		MONUMENT_ADDRESSES.ST_NUMBER_START		Not mapped as field not used in Monuments or Events	**Not required**
		MONUMENT_ADDRESSES.ST_NUMBER_START_QUAL		Not mapped as field not used in Monuments or Events	**Not required**
		MONUMENT_ADDRESSES.ST_NUMBER_END		Not mapped as field not used in Monuments or Events	**Not required**
		MONUMENT_ADDRESSES.ST_NUMBER_END_QUAL		Not mapped as field not used in Monuments or Events	**Not required**
		MONUMENT_ADDRESSES.POSTCODE	Monuments/monument/characters/character/spatial/place/address/postcode		**Not required**
		MONUMENT_ADDRESSES.COUNTRY	Monuments/monument/characters/character/spatial/place/address/country Monuments/monument/characters/character/spatial/namedplace/location Namespace = http://www.iso.org/iso/english_country_names_and_code_elements Type = “Country”	MIDAS XML allows country to be represented in two ways either as part of midas:address or as part of midas:namedplace. Both mappings are given here. For the namedplace option the ISO standard for country names should be used as the definitive controlled vocabulary.	**Not required**
		MONUMENT_ADDRESSES.LOCA		Not mapped as field not used in Monuments or Events	**Not required**

		TION_PRECISIO N			
Classificati on Details	number	MONUMENT_CL ASSIFICATIONS. STRUCTURE_G ROUP		This is used to associate a monument type or object type in the same phase with an evidence type. A programme will need to be written to automate the process but the following SQL statement provides an example of how to extract a monument type and its associated evidence. select mp.hob_uid, period_uid, mp.mp_uid, mc.term_uid, mc.structure_group from monument_phases mp, monument_classifications mc where mc.mp_uid = mp.mp_uid and structure_group = 1 and hob_uid = 1075	
	quantity	MONUMENT_CL ASSIFICATIONS. QUANTITY		Not mapped as field redundant for all practical purposes.	**Not required**
	term (actual as it appears on the form)	THESAURUS_TE RMS.TERM	Monuments/monument/characters/character/type/ monumenttype Namespace = “English Heritage National Monuments Record Thesaurus of Monument Types” Monuments/monument/characters/character/type/ evidence Type = “English Heritage National Monuments Record Evidence Type Thesaurus”	If MONUMENT_CLASSIFICATIONS. CLA_GR_UID = 1 then select term from thesaurus_terms where cla_gr_uid = 1 This needs to be repeated for all cla_gr_uids which may appear in this table although Maritime records are mapped differently see below.	OK
	term (how it is linked)	MONUMENT_CL ASSIFICATIONS. TERM_UID	Monuments/monument/appellation/identifier Type = “System_uid”	Link to thesaurus_terms table to identify which thesaurus term is being used for indexing	**Not required**

			Namespace = “English Heritage National Monuments Record Thesauri”	select term from thesaurus_terms t, monument_classifications mc where mc.term_uid = t.the_te_uid	
		MONUMENT_CLASSIFICATIONS.MP_UID	Monuments/monument/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Link to monument_phases table allowing HOB_UID to be identified for records where a certain thesaurus term has been used for indexing select mp.hob_uid from monument_phases mp, monument_classifications mc, thesaurus_terms t where mp.mp_uid = mc.mp_uid and mc.term_uid = t.the_te_uid and t.term like ‘PILLBOX’	**Not required**
	class scheme	MONUMENT_CLASSIFICATIONS.CLA_GR_UID	Monuments/monument/appellation/identifier Type = “System_uid” Namespace = “English Heritage National Monuments Record Thesauri”	Identifies which thesaurus is being used. Thesaurus of Monument types = 1 select name from classification_groups cg, monument_classifications mc where mc.cla_gr_uid = cg.cla_gr_uid	**Not required**
		MONUMENT_CLASSIFICATIONS.MCL_UID	Monuments/monument/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Unique Identifier for this row in the monument_classifications table	**Not required**
		MONUMENT_CLASSIFICATIONS.DESCRIPTION		Not mapped as field not used in Monuments or Events	**N/A**
A separate annex exists in the XML schema for recording Maritime Craft. The following xpaths should be used dependent on the cla_gr_uid					
		THESAURUS_TERMS.TERM			
		Craft = 143	Monuments/monument/characters/character/type/annex/craft/crafttype	Records the term from the Maritime Craft Type Thesaurus MONUMENT_CLASSIFICATIONS.CLA_GR_UID = 143 then	OK

				select term from thesaurus_terms where cla_gr_uid = 143	
		Registration Place = 307	Monuments/monument/characters/character/type/annex/craft/placeofregistration	CLA_GR_UID = 307	Not Midas compliant. MIDAS doesn't permit multiple places of registration
		Construction = 72	Monuments/monument/characters/character/type/annex/craft/constructionmethod		Not Midas compliant. MIDAS doesn' t permit multiple construction methods
		Propulsion = 70	Monuments/monument/characters/character/type/annex/craft/propulsion		OK
		MONUMENT_DIMENSION.DIMENSION MONUMENT_DIMENSION.VALUE MONUMENT_DIMENSION.UNIT	Monuments/monument/characters/character/type/annex/craft/dimension Measured = "dimension" Units = "feet"	DIMENSION and UNIT should be used to populate the attributes. Example: <dimension measured ="length" units = "feet">143</dimension>	OK
		Nationality = 80	Monuments/monument/characters/character/type/annex/craft/lastjourney/nationality		OK
		Departure = 305	Monuments/monument/characters/character/type/annex/craft/lastjourney/departure		OK
		Destination = 306	Monuments/monument/characters/character/type/annex/craft/lastjourney/destination		OK
		Cargo = 77	Monuments/monument/characters/character/type/annex/craft/lastjourney/product		OK
		Manner of Loss = 78	Monuments/monument/characters/character/type/annex/craft/lastjourney/mannerofloss		OK
Associated Named Locations	Dates	HOB_LOCATIONS.MAX_DATE HOB_LOCATIONS.MIN_DATE HOB_LOCATIONS.PRECISION	Monuments/monument/characters/character/type/annex/craft/lastjourney/dateof loss/temporal/span/end/appellation Type = "Date" Qualifier = "Maximum date" Monuments/monument/characters/character/type/annex/craft/lastjourney/dateof loss/temporal/span/end/appellation Type = "Date" Qualifier = "Minimum date"	Where MIN_DATE and MAX_DATE are not equal use precision to determine	Not Midas compliant. The mappings we use are shown to the left

			Monuments/monument/characters/character/type/ annex/craft/lastjourney/dateof loss/ Precision = “year”		
Monument periods and types		MONUMENT_PHASES.MP_UID	Monuments/monument/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Unique Identifier for this row in the monument_phases table Also used as link to monument_classifications table to allow multiple classifications to be associated with a single phase	**Not required**
	period	PERIODS.NAME	Monuments/monument/characters/character/type/ temporal/span/start/appellation Type = “period” Monuments/monument/characters/character/type/ temporal/span/end/appellation Type = “period”	Select name from periods p, monument_phases mp where mp.period_uid = p.period_uid	OK
		MONUMENT_PHASES.MAX_DATE	Monuments/monument/characters/character/type/ temporal/span/end/appellation Type = “Date” Qualifier = “Maximum date”		OK
		MONUMENT_PHASES.MIN_DATE	Monuments/monument/characters/character/type/ temporal/span/start/appellation Type = “Date” Qualifier = “Minimum date”		OK
		MONUMENT_PHASES.DISPLAY_DATE	Monuments/monument/characters/character/type/ temporal/span/display/appellation Type = “Display Date”		OK
		MONUMENT_PHASES.RE_R_T_UID	Monuments/monument/actor/role Type = “recording role type”	“Inventory” most common select recording_role_type.description from recording_role_type r, monuments m where m.re_r_t_uid = r.re_r_t_uid	**Not required.** Recording role type is held at monument level
		MONUMENT_PHASES.PRECISION	Monuments/monument/characters/character/type/ temporal/span Qualifier = “precision”		? See under
		MONUMENT_PHASES.PERIOD_CERT_FACTOR		Not mapped as field not used in Monuments or Events	**N/A**
		MONUMENT_PHASES.HOB_UID	Monuments/monument/appellation/identifier Type = “System_UID”	Link between monuments and monument_phases	**Not required**

			Namespace = “English Heritage National Monuments Record Monument Inventory”		
Monument locations		TIED_VECTORISED_LOCATIONS.TI_VEC_UID	Monuments/monument/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Unique identifier for this row. Link between tied_vectorised_locations and vector_coordinates	**Not required**
		TIED_VECTORISED_LOCATIONS.COORDINATE_SYSTEM	Monuments/monument/characters/character/spatial/geometry/spatialappellation/quickpoint/srs	Srs = spatial referencing system. EPSG idenitifiers should be used and OS GR are always 27700 <srs>EPSG:27700</srs>	**Not Required**
		TIED_VECTORISED_LOCATIONS.PRECISION	Monuments/monument/characters/character/spatial/geometry/spatialappellation/entity/storedprecision Units = “metres”		OK
	For OS NGRs	TIED_VECTORISED_LOCATIONS.NG_100KM_SQUARE VECTOR_COORDINATES.X VECTOR_COORDINATES.Y	Concatenate to Monuments/monument/characters/character/spatial/place/gridref Namespace = “OSGB36” for terrestrial Namespace = “WGS84” for maritime	<gridref namespace = “OSGB36”>NT 71235698</gridref> N.B. x and y coordinates stored as absolutes not OS NGRs so conversion to remove first digit is needed. Use OSGB36 field in tied_vectorised_locations to determine whether terrestrial or maritime	OK
	For storing absolute coordinates	VECTOR_COORDINATES.X	Monuments/monument/characters/character/spatial/geometry/spatialappellation/quickpoint/x		Not Midas compliant. Midas does not permit multiple quickpoints
	For storing absolute coordinates	VECTOR_COORDINATES.Y	Monuments/monument/characters/character/spatial/geometry/spatialappellation/quickpoint/y		Not Midas compliant. Midas does not permit multiple quickpoints
	For storing shape and coordinates	TIED_VECTORISED_LOCATIONS.VEC_LO_TYPE VECTOR_COORDINATES.X VECTOR_COORDINATES.Y	Concatenate to Monuments/monument/characters/character/spatial/geometry/spatialappellation/entity English Heritage National Monuments Record Monument GIS	Example: <entity spatialtype="Point" uri="212132" namespace="LBS"> <wkt srs="EPSG:27700">POINT(400582 408186)</wkt> select l.char40_value, v.x, v.y from look_up_table l, tied_vectorised_locations t, vector_coordinates v	OK

				where v.ti_vec_uid=t.ti_vec_uid and l.int_value = t.vec_lo_type and l.class_uid = 19	
		TIED_VECTORISED_LOCATIONS.QUALIFIER		Redundant – No longer used	**NA**
	Date of Fix	TIED_VECTORISED_LOCATIONS.DATE_OF_FIX	Monuments/monument/characters/character/type/temporal/span/start/appellation Type = “date” Monuments/monument/characters/character/type/temporal/span/end/appellation Type = “date”	select date_of_fix from tied_vectorised_locations where monume_uid = [hob_uid for this monument]	**Not required**
	Shape	TIED_VECTORISED_LOCATIONS.VEC_LO_TYPE	Monuments/monument/characters/character/spatial/geometry/spatialappellation Type = “Shape”	select l.char40_value from look_up_table l, tied_vectorised_locations t where l.int_value = t.vec_lo_type and l.class_uid = 19	**Not required** (see above Monuments/monument/characters/character/spatial/geometry/spatialappellation/entity)
		TIED_VECTORISED_LOCATIONS.MONUME_UID	Monuments/monument/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Used to link a monument to a tied vectorised location Select * From monuments m, tied_vectorised_locations t Where m.hob_uid = t.monume.uid	**Not required**
		TIED_VECTORISED_LOCATIONS.ACT_UID	Monuments/monument/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Used to link an event to tied vectorised location select * from tied_vectorised_locations t, activities a where t..act_uid = a.act_uid	**Not required**
	Role	TIED_VECTORISED_LOCATIONS.RE_R_T_UID	Monuments/monument/actor/role Type = “recording role type”	“Inventory” most common select recording_role_type.description from recording_role_type r, tied_vectorised_locations t where t.re_r_t_uid = r.re_r_t_uid	**Not required.** Recording role type is held at monument level
		TIED_VECTORISED_LOCATIONS.NUMBER_OF_DIGITS	Monuments/monument/characters/character/spatial/geometry/spatialappellation/entity/deliveredprecision Units = “number of digits”		OK

		TIED_VECTORISED_LOCATIONS.PRIMACY_FLAG		**Not required**	**Not required**
		TIED_VECTORISED_LOCATIONS.RADIUS		?	**Not required**
		TIED_VECTORISED_LOCATIONS.LOC_UID	Monuments/monument/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Used to link tied_vectorised_locations to admin_locations	**Not required**
		TIED_VECTORISED_LOCATIONS.HSIS_STATUS		Redundant – not populated	**N/A**
		TIED_VECTORISED_LOCATIONS.QUARTER_SHEET	Monuments/monument/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”		**Not required**
		TIED_VECTORISED_LOCATIONS.OSGB_36		?	**Not required**
	Lat/long	VECTOR_COORDINATES.LONG_DEGREE	Monuments/monument/characters/character/spatial/geometry/spatialappellation/quickpoint/y		**Not required**
	Lat/long	VECTOR_COORDINATES.LAT_DEGREE	Monuments/monument/characters/character/spatial/geometry/spatialappellation/quickpoint/x		**Not required**
		VECTOR_COORDINATES.HEIGHT_OD VECTOR_COORDINATES.HEIGHT_QUALIFIER	Concatenate to Monuments/monument/characters/character/spatial/geometry/spatialappellation/height Datum = “WGS84” Units = “metres”		**Not required**
Long Text and Sources	Text	LONG_TEXT.TEXT	Monuments/monument/description/full	select text from long_text l, monuments m where l.t_uid=m.hob_uid and table_id_code = 40 In addition the attributes for the description should be assigned. Example: <description source = “EH NMR Inventory” audience = “general”	OK

				preferred = “true”> <full>Blah…….blah</full></description>	
		REFERENCES.GEN_MA2_UID	Monuments/monument/related/has_resource Namespace = “English Heritage National Monuments Record Inventory References Module” Reltype = “is related to” Linkref = “number”	select gen_ma2_uid, compiler_ref from references where monume1_uid = [hob_uid for this monument]	**Not required**
	Source Number	REFERENCES.GEN_DESC_REF	Monuments/monument/has_related/has_resource Linkref = “[This source number]”		Not Midas compliant. The Midas primary references schema has been made a sub-schema and source number has been made an attribute of references/reference
	Title	GENERAL_ARCHIVE_MATERIALS.TITLE	Monuments/monument/related/has_resource/References/references/referencetitle/appellation/name Type = “Title”	select g.title, r.compiler_ref from references r, general_archive_materials g where r.gen_ma2_uid = g.hob_uid and r.monume1_uid = [hob_uid for this monument]	Not Midas compliant. The Midas primary references schema has been made a sub-schema
					Not Midas compliant. The Midas primary references schema has been made a sub-schema
	Page	REFERENCES.INCL_PAGE_NOS	Monuments/monument/related/has_resource/References/reference/referenceextent Type = “Pages” N.B this is for recording the page numbers which refer to the monument		Not Midas compliant. The Midas primary references schema has been made a sub-schema
	Volume	REFERENCES.VOLUME_NOS	Monuments/monument/related/has_resource/References/reference/referenceextent Type = “Volume Number”		Not Midas compliant. The Midas primary references schema has been made a sub-schema
	Archive Type	ARCHIVE_TYPES.NAME	Monuments/monument/related/has_resource/References/reference/referencetype	select a.name from archive_types a, references r, general_archive_materials g where a.at_uid = g.at_uid and g.hob_uid = r.gen_ma2_uid and r.monume1_uid = [hob_uid for this monument]	**Not required**
	Archive Type	ARCHIVE_TYPES.NAME	Monuments/monument/related/has_resource/References/reference/referencemedium	select a.name from archive_types a, references r, general_archive_materials g where a.at_uid = g.at_uid	

