4G2 Ploughzone Archaeology – Historic Environment Record Case Studies: Use of Ploughzone Data 6806

Final Summary Report

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Summary

The project was commissioned by English Heritage to look at how accessible ploughzone archaeology is within Historic Environment Records and how this data is used within Local Planning Authorities. Oxford Archaeology researched this topic by agreeing a sample of case studies with English Heritage and using these, through a series of interviews, questionnaires and analysis of the HER data itself, to investigate these issues.

This research showed that HERs do consider ploughzone archaeology useful and most HERs returned a significant amount of ploughzone archaeological data within the searches requested. The data is therefore retrievable but there are inconsistencies in approach leading to some relevant data being missed. It is suggested that to ensure this data is included, more consistency is needed in both recording of the data and in the search terms used to retrieve it - whether this consistency can be achieved using existing terms or through the introduction of the term 'ploughzone' is for the HERs to discuss and demonstrate. However, only data that exists can be retrieved and there is much data that is not being integrated into the system which could make the key difference when it comes to development control and management decisions. Discussions needs to take place to look at ways in which paper records, community projects and PAS data can be included more effectively as 'good' data. Similarly it is suggested that the Planarch project is revisited to look at the importance of both old and new ploughzone techniques and their use to inform the decision making process.

Acknowledgements

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Appendices

Appendix 1: Letter and questionnaire sent to HERs

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Final Summary Report

1 INTRODUCTION

1.1 *Background*

1.1.1 This project was undertaken in response to a brief set by English Heritage (EH) (EH June 2013) as part of the National Heritage Protection Programme Measure 4: Understanding Assessment of Character and Significance, produced in response to the identification of Ploughzone Archaeology as being insufficiently understood, significantly threatened by change and of potentially high significance. Internal review of EH's own records suggested that it is poorly represented and not easily accessible, and the project investigates whether the same is true within HERs. If ploughzone archaeology is poorly represented within HERs, then it will be overlooked in terms of decisions on both risk and management.

1.1.2 The project has therefore selected a sample of Historic Environment Records and Local Planning Authorities (HERs/LPAs) and examined how ploughzone archaeology is represented, managed and used by them.

1.1.3 Two reports were produced for this project, a full report which reports all detailed results and a second summary report for external dissemination with less detail and which ensures the anonymity of the participating HERs. This report is the summary report. The anonymity of the HERs has been guaranteed by replacing names with the letters A-F.

1.2 *Aims and Objectives*

1.2.1 The overall aim of the NHPP Measure 4 is to develop a detailed understanding of the distribution and characteristics of ploughzone archaeology and measures for assigning significance to it.

1.2.2 The original brief for this project lists the following aims and objectives:

Aims

To understand how effectively ploughzone archaeology is represented and used within HERs to inform the management of the resource.

Objectives

For a representative sample of HERs, the Objectives are to answer the following questions:

Representation:
- How does the HER represent ploughzone archaeology?
- How are ploughzone archaeology 'sites' (monuments) defined?
- How comprehensive is the HERs' coverage of ploughzone archaeology, both in terms of coverage of known ploughzone events/monuments and the level of information for each entry within the HER?

> *- How accessible is the information on ploughzone archaeology held by the HER?*
> *- Are Portable Antiquities Scheme (PAS) data incorporated in any way into the HER, and if so how?*
>
> *Usage:*
> *- How are ploughzone archaeological sites managed?*
> *- Are the HER data fit for the evidence-based management of ploughzone sites?*
> *- How does the HER (and associated LPA) use ploughzone archaeology in development control?*
> *- How are ploughzone archaeology techniques used as part of the evaluation/mitigation process?*
> *- How does the HER (and associated LPA) use ploughzone archaeology to inform land management advice, such as agri-environment schemes?*
> *- If PAS data are included in the HER, how useful are they? What are the issues with/advantages of using the data?*

1.2.3 'Representation' objectives are examined through detailed analysis of filtered data provided by HERs, which was compared against original unfiltered field survey datasets. The results of the comparison are discussed in Section 5. The 'Usage' objectives were examined through a series of interviews with representatives of the HER, development control archaeologists, PAS officers, and others where deemed useful and discussed in Section 5. Both parts of the study are informed by a questionnaire which was sent to the HER representative for each case study area.

1.2.4 A further aim was to assess the value of the digitisation of historic fieldwalking data in the West Berkshire HER (Featherby 2010) to see if this may be a viable and cost effective approach for other historic datasets. This is discussed in Section 3, which includes the methodology for this individual piece of work. The issues are pulled together and discussed in Section 4 and recommendations made in Section 5.