			N.B. no specific field for recording medium but some mediums are included in the archive_type field	and g.hob_uid = r.gen_ma2_uid and r.monume1_uid = [hob_uid for this monument]	
	Extent	GENERAL_ARCHIVE_MATERIALS.EXTENT	Monuments/monument/related/has_resource/References/reference/referenceextent Type = “Number of Pages” N.B this is for recording the number of pages within a book/monograph/report etc.	select g.extent from references r, general_archive_materials g where g.hob_uid = r.gen_ma2_uid and r.monume1_uid = [hob_uid for this monument]	
	Comments	REFERENCES.DESCRIPTION	Monuments/monument/related/has_resource/References/reference/description	select r.comments from references r, general_archive_materials g where g.hob_uid = r.gen_ma2_uid and r.monume1_uid = [hob_uid for this monument]	Not Midas compliant. The Midas primary references schema has been made a sub-schema
		MONUMENTS.HOB_UID	References/reference/has_monument Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is related to”	select monume1_uid from references r, general_archive_materials g where r.gen_ma2_uid = g.hob_uid and g.hob_uid = [hob_uid for this source]	
	Publisher	GENERAL_ARCHIVE_MATERIALS.PUBLISHER	Monuments/monument/related/has_resource/References/reference/referencepublisher	select g.publisher from references r, general_archive_materials g where r.gen_ma2_uid = g.hob_uid and r.monume1_uid = [hob_uid for this monument]]	
	Statement of Responsibility	GENERAL_ARCHIVE_MATERIALS.R_STATEMENT	Monuments/monument/related/has_resource/References/reference/referencecreator/appellation/name Type = “Author” May need some work to remove words such as ‘by’ appearing in statement of responsibility	select g.r_statement from references r, general_archive_materials g where r.gen_ma2_uid = g.hob_uid and r.monume1_uid = [hob_uid for this monument]	
Associated Archives and Events	Object Number	ARCHIVE_OBJECTS.OBJECT_NO	Monuments/monument/related/has_object/Objects/Object/appellation/identifier Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is related to”	Select a.object_number From archive_objects a, references r Where a.object_uid = r.archive_object1_uid And r.monume1_uid = [hob_uid for this monument]	Not Midas compliant. The Midas objects schema has been made a sub-schema under ‘has_object’ and used for archive objects

	Object Title	ARCHIVE_OBJECTS.OBJECT_TITLE	Monuments/monument/related/has_object/Objects/Object/appellation/name Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is related to”	Select a.object_title From archive_objects a, references r Where a.object_uid = r.archive_object1_uid And r.monume1_uid = [hob_uid for this monument]	Not Midas compliant. The Midas objects schema has been made a sub-schema under ‘has_object’ and used for archive objects
	Event_uid	HOB_HANDLING_LISTS.ACT_UID ACTIVITIES.ACT_UID	Monuments/monument/related/has_event Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is related to”	select act_uid from hob_handling_lists where monume_uid = [hob_uid for this monument]	Not Midas compliant. The Midas primary events schema has been made a sub-schema events/event/appellation/identifier
	Event type	ACTIVITY_TYPES. DESCRIPTION	Events/event/eventtypes/type		Not Midas compliant. The Midas primary events schema has been made a sub-schema
	Event name	ACTIVITIES.ACTIVITY_NAME	Events/event/appellation/name		Not Midas compliant. The Midas primary events schema has been made a sub-schema
	Start Date	ACTIVITIES.DATE1	Events/event/temporal/span/start/appellation Type = “Date” Qualifier = “minimum date”		Not Midas compliant. The Midas primary events schema has been made a sub-schema
	End Date	ACTIVITIES.DATE2	Events/event/temporal/span/end/appellation Type = “Date” Qualifier = “maximum date”		Not Midas compliant. The Midas primary events schema has been made a sub-schema
Child Monuments and associated monuments	Hob_uid	MONUMENTS.HOB_UID	Monuments/monument/related/has_monument Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is parent of” Monuments/monument/related/has_monument/Monuments/monument/appellation/identifier Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is parent of”	Select hob_uid From monuments Where parent_uid = [hob_uid for this monument]	OK
	name	MONUMENT_ADDRESSES.NAME	Monuments/monument/related/has_monument/Monuments/monument/appellation/name Type = “current” Preferred = “true”	Select name From monuments_addresses where parent_uid = [hob_uid for this monument]	
	hob_uid	MONUMENTS.HOB_UID	Monuments/monument/related/has_monument Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is associated with”	select monume1_uid from references where monume2_uid = [hob_uid for this monument]	OK

	name	MONUMENT_ADDRESSES.NAME	Monuments/monument/related/has_monument/Monuments/monument/appellation/name Type = “current” Type = “current” Preferred = “true”	Select name From monument_addresses ma, references r, Where ma.hob_uid = r.monume1_uid And monume2_uid = [hob_uid for this monument]	
Monument Identifiers in other numbering schemes	Identity Method + Value	HOB_IDENTITY_METHODS.NAME HOB_IDENTITIES.HOB_IDENTITY_CODE	Monuments/monument/appellation/identifier Type = “Other Identifier ” Namespace = “[HOB_IDENTITY_METHODS.Name]” <identifier type = “Legacy_UID” namespace = “Scheduled Monument (County Number)”> ND22</identifier>	select name, hob_identity_code from hob_identity_methods h, hob_identities hi, where h.him_uid = hi.him_uid and hi.monume_uid = [hob_uid for this monument]	
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Where other_classifications.term includes the grade this needs to be separated out form the term For example LISTED BUILDING || GRADE I should be separated out with the first element going in <status> and the second in <grade>
Associated Named Locations	Named Location	NAMED_LOCATIONS.NAME	Monuments/monument/characters/character/spatial/namedplace/location Type = “Named Location” Namespace = “English Heritage National Monuments Record Monument Inventory”	select name from named_locations n, hob_locations h where n.loc_uid = h.nam_ln_uid and monume_uid = [hob_uid for this monument]	OK
	Dates	HOB_LOCATIONS.MAX_DATE HOB_LOCATIONS.MIN_DATE HOB_LOCATIONS.PRECISION	Monuments/monument/characters/character/type/annex/craft/lastjourney/dateof loss Precision = “year”	Where MIN_DATE and MAX_DATE are not equal use precision to determine	Not Midas compliant. (see above under maritime mappings)
Parties and roles	Role name	ROLE_TYPES.DESCRIPTION	Monuments/monument/actors/actor/role Type = “EH_Roles”	Select rt.description From roles r, role_types rt	OK

				Where r.role_type = rt.role_type And r.monume_uid = [hob_uid for this record]	
		ROLES.PRECISION	D = Day Y = Year C = Century	This doesn't map to a field but provides the type for the start and end appellations	**N/A**
	Start date	ROLES.MIN_DATE	Monuments/monument/actors/actor/temporal/span/start/appellation Type = "Day" Qualifier = "precise"	Select min_date From roles r, monuments m Where r.monume_uid = m.hob_uid And m.hob_uid = [hob_uid for this record]	OK
	End date	ROLES.MAX_DATE	Monuments/monument/actors/actor/temporal/span/end/appellation Type = "Day" Qualifier = "precise"	Select max_date From roles r, monuments m Where r.monume_uid = m.hob_uid And m.hob_uid = [hob_uid for this record]	OK
	Person Uid	PEOPLE.PARTY_UID	Monuments/monument/actors/actor/appellation/identifier Type = "system_uid" Namespace = "English Heritage National Monuments Record Monument Inventory"		**Not required**
	Surname/forename/initials/salutation	PEOPLE.SURNAME PEOPLE.FORENAMES PEOPLE.INITIALS PEOPLE.SALUTATION	Concatenate to Monuments/monument/actors/actor/appellation/name Type = "personal name" Preferred = "True"	Select salutation, initials, forenames, surname From people p, roles r Where p.role_uid = r.role_uid And r.monume_uid = [hob_uid for this record] <name type = "personal name"> [SALUTATION] single space [FORENAMES] single space [surname]</name> Where no Forename is present INITIALS should be used	OK
	Organisation Uid	ORGANISATIONS.PARTY_UID	Monuments/monument/actors/actor/appellation/identifier Type = "system_uid" Namespace = "English Heritage National Monuments Record Monument Inventory"		**Not required**
	Organisation	ORGANISATIONS.NAME	Monuments/monument/actors/actor/appellation/name Type = "organisation name"	Select name From organisations o, roles r Where o.role_uid = r.role_uid	OK

			Namespace = “English Heritage National Monuments Record Inventory”	And r.monume_uid = [hob_uid for this record] <name type = “organisation name”> [NAME]</name>	
EVENT RECORDING FORMS					
N/A	N/A		Metadata fields	These metadata fields refer to the dataset as a whole	
	N/A		Events/meta/title	<title> English Heritage Excavations Index </title>	
	N/A		Events/meta/subject N.B. need to be able to record the source of the keyword used in the subject field eg. IPSV, UKAT etc.	<subject>archaeology</subject>	
	N/A		Events/meta/keywords	<keywords>excavations, watching briefs, archaeological sites</keywords.	
	N/A		Events/meta/contacts/contact/name/title Events/meta/contacts/contact/name/firstname Events/meta/meta/contacts/contact/name/surname Events/meta/contacts/contact/name/othername	The contact details for the owner/producer of the dataset. <title>Mr</title> <firstname>Mark</firstname> <surname>Barratt<surname>	
	N/A		Events/meta/contacts/contact/organisation	<organisation>English Heritage</organisation>	
	N/A		Events/meta/contacts/contact/role	<role>Head of Signposting</role>	
	N/A		Events/meta/contacts/contact/address/streetaddress Events/meta/contacts/contact/address/streetaddress Events/meta/contacts/contact/address/city Events/meta/contacts/contact/address/adminarea Events/meta/contacts/contact/address/postcode Events/meta/contacts/contact/address/country	<streetaddress>NMRC</streetaddress> <streetaddress>Kemble Drive</streetaddress> <city>Swindon</city> <adminarea>Wiltshire</adminarea> <postcode>SN2 2GZ</postcode> <country>United Kingdom</country>	
	N/A		Events/meta/contacts/contact/phone Type = “Business”	<phone type = “business”>01793 414700</phone>	
	N/A		Events/meta/contacts/contact/fax	<fax>01793 414701</fax>	
	N/A		Events/meta/contacts/contact/email	<email>signposting@english-heritage.org.uk</email>	
	N/A		Events/meta/rights/copyright/holder Events/meta/rights/copyright/year		

			Events/meta/rights/copyright/statement		
	N/A		Events/meta/rights/accessrights/grantedto Events/meta/rights/accessrights/conditions Events/meta/rights/accessrights/datefrom Events/meta/rights/accessrights/dateto Events/meta/rights/accessrights/statement	<datefrom>01-JAN-2009</datefrom> <dateto>31-DEC-2010</dateto> <statement>The information is available for the duration of this project and remains the property of EH and may not be changed</statement>	
			Events/meta/rights/reproductionrights/statement Events/meta/rights/reproductionrights/contact Events/meta/rights/reproductionrights/fees		
			Events/meta/source/statement		
			Events/meta/creation/createdon Events/meta/creation/query N.B. This will be the SQL query used to extract the data	<createdon>01-JAN-2009</createdon> <query>select * from monuments……</query>	
	N/A		Events/meta/coverage/spatial/place/namedplace/location Type = “country” N.B. For AMIE this will default to ENGLAND not UK		
	N/A		Events/meta/coverage/spatial/geometry/bounding box Srs = spatial referencing system. EPSG idenitifiers should be used and OS GR are always 27700		

			Minx Miny Maxx Maxy The bounding box defines the bounding polygon covering the whole area of the dataset		
	N/A		Events/meta/coverage/temporal/span/display/appellation Type = “period”	<display> <appellation>Palaeolithic, Mesolithic, Neolithic etc </appellation </display>	
	N/A		Events/meta/coverage/temporal/span/start/appellation Type = ”period”	<start> <appellation>PALAEOLITHIC</appellation> </start>	
	N/A		Events/meta/coverage/temporal/span/end/appellation Type = ”period”	<end> <appellation>21ST CENTURY</appellation> </end>	
	N/A		Events/meta/coverage/temporal/span/duration/length Units = “years”	<length units = “years”>700,000</length	
Events	Event uid	ACTIVITIES.ACT_UID	Events/event/appellation/identifier Type = “System_UID” Namespace = “English Heritage Excavation Index”		
	Name	ACTIVITIES.ACTIVITY_NAME	Events/event/appellation/name Type = “English Heritage Excavation Index”		
	Event type	ACTIVITIES.ACT_TYPE ACTIVITY_TYPE.DESCRIPTION	Events/event/eventtypes/type	Select at.description From activity_types at, activities a Where a.act_type = at.act_type	
	Our Reference	ACTIVITIES.OUR_REF		Not mapped - redundant	
	Parent project	ACTIVITIES.PARENT_UID	Events/event/related/has_event Namespace = “English Heritage Excavation Index” Reltype = “has parent”	Select activity_name From activities Where parent_uid in (Select parent_uid from activities where act_uid = &uid [this record])	

	Start date	ACTIVITIES.DATE1	Events/event/temporal/span/start/appellation Type = “Day” Qualifier = “precise”		
	End date	ACTIVITIES.DATE2	Events/event/temporal/span/end/appellation Type = “Day” Qualifier = “precise”		
	Date Precision	ACTIVITIES.PRECISION	D = Day Y = Year C = Century	This doesn’t map to a field but provides the type for the start and end appellations	
	OS 1:10000 Sheet No.	ACTIVITIES.1_1000 (sic)	Events/event/spatial/place/gridref Namespace = “OSGB36”		
	Description	ACTIVITIES.DESCRIPTION	Event/event/description/summary		
Associated Archive Material Contents	Archive Type	ARCHIVE_TYPES.NAME	References/references/referencetype	select name from archive_types a, archive_mat_contents am where a.at_uid = am.at_uid and am.act_uid = [act_uid for this event]	
	Archive Type	ARCHIVE_TYPES.NAME	References/reference/referencemedium N.B. no specific field for recording medium but some mediums are included in the archive_type field	select name from archive_types a, archive_mat_contents am where a.at_uid = am.at_uid and am.act_uid = [act_uid for this event]	
	Whose View			Not mapped as deemed to be redundant	
	Organisation Uid	ORGANISATIONS.PARTY_UID	Events/event/actors/actor/appellation/identifier Type = “system_uid” Namespace = “English Heritage National Monuments Record Monument Inventory”		
	Organisation	ORGANISATIONS.NAME	Events/event/actors/actor/appellation/name Type = “organisation name” Identifier = “English Heritage National Monuments Record Inventory”	select name from organisations o, archive_mat_contents a where o.party_uid = a.organisation_uid and act_uid = [act_uid for this event]	
	Person Uid	PEOPLE.PARTY_UID	Events/event/actors/actor/appellation/identifier Type = “system_uid” Namespace = “English Heritage National Monuments Record Monument Inventory”		