2 METHODOLOGY APPLIED TO CASE STUDIES

2.1 *Scope*

2.1.1 The scope of works is as defined in the original brief written by EH (EH June 2013). The focus of the project is both sites where the ploughzone is the archaeology and also sites above buried archaeology. As stated in the brief Ploughzone archaeology typically involves the recovery of this evidence using techniques such as:

- fieldwalking/surface collection
- test-pitting
- sieving/monitoring of topsoil removed during other investigations/works
- metal detecting
- geochemical analysis[1]

2.1.2 For the purposes of this study the ploughzone is defined as the upper layer of soil modified by agricultural activity - by being physically broken up (i.e. ploughed) and the addition of organic material (i.e. manure) and/or other fertilisers, thereby altering its physical and chemical structure. The modern ploughzone is typically about 30cm in depth, although this can be significantly deeper, and known as topsoil or ploughsoil. In geomorphological terms, it is the 'A-horizon', though this includes soils that have been naturally enriched (through humic accumulation for example).

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[1] Whilst this is included within the definition of ploughzone archaeology no examples were returned and it was not brought up in the questionnaires or interviews

Modern deep ploughing techniques (typically to *c* 500mm) and installation of land drains can result in modification to significantly greater depths.

2.1.3 The project focuses on the threat to archaeology from modern agriculture, primarily ploughing itself. Ancient ploughsoils are therefore excluded (buried deposits and upstanding earthworks such as ridge and furrow), as are areas ploughed in the past but not currently or in the foreseeable future. This would appear to be equivalent to the 'land available for cropping' in Defra statistics, comprising land under crops, uncropped arable land and temporary grass under 5 years old.

2.1.4 For the purposes of this study 'ploughzone' is defined broadly to encompass all evidence for past human activity located within the ploughzone. This evidence can consist of durable artefacts such as lithics, pottery, metalwork, and some building materials, as well as less obvious remains such as the structure of the ploughsoil itself or geochemical signatures.

2.1.5 Whilst not included within the definition of ploughzone archaeology used here, cropmarks as a possible component part of ploughzone archaeology are also discussed where certain HERs saw these as part of the ploughzone resource.

2.2 *Choosing case studies*

2.2.1 A meeting was held with Magnus Alexander (EH Senior Investigator), the EH project manager, to discuss and agree on the criteria to be used in the selection of HERs for case studies. Representative areas were to be selected with one or more of the following characteristics:

- Known extensive fieldwalking has been carried out where the results can be compared
- A similar landscape to the above, but with a lower level of development /fieldwalking
- Significant community/voluntary/PAS recording has been carried out
- Methodological guidance has already been produced internally by the local authority
- An adjoining county without such guidance
- An area with unknown but expected ploughzone data

2.2.2 It was agreed that four initial case studies would be chosen using these criteria, with the final two chosen to answer or refine any questions raised by the previous four.

2.2.3 The first four case studies chosen were as follows:

- A - an area where guidance has already been produced internally by the local authority.
- B - an area where significant community/voluntary work and PAS recording has been carried out.
- C - an area where it is known that extensive fieldwalking has been carried out. It also fulfils the criteria of being adjacent to A, but has no existing methodological guidance.
- D - a local authority area adjoining C (for comparative purposes) with a similar landscape, but a lower level of development.

2.2.4 The final two case studies chosen were:

- E – as an example which does not use HBSMR (used by all the others)
- F – randomly chosen as a control – with unknown but expected data.

2.3   *Initial Contact and Questionnaire*

2.3.1   A covering letter and list of questions (Appendix 1) was composed and agreed with EH prior to circulation. The letter introduced the project and requested:

- That the HER answers a series of questions
- That the HER undertakes a search of records in an agreed study area (filtered data) and send this and a full dataset for the same area (unfiltered) to allow OA to assess accessibility and comprehensiveness in a consistent and objective manner
- A meeting with members of the Local Planning Authority (LPA), eg county archaeologist, HER officer and whoever else may be interested, to discuss wider issues on the use of ploughzone data (eg how it is used in development control, within discussions about management of sites)
- That the HER supply a sample from the original source data if possible for comparative purposes.

2.3.2   A fee was offered to cover time and expenses required to complete the questionnaire and searches. Some HERs provided a quote for contributing, others did not.

2.4   *Interviews*

2.4.1   OA visited the different offices and met with whoever the LPA thought most appropriate.

2.4.2   The following questions were discussed:

- How do they use HER ploughzone data as part of the development control process?
- How do they use the data within more proactive management discussions with EH and NE for both Farm Environment Plans and agri-environment schemes?
- How useful is ploughzone archaeology?
- How useful is the PAS data within the HER?
- Are fieldwalking surveys included in the HER and if so how useful are they?
- How accessible is ploughzone archaeology within their HER?
- Has recording changed over time and, if so, for better or worse?
- Is it worth enhancing the ploughzone information they have, and/or do they have the resources to do so?

2.4.3   The consultees were also encouraged to raise any other issues related to the subject. The meetings were recorded using a digital recorder and the main issues summarised back in the office. If subsequent clarification was needed on issues discussed, or on the data sent, this was requested via telephone or email.

2.5   *HER Analysis*

2.5.1   Each HER was asked to select a study area, sometimes with input from OA and influenced by the fee offered, within which OA asked for a search to be undertaken for 'ploughzone archaeology'. While limited guidance was given within the questionnaires, and through discussion with the various HER officers if necessary, each HER searched using their own understanding of how they would filter out the relevant records. This was necessary not only for assessing the presence of ploughzone archaeology within the digital HER, but for gauging the understanding of ploughzone archaeology across the HER staff. As searches are usually undertaken by

HER officers on behalf of a client, the client is reliant on the accuracy of the search, especially if the client wants the same search over more than one HER region.

2.5.2 The areas of study area as defined by the HERs varied in size and were chosen mainly on the basis of the quality of data they could provide based on the criteria OA provided and in some cases how much work could be done for the payment offered. The different sizes was not an issue as the analysis was not based on a numerical assessment but on the quality of data provided, except for the two direct comparisons but this was taken into account during the analysis.

2.5.3 OA asked for both the filtered and unfiltered data so that the search could be replicated, and to see both how easily retrievable and comprehensive the data was in comparison with the original survey data.

2.5.4 The spatial datasets were provided in ESRI compatible shapefile formats.. OA did not ask for specific layers to be returned, but it was expected that a combination of Monument and /or Event layers at a minimum, complimented with Portable Antiquity Scheme data would be received.

2.5.5 Initial assessment of the data showed that many records were duplicated across multiple layers. Consequently, all OA database queries were run based on the number of individual UIDs if possible, removing the duplicates. Once received by OA, the table attributes of each dataset were transferred into a simple database to aid interrogation of the data. The key fields transferred were 'UniqueID', 'Source Layer', 'RecType', 'MonType' and 'Name'.

2.5.6 The bulk of the monument records were anticipated to be filtered based on search terms that included FINDSPOTS, ARTEFACT SCATTERS, FLINT SCATTERS or LITHIC SCATTERS. Therefore each monument layer would initially be searched using the MonType and RecType fields (or equivalent) with the following queries:

- RecType Query: LIKE "*FS*" OR LIKE "*Find*" – This picked up variants of findspot and its more common abbreviation.
- MonType Query: LIKE "*Find* " OR LIKE "*Scatter*" - This picked up all the basic search terms above.

2.5.7 In both cases the term LIKE was used in order to account for record variability. These two queries were referenced across the analysis, although others were used and commented upon as necessary.

2.5.8 Event data was anticipated to be more varied in its range and in the possible search terms used. These ranged from the broader terms such as NON INTRUSIVE EVENT or FIELD SURVEY, to the more specific FIELDWALKING SURVEY (SYSTEMATIC or UNSYSTEMATIC), FIELD VISIT or METAL DETECTING SURVEY. Due to the variety of the Event layers each search was defined on a case by case basis.

2.5.9 With the Portable Antiquity Scheme as an obvious source of ploughzone information, how this data was integrated into the HERs was part of the overall assessment. It was unclear if this data would be returned as a separate dataset, as a part of the general HER data, or returned at all. The relationships between the HER and the PAS was considered as a secondary aim of the analysis.

2.5.10 Further supplementary information was requested in order to enhance OA's analysis of the data. This information included a table of the associated keyword search terms attached to each record (if possible). This was particularly needed for the Event data, which was often provided with their keyword terms hidden, or buried in a PDF report. Whilst useful from a research point of view, PDF documents do not readily enable a

systematic search of the data. Having this information in a spreadsheet, for example, would have made it easier to expand the interrogation of the data to include text searches using summary and description fields, which were not present in the spatial provided datasets.

2.5.11   The chosen HERs were assessed to determine how ploughzone archaeology is represented in their systems. More specifically the aims were to answer the following questions:

- How easy was it to produce a search for ploughzone archaeology within the HER?
- What was the overall 'quality' of the data?

2.5.6   'Quality' in this context was considered in the following terms:

- Was it clear that the data represented ploughzone events or was further processing required to produce a final dataset? Was the spatial resolution of the data suitable for foreseeable purposes?
- What was the relationship between the HER and the PAS data?