	Person	PEOPLE.SURNAME PEOPLE.FORENAMES PEOPLE.INITIALS PEOPLE.SALUTATION	Concatenate to Events/event/actors/actor/appellation/name Type = “personal name” Identifier = “English Heritage National Monuments Record Inventory”	Select salutation, initials, forenames, surname From people p, roles r Where p.role_uid = r.role_uid And r.act_uid = [act_uid for this record] <name type = “personal name”> [SALUTATION] single space [FORENAMES] single space [surname]</name>	
Event Addresses	County/District/Parish	MONUMENT_ADDRESSES.ADM_LO_UID	Events/event/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Link to ADMIN_LOCATIONS and CDP_FLAT tables select name from admin_locations al, monument_addresses ma, activities a where al.loc_uid= ma.adm_lo_uid and a.act_uid = [act_uid for this record] and adln_type = [county, district or parish] Repeat for different adln_types	
	Non-Parished Areas	MONUMENT_ADDRESSES.NON_PAR_LOC_UID	Events/event/appellation/identifier Type = “Non Parish Area UID”	select non_par_loc_name from non_parish_locations nl, monument_addresses ma, admin_locations al where nl.non_par_loc_uid =ma.non_par_loc_uid and a.act_uid = [act_uid for this record] and al.loc_uic=ma.non_par_loc_uid and al.npl_flag is not null	
		MONUMENT_ADDRESSES.STATUS	Events/event/appellation/identifier Type = “Address_statuses” Namespace = “EH_LUT _classid_1”	‘P’ is most common select l.char1_value from look_up_table l, monument_addresses ma where l.char10_value = ma.status and l.class_uid = 1	

		MONUMENT_ADDRESSES.PRIMACY		Not mapped as field redundant. Primacy can be deduced from STATUS.	
		MONUMENT_ADDRESSES.MON_AD_NUMBER MONUMENT_ADDRESSES.STREET	Concatentate to Events/Event/ spatial/place/address/streetaddress	<street address>24-26 Even[single space]Bridge Street</streetaddress>	
		MONUMENT_ADDRESSES.RE_R_T_UID	Events/event/actor/role Type = “recording role type”	select recording_role_type.description from recording_role_type r, monument_addresses ma where r.re_r_t_uid = ma.re_r_t_uid	
		MONUMENT_ADDRESSES.ACT_UID	Events/event/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Used to link an event to an address select * from monument_addresses ma, activities a where ma.act_uid = a.act_uid	
	Name	MONUMENT_ADDRESSES.NAME	Events/event/appellation/name Type = “current” Preferred = “true”	select name from monument_addresses ma, activities a where ma.act_uid = a.act_uid	
Associated Event Classifications	Period	PERIODS.PERIOD_UID	Events/event/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”		Not Required for export but for connecting PERIODS to ARCH_MAT_CLASSIFICATIONS
	Period	PERIODS.NAME	Events/event/temporal/span/start/appellation Type = “period” Events/event/temporal/span/end/appellation Type = “period”	select name from periods p, arch_mat_classifications a where a.period_uid=p.period_uid and a.act_uid = [act_uid for this event]	
	? (period certainty)	ARCH_MAT_CLASSIFICATIONS.PERIOD_CERT_FACTOR		Not mapped as field not used in Monuments or Events	
	Display Date	ARCH_MAT_CLASSIFICATIONS.DISPLAY_DATE	Events/event/temporal/span/display/appellation Type = “Display Date”	Select display_date From arch_mat_classifications Where act_uid = [act_uid for this event]	

	Class Scheme	ARCH_MAT_CLASSIFICATIONS.CLA_GR_UID	Events/event/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”		Not required for export but to link CLASSIFICATION_GROUPS to ARCH_MAT_CLASSIFICATIONS
	Term	THESAURUS_TERMS.TERM	Events/event/appellation/name Type = “[DEPENDENT ON CLA_GR_UID]” Namespace = “English Heritage National Monuments Record Thesaurus of Monument Types” To obtain type attribute info: Select name from classification_groups Where cla_gr_uid = &UID	Select term From thesaurus_terms t, arch_mat_classifications a Where a.term_uid = t.the_te_uid And a.cla_gr_uid = t.cla_gr_uid And a.act_uid = [act_uid for this event]	Terms from various classification groups are stored in this row
Associated Monuments	Monument_uid	HOB_HANDLING_LISTS.MONUME_UID MONUMENTS.HOB_UID	Events/Event/related/has_monument Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is related to”	select monume_uid from hob_handling_lists where act_uid = [act_uid for this event]	
Parties and roles	Role name	ROLE_TYPES.DESCRIPTION	Events/event/actors/actor/role Type = “EH_Roles”	Select rt.description From roles r, role_types rt Where r.role_type = rt.role_type And r.act_uid = [act_uid for this record]	
		ROLES.PRECISION	D = Day Y = Year C = Century	This doesn’t map to a field but provides the type for the start and end appellations	
		ROLES.MIN_DATE	Events/event/actors/actortemporal/span/start/appellation Type = “Day” Qualifier = “precise”	Select min_date From roles r, activities a Where r.act_uid = a.act_uid And a.act_uid = [act_uid for this record]	
		ROLES.MAX_DATE	Events/event/actors/actor/temporal/span/end/appellation Type = “Day” Qualifier = “precise”	Select max_date From roles r, activities a Where r.act_uid = a.act_uid And a.act_uid = [act_uid for this record]	
	Person Uid	PEOPLE.PARTY_UID	Events/event/actors/actor/appellation/identifier Type = “system_uid” Namespace = “English Heritage National Monuments Record Monument Inventory”		

	Surname/forename /initials/salutation	PEOPLE.SURNAME PEOPLE.FORENAMES PEOPLE.INITIALS PEOPLE.SALUTATION	Concatenate to Events/event/actors/actor/appellation/name Type = “personal name” Identifier = “English Heritage National Monuments Record Inventory”	Select salutation, initials, forenames, surname From people p, roles r Where p.role_uid = r.role_uid And r.act_uid = [act_uid for this record] <name type = “personal name”> [SALUTATION] single space [FORENAMES] single space [surname]</name> Where no Forename is present INITIALS should be used.	
	Organisation Uid	ORGANISATIONS.PARTY_UID	Events/event/actors/actor/appellation/identifier Type = “system_uid” Namespace = “English Heritage National Monuments Record Monument Inventory”		
		ORGANISATIONS.NAME	Events/event/actors/actor/appellation/name Type = “organisation name” Identifier = “English Heritage National Monuments Record Inventory”	Select name From organisations o, roles r Where o.role_uid = r.role_uid And r.act_uid = [act_uid for this record] <name type = “organisation name”> [NAME]</name>	
Associated NG Coordinates		TIED_VECTORISED_LOCATIONS.TI_VEC_UID	Events/Event/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Unique identifier for this row. Link between tied_vectorised_locations and vector_coordinates	
		TIED_VECTORISED_LOCATIONS.COORDINATE_SYSTEM	Events/event/spatial/geometry/spatialappellation/quickpoint/srs	Srs = spatial referencing system. EPSG idenitifiers should be used and OS GR are always 27700 <srs>EPSG:27700</srs>	
	Date of Fix	TIED_VECTORISED_LOCATIONS.DATE_OF_FIX	Events/event/temporal/span/start/appellation Type = “date” Events/event/temporal/span/end/appellation Type = “date”	select date_of_fix from tied_vectorised_locations where act_uid = [act_uid for this event]	
	For OS NGRs	TIED_VECTORISED_LOCATIONS.NG_100KM_SQUARE VECTOR_COORDINATES.X	Concatenate to Events/event/spatial/place/gridref Namespace = “OSGB36” for terrestrial Namespace = “WGS84” for maritime	<gridref namespace = “OSGB36”>NT 71235698</gridref> N.B. x and y coordinates stored as absolutes not OS NGRs so	

		VECTOR_COORDINATES.Y		conversion to remove first digit is needed. Use OSGB36 field in tied_vectorised_locations to determine whether terrestrial or maritime	
	For storing absolute coordinates	VECTOR_COORDINATES.X	Events/event/spatial/geometry/spatialappellation/quickpoint/x		
	For storing absolute coordinates	VECTOR_COORDINATES.Y	Events/event/spatial/geometry/spatialappellation/quickpoint/y		
	For storing shape and coordinates	TIED_VECTORISED_LOCATIONS.VEC_LO_TYPE VECTOR_COORDINATES.X VECTOR_COORDINATES.Y	Concatenate to Events/event/spatial/geometry/spatialappellation/entity spatialtype="Vec_lo_Type" uri="" namespace=" English Heritage National Monuments Record Monument GIS"	Example: <entity spatialtype="Point" uri="212132" namespace="EI"> <wkt srs="EPSG:27700">POINT(400582 408186)</wkt> select l.char40_value, v.x, v.y from look_up_table l, tied_vectorised_locations t, vector_coordinates v where v.ti_vec_uid=t.ti_vec_uid and l.int_value = t.vec_lo_type and l.class_uid = 19	Where l.char40_value = ‘Area’ use WKT element POLYGON Where l.char40_value = “centre/point’ or ‘locality’ use WKT element POINT
		TIED_VECTORISED_LOCATIONS.QUALIFIER		Redundant – No longer used	
	Shape	TIED_VECTORISED_LOCATIONS.VEC_LO_TYPE	Events/event/spatial/geometry/spatialappellation Type = “Shape”	select l.char40_value from look_up_table l, tied_vectorised_locations t where l.int_value = t.vec_lo_type and l.class_uid = 19	
		TIED_VECTORISED_LOCATIONS.ACT_UID	Events/event/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Used to link an event to tied vectorised location select * from tied_vectorised_locations t, activities a where t..act_uid = a.act_uid	

	Role	TIED_VECTORISED_LOCATIONS.RE_R_T_UID	Events/event/actor/role Type = “recording role type”	“Archaeological Event Recorder” most common select recording_role_type.description from recording_role_type r, tied_vectorised_locations t where t.re_r_t_uid = r.re_r_t_uid	
	Number of Digits	TIED_VECTORISED_LOCATIONS.NUMBER_OF_DIGITS	Events/event/spatial/geometry/spatialappellation/entity/deliveredprecision Units = “number of digits”		
		TIED_VECTORISED_LOCATIONS.PRIMACY_FLAG		Not mapped	
		TIED_VECTORISED_LOCATIONS.RADIUS		?	
		TIED_VECTORISED_LOCATIONS.LOC_UID	Events/event/appellation/identifier Type = “System_UID” Namespace = “English Heritage National Monuments Record Monument Inventory”	Used to link tied_vectorised_locations to admin_locations	
	Height	VECTOR_COORDINATES.HEIGHT_OD VECTOR_COORDINATES.HEIGHT_QUALIFIER	Concatenate to Events/event/spatial/geometry/spatialappellation/height Datum = “WGS84” Units = “metres”		
General Archive References		REFERENCES.GEN_MA2_UID	Events/Event/related/has_resource Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is related to” Linkref = “number”	select gen_ma2_uid, compiler_ref from references where actvty1_uid = [hob_uid for this event]	
	Title	GENERAL_ARCHIVE_MATERIALS.TITLE	References/references/referencetitle/appellation/name	select g.title, r.compiler_ref from references r, general_archive_materials g where r.gen_ma2_uid = g.hob_uid and r.actvty1_uid = [hob_uid for this event]	
	Archive Type	ARCHIVE_TYPES.NAME	References/references/referencetype	select a.name	

				from archive_types a, references r, general_archive_materials g where a.at_uid = g.at_uid and g.hob_uid = r.gen_ma2_uid and r.actvty1_uid = [hob_uid for this event]	
	Archive Type	ARCHIVE_TYPES.NAME	References/reference/referencemedium N.B. no specific field for recording medium but some mediums are included in the archive_type field	select a.name from archive_types a, references r, general_archive_materials g where a.at_uid = g.at_uid and g.hob_uid = r.gen_ma2_uid and r.actvty1_uid = [hob_uid for this event]	
	Extent	GENERAL_ARCHIVE_MATERIALS.EXTENT	References/reference/referenceextent	select g.extent from references r, general_archive_materials g where g.hob_uid = r.gen_ma2_uid and r.actvty1_uid = [hob_uid for this event]	
	Comments	REFERENCES.DESCRIPTION	References/reference/referenceextent	select r.comments from references r, general_archive_materials g where g.hob_uid = r.gen_ma2_uid and r.actvty1_uid = [hob_uid for this event]	
		ACTIVITIES.ACT_UID	References/reference/has_event Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is related to”	select actvty1_uid from references r, general_archive_materials g where r.gen_ma2_uid = g.hob_uid and g.hob_uid = [hob_uid for this source]	
References of Archives to Events	Object Number	ARCHIVE_OBJECTS.OBJECT_NO	Events/Event/related/has_object Namespace = “English Heritage National Monuments Record Inventory” Reltype = “is related to”	Select a.object_number From archive_objects a, references r Where a.object_uid = r.archive_object1_uid And r.actvty1_uid = [act_uid for this event]	
Associated External Identifiers	Identity Method + Value	HOB_IDENTITY_METHODS.NAME	Monuments/monument/appellation/identifier Type = “Other Identifier ” Namespace = “[HOB_IDENTITY_METHODS.Name]”	select name, hob_identity_code from hob_identity_methods h, hob_identities hi, where h.him_uid = hi.him_uid	

		HOB_IDENTITIES.HOB_IDENTITY_CODE	<identifier type = “Legacy_UID” namespace = “Scheduled Monument (County Number)”> ND22</identifier>	and hi.monume_uid = [hob_uid for this monument]	
	Condition scheme + Term	CLASSIFICATION_GROUPS.NAME OTHER_CLASSIFICATIONS.TERM	Monuments/monument/designations/designation/status <status>LISTED BUILDING</status> Monuments/monument/designations/designation/grade <grade>GRADE I</grade>	Identifies which authority file is being used. Eg. AREA STATUS = 7 select cg.name, oc.term from classification_groups cg, other_classifications oc, hob_conditions hc where cg.cla_gr_uid = hc.cla_gr_uid and hc.term_uid = oc.classi_uid and hc.monume_uid = [hob_uid for this monument	Where other_classifications.term includes the grade this needs to be separated out from the term For example LISTED BUILDING || GRADE I should be separated out with the first element going in <status> and the second in <grade>

Appendix D Actions arising from Stage 2 testing

The following actions were agreed by the project team, based upon feedback from Stage 2 testing. The hyperlinks on issues have been retained and are directed to a section of the forums on the website available to the project team only. Actions were allocated to the organisation in square brackets.