2.6   *Comparison with case studies*

2.6.1   OA requested that the HERs provide either source data (such as fieldwalking reports from which information was added to the HER), or references to published sources containing this data. OA then examined this source data and explored how well it was represented within the HER. Questions considered were as follows:

- Is the information in the HER easy to track back to its source?
- Does it accurately reflect the source data?
- Does it just record finds, or has an interpretative step been introduced?
- Does it follow its own guidance (in the case of A)?

2.7   *The HBSMR*

2.7.1   The Historic Buildings, Sites and Monuments Record system (HBSMR) is the database used by the majority of HERs and is a database and integrated GIS solution specifically designed to manage HERs. It was developed by the spatial data management company exeGesIS in partnership with English Heritage and the Association of Local Government Archaeological Officers (ALGAO).

2.7.2   Data is recorded using established Monument and Event relationships and can include Sources, Finds, Historic Landscape Character, Designations and Caseworks. All of the information is indexed using the English Heritage and FISH/INSCRIPTION thesauri and is compliant with the MIDAS Heritage data standards. Records can be searched using these established thesaurus terms on a variety of fields.

3   WEST BERKSHIRE DIGITISATION PROJECT

3.1   *Introduction, aims and methodology*

3.1.1   With a significant proportion of 'ploughzone' archaeological evidence historically being produced through fieldwalking surveys, it has been necessary to consider how accessible this data is in relation to current digital workflows. Many of the surveys were produced before the use of digital systems, meaning the results were often archived in paper forms. The translation of these paper archives into useable digital formats could therefore allow an influx of new records and understanding into these landscapes and the associated ploughzone archaeology. Time and budget constraints however, as well as the varying nature of the survey methodologies employed, has often meant this task has been overlooked. This part of the project therefore provides a cost-benefit analysis of the digitisation of the Lower Kennet Valley Fieldwalking Survey project. This project sought to modernise the archive data of the Lower Kennet Field Walking Survey, which was undertaken in three phases in 1976-7, 1982-7 and 1988-9, and subsequently summarised in the 1996 monograph *Archaeological Survey of the Lower Kennet Valley* (Lobb and Rose 1996). This data was only available in paper form, and only analysed in the 1996 report on a per field scale, meaning any interrogation of the data beyond this level was not possible.

3.1.2   The aims of the original project were:
- To digitise the paper archive and make it suitable for a GIS; including the survey areas and the artefact densities;
- To examine the digitised data in relation to National Mapping Project (NMP) data, in order to establish whether the combined data enhances understanding of areas of archaeological potential;
- To incorporate the data into the HER.

3.1.3   The criteria OA used to undertake this assessment was discussed in detail at a meeting with the West Berkshire LPA and HER. Jon Chandler and Rupert Featherby of MOLA, who were involved in the original project itself, were also consulted and provided much useful information on the methodology and resources used. OA also examined the digital data and the paper archives held at the West Berkshire Museum.

3.1.4   This assessment aims to consider the effectiveness of the digitisation project, considering it in terms of 'value' as determined by the information gained versus the costs involved. It will briefly consider the aims of the project, and how successfully they were met. This will be followed by a discussion on the perceived value of the work by those that undertook it.

3.2   *Digitising the paper archive*

Locating the fields

3.2.1   Early challenges in the project involved translating the varying survey methodologies into a coherent digital format. These issues were focussed on locating the surveys, and translating the finds data into a usable GIS layer.

3.2.2   The 1976-7 survey was basic in its implementation, due to being undertaken by a single person with limited time. The fields were walked prior to ploughing and the spread of walked fields was erratic due to the presence of woodland and grassland.

These fields were walked in lines across the shortest axis at 45-55m intervals. The locations of the finds were then simply noted on the plan of the field within the recording. This led to the exact locations of the fields being hard to tie to the current geography, and thus only half of the fields were located and digitised with any confidence.

3.2.3 The later 1982-7 and 1988-9 surveys were undertaken by WA Archaeology using a more robust methodological approach. The fields walked fell within two transects, each divided evenly into one-hectare areas. In turn these were mostly surveyed using a 25m^2 grid resulting in 16 collection units per hectare. Each of these grids was tied to the OS grid during the survey, meaning that all of the fields were easily located.

Presenting the data

3.2.4 An important goal of this project was to present the fieldwalking data in a manner suitable for current analytical purposes. As the 1996 monograph (Lobb and Rose 1996) demonstrated, standard interpretations of pre-digital fieldwalking surveys were often limited to tabular summaries based on field numbers. Whilst still useful, such data lacks spatial resolution.