#	Issue/request	Discussion	Action
1	IE9 issues	Cosmetic problems with the header area affecting Internet Explorer 9.	Fix issues before HER testing starts. [ESDM]
2	Validating UIDs	Possibly of validating UIDs by defining a pattern.	None at this stage.
3	Map search zoom scale	The scale of the map when location search results were displayed (100m) was felt to be too zoomed in.	Reduce map scale on search results to 200m. [ESDM]
4	Event links not working	Some did not work as they were missing from the export.	Explain this in documentation. [Historic England]
5	Data values in Identifiers	General lack of clarity.	Explain this in documentation. [Historic England
6	Remember user's last filter on Records page	The filters on the records page reset when reloaded.	Ensure that the filters on the records page are remembered. [ESDM]
7	Change order of filter groups	Suggestion that the HER filter should be further towards the top of the page.	None at this stage.
8	Mandatory fields when accessioning	Mandatory fields are not highlighted.	Highlight mandatory fields in accessioning form. [ESDM]
9	Visibility of record ID	Uncertainty over whether project-specific ID should be visible.	Explain this in documentation. [ESDM]
10	Map speed and caching	Map caching currently set to 1 hour.	None at this stage.
11	Monument and Event URL templates	Invalid hyperlinks to Events on Heritage Gateway.	Implement different templates for Monuments and Events. [ESDM]
12	Registration T&Cs	All users have now registered so there's no point changing these now within the website, but there is still a need to ensure testing HERs are on-board.	Liaise with testing HERs to distribute 'letter of comfort' and ensure satisfactory sign-up to terms. [Historic England & ESDM]

#	Issue/request	Discussion	Action
13	Possible need for pick-list	Should HERs be able to select multiple reasons for rejecting or partially rejecting HER data	Explain in documentation. [Historic England]
			Review after first HER testing phase. [ESDM]
14	Possible need for more guidance	The help page on accessioning required more detail.	Update guidance. [Historic England]
15	How PastScape links open	PastScape was set to open in the same tab for Monuments and on a new tab for Events.	Change PastScape links from Monuments to open in new tab. [ESDM]
16	Cancellation of accessioning response	Bug that prEvented cancelation of an accessioning response in Firefox.	Implement bug fix. [ESDM]

Appendix E Instructions for Stage 5 testers

Introduction

The following HERs are being asked to undertake one full day of testing during this phase (or the equivalent time across multiple days):

- Bedford Borough HER
- Cambridgeshire HER
- Coventry HER
- Durham HER
- Somerset HER
- Warwickshire HER

Two HERs have in addition been identified as mentors, with time allocated to help others:

- Coventry HER
- Somerset HER

Methodologies

The Project Design described the HERs "accessioning a prescribed number of NRHE records" however we would now like tester simply to spend the assigned amount of time on the task, without numerical targets.

We have identified two possible approaches: map-based and list-based, described below. We would like to divide the initial group between these methods, as follows:

- Bedfordshire, Coventry and Durham use method A (map-based).
- Cambridgeshire, Somerset and Warwickshire use method B (list-based).

Method A: map-based

Swiftly review the map of Monument and Event records for your HER area in the main interactive map or the shapefiles for your area from https://nrhe-to-her.esdm.co.uk/downloads.

Select an area that appears typical in terms of the ratio of new record to records you already have in the HER. Try also to ensure the area has significant numbers of both Monuments and Events. It may be helpful to choose an easily identifiable area, such as a 10x10km square, or a 1x1km square if the coverage of Monuments and Events is very dense, to make it simpler to monitor progress. You may of course move beyond this area if it is completed within the time available.

Method B: list-based

Select the Monuments and Events records in your HER area using the Records page, and simply work from the top. Filtering for records in the "Not processed" state will show the list of records needing action.

Whichever method is used, please divide time approximately 2:1 between Monuments and Events. It is expected that Event records will usually be faster to accession than Monuments.

How to process a record

It is expected that entering NRHE information into the HER will be carried out by copying and pasting from the details page and from the downloaded shapefile. Take care to note which HER records are created and updated from the NRHE record, ready to enter this into the website.

For each NRHE record in the chosen area, review the record details against your existing HER holdings. A record is likely to fall into one of six categories, shown in the table below with suggested actions for each.

Scenario	Suggested action
All of the information is already in the HER. It could be all in one record or across multiple.	On the Accessioning tab, click "Add response" and set the status to "Fully accessioned", then enter the UID of the HER record that most closely matches the NRHE record and specify the nature of the relationship (adding comments if needed). Save the accessioning status record. You can then add additional cross-references if the NRHE record correlates with more than one HER record. Cross-reference must be to the same kind of record, i.e. Monument to Monument (so do not enter cross-references from an NRHE Monument to your HER Sources, Events, etc).
Some of the information is already in the HER, but there is new information in the NRHE record that should be accessioned into the HER.	Add the new information to the HER, either by enhancing existing records or creating new ones or both. Then proceed as for a).
Some of the information is already in the HER but some is not, and the extra information is not wanted, perhaps because it is outside the HER recording policy.	Set the accessioning status to "Partly accessioned" and give reasons for the partial rejection. As for a) and b), enter one or more cross-references with HER records.
The NRHE information is not in the HER at all, and should be accessioned in whole or in part.	If all of the NRHE information can be incorporated, proceed as in b). If any significant part of the NRHE record's information is not to be incorporated into the HER, set the accessioning status to "Partly accessioned" and give reasons for the partial rejection. As for a) and b), enter one or more cross-references with HER records.
The information from the NRHE is not in the HER at all, but is not wanted, perhaps because it is outside the HER recording policy.	Set the accessioning status to "Rejected" and give reasons. There will be no cross-references, by definition.
The information in the NRHE cannot be understood well enough for the above judgements to be made without more information from Historic England.	During this testing phase you may contact one of the mentoring HERs (Somerset and Coventry) to discuss the case. You may also post a question about the record on the "Q&A" tab; Historic England will respond. It may be useful to set the status to "In progress", which will allow you to filter for these records easily.

How to create and edit a response

On the Accessioning tab for each record, click "Add response" and set the status as appropriate. If the status is either "Partly accessioned" or "Rejected" you will be required to add a comment explaining why the record could not be fully accessioned.

You may wish to create a Source record for the NRHE to HER prototype site, then cross reference this for each newly entered record with the record URL as the specific reference and giving the date the page was accessed. Alternatively you may note this elsewhere (e.g. in an audit trail) and instead cross-reference only the Sources used in the NRHE record (which may in turn need to be created). At this point in the project we have no clear view which method is best, so long as there is a clear audit trail and adequate cross-referencing.

Please keep notes about the approaches you adopt, including any verdicts on which are better or worse.

It is necessary to focus on efficiency, as well as quality and completeness. Please think about techniques to make the accessioning as efficient as possible.

Be prepared to tell us about the approaches used, and your experiences. As well as the information entered into the website for individual records we will seek more general feedback after the completion of testing.

How to test a cross-reference

If you publish Monument and/or Event records through a web-based interface such as an HER website or the Heritage Gateway, there is a mechanism for using this to test entered cross-references.

On the "Manage Organisations" page (https://nrhe-to-her.esdm.co.uk/manage-organisations) it is possible to define two URL templates (one for Monuments, one for Events) for your organisation. Please do not edit anyone else's templates!

You need to know the format of a record URL that has the record ID embedded within it. This is turned into a template by replacing any one ID with "{0}" (without the quotes). For example, the template for Bath & NES's Heritage Gateway records looks like this:

http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid={0}&resourceID=1036

When the {0} is replaced with a record ID, such as "MBN1930" it becomes:

http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MBN1930&resourceID=1036

which opens the record in the browser successfully.

If you define such templates, then every cross-reference entered during accessioning turns into a hyperlink to open the online HER record. This provides a simple means to test that the ID you entered was valid.

This method may of course not work for newly-created records, if there is a lag between entering records in the HER and their appearance online.

How to review progress

Progress can be seen in a number of ways.

- The map layers show records by status (though note that there is some caching for performance, and the map will take some time to reflect status changes).
- The Records page shows counts of records per status and can be used to filter for these.
- The Progress page shows counts by status overall and by HER.
- The Manage Organisations page shows a count of records in each status per HER.

How to get help

- As mentioned above, testers can make use of the two Mentors during this testing phase.
- You may also post questions on the "Q&A" tab of individual records.
- The "Help" page on the website has lots of information about the nature of the NRHE data and the functionality of the website.
- Also within the Help area of the site we have provided discussion forums for testers to post questions of a general nature. These forums are visible to all testers and the project team including the Mentors and Historic England. The forums have been divided into logical areas; please review existing posts and use the search facility to see whether your question has already been covered.

How to record your time

To secure payment for your work on the project it is necessary to record time spent. This is done here: https://nrhe-to-her.esdm.co.uk/time-recording (under the Project menu in the site). Remember you can only be paid for work up to the sums agreed in the Project Design and explained previously by email.

Can I do more?

Yes; if you would like to do more hours testing than scheduled in the Project Design that is fine, but you need to record the time, and the extra cannot be paid. It is important to record the time as we need to know rates of progress (e.g. Durham worked for 12 hours and accessioned 42 Monument records and 38 Events, or whatever).

Appendix F Feedback from the Stage 5 testers

The following notes summarise the general feedback from the six HERs involved in Stage 5 testing. Specific feedback on functionality was captured in the project forums and is covered by Appendix G. Note that the feedback in this appendix have been anonymised.

F.1HER 1

- Accessioning times were accurate.
- Value added work was done, but was not included as part of the recorded accessioning time.
- Thought the difference in rates may be due to how people were accessioning.
- Had about 2/3 of the records accessioned.
- Believed that accessioning in an urban area may have reduced rates.

F.2HER 2

- Deliberately chose problematic records (e.g. rock art) in order to test the process.
- Noted that completely new records were very quick to accession, rather than integrating with existing data in HER.
- Copied and pasted from NRHE to HER.
- Did a little data enhancement and followed sources during logged time.
- Suggested making the guidance clearer for the 2nd phase of testing:
    - Not about HER data enhancement.
    - Meant to be about data migration, not data cleaning.
- Used 2 monitors.
- Felt that the time required for deal with Monuments was not equivalent to time on Events.
- Could find places for all information within the HER, but not always very well placed.

F.3HER 3

- Only did a few Events, which were likely to take longer, which might go some way to explaining rates.
- Most of the data accessioned was already in the HER, thought to be due to:
    - The list approach being non-random.
    - Pilot data exchange in the 1980s.
    - HER being up to date – others may not be so up to date.
- Thought that internet/system speed was unlikely to have a significant impact on rates.
- Used 2 monitors, but thought the impact on accessioning rates due to this was not likely to be large.

F.4HER 4

Notes from the phone conversation:

- Accessioning rate affected primarily by difficult data.
- Noted that the distinction between accessioning and enhancing data is unclear.
- Did to some data enhancement and followed sources where required.

- Thought that we needed to define what counts as accessioning for the next round of testing and suggest that data enhancement is not included as part of the recorded time (i.e. HERs can do it on their own time if they want).
- Suggested flagging records for future enhancement may be an approach worth considering.
- Felt that interruptions as a result of being in a busy office may have affected rates.
- Found that accessioning rates increase after a few days in a previous similar test covering 10 km.
- Hold off discussions/questionnaire in the second round of testing until testing completed, but encourage HERs to make notes.

F.5HER 5

By email:

"I think the figures for [Town] are broadly realistic when scaled-up for us. This work involved two officers (me for about 6 hrs and [Person], the remainder). What might be some of the characteristic variables we have? Well, the obvious is that we aren't the quickest, as [person] and I, are in reality about 95% Development Management and 5% HER maintenance and updating, meaning that it nearly always takes us some adjustment time to get back into the rhythm of checking and inputting data. We also had the usual distractions during this testing-process from DM telephone calls, emails, planning colleagues etc. - this sort of HER work is nearly always interrupted by other pressures.

I largely chose a number of buildings to input. As building components haven't in the past been widely recorded in [HERs] HBSMR, these sorts of records were a little more time-consuming to input as all the helpfully identified components by the NHRE had to be input by hand (if only we could get our Conservation colleagues more interested in HBSMR – have tried repeatedly and just about given up now). There was also a lot of new data regarding pre-PPG16 'rescue-archaeology' or antiquarian sites/finds missing from [HERs] HBSMR, when we looked at the more archaeological records.

"I would have preferred an automatic rather than manual input of data, based solely on the lack of resources here. However, it was useful to check on the validity and accuracy of data through the manual inputting process. The record I rejected had a NHRE address and map totally at odds with each other, so it was impossible to tell which buildings were being referred to. Furthermore, in the cases we already held some information, I can see that an automatic input of data would probably have resulted in the need for 'cleaning' and rationalising of these records at a later date, anyhow.

"At [HER], we are left with the concern of where/how we might finds the resources to input all this new data in the future (currently exploring a [City] Placement). Having said this, the testing made me realise how much new or invaluable data the NHRE holds that we don't currently, and how much we were able to flesh out and add detail to existing records. Such a useful resource and we found the website very intuitive and easy to use. Loved the fact that the point data disappeared into another layer when signed off as complete. The interface was very user-friendly. The one criticism is that the difference between partly accessioned and fully accessioned needed to be clearly defined (maybe I just missed this somewhere)."

F.6HER 6

- Enjoyed the process, and did not find it onerous.
- Used two monitors, and thought it would have been more difficult with only one.

- Used the 'list-based' approach, but also downloaded the GIS data and used this within their own GIS environment (this was needed to help determine the relationship between some NRHE records and HER records).
- Most of the Event records were old antiquarian records, so were fast to process as already in the HER from the same sources.
- Some valuable new Monument records were added to the HER through this process.
- Asked a couple of questions and was very happy with the Q&A process.
- The Q&A process revealed some poor NRHE recording on a couple of Monument records, with mysterious references to Linear Archive that may not exist.
- Accessioned some long linear Monuments that crossed into other HER areas; recorded these as 'partly accessioned' and added comments.
- Quality of provided information on Sources was not good enough to create HER sources. Recorded the website as the Source, and flagged each record as needing enhancement with fuller Source information when it becomes available.
- No suggestions for improvement to the functionality of the site.

Appendix G Actions arising from Stage 5 testing

The following actions were agreed by the project team, based upon feedback from Stage 5 testing. The hyperlinks on issues have been retained and are directed to a section of the forums on the website available to the project team only. Actions were allocated to the organisation in square brackets.

#	Issue	Discussion	Action
1	Holders	Consider whether it is possible to query where Archive Holder and Finds Holder are different. Implement if appropriate.	Update guidance. [Historic England]
2	Monument metadata	Advise on how to deal with Monument records that have e.g. "When created = prior to 01-APR-1999" and "Created by = Inventory".	Update guidance. [Historic England]
3	Map Text Box- what it shows	Consider changes to the info popup on the map and implement as appropriate.	Drop COORD SYS and CAPTURE_SCALE for Monuments in popup. Leave Name as is. Monuments – related issue… Primary address… promote this to top of page, repeating it at top if present. Events – drop COORD SYS Add Event Type into popup. Add StartDate (the first). This applies to downloads. [ESDM]
4	Events testing - from the Map- minor suggestion	Copy grid references on the spatial data to the record details page.	Check whether the coords in the GIS dataset match the position, and add to record details to the page if they are OK. [ESDM]
5	Non Antiquities	Update guidance to describe how to deal with Sources that are both an aerial photograph and someone's assessment of it.	Provide principles - HER recording policy should take priority on this particular issue.

#	Issue	Discussion	Action
			[Historic England]
		Advise on how to deal with records that are assessed as part of the process and thought to be non-antiquity. Relates to the 'Fully accessioned' definition suggesting these should be accessioned.	Update guidance. [Historic England]
6	Multiple External Statuses to the same thing	Advise whether old SM numbers should be accessioned. According to previous thinking, these should all be entered before can say 'Fully accessioned', but this should not be done for efficiency. So during testing it's fine to leave them out but has to be 'Partly accessioned'.	Update guidance. [Historic England]
7	Top Tips	This might be a useful thing to have on the Forum/website - places where people deal with the logistics of editing/concordance.	None, as this forum is being hidden for now.
8	Records near/on the boundary of HERs	Possible addition to status: 'Not in area'.	Implement changes to status categories (Section 3.6.1). [ESDM]
9	**Mapping Features**	**Some HERs can only record points, whilst the NRHE includes lines and polygons. The loss of that detail will presumably means that at best they are only 'Partly accessioned'.**	**Update guidance. [Historic England]**
10	Abbreviations	Consider creating an abbreviations table and add to guidance.	Update guidance. [Historic England]
11	Map visible statuses	Implement an 'In progress' (overall) status to the tags and map layers.	Implement changes to status categories (Section 3.6.1). [ESDM]
12	**Automated emails from the website**	**Investigate whether it is possible to prevent URLs in emails being broken and implement a fix if possible.**	**Implement changes to notification email. [ESDM]**
13	Identifiers	Consider which Historic England identifiers need to be accessioned and add to guidance.	Update guidance. [Historic England]
14	Recording extent of NRHE/HER duplication	Clarify in the guidance that information on how much of the NRHE information is new to the HER is not required.	Add new tick box "has anything significant been added to the HER?" [ESDM]

15	Full Accessioning - Events	Update guidance to explain how to accession where elements are known to be wrong.	Update guidance. [Historic England]
		Update guidance to explain whether to accession elements in the NRHE that the HER would typically not do.	Update guidance. [Historic England]
16	Duplicate NRHE entries	Consider how to deal with duplicate NRHE entries and update guidance as appropriate.	Update guidance. [Historic England]
17	NRHE – Order of Sources	Consider whether Sources need to be numerically ordered on the website and implement if necessary.	None, for now.
18	Fieldwork people records	Advise on whether fieldwork 'people' should be recorded by HERs.	Update guidance. [Historic England]
19	NRHE Events - Classifications - Monument Type = "Site"	Update guidance to clarify the use of Monument Type = 'Site' on Events and how this information should be accessioned. 'Site' means there is no Monument, so a Monument should not be created.	Update guidance. [Historic England]
20	Source - Oral information, correspondence (not archived) or staff comments	Update guidance on accessioning "Oral information, correspondence (not archived) or staff comments".	Update guidance. [Historic England]
21	"Fully accessioned" and "Partly accessioned"	Clarify definitions and guidance on 'Fully accessioned' and 'Partially accessioned'.	Update guidance. [Historic England & ESDM]
22	Comments	Consider the best approach to collating feedback during the next round of testing.	Implement a questionnaire after Stage 7 testing, with selected phone calls. Hide forums from testers. [ESDM]
23	Payment	Decide whether HERs should be paid per unit time or per record.	None.
24	Record cleaning during accessioning	Advise on how much time should be spent cleaning HER records (or how much of this will be paid for). Clarify that cleaning should be undertaken "where essential to accession the data".	Update guidance. [Historic England]
25	Thematic accessioning methods	Consider whether filtering by themes is possible/advisable. Discussed and rejected.	None.
		Consider technical feasibility of filtering by themes and implement as appropriate. Discussed and rejected.	None.

26	Determining which record in the NRHE is which record in the HER	Consider whether original Sources should be sent to HERs, to help relate NRHE records to HER records. This was not considered to be an issue during this trial.	None.
27	Mapping	Consider whether MasterMap can be used as base-mapping and any licensing costs. This was not feasible due to the difficulty in licensing.	None.
		Estimate the costs of adding MasterMap to the map.	None.
28	Display of IDs	Hide project IDs, and move HE UID to first column.	Implement change. [ESDM]
29	NRHE Events	Possibly update guidance on dealing with Event records containing Monument data.	Update guidance. [Historic England]
30	NMP & NRHE	Decide how to deal with NMP type projects and R&F where extents differ, and update guidance. There is a feeling NMP data in NRHE cannot be adequately accessioned without also having the NMP data, and not all HERs have any or all of this.	Update guidance. [Historic England]
31	How to accession	Decide whether to use NRHE as the Source and provide guidance. All Sources from the NRHE should be accessioned for a 'fully accessioned' status.	Update guidance. [Historic England]
32	URLs	Advice required on whether links to PastScape and the Excavation Index should be created. HERs should focus on adding reference identifiers. Links can be created from these.	Update guidance. [Historic England]
33	Contradictions in Events records	Add guidance on how to deal with contradictory People and Organisation details.	Update guidance. [Historic England]
34	Monument Actors - Compiler or Heritage Protection Adviser	Possibly update guidance to recommend how best to deal with 'Compiler' and 'Heritage Protection Adviser' Monument Actors.	Update guidance. [Historic England]
35	Raising issues	Consider the best approach to collating feedback during the next round of testing.	Implement a questionnaire after Stage 7 testing, with selected phone calls. [ESDM]
36	Urban areas	Advice required on level of effort required from HERs.	Update guidance. [Historic England]
37	Original Sources	Advice required on level of effort required from HERs.	Update guidance.

			[Historic England]
38	Linked Monuments and Events	Possibly update guidance to recommend following linked Monuments and Events to ensure data consistency and efficiency. Advise that HERs should follow links.	Update guidance. [Historic England]
39	List vs. map method	Possibly update guidance to recommend map approach first with list approach to deal with any non-accessioned records later. Agreed to suggest a day of each approach for Stage 7 testing.	Add to guidance for Stage 7 testers. [ESDM]
40	Marking Records as Fully Accessioned	Rethink the status categories to show that a feature that crosses HER boundaries has been fully accessioned by one HER but not by others.	Implement changes to status categories (Section 3.6.1). [ESDM]
41	**Entering multiple identifiers in one cross-references**	**Update guidance to state that there should only be one identifier in each cross-reference.**	**Update guidance. [Historic England & ESDM]**
42	Cross-ref relationship to NRHE records - use of equivalent	Update guidance regarding cross-references.	Update guidance. [Historic England]
43	Sources for Monuments have no Originator	Update guidance to state that Monument Sources have no Originator and that this information can be found via PastScape.	Update guidance. [Historic England]
44		Tab title for record details - change this to begin with the record UID.	Implement change. [ESDM]

Appendix H Assigning overall statuses

The table below shows how the overall accessioning status is assigned based upon various combinations of HER specific statuses. A shaded cell indicates that one or more HER selected the relevant HER specific accessioning status.

Overall status	HER specific status					
	Not processed	In progress	Rejected	Partly accessioned	Fully accessioned	Not in my area
Not processed	■					
	■	■				
	■		■			
	■					■
	■	■	■			
	■	■				■
	■		■			■
	■	■	■			■
		■				
		■	■			
		■				■
		■	■			■
Rejected			■			
			■			■
Partly accessioned	■			■		
	■				■	
	■			■		
	■				■	
	■		■	■		
	■		■		■	
	■			■	■	
	■			■		■
	■				■	■
	■	■	■	■		
	■	■	■		■	
	■	■		■	■	
	■	■		■		■
	■	■			■	■
	■		■	■	■	
	■		■	■		■
	■		■		■	■

Overall status	HER specific status					
	Not processed	In progress	Rejected	Partly accessioned	Fully accessioned	Not in my area
Partly accessioned	■			■	■	■
	■	■	■	■	■	
	■	■	■		■	■
	■	■		■	■	■
	■	■	■	■	■	■
	■		■	■		
	■		■		■	
	■		■	■	■	
	■		■	■		■
	■		■		■	■
	■	■	■	■	■	
	■	■		■		
	■	■		■	■	
	■	■		■		■
	■	■		■	■	■
Fully accessioned					■	
					■	■

Appendix I Instructions for Stage 7 testers

Introduction

The following HERs are being asked to undertake two full days of testing during this stage (or the equivalent time across multiple days):

- Central Bedfordshire & Luton HER
- Cheshire HER
- Devon HER
- Dorset HER
- East Sussex HER
- Exmoor National Park HER
- Gloucestershire HER
- Greater London HER
- Leicestershire & Rutland HER
- Lincolnshire HER
- North Yorkshire HER
- Northamptonshire SMR
- Northumberland HER
- Nottingham City UAD
- Peterborough City HER
- Shropshire HER
- South Gloucestershire HER
- Southampton HER Staffordshire HER
- Suffolk HER
- Tees Archaeology HER
- Winchester HER
- Wolverhampton & Walsall HER
- Worcester City HER
- Worcestershire HER

Two HERs have in addition been identified as mentors, with time allocated to help others:

- Coventry HER
- Somerset HER

Methodologies

We would like each tester simply to spend the assigned amount of time on the task of accessioning NRHE records into their HER. Note, there are no numerical targets of how many records to accession.

HERs should attempt to accession the entirety of each NRHE record into their HER. Please divide time approximately 2:1 between Monuments and Events. It is our expectation that Event records will usually be faster to accession than Monuments.

For this round of testing we would like you to consider and try different approaches (map-based and list-based, described below) but spend the majority of the time working in the way that seems most efficient. Feedback from the first round of testing suggested that the map-based approach, and following and accessioning links between records, was the most efficient. Feel free to adapt this as you go, but also please make brief notes about what you do and why. It is necessary to focus on efficiency, as well as quality and completeness. Please think about techniques to make the accessioning as efficient as possible. Be prepared to tell us about the approaches used, and your experiences. As well as the information entered into the website for individual records we will seek more general feedback after the completion of testing.

Map-based method

Swiftly review the map of Monument and Event records for your HER area in the main interactive web map, or within your own GIS the shapefiles for your area from https://nrhe-to-her.esdm.co.uk/downloads.

Select an area that appears typical in terms of the ratio of new record to records you already have in the HER. Try also to ensure the area has significant numbers of both Monuments and Events. It may be helpful to choose an easily identifiable area, such as a 10x10km square, or a

1x1km square if the coverage of Monuments and Events is very dense, to make it simpler to monitor progress. You may of course move beyond this area if it is completed within the time available.

List-based method

Select the Monuments and Events records in your HER area using the Records page, and simply work from the top (sorting on whatever column you choose). Filtering for records in the "Not processed" or "In progress" states will show the list of records needing action.

How to process a record

It is expected that entering NRHE information into the HER will be carried out by copying and pasting from the details page and from the downloaded shapefile. Take care to note which HER records are created and updated from the NRHE record, ready to enter this into the website.

For each NRHE record in the chosen area, review the record details against your existing HER holdings. A record is likely to fall into one of six categories, shown in the table below with suggested actions for each.

Scenario	Suggested action
All of the information is already in the HER. It could be all in one record or across multiple.	On the Accessioning tab, click "Add response" and set the status to "Fully accessioned", then enter the UID of a single HER record that most closely matches the NRHE record and specify the nature of the relationship (adding comments if needed). Save the accessioning status record. You can then add additional cross-references if the NRHE record correlates with more than one HER record. Cross-reference must be to the same kind of record, i.e. Monument to Monument (so do not enter cross-references from an NRHE Monument to your HER Sources, Events, etc).
Some of the information is already in the HER, but there is new information in the NRHE record that should be accessioned into the HER.	Add the new information to the HER, either by enhancing existing records or creating new ones or both. Then proceed as for a).
Some of the information is already in the HER but some is not, and the extra information is not wanted, perhaps because it is outside the HER recording policy.	Set the accessioning status to "Partly accessioned" and give reasons for the partial rejection. As for a) and b), enter one or more cross-references with HER records.
The NRHE information is not in the HER at all, and should be accessioned in whole or in part.	If all of the NRHE information can be incorporated, proceed as in b). If any significant part of the NRHE record's information is not to be incorporated into the HER, set the accessioning status to "Partly accessioned" and give reasons for the partial rejection. As for a) and b), enter one or more cross-references with HER records.
The information from the NRHE is not in the HER at all, but is not wanted, perhaps	Set the accessioning status to "Rejected" and give reasons. There will be no cross-references, by definition.

Scenario	Suggested action
because it is outside the HER recording policy.	
The information in the NRHE cannot be understood well enough for the above judgements to be made without more information from Historic England.	Post a question about the record on the "Q&A" tab; Historic England will respond. During this testing phase you may also wish to contact one of the mentoring HERs (Somerset and Coventry) to discuss the case. While waiting for a response about the record, set the status to "In progress", which will allow you to filter for these records easily.
The NRHE record falls in other HER areas as well as your own (e.g. linear).	Respond for the part of the record that is in your area, ignoring the rest. That is, if you accession or already have all the information for the part of the record in your area, set the accessioning status to "Fully accessioned".
The NRHE record was tagged as being in your HER area, but is actually entirely outside it.	Set the accessioning status to "Not in my area".

How to create and edit a response

On the Accessioning tab for each record, click "Add response" and set the status as appropriate. If the status is either "Partly accessioned" or "Rejected" you will be required to add a comment explaining why the record could not be fully accessioned.

If the status is either "Partly accessioned" or "Fully accessioned" you will be required to enter at least one record ID cross-reference. Enter these individually (i.e. do not type in multiples into one box). You may test your entered ID if your records are online (see below) to avoid accidental errors.

Sources

All Sources mentioned in the NRHE record must be captured within your records for the response to be "Fully accessioned". This may require the creation of new Source records.

You may also wish to create a Source record for the NRHE to HER prototype site, then cross reference this for each newly entered record with the record URL as the specific reference and giving the date the page was accessed. Alternatively you may note this elsewhere (e.g. in an audit trail).

How to test a cross-reference

If you publish Monument and/or Event records through a web-based interface such as an HER website or the Heritage Gateway, there is a mechanism for using this to test entered cross-references.

On the "Manage Organisations" page (https://nrhe-to-her.esdm.co.uk/manage-organisations) it is possible to define two URL templates (one for Monuments, one for Events) for your organisation. Please do not edit anyone else's templates!

You need to know the format of a record URL that has the record ID embedded within it. This is turned into a template by replacing any one ID with "{0}" (without the quotes). For example, the template for Bath & NES's Heritage Gateway records looks like this:

http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid={0}&resourceID=1036

When the {0} is replaced with a record ID, such as "MBN1930" it becomes:

http://www.heritagegateway.org.uk/Gateway/Results_Single.aspx?uid=MBN1930&resourceID=1036

which opens the record in the browser successfully.

If you define such templates, then every cross-reference entered during accessioning turns into a hyperlink to open the online HER record. This provides a simple means to test that the ID you entered was valid.

This method may of course not work for newly-created records, if there is a lag between entering records in the HER and their appearance online.

How to review progress

Progress can be seen in a number of ways:

- The map layers show records by status (though note that there is some caching for performance, and the map will take some time to reflect status changes).
- The Records page shows counts of records per status and can be used to filter for these.
- The Progress page shows counts by status overall and by HER.
- The Manage Organisations page shows a count of records in each status per HER.

How to get help

The "Help" page on the website has lots of information about the nature of the NRHE data and the functionality of the website.

You may post questions on the "Q&A" tab of individual records.

Also within the Help area of the site we have provided discussion forums for testers to post questions of a general nature. These forums are visible to all testers and the project team including the Mentors and Historic England. The forums have been divided into logical areas; please review existing posts and use the search facility to see whether your question has already been covered.

As mentioned above, testers can make use of the two Mentors during this testing phase.

How to record your time

To secure payment for your work on the project it is necessary to record time spent. This is done here: https://nrhe-to-her.esdm.co.uk/time-recording (under the Project menu in the site). Remember you can only be paid for work up to the sums agreed in the Project Design and explained previously by email.

Please record only time spent on accessioning work. If you are being interrupted by other work, please record the actual time spent on accessioning, not the overall elapsed time, as this would greatly distort any analysis.

Can I do more?

Yes; if you would like to do more hours testing than scheduled in the Project Design that is fine, but you need to record the time, and the extra cannot be paid. It is important to record the time as we need to know rates of progress (e.g. Essex worked for 28 hours and accessioned 42 Monument records and 38 Events, or whatever).

Appendix J HER feedback comments

Note that the comments in this appendix have been anonymised.