3.2.5 In this case the digitising method was taken from the later 1982-89 surveys. Their use of a uniform grid allowed a relatively easy integration into a GIS format. For the early surveys they created a 50m grid matching the line resolution of the surveys, whilst the 1980s surveys used a 25m grid.

3.2.6 Artefact data was then joined to each square of the grid. Again the methodology of the earlier survey meant that this was a 'best fit' exercise as the early artefacts were only recorded in sketches, whilst the later surveys had already allocated each find a unit number, which in turn corresponded to a grid unit in the GIS.

3.2.7 Once this was completed the layers allowed for a more refined and spatially aware representation of the survey results.

3.3   *Comparison of Survey Data to the NMP*

3.3.1 At the time the report was written, only a small section of the Lower Kennet Valley had been subject to the NMP, corresponding to the Pingewood/Burghfield area from the 1982-7 survey and the Donnington Castle areas from the 1988-9 survey.

3.3.2 This limited spatial overlap between the two datasets meant that, due to the small sample size, the artefact scatters did not correspond well to any of the archaeological features identified within the NMP data. It was suggested that this was less to do with the methodologies employed, than with the nature of the archaeology the datasets considered.

3.3.3 The fieldwalking surveys primarily focused on the valley floor areas, which are generally infilled with varying thicknesses of alluvium. This sort of environment is not conducive for cropmarks and other features visible from aerial photographs. It was also noted that in this area artefact scatters are more likely to represent sites and activity within a landscape, whilst cropmarks generally do not contain many artefacts.

3.4   *Incorporation of the data into the HER*

3.4.1 The GIS datasets produced from the project included the survey area extents and the final grid shapefile that contained all of the artefact attribute data. This grid file was used to produce multiple thematic 'layers', each symbolised to represent a different phase, density, or topic of interest.

3.4.2   West Berkshire HER received delivery of the final product (consisting of shapefiles and ESRI layer files) in June 2012. At the time of writing, whilst these layers are available to the staff of the HER as distinct layers, they have not been imported into the HBSMR as Event or Monument records. The reason given was due to time/budget constraints. If these were available then the data would be analysed to identify significant scatters and sites to be added to the HER.

3.5   *Value of the work*

3.5.1   Deciding on the value of work undertaken is always a difficult proposition. Objectively the project did not meet several of its desired aims. The location and nature of the data did not allow for a meaningful comparison with existing NMP. This lack of spatial correlation, whilst not the fault of the project, means that the data cannot be used as a basis for assessing the viability of the method for future projects.

3.5.2   The final layers have also yet to be integrated into the HER. It is clear that the time and budget constraints of the HER are beyond the control of the project, which did produce useable digital datasets.

3.5.3   From a purely cost / time point of view the value of this type of project is often dictated by the original data that needs to be processed. Well-maintained digital data allows for a smooth transition to a more useful format, whilst other types require far more work to render them compatible. In this case, regardless of the presence of the 1996 report, all of the data was paper-based. This led to issues regarding digitisation of the walked fields for the 1972-9 surveys. Also, the bulk of the resources of this project went into the conversion of the artefact data into useable digital data, a task requiring the information to be manually entered into two databases (due to the difference in data recording methods used between the 1970s survey and the 1980s ones).

3.5.4   All of this meant that the initial estimate of 45 days for the digitisation and the creation of the database stretched to around 60 days. This extra time was an underestimation in the original tender that was attributed to a failure to undertake a pilot project beforehand. In the end the budget overspend was recouped from savings elsewhere in the project budget.

3.5.5   When compared to the 1996 synthesis, this new methodology only identified a single new 'site'. Yet arguably the most important aim of the project was successfully achieved, and offers considerable value in spite of the perceived failures. A notable archaeological archive was translated into a modern, useable GIS resource. Whilst there are issues that need to be addressed within the base methodology of the digitisation, specifically a reliance on proprietary software mechanics, it successfully presents the original data in a spatially meaningful way. Discussions with the West Berkshire HER officers suggested that even though the data was not fully incorporated into the HBSMR, the layers were very useful and used in all of their decisions on development control for the areas covered. They highlighted the spatial resolution of the data as an important facet of this usefulness, especially when compared to the more general findspot information seen in standard HER or PAS point datasets.

3.5.6   Even though the end results in this case did not instantly offer any new interpretation of the archaeology, the layers themselves have become a staple part of the workflow employed by the HER and was widely praised by the staff that used it. A definite value can therefore be seen making an old archaeological resource into an accessible, analytical resource.