J.1 Map – comments on keeping track of progress

The testers provided the following comments on keeping track of accessioning progress when working from the map:

- "It was very easy."
- "It was fine until I zoomed out and then everything I had done reappeared."
- "Was slightly tricky when there were several records on top of each other (especially the case with Events), but seemed to work well."
- "I drew a 10km square in the GIS and then worked through the records within the square using a parish boundary map to divide up the square into sections and then changing the colour of the parish polygon as each part was completed so that I could track progress. I had no problems."
- "It was easy but I had to fall back on a printout of the map to cross off the NRHE features from my shapefile as I went along."
- "It was easy to tell (in any area) which records had been accessioned and which ones hadn't (or were in progress), which was the simplest way of accessioning most of the time. The list-based approach was easiest to use however when going back to records that were in progress to ensure they were finished."
- "Felt in downloading GIS data in to HER it was easy to compare records but not easy to track progress easily. The online map did make it easier to track progress, but obviously less easy to compare against existing HER records."
- "I began testing by using the list-based approach and found this to be a relatively easy way to work through the records, many of which were to be found grouped in the same places. Unfortunately, I have not been able to test the map-based approaches as fully as I would have liked in the time available to me."
- "It can be problematic in denser areas. I appreciate a fresh sheet can be downloaded periodically but I then have to convert it to a *.TAB file on each occasion and set up the hyperlinks to your website before I can work with it."
- "I actually also printed a map of the area I was targeting so I could 'cross off' records as accessioned. I found it just helped visually."
- "Easy but could do with a quicker refresh on the web map."
- "Only processed 30 or so records, so knew which I'd amended, but obviously for future work would need to download the shapefiles from the website on a regular basis to keep track of progress."
- "I mostly undertook work within my own GIS (ArcView within HBSMR). My procedure was to download the shp file from the website, cut out the area of interest and work through systematically, largely using the attribute table to zoom to the relevant record. (I am guessing most HERs would support this approach as it gives you access to your usual datasets for record assessment and accessioning). I would then edit manually the progress field to reflect whether that record had been dealt with. This mirrors the way I would see such a process happening with a WMS - basically editing only to say fully accessioned would save in the WMS layer which would then be fed into a local GIS. Basically, records then could be sorted on which had been successfully accessioned."
- "Working from the list it would be very helpful if the HER status could be added to the list as well as the Accession Status."
- "Generally easy to track though a few inaccuracies in terms of grid references so, for a built up area, working from the mapped data is more difficult."

- "I selected an area on the outskirts of the city centre, which should be fairly typical of the spread of records, although I can't be sure (Events v Monuments, old Antiquity/NMR Monument records already on HER v newer Monument records not on HER). I note that all the Event records available on the test site were for archaeological investigations, all of which are already on the HER, whereas the Event records not available (?field observations, etc) - I had a few of these in links on Monument records) are not on the HER yet.
  "I found the web map easy to use. I also accessioned any related records (Event or Monument) listed on particular records, as advised; for records for [City]'s railway system, this meant going beyond the chosen map square."

J.2 Map – comments and suggestions

The testers provided the following comments on the map and suggestions for improvement:

- "MasterMap would've been useful."
- "Sometimes it crashed but that is possibly due to technical issues with our IT."
- "The base mapping could be better with maybe MasterMap imaging as you zoom in, and better visible field boundaries."
- "Sometimes it seemed to show records as processed at one zoom and not processed at another, which was odd. Would be good to be able to see the grid squares at more of the zoom levels."
- "Unfortunately the web mapping was so slow on our systems it was unusable. I believe that this is the fault of our IT systems, as we are plagued by very slow internet speeds, rather than any shortcomings in the website interactive map."
- "The map depiction, being largely only point data, meant that the full extent of Monuments could not be mapped clearly in HER (for example, I am aware of and have GIS polygon and line data for some areas where NMP has been undertaken much of this is only mapped as points on the NRHE website)."
- "The web-based mapping provided a good visual record, although on many occasions the polygons were mapped correctly from the coordinates held, although these coordinates were wrong. This was even the case with a scheduled site! As an indicative map, the web-based mapping was very useful and responsive."
- "I found the whole website quite slow but I seem to have had connectivity issues which Exegesis said were at my end, but our IT couldn't resolve. This did lead to loss in the mapping connectivity, which is why I undertook most checking of records within our own GIS using the downloaded shapefiles."
- "The low base mapping detail wasn't generally a problem. For instance, one new record required a polygon which I couldn't plot from the base map alone, but then the site boundaries were no longer on current OS MasterMap. I could have copied the shapefile polygon, but chose instead to plot from a raster historic map. (There were actually more problems with the accuracy of some of the NRHE GIS plots (and grid references for points), and I usually retained the existing HER GIS data as more refined, or (for new records) devised a more acceptable GIS plot from other available information such as historic maps.)"
- "It would be useful to bulk upload comments and accession statuses, as they were processed in bulk."

J.3 Shapefile – comments and suggestions

The testers provided the following comments on the shapefile download and suggestions for improvement:

- "Would be helpful to have a MapInfo TAB file too."
- "In very many cases the locations of Events and Monuments was very wrong and so I did not use the shapefiles because I found them unreliable."
- "No - didn't use much."
- "I didn't try it as it seemed easier just to go with the online map and see it change colour as I worked."
- "A parish field might have been useful although it would have to be used with some circumspection."
- "I did download the shapefile, but I found that I didn't use it at all."
- "As stated previously, it may be useful if the GIS download included full polygon data where available (in particular where extent of features have been mapped for NMP). I found that sometimes there was a discrepancy between Event and Monument data, where an Event was linked to a Monument but the GIS depictions for the two linked records were in the different locations."
- "An optional MapInfo download would be good too. I have downloaded the data, but have not had chance to explore it as fully as I would like. I will continue to look at it and use it beyond the end of the testing."
- "I appreciate it may be difficult to also make *.TAB files available but this would be very useful."
- "Seemed very quick & straightforward. One useful thing I found in loading the shapefiles into HBSMR was the ability to change the symbology for points (mons and Events), lines and polygons, making them easier to see on screen.
  "[Persons]'s suggestion = possibility of accessing the GIS data in future via WMS to avoid the need to download the GIS data."
- "Vital to the accessioning process - see previous responses."
- "To save searching each shapefile for a record number from the list a single merged (point) shapefile was created which made things easier."
- "I downloaded the shapefiles, but haven't used them yet (except now, to answer this questionnaire). I will probably find them useful in future for some new records, especially for polygons and lines."
- "Re Attributes, the one shapefile polygon that I've checked doesn't say what source map was used to create the polygon, although presumably because the information isn't recorded in the NRHE (CapScale "unknown")."

J.4 List – comments about other sort fields needed

Testers suggested that the following additional sort options were needed on the record list:

- "It would be good to be able to search for an HE UID as otherwise you have to scroll through all the lists if you are trying to find one (unless that option to search was there and I missed it)."
- "Didn't really use the list much, it seemed easier to work via the map - it's generally easier to work in one area to do HER work."
- "Sorting by parish would be useful."
- "Parish or mapsheet - these would be the way we would accession the NRHE data so we could keep track of what had been done and what hadn't.
  "Monument type - useful to aid us record things like ridge and furrow which we would do with a generic record.
  "Originating project if applicable - we have full NMP coverage so, in the first instance, it would be useful to concentrate on records that did not originate from these projects as we will have 90% of the information on already."
- "I didn't sort the list when I used the list-based - however it might have been useful to be able to sort by NRHE date created - the earlier records I suspect would all be on the

HER already, it's the later projects that were throwing up new sites to be entered. Doing similar things to similar records (rather than jumping between different sites) would speed up the accessioning process."
- "Filtering on grid square would have been useful seeing as a subset approach using 10km/1km grid square was advocated."
- "HER Status."
- "Useful to have a column for HER UID number for those records that we want to go back to. I went back to assign the prototype website as a source to a number of records in one batch and this could have been much quicker if the mon/Event record number appeared in the list."

J.5 List – other comments and suggestions

The testers provided the following comments on the record list and suggestions for improvement:

- "It would be more useful to automatically tag the relevant HER area. I found that sometimes I would view a record via the list and then once I had accessioned it I viewed the list again only to find the tags had been removed and all Monuments for all HERs were shown and so I would have to use the filters again to get only records for [City]. This was a very minor inconvenience."
- "The 'HER area' and 'Amie area' is confusing and when I looked at the progression, it showed different numbers according to which dataset and it didn't give you an overall total for both datasets so I was concerned initially that it wasn't saving my accessioning. It was saving but it was under a different filter, perhaps it needs to be made more clear?"
- "Didn't use it a lot so don't really have any comments. It seemed fine though it's a scarily long list when you see it like that!"
- "A possible problem (for me at least) is that there was no way in the list view to filter for either [City] or [Town] HER information. If the NRHE data is to be accessioned into HERs fully, then [City] and [Town] would each need to pay for their own data separately, as different projects.
  "It's not a massive problem, as obviously there is the map view to select the records for accessioning - however keeping track of what had been done and the progress etc was easiest in list view."
- "It would be useful to be able to 'exclude' certain filters from the list to make it clearer regarding what progress has been made. For example, I flagged two records as not being in my area, but these still appear in my list when I filter for 'Not processed' records (I assume because they have not yet been processed by the HER within which they actually fall). It would be nice to be able to 'exclude' these."
- "Records from other HER areas did not show as such in my list once marked as such, and a way to keep them filtered out would be useful. In fact, several records didn't have [County] admin areas attached, so I presume a buffer of some kind has been imposed on the data.
- Very straightforward. No comments."
- "Add the 'HER status' to the List and add 'not processed' to the filters. Being able to increase the number of records shown on the screen would also help (more than 50!)."
- "Not used for accessioning but good for double-checking. Monument Record details: make names consistent e.g. 'Primary System ID' is the same as HER_UID."

J.6 Accessioning – other comments and suggestions

The testers provided the following comments on the accessioning process and suggestions for improvement:

- "I found it all very easy."
- "Most records are quick and easy to accession, but some require in depth study of the HER source material too to enable proper accessioning - a 'save for later' option would be helpful as it is not partially accessioned, but is not rejected, just needs more time to work it all out."
- "When accessioning on the border of HER areas using the list, there is no notice or notification to say why the record won't 'complete accession'. If you are using map based viewer then its more obvious why a record wouldn't complete as it is near border - could do with some indication as to why the record will not entirely complete when using list?"
- "Seemed to work well."
- "A tick box to indicate which is the primary HER record to which a HE record has been accessioned. Having to rely on the order in which the records were added to the response form caused me some problems."
- "More subtlety and the space for multiple HER entries would be good. For example, the whole [Ancient Trackway] is one record across southern England, but we have the [County] stretch alone as six records."
- "Using two screens was definitely useful; I spent some time working from home also, with only one screen and it did slow down progress a little (but that may also have been because I was using my work desk-top via a remote access)."
- "Again, connectivity issues probably made the process much more challenging than it should have been."
- "Being able to search for a record number on the list screen would help."

J.7 Additional comments on map vs list approaches

The testers provided the following comments on working from the map or list:

- "Quicker to use a map-based approach, as can quickly go to related records."
- "The map was much faster and more useful in showing which areas had been fully accessioned. The list was useful in that it was a quicker way of seeing Monument names so you could go through the list to identify Monuments to accession. The problem with the map was the unreliable spatial data. In many cases the Monument or Event was a significant distance away from where it should have been."
- "I started using the map and move to the list option and then moved back to the map. I found the map slightly more interesting as you were focusing on an area of the HER and a variety of large and small sites."
- "Not really, map was just quicker since records tended to be related more often than on the list."
- "For Monuments the list was faster but for Events the map was faster. The reason for this was because the early Events in the list were all older Events that often needed considerable work to accession into the HER. Using the map there was a variety of old and more recent Events. The more recent HE Events usually had a directly equivalent HER Event and so accessioning was much quicker."
- "We need to be able to track the progress of the accessioning so we need to work with an area (parish of map sheet). The map view using a shape file was a much quicker way of doing this."

- "I personally found the list based approach much easier to track progress, though it was useful to have the supporting GIS layers to verify locations."
- "The list method was effective in itself and seems like as good (albeit arbitrary) way of selecting records. The time delays crept in within individual records rather that with selection. I had hoped to be able to test the mapping methods more fully, but haven't been able to."
- "The list is far more organised and easier to work from. I imagine it would also take less training for a volunteer to use."
- "I am a visual person, so a map based approach was definitely better for me that just ticking off a list."
- "It was generally too difficult to match list entries with HER entries.
  Some entries only have a 4 or 6 figure grid reference, making them hard to match from the map as well."
- "I found it useful to tackle a geographical area for accessioning as then you could incorporate both Monument and Event data for sites in one fell swoop, maximising understanding and making concordance more seamless."
- "Not really my preferred choice to use these within a website environment. A WMS approach based within our own GIS seems eminently more sensible seeing as this is where the rest of our dataset sits!"
- "Easier to focus on one geographical area rather than jumping around the county (particularly a large county like [County]!)"
- "It has been most useful to treat the records as a 'to do' list and work through them rather than working from the map. This may be the case in a small authority area where the HER officer is more familiar with the individual records and can identify them by sight. Have found it easy to pick off the easy wins to reduce the to do list rather than anything more systematic, though tried to balance this with more problematic records."
- "Using the map-based approached allowed me choose what seemed to be a fairly representative group of records. I also accessioned any linked records (as suggested in introductory email of 20 June 2016); that allowed me to follow a train of thought, copy and paste between records, be consistent in accessioning methodology, and generally avoid duplication of effort. However, it is likely that when I come to do the full set of records, I will use a list-based method much more, particularly to work through specific groups of records (for instance all Events, old Antiquity/NMR records), as records within these groups are likely to present a similar set of issues, requiring a similar approach to accessioning."
- "While I focused on the map, I had the list open with additional columns to keep track of where I was."

J.8 Accessioning rate comments

The testers provided the following comments regarding rates of accessioning and suggestions for improvement:

- "I was going pretty fast anyway!"
- "It is difficult to quantify how much faster it would be with time and practice. It would certainly be much quicker but I don't know how much. Some Monuments and Events take longer than others to accession, particularly when sources have to be checked. I found some of the NRHE entries to differ greatly from the [City] HER records so I had to double check the sources to confirm the errors were in the NRHE data."
- "As stated before, some records are just too complex and require the HER material to be got out and gone through to make sure is same record (or we already knew the HER material needed splitting to two separate sites for example). Ideally for each record

being accessioned we would be getting the original HER record out anyway and updating the HER record card with the NRHE information as well - but that would have significantly slowed accessioning record for this testing phase."

- "Mainly depends on the number and frequency of interruptions, e.g. phone calls, enquiries etc."
- "The rate of accessioning was most influenced by the way our data is organised rather than how it was presented on the NRHE website. It can be split into a number of different Monuments and it is sometimes difficult to rationalise the data. Records like this will not get much faster to accession."
- "I found initially I did speed up but then it depended on the record size as some records took much more work than others."
- "The first few records threw up a number of inconsistencies in our approach to HER data entry which required thinking through - having done that, I feel the work rate would be much quicker."
- "It was much quicker to go through Event records generally, though there were some that were impossible since no-one has a report for them and they're not on the HER! You could get bogged down with some more complicated records. Some records are very time consuming and hard to unravel."
- "I think the accession rates would get much faster. Despite having spent a while prior to officially starting familiarising myself with the website and records etc, I found that a certain amount of time was spent deciding what to do with the data (rather than following a self-created set of rules) - which would obviously get better with practice. "I would also note that with the best will in the world, I was distracted quite a lot with other work, and although the full 2 days was spent accessioning, these distractions slowed down the process. I suspect that if there was to be a larger project accessioning all the records, then it would be best to get in a new (temporary) member of staff who would not have day to day distractions and could focus on the task."
- "I think the first few hours of testing involved a lot of time working out where elements of data might best fit within the HER, but once I had worked through some this became much clearer and therefore I think helped with the speed of accessioning. I imagine that as people become more familiar with the website the speed with which they will be able to accession will increase."
- "I think it is difficult to get much faster as some of the time working on the records has involved looking up sources, as they are unclear on the website. Also it is difficult not to enhance records when you can see they clearly need improving. This is a number of the NRHE records are old, and when added to the [HER] it was under a previous computer system."
- "Based on the records worked on, the techniques of accessioning could improve, but the intellectual part of the process would still take time. I think that we would quickly establish what was worth accessioning and what wasn't in terms of the usefulness to the HER. I would focus on adding in new and missing material rather that attempting to take in everything, and rely upon the cross-linking of data to provide the extra details for those who wanted it."
- "I've been doing something similar with a previous data supply for a while so am already pretty quick at it. I am undertaking this as part of a wider clean-up of the records on our system so it takes a little longer than just straight copy and pasting. We have already been provided with the majority of the records on the website so it's mostly a case of checking the data is up to date and not duplicated within our own database."
- "The main time affecting speed was actually the need to create and reference multiple sources (some of which are just indexes e.g. Field investigator comments)."
- "Events were generally faster to accession than HER entries."

- "The processing of Event records was definitely more straight forward and therefore much quicker than Monument records. The time taken for concordance for Monument records very much relied on the complexity of the Monument record, also the current state of the record. A proportion of the records, especially Monument records, I enhanced required tweaking over and above the addition of the new data to achieve a consistent standard."
- "A full record was kept of all records accessioned. The greatest difficult was working out the sources for info that the NRHE used. Many hadn't been fully identified (definitely not to IFP standards anyway) and many more may well have been duplicates of one's held by the HER (particularly aerial photographs).
  "In all honesty, I was concerned in record quality on a surprising number of records. As ever, a disproportionate amount of time was spent on identifying whether a site was previously recorded - there were relatively few completely new records and the time was in dis-aggregating differences of opinion/interpretation between the local and national records."
- "Very slow while evaluating records and our network is very slow at the moment. Speed would definitely increase considerable as we got more used to the format of the incoming records and the best way to cross reference these with our database. Different recording methods will cause difficulties, for example ridge and furrow from NMP is by parish whereas the HER records it by each (ridge and furrow) field. Suitable ways to deal with this will have to be investigated."
- "It would be quicker if all the information was set out in a form that made copy and paste of all the text quicker i.e. no spaces/gaps/formatting, map, table, etc."
- "Where records have been readily identified with their HER equivalent, the process has been relatively swift with records often only taking around 10 minutes to check and update."
- "Or possibly 50% faster. This will largely depend on exactly what information we are required to add before ticking 'completely accessioned', especially when there is already a perfectly adequate equivalent HER record, albeit in a different layout and omitting admin information such as NRHE compiler.
  "For instance, I could whiz through the archaeological Events if I only need to add the NRHE record numbers and archive numbers as 'Other Refs' on the existing HER records. If we are required to add NRHE compiler details, etc, it will take longer; I devised a short template for adding this information to the Description field during the testing to speed things up, but it was still a faff - and there are a lot of Event records. Also, not all Event records were available at this stage, and it is likely that the non-available Events are new records, which will take longer to accession (assuming they fall within HER recording policy).
  "Similarly, most of the more detailed NRHE Monument records are the old Antiquity/NMR records, which I added to the HER ages ago, rechecking sources, and correcting and enhancing the records. The HER records are not necessarily in exactly the same format/layout as the equivalent NRHE records, and omit some admin details such as Compiler. (I have photocopies and scans of the original paper Antiquity/NMR record in the HER backup system, for reference.) I don't want to have to go over these records again in order to 'fully accession' them (which I felt I had to do to meet the spec); all I really want to do is to add the NRHE record numbers/archive numbers to the Status and Codes field.
  "I accessioned some new Monument records, although some of these appeared to be incorrect, and will need to be checked before being 'published'. Some of these were for [City]'s railway system, and were very basic; I would really want to enhance these before publishing."

J.9 Accessioning not possible - comments

The testers provided the following explanations where they found that they could not accession all information:

- "Some records were incorrect, others did not fit in with our recording policy, some were not in our HER area."
- "Sometimes there insufficient data available to meet our recording policy, sources cited with no accompanying information to say what the source added to the record."
- "Event links didn't work for those that I tried so gave up on this."
- "With hindsight I feel I may have missed some linked Monuments and Events, simply because I didn't spot them in the early stages. NRHE information re many Events seemed rather skimpy, and it wasn't always easy to identify the corresponding HER Event (if any). Generally the sources and Events were 'accessionable' to the HER but raised some questions about our current approach, which I need to think through properly."
- "There are some cropmark records (Peek and Parsons!) that are dubious records and we had discounted some, but they were on the NRHE."
- "Only a small amount of data could not be accessioned. One record was outside our administrative area."
- "We don't create HER records for ridge and furrow but rely instead on NMP coverage. We will have to examine this aspect of our recording policy."
- "Certain records did not fall within our HER area."
- "Some sources it was difficult to see what they were.
  Sometimes our records were confusing, so it took time to match with the NHRE record.
  Also some of the NHRE record, Events, are our 'backlog' records (not added yet/or completely added to the HER) so time was spent added them fully.
  "Some of the NHRE GIS, many for railway stations, was only a circle, so time was spent accurately spatially recording them."
- "Some considered to be extraneous for our HER; some contradictory; some not as in depth as our own; some incomplete data surrounding Events and sources which could not be unpicked."
- "Some records were for Monuments or Events that were outside our HER area."
- "Tried to follow links from Events to Monuments but they didn't work.
  We do not have a separate Sources module, they are held in a reference field in the HER and Events modules.
  "There were a couple of entries I wasn't too happy about accessioning as there was very little information for the site and no source was stated, 17th century farms I think."
- "We decided not to create a generic NRHE to HER source record, instead we incorporated individual source information where possible. However, we did create an NRHE to HER Event record which gives an overview of the concordance process and which is linked to every Monument and Event record in the HER which has been enhanced through the process. This allows us to keep track of progress and puts new data into context.
  "Found it difficult to incorporate all the Roles metadata from the NRHE records, ie: who added what information when. Something we did which helped with this is to create Event records for some of the large thematic recording projects, such as the [Project] and the [Project]. This allowed us to give an overview of the project, when it was done, who was involved, the archive it created and any publications that ensued. We linked these Event records to the Monument records enhanced through the project thus putting the data into context of how and why it was created.
  "There was at least one piece of source information for one record that even [Historic England support] found difficult to explain, so left this out..."

- "NRHE Event information was usually terribly skeletal and to be honest was far better recorded in the HER. In actual fact, the way the NRHE recorded Event info was often misleading and took a while to disentangle - one wonders why it was recorded in the first place.
  "NRHE source information was often difficult to disentangle as the website only reproduced often mangled source descriptions. Much of this replicated what was in the HER, with the most frequently added sources being field investigator's comments. APs were also difficult to identify and much of the time it appeared that both the HER record and NRHE record were using the same APs but it was impossible to correlate both sources.
  "Some NRHE records appeared to be created entirely from pers. comm. but this was inconsistently recorded."
- "Some detective work was necessary on Google to track down sources. Events being point records made it necessary to check the source to establish the exact location for the work - and to see whether it was across county boundaries."
- "I 'partly accessioned' four records - these all had existing HER records. For these records, I noted the following reasons for rejecting information on the NRHE:
  - Information incorrect (either text or locational/GIS);
  - Compilers not added as ACTORS (Monuments);
  - Field observations mentioned on Monument records not added as Sources, as not HER recording policy;
  - Events - some categories of 'People and Organisations' (developer, funder) not accessioned as are outside HER recording policy (and NRHE details sometimes wrong);
  - Events - some Monument indexing rejected if existing record already fully indexed on related Monument records.

  "I wasn't completely consistent, and for some 'Fully Accessioned' Event records I didn't add all the 'People and Organisations'.
  "Also, I usually rejected the NRHE grid references/GIS plot in favour of the more refined HER data.
  "On one NRHE Monument record, a national project ([Project]) had an Event record as well as a source; I'd recorded it as a source, but will not be creating an Event record."

J.10 Any other problems or suggested improvements?

Testers reported the following problems not otherwise covered by the questionnaire:

- "I spent approximately an hour checking sources because sometimes there were errors in the NRHE data. I worked some time in addition to the 16 hours in order to accommodate this time. I recorded all the time I spent working. However, occasionally I started working and was interrupted and so there was perhaps 1 or 1.5 hours additional time that I spent which was not recorded."
- "Could not link from Monuments to Events on many records or vice versa.
  The question about whether you had added any 'Significant' data to the HER was not clear - I was unsure what level of additional data was 'significant'"
- "Was impossible not to spend time fixing HER records (a lot of info was on paper still and hadn't been put onto the computer). Where I could I didn't count this work in the time, though clearly it would need to be done to complete the project."
- "The NRHE Event records were very sparse. For those older Events that were not in the HER it was necessary to find the original sources in order to be able to create reasonable HER Event records. This was very time consuming."
- "The mapped point on the shapefile was often inaccurately located so sometimes it took a while to locate the corresponding record in the HER. This was especially true of

Events. In addition it was often hard to correlate Events because the NRHE descriptions did not contain enough information on when or where the site was."

- "The time recorded was (as close as I could estimate) all spent accessioning. However significantly more time was spent with the website open (dealing with other office interruptions) - we're talking days and days here.
  "I tried to keep the record enhancement to a minimum (and not count it as time) - however the urge was there. Copy/pasting NRHE info into the HER without thoughtful integration may ensure that the NRHE gets accessioned as quickly as possible, however much of this data would need to be revisited by the HER. Where it was obvious that the data was wrong, the record could be rejected, however sometimes it was just a bit contradictory - I could have spent hours researching stuff!"
- "I tried to discount any time where I was interrupted from the total time logged on the website. I spent up to an hour before beginning accessioning simply familiarizing myself with the website, but did not account for this in the time recording inline."
- "GIS grid coordinates in the records did not have the right number of digits for effective cutting and pasting. Text could be cut and pasted, but line breaks were carried over and then had to be manually removed from records. Source records were often missing crucial details or truncated."
- "I tried not to enhance records apart from incorporating them with our own duplicate data. When I normally undertake this, I would look at additional sources (e.g. historic mapping) to quality check what is being accessioned. I also avoided clicking through to linked Mons and Events and accessioning those to ensure I didn't end up side-tracked but again, this may be part of normal working.
  "N.B. under 'Identifiers', some records have a Site Survey Condition. In our previous data supply, these had a date and linked Event but I can't see them on your record page: E.G. [Link]. The Score here should be linked to Event [Number]; perhaps displaying a date against each Event in the list would also be useful?"
- "Each entry that was accessioned required the corresponding HER or Event to be updated to show that it had been accessioned. This also meant checking the rest of the record for currency which meant enhancement in some cases, slowing the process down. Changing location data meant having to refresh the GIS layers which is also slow."
- "Some records did require a level of enhancement over and above simple addition of new data (i.e.: checking OS record cards to clarify information in both the HER and NRHE records), and although tried to keep this to a minimum equally think there is little point in not making the records concorded consistent."
- "Office interruptions and very slow network were the main distractions during investigation. More time was spent looking at the feasibility and the general state of records to understand how best to check and input the information incoming. This often varied on a record by record basis often depending on how long ago the database record was updated."
- "I only recorded time spent directly on accessioning data. There were many interruptions of my time - this is the sort of work that would benefit from being shut away in a quiet room. Mostly snatched time here and there to work on the records. Additionally, I was hampered by issues with GIS servers, for which reason I didn't download the shapefiles and moved away from working directly with the mapped overlays (though for me the list was a good approach anyway)."
- "I've mentioned some problems above. The main problem concerns exactly what information we need to accession, for NRHE records where we already have a perfectly adequate HER equivalent (albeit not exactly the same). The website spec stated that a record could be classed as fully accessioned "as long as... all the data from the NRHE record is present in the HER", and that included all People and Organisations. Although I tried to fully accession as many records as possible, I don't really want to have to add

all People and Organisations, NRHE compilers, etc where I don't think that information is useful/is not part of HER recording policy. When accessioning the remaining records, I would want to just cross reference existing records, to speed things up. I doubt many HERs have the time to accession ALL the information in the NRHE records. Are the digital NRHE records going to be archived somewhere?"
- "Downloading issues (our problems not the website)."

J.11 Guidance – comments

The testers provided the following comments about the guidance provided and suggested improvements:

- "Better clarity over Accessioning options."
- "I suspect that everyone will be interpreting the guidance differently. It would be interesting to see some examples of how other HERs have accessioned things. I ended up with a long list of queries (I wasn't sure what to do about the related archives/objects, actors and the Events that weren't Events). If the idea is for the NRHE info to be added in a consistent fashion then more guidance would be needed, though I suspect all HERs do things quite differently so it would be impossible to be consistent!"
- "I was initially quite confused as the guidance in the email as to how to deal with sources differs from the guidance on the webpage - i.e. if it's best practice to ensure that each source mentioned is a source in the HER, or to use the project itself as the source?
  "I ended up using the latter method, but now I have sources in the description field of my HER, and no way of knowing if the NRHE will be archived?"
- "Good guidance was given and responses to questions prompt and helpful, but no doubt people will have tackled the concordance in different ways, employing different solutions, i.e.: what information goes where. Concordance of information from a variety of sources is often not straight forward."
- "More clarity on how to record time would be useful (e.g. per Monument or per day)."
- "There were come contradictions between the website HELP and the exeGesIS email. Mainly, as mentioned above, more thought needs to go into exactly what HERs need to accession, in order to speed up the process - given that we are all hard-pressed for time."

J.12 Any other comments?

The testers provided the following general comments on the testing exercise:

- "I found the exercise to be very useful. It led to some Events which we were not aware of being identified.
  "I found the accessioning of Monuments to be very time consuming, which is why a relatively small number of Monuments have been accessioned.
  "Other than the problems with the map (inaccurate locations) I found the map to be very useful and very easy to navigate."
- "This testing phase was a good experience, but moving forward to fully accessioning all record it would be useful to have authority boundaries on the base mapping, and we would want to be simultaneously updating our HER record cards as well as the database (can't get the others to go paperless yet), so would take longer to actually accession all the records than the projected timescale based on the amount accessioned in the testing phase."
- "I did struggle with viewing the website in Internet Explorer 11 - the website worked but the accessioning box was not viewable. I used Chrome and it worked perfectly.

Although a slow manual process (and I know HER officers asked for a manual process) I think the system overall is very good for the task."