4   DISCUSSION AND KEY ISSUES

4.1   *Searching for Ploughzone data within the HERs and the quality of data returned*

4.1.1   Each HER was encouraged to devise its own search methodology, which led to variability in the nature of the data returned. Although the same thesaurus of terms are used within the HBSMR and non-HBSMR databases, the differences in the search methodology and key terms used led to variances and inconsistencies in the data received from the different counties.

4.1.2   Each of the assessed HERs were confident in their abilities to filter out ploughzone related archaeology from their databases, although both A and C suggested that not all the records could be extracted in an initial data search. A also suggested that the available search terms were not always helpful. The questionnaire responses demonstrated a similar understanding of what are the most likely key terms to use in accessing the information needed, although these key terms were not always used in the actual searches undertaken.

4.1.3   The table below summarises the data layers that were returned by each county:

HER	HBSMR	Monument	Events	PAS	Other
A	X	Unfiltered / Filtered	Filtered		Fieldwalking
E		Unfiltered / Filtered	Unfiltered / Filtered		
D	X	Unfiltered / Filtered		X	
B	X	Unfiltered	Unfiltered	X	
F	X	Unfiltered	Unfiltered / Filtered	X	Parish Dataset
C	X	Unfiltered / Filtered	Unfiltered / Filtered		

4.1.4   The search terms for the Monument data used by each county were:

A	E	D	B	F	C
Findspot / FS	Findspot / FS	Findspot / FS			Findspot / FS
Cropmark		Artefact Scatter			Artefact Scatter
					Unstratified Find

4.1.5   Four of the six participating HERs considered Monument records to contain ploughzone related data. One of the exceptions was B, who did not believe there were any searches that applied to the Monument data that would produce relevant data. This was in contrast to the HERs that successfully utilised the Monument data, especially using the primary Monument Record Types FINDSPOT / FS. OA's search of the B unfiltered data produced a significant number of records, suggesting that B could have productively used this search term to filter their data. The other county not to return a search on Monument was F, where two additional sites were identified by OA using a Monument search of the unfiltered data.

4.1.6   The decision of two HERs aside, the Monument data seems well set up to provide ploughzone records. The use of Findpost as a primary record type offers an easy first step to begin the database search. This could be enhanced with a Monument type search for Findspots and Scatters, as not all references are given a record type of Findspot. However, the uniformity of information in the Monument type is unfortunately not guaranteed, with some returned records not containing any values in this field.

4.1.7 Whilst cropmarks were not included within the definition of ploughzone archaeology used for this project, it was interesting to see whether, unprompted, the different HER's considered them as ploughzone archaeology or not. Only A provided a specific search for Cropmark records within the Monuments, although B also stated that they were part of it. OA's own searches using Cropmark on the unfiltered data from the other HERs demonstrated that in at least some cases additional potential ploughzone sites may have been identified (eg 24 extra records found in D and potentially 123 in the C data), although not all of course may be relevant.

4.1.8 Event data was considered useful by all the HERs except D, although the range of information returned within these records varied in quality.

4.1.9 The search terms for the Event data used by each county were:

A	E	D	B	F	C
Field Survey	Fieldwalking		Fieldwalking	Find Type - Any	Fieldwalking
Non-Archaeological Intervention	Fieldwalking – Systematic		Fieldwalking - Systematic		Fieldwalking - Systematic
	Metal Detector Survey		Metal Detector - Use		Metal Detector Survey
	Metal Detector – Use				Metal Detector – Use
					Test Pit
					Environmental Sampling
					Geochemical Survey

4.1.10 The Event thesaurus allows for a number of narrow record types directly related to ploughzone archaeology. It was therefore unexpected that only three of the HERs applied these narrow search types in their filtered data. The data A supplied was only filtered to the broadest level, ignoring the more refined search terms directly related to Fieldwalking and Metal detecting, which led to poorly filtered data. F chose a different approach, instead focusing on the presence of finds. Whilst this provided a good basis for identifying ploughzone sites, OA's search of the unfiltered data using the narrower search terms produced additional sites. Furthermore, as with A, the use of the broad search term could not guarantee that erroneous records were not included in the returned results.

4.1.11 Whilst further filtering of the data to exclude non-ploughzone related sites by the HERs would enhance the dataset, once received, such refinements are hard to achieve outside the HBSMR system. As a rule, all of the received shapefiles contained the main fields of RecType, Name, and MonType (or close variations). As the HER databases offer more nuances in how records are recorded, many of the important search fields and relationships are only provided in supporting documentation. This was provided in PDF records, which are not practical to use when trying to refine and process a large number of records. Asking the HERs for further documentation providing links and extra search terms proved problematic. This was partly due to a lack of clarity on OA's part, as it was difficult to know what was missing from the data provided. OA's lack of familiarity with the intricacies of using the actual HER databases also contributed to this issue. Understanding the processes involved in theory is not the same as using them on a day to day basis for data searches. In some cases the ability of the HER officers to manipulate the databases, beyond set reports and templates, may have created difficulties.