- "Because I was up against the deadline I didn't use the Q&A or mentors. Under normal circumstances, I'm sure I would make more use of them, particularly to clarify NRHE content."
- "There was definitely some really useful information in the NRHE that added to the HER (though a lot was duplication). I was especially happy to have a whole bunch of cropmark sites from recent aerial photo work that weren't on the HER, and [Historic England support] kindly sent me the APs so I could plot them properly (why are they only points on the NRHE?!). I didn't include things like that in the time! There were also some very blank records (such as two that basically said 'post-medieval house') that [Historic England support] found more info on and sent me reports for. There would have to be a lot of Historic England time to deal with HER requests if everyone was doing work at once, I think! And I don't know how you'd get hold of some of the reports that the HER and the ADS don't have to sort out some of the vague Event records. All in all it seemed quite a painless process."
- "Sometimes records that were fully accessioned were recorded as partly accessioned in the index e.g. [Number].
  "Records that cross an HER boundary, from HER 'A' into HER 'B', that are then fully accessioned by HER 'A' do not get filtered as 'not processed' for HER 'B'. Such records may not ever be found and accessioned by HER 'B'.
  "One of the records HE UID [Number] was not in my area. This record did not appear in the progress statistics under the project tab on the website.
  "Overall a useful exercise and I got a couple of new HER records from it. Will the website remain up so that I can do further work when I get the time?"
- "I think the process was relatively painless and easy. I estimate that the whole process would take about 18 months; less if we could eliminate records that stem only from NMP."
- "I should probably note - the GIS location of many of the records for [City] was totally inaccurate. Where all the text information was integrated into (or already in) the HER I put it down as fully accessioned, regardless of the accuracy of the GIS.
  "Cross-referencing between the NRHE and HER was easiest by searching the HER for specific terms, or tracking a Monument down via related Events/sources, rather than using location. I think having a small (but perfectly formed) HER helped, and focusing on the city centre (which I know quite well) as some of the NRHE records I recognised, so could tell they were wildly inaccurate and in the wrong place. If I'd have chosen an area that I was less familiar with (or had a much larger HER to deal with), it's possible that matched records would be missed."
- "Overall I think that the accessioning process was relatively straightforward once I had found a home for."
- "My main priority for these data is being able to identify those records which the NHRE has which the [County] HER doesn't have so that our record can be made more complete. There are a lot of cropmark sites flown by HE which have never been passed to us, for example. Plugging these gaps is crucial for development control. The second priority is enhancing existing records with additional and missing data, although I would see this as 'desirable' rather than essential.
  "I can see that it is necessary for human checking of each and every record, but there needs to be a way to effectively identify those records for which we have nothing and prioritise them over everything else. The map-based approach is a good start for this, but the quality of the mapping in the records I looked at was questionable at times. I would like to play with this data some more and see if it could be used more effectively both with spatial querying and cross-referencing to see what could be achieved.

"Finally, I would be keen to know what the plan is to pay for all this work. We already have a substantial backlog of material to add to the [County] HER with two members of staff working on this. To sift and assimilate 13,000 more records is going to take a very long time, with very little direct benefit to service delivery if we cannot prioritise the gaps. This will be a hard sell for the local authority to fund and there is an expectation that central funding will need to be provided in order to achieve this task."

- "Testing large areas of cropmarks visible on aerial photographic was challenging."
- "Very neat and very easy to use."
- "A very valuable and useful project. I chose a search area that covered both the urban core of [City] and the rural hinterland around this, to ensure a 'typical' area. In the main I found that the NHRE records were much less in number than the HER, in particular for the city area. From the sample records accessioned I would say that the majority of new Monument records related to thematic surveys undertaken by Historic England and its predecessors - e.g. Lido's / Defence of Britain (this is a source we know has not been trawled for our HER area). Also, for the city particularly, being a UAD in origin, only Monuments / sites with data from archaeological investigations or highly significant finds were included in the UAD as this was set up as a planning tool originally. As such there were a few sites / Monuments known only from documentary evidence or other finds, which were added as new records in the HER from the NHRE data. A few records with highly specialised sources (e.g. numismatics journals) were also added as new records. Overall however the majority of the NHRE records were already on our HER, with only some data (e.g. sources, linked people / monitoring Events in the main and some descriptive information and Monument type / period) added / edited in our HER. Having focused on the sample area detailed above, I also spent a short time just visually checking the shapefile against the HER GIS layers for another area and I would say the above comments would relate to the entire HER area. Happy to provide further information / discuss my experiences in more detail."
- "If this project goes ahead it's going to take a very long time..."
- "General thoughts were that it was a worthwhile exercise and, although not straightforward and taking not inconsiderable time and effort, the resulting concorded records were better.
  "Through the exercise it was evident that the HER contains many more records and more data than the NHRE record particularly in the more urban areas where more development-led archaeological work has been undertaken. Hence this is the right way for concordance to proceed, i.e.: from NRHE to HER; the other way round would be a much greater task.
  "As mentioned, we thought it useful to create Event records for the concordance exercise as a whole linking this to all HER records enhanced through the process. Also we created Event records for certain RCHME/HE thematic recording projects allowing us to record details of the project and therefore putting new data generated through these projects in the context of when/how and why it was created."
- "No timely response after submitting Q&A questions other than acknowledgement.
  "Mentors were helpful - confirming how to treat sources (we just copied all info into the Monument description field citing the NRHE (this website) website as a source).
  "Timing of the project in the summer holidays was not helpful.
  "Would be good to have sight of the questionnaire in full, or capacity to save responses and come back to it.
  "Three of us were involved with this testing phase - so this response is a compilation."
- "Most of the issues that I encountered related to insufficiencies in the data and not to the layout of the site or the process generally, though as mentioned it would be helpful to be able to search via HER UID once that information has been included. Some of the source records were difficult to cross relate as they didn't include full titles etc. On the whole we found that there wasn't much to add from the data on NRHE but there have

been exceptions to this particularly where thematic studies have been undertaken. As the [City] HER includes the UAD, many of the records from the NRHE had been systematically trawled in the early 2000s, so reference numbers have often been added. It is proving useful to validate this material as well as seeing where new information has been added."

- "Are the digital NRHE records going to be archived on the web? It would be useful to be able to link the HER records permanently to the original digital record (and that would cut down on some data accessioning time, see above). I'm not suggesting a searchable NRHE dataset, as that will just continue the current situation of duplicate datasets. But a non-searchable dataset available via the HERs would be useful."
- "Exegesis were very helpful when I had downloading trouble!"

Appendix K Predicted time required for each HER

The following table shows the estimated number of NRHE Monuments and Events in each HER area, and the estimated number of days required to accession them, based upon the predicted accessioning rate (Section 3.8.4). Note that the table is based upon the trial data and therefore only those HERs for which boundaries were available are included.

HER	Monuments		Events		All
	No.	Est. days	Est. no	Est. days	Est. days
Bath and North East Somerset SMR	2,164	34.59	1,767	30.02	64.61
Bedford Borough HER	1,462	23.37	1,235	20.98	44.35
Berkshire Archaeology HER	1,975	31.57	2,851	48.44	80.01
Birmingham HER	1,716	27.43	909	15.44	42.87
Bristol City Council HER	1,541	24.63	3,852	65.45	90.08
Buckinghamshire HER	3,620	57.86	2,792	47.44	105.30
Cambridgeshire HER	9,008	143.99	6,587	111.91	255.90
Central Bedfordshire and Luton HER	1,884	30.11	1,796	30.52	60.63
Cheshire HER	3,652	58.38	2,794	47.47	105.84
Chichester District HER	1,872	29.92	1,658	28.18	58.10
City of York HER	1,980	31.65	3,279	55.70	87.35
Cornwall and Scilly HER	13,636	217.96	5,451	92.62	310.59
Coventry HER	280	4.48	439	7.47	11.94
Cumbria HER	13,489	215.61	4,787	81.33	296.95
Dartmoor National Park HER	5,552	88.75	600	10.19	98.94
Derbyshire HER	7,003	111.94	4,142	70.37	182.31
Devon HER	9,651	154.27	4,954	84.18	238.44
Dorset HER	9,633	153.98	5,436	92.36	246.33
Dudley HER	303	4.84	258	4.39	9.23
Durham HER	6,740	107.74	2,353	39.97	147.71
East Sussex HER	7,673	122.65	3,319	56.39	179.03
Essex HER	9,382	149.97	7,471	126.93	276.90
Exmoor National Park HER	4,697	75.08	214	3.64	78.72
Gloucester City Council HER	511	8.17	1,845	31.35	39.52
Gloucestershire HER	11,320	180.94	7,256	123.29	304.23
Greater London HER	10,852	173.46	21,342	362.61	536.07
Greater Manchester HER	3,167	50.62	2,234	37.96	88.58
Hampshire Archaeology and Historic Buildings Record	7,588	121.29	4,550	77.30	198.59
Herefordshire HER	4,936	78.90	2,623	44.56	123.46
Hertfordshire HER and St Albans UAD	5,557	88.83	5,666	96.27	185.09
Humber SMR	7,562	120.87	4,402	74.79	195.66
Isle of Wight HER	1,499	23.96	612	10.40	34.36
Kent HER	18,411	294.29	9,621	163.47	457.76
Lake District HER	3,219	51.45	698	11.85	63.31

HER	Monuments		Events		All
	No.	Est. days	Est. no	Est. days	Est. days
Lancashire HER	5,402	86.35	2,794	47.47	133.81
Leicester City HER	378	6.04	1,038	17.63	23.67
Leicestershire and Rutland HER	4,299	68.72	5,978	101.57	170.29
Lincolnshire HER	12,704	203.07	8,277	140.62	343.69
Merseyside HER	4,070	65.06	628	10.67	75.72
Milton Keynes HER	825	13.19	1,472	25.01	38.19
Norfolk HER	11,843	189.30	7,249	123.17	312.47
North East Lincolnshire HER	740	11.83	300	5.10	16.92
North Lincolnshire HER	1,523	24.34	1,364	23.17	47.51
North Somerset HER	1,725	27.57	884	15.02	42.60
North York Moors National Park HER	8,042	128.55	1,083	18.40	146.95
North Yorkshire County Council HER	20,806	332.57	5,469	92.92	425.49
Northamptonshire SMR	6,991	111.75	4,252	72.24	183.98
Northumberland HER	12,522	200.16	4,722	80.24	280.39
Nottingham City Council UAD	446	7.13	403	6.84	13.97
Nottinghamshire HER	3,788	60.55	2,414	41.01	101.56
Oxfordshire HER	10,253	163.89	7,300	124.03	287.92
Peterborough City HER	1,132	18.09	1,315	22.34	40.44
Plymouth HER	725	11.59	659	11.20	22.79
Portsmouth City HER	524	8.38	356	6.04	14.42
Sandwell HER	517	8.26	307	5.21	13.48
Shropshire HER	6,905	110.37	2,632	44.71	155.08
Solihull SMR	249	3.98	218	3.70	7.68
Somerset HER	9,777	156.28	5,066	86.07	242.35
South Gloucestershire HER	1,710	27.33	1,212	20.59	47.93
South Yorkshire SMR	3,915	62.58	2,879	48.92	111.50
Southampton HER	376	6.01	2,190	37.22	43.23
Southend Borough Council SMR	335	5.35	176	2.99	8.35
Staffordshire HER	5,426	86.73	2,410	40.95	127.68
Stoke-on-Trent HER	274	4.38	424	7.20	11.58
Suffolk County Council HER	8,331	133.17	8,320	141.36	274.53
Surrey HER	7,753	123.93	4,961	84.30	208.22
Tees Archaeology HER	2,579	41.22	1,214	20.62	61.85
Torbay HER	550	8.79	199	3.38	12.17
Tyne and Wear HER	3,763	60.15	3,083	52.39	112.53
Warwickshire HER	3,198	51.12	4,182	71.05	122.17
West Berkshire HER	2,386	38.14	1,608	27.32	65.46
West Sussex County Council HER	3,462	55.34	2,504	42.55	97.89
West Yorkshire HER	9,007	143.97	3,078	52.30	196.27
Wiltshire and Swindon SMR	17,145	274.05	8,737	148.45	422.50

HER	Monuments		Events		All
	No.	Est. days	Est. no	Est. days	Est. days
Winchester HER	1,765	28.21	1,779	30.22	58.43
Wolverhampton and Walsall HER	400	6.39	555	9.42	15.82
Worcester City HER	688	11.00	895	15.20	26.20
Worcestershire HER	4,423	70.70	2,717	46.16	116.86
Yorkshire Dales National Park HER	10,420	166.56	909	15.44	181.99
All	**407,627**	**6,515.68**	**250,000**	**4,247.64**	**10,763.33**

Appendix L Succession strategy for NRHE data editing

For a transfer of data from the NRHE to the HERs to be effective, it has been strongly argued by participants in this project that the NRHE records must not be dynamic during the process. These records must be frozen at (or shortly before) the time of data supply, or the receiving HER will not know whether the job has been finished. So the terrestrial data within the NRHE should become read-only before the extraction of the dataset that will be used for accessioning, while the maritime data will continue to be maintained.

The terrestrial NRHE dataset is at present being actively maintained and enhanced. This programme is undertaken due to current needs and business purposes within Historic England. Stopping this programme will clearly provide both a resource saving and also a business impact. Evaluation of Historic England's business requirements was out of scope for this project, but if Historic England will retain any role in creating and enhancing terrestrial Monument and Event data, then clearly alternative methods for managing and accessing this information will be needed if the data are not to be entered into the NRHE.

The results of such work by Historic England should in future be made available to those involved in heritage protection casework by the most rapid means possible.

New Event data could be entered directly to OASIS, meaning that in due course the data would become available to HERs along with the accompanying fieldwork reports. It may be felt this is sufficient to meet requirements, and that the job of integrating the interpretative results of investigate work into the existing HERs holdings should rest with the HERs themselves (as it is often a complex process of integrating new and partially enhanced information with existing material).

On the other hand, there is no doubt that sometimes such investigative activities do yield evidence for new Monuments and important re-interpretations of existing ones, such that the results should be made available to those involved in heritage protection casework by the most rapid means possible. Examples of actions that may be necessary as a result of Historic England investigative activities would include (and would not be limited to) the following, which are presented roughly in the order of likelihood along with the agencies/teams responsible for the action:

- Inclusion of new Monument records in the HER which in turn informs planning and other casework (HER)
- Revision/addition of "consultation trigger" maps for planning (local authority/HER)
- Revision/addition of SHINE areas (HER)
- Revision/addition of Local List entries (local authority /HER)
- Revision/addition of a Conservation Area (local authority /HER)
- Revision/addition of a new NHLE Scheduled Monument or Listed Building (Historic England)
- Revision/addition of a World Heritage Site boundary (UNESCO + ?)

In the past there has been an imperfect flow of such information from Historic England through to the agencies and staff who can implement these changes (including the HERs). During the testing undertaken under this project some HERs remarked that they had accessioned important new Monument records that were previously unknown to them. This highlights that *entering data into the NRHE was not an effective method of making the information available to these external agencies and staff*.

Submission of Historic England Events and their reports through OASIS may improve this sufficiently, but it is suggested that the change in business processes underlying "NRHE to

HER" provides an opportunity to go one step further to address this dislocation. A new mechanism for creating and submitting Monument record data would give Historic England staff the capability to direct new information to the service most likely to implement or influence protection and/or enhancement. This could arguably reside most naturally within or alongside the Heritage Gateway, as the single point of publication of all Monument data. On a technical level, only the entry point to this functionality would need to be embedded in the Heritage Gateway; the subsequent forms/mapping, and the mechanism for the management and onward transmission of submitted data could be within the Gateway or it could be free-standing, or it could be within the next iteration of the NRHE to HER website (as a new class of Candidate information to be reviewed and accessioned in similar manner to the NRHE data).

One of the functions of the NRHE data is to provide a searchable index to the rich physical and digital archives curated by Historic England. This is an important function that is not met by the suggestions above. The obvious answer would be to morph the NRHE systems through a radical transformation into an extension of the archive catalogue system, so that it becomes a rich set of facets by which the archives can be interrogated (including spatial, temporal, thematic, by association with people and organizations, etc.). This approach would focus the recording and retention policy onto items within the physical or digital archive, and would involve changing the names and terminologies around the systems to focus on access to archives rather defining the historic environment. So the "National Record of the Historic Environment" might in its new guise become a welcome enhancement to "Historic England Archive".