4.1.12 The searches applied by the HERs, using HBSMR or otherwise, demonstrated that it was possible to pick up ploughzone-related records from within the databases. However, while theoretically possible, their searches did not pick up all relevant data. In some instances data totally unrelated to the ploughzone was included. The Event-Monument relationships and the possible range of keywords present in the thesaurus means that at some level a search would filter all of the required records. The range of searches applied by the HERs showed that searches to retrieve this data are not standardised, and it seems especially necessary to apply more refined filter types to the searches, such as carried out by OA on the unfiltered data, to achieve the optimum results. The process of searching for only the relevant sites would have been facilitated if the word ploughzone was included as an option within the thesaurus.

4.1.13 There were also differences in the way HERs record ploughzone events where they are part of several phases of archaeological intervention. In the HERs studied most were recorded as separate events with both A and B stating that in some cases sites would be entered as 'mixed' rather than single events. It was observed in the case studies that in both A and C some ploughzone events were missed on multi-event sites.

4.1.14 A rapid analysis was undertaken to see if the results of the HER searches using HBSMR were different from that undertaken by E. However, given that all of the HERs fell short of providing an 'ideal' dataset, there was little difference between the two systems. It is unlikely that the systems used would affect the searches to any great extent. It is much more likely that variations arise from different methods of querying the data. Variance may be affected by the understanding of the individual HER Officer, their individual technical skill in using the software, their awareness of the potential criteria for ploughzone archaeology and the time they devote to the search.

4.2   *Views of HERs on the value of ploughzone archaeology*
Usefulness of the data

4.2.1 All HERs said ploughzone archaeology was useful to some degree, with responses ranging from very useful to being uncertain as to its value. The value of ploughzone archaeology was acknowledged for identifying 'hot spots', confirming the presence of sites as part of a combination of investigation techniques, and for its use in dating cropmarks and sites identified by geophysical surveys. The majority of contributors also identified its usefulness for identifying sites of certain dates and types, for example, Palaeolithic and Mesolithic sites. In B finds relating to the Saxon period were key to identifying sites that may only exist within the ploughsoil and/or which were rarely found by other techniques. In A ploughzone archaeology is deemed useful in identifying burnt mounds and transient sites like fares and markets which otherwise would leave no diagnostic below ground archaeology. In F ploughzone surveys are regarded as key to the identification of rural Roman sites. They suggest that some rural settlements produce only residual material in the ploughsoil with little surviving below ground, therefore raising the importance of otherwise undistinguished artefact scatters. E states that ploughzone archaeology may also provide information on when a field went into cultivation for first time and both E and C realise its potential to contribute to predictive modelling of past settlement patterns. C also say that it cannot just be used to determine the character of a site but also how badly plough-damaged it is likely to be. Ploughzone archaeology, when discovered at a location for the first time, can be used to justify new work and inform its scope.

4.2.3   The perceived value of the resource can perhaps be seen though the treatment of the data, with several HERs spending at least some time (D and F in the past) checking the ploughzone data to identify clusters of significant finds and sites, or in the case of F adding the data to a parish polygon. The value that A places on the information is perhaps shown by the maintenance of a separate fieldwalking layer. Others, for example B and E, leave the PAS data as a separate layer with little integration and analysis. In B their stated uncertainty as to the value of the resource is perhaps reflected in the lack of sites returned as part of their filtered data search for ploughzone archaeology, in comparison with sites identified when OA searched the unfiltered data.

4.2.4   The differences in the treatment of data, discussed above, are just as likely to be down to pressure on time and resources, and historical uses of systems and structures. Levels of staffing vary from place to place, and the distinction between development control and the HER is increasingly blurred. Where staffing levels are more generous it is easier to generate appropriate HER records and to benefit from discussions of ploughzone issues. For example, in B the HER is staffed by just one person, in contrast to F, which utilises no local authority funding and has a staff of ten within the archaeological section, of whom two are dedicated to HER work with support from several others. The whole team is involved in outreach. D is divided into a number of unitary authorities. In total there are five people involved in HER work in the county.

4.2.5   It is also often the case that the familiarity and awareness of ploughzone archaeology depends on how much agricultural land there is within a given local authority area and on the level to which it is threatened by potential development. D has a very large amount of ploughzone land, but little development occurs outside the existing urban areas. In contrast, in C there is both more development, and more ploughzone techniques specified in evaluation briefs. There are also more community projects concerned with retrieving ploughzone archaeology.

Changes in recording standards

4.2.6   One of the other issues examined is whether the level of recording of ploughzone archaeology has improved over time. This is tied up with the quality of both fieldwalking and PAS data, discussed in more detail below. However, in general terms it is thought that recording has improved over time. C stated that the level of training for community groups has helped this improvement including better recognition of the value of negative results, although they also state that antiquarian field surveys were also very accurately located. D recognises the role of the PAS in improving the accuracy and reliability of finds recording; E agreed and added that the widespread use of GPS has facilitated this improvement, although admit they have to improve their own role in guiding local groups to record data in a consistent and helpful manner. However, B cites the PAS as being partially to blame for the falling standards of recording, due to the overall inaccessibility of the results and lack of interpretation associated with it. All cite the problem of the lack of recording of negative results, which has been poorer in the past, but which in places is now better.

Comparison with raw data

4.2.7   When the HER data from the various counties was compared with the raw data on which it was based, the correlation was generally very good, allowing clear cross-referencing and comparisons to be made. The exception, by a small margin, was in A, where, although the standard of the fieldwalking is high (to be expected given that this was the only county studied with its own guidance), when it came to relating the detailed data recorded and reported, the correlations were not particularly transparent.

In particular, some ploughzone events were not flagged on multi-event sites. In the questionnaire both A and B stated that in some cases sites would be entered as 'mixed' rather than single events.

4.3 *The HERs and the Portable Antiquities Scheme*

4.3.1 It is generally acknowledged that PAS finds are valued for their help in the dating of cropmarks, identifying patterns in the landscape and helping, in conjunction with other evidence, to build up a picture of the archaeological potential of an area. In all cases the PAS was lauded as a good potential resource that could help inform decisions and searches within the HERs. C added that the data, although biased towards metal finds, could also be used to help judge the character and significance of a site, suggesting the presence of burials, hoards, industrial or domestic remains. They also said that the incorporation of the PAS into HERs is vital as it serves to indicate the presence of archaeological remains in areas otherwise not threatened or part of an existing research agenda.

4.3.2 However, much of the ploughsoil evidence is reported as individual findspots. For this information to inform development control, a level of analysis is required to identify and plot concentrations and/or significant artefacts, which may represent archaeological sites. This has to be done before it is fully integrated into the HER, but neither HER officers nor FLOs have the time to carry this out.

4.3.3 It is unfortunate that what seem to be procedural, technical incompatibilities and lack of time for analysis, are preventing the integration of the HER and PAS datasets. This problem of lack of integration was almost universally mentioned in the questionnaires and discussions. Many of the officers also spoke about having trouble downloading data from the PAS database, which can mean that the data on their systems may not be updated regularly.

4.3.4 B in particular identified problems with using PAS data and the case study showed how much the HER would have been enhanced if the PAS data (and unreported fieldwalking data) were considered and integrated. Their view of its limited potential is reflected in the fact that they have only ever downloaded the dataset once and consider that given that the PAS records this data, they do not have to.

4.3.5 Only F processes (but does not analyse) the PAS data beyond a basic database download, combining it with other unverified data to be part of their parish polygons. Even then they admit that the data is over *c* 5 years old. D was able to find some time to inspect the data to identify scatters and sites with some limited FLO input. However, it was flagged that many artefacts are recorded with the same grid reference, therefore blocking the potential for the identification of significant patterns and clusters.

4.3.6 Beyond the technical issues there are noted concerns over some of the procedures of the PAS and the licensing restrictions. Often finds are just given general co-ordinates and in many cases numerous points are placed in the same location. It was also raised that a reliance on the PAS to handle ploughzone-related data often means they are subject to the PAS licence restrictions, including the restriction of passing on accurately located PAS data to third parties (eg Natural England).

4.4 *How does the HER (and associated LPA) use ploughzone archaeology in development control? How are ploughzone archaeology techniques used as part of the evaluation/mitigation process?*

4.4.1 All of the LPAs use ploughzone data within the HER to a greater or lesser extent as one part of the plethora of information used to assess the archaeological potential of an area of proposed development. The methods of using the data vary from county to county. Ploughzone data has little influence in A and B but considerable influence in C and F, where it is an integral part of briefs. In the latter a wider topsoil strip routinely follows when trenched evaluation produces finds, to specifically examine the ploughzone archaeology, with the bucket sampling of evaluation trenches providing a similar test in C. They also regularly include fieldwalking, geophysics and metal detecting in their development control briefs. C issue briefs for metal detecting and fieldwalking in most cases and for test pits, bucket sampling and geophysics where suitable. C not only issue briefs for evaluations, but also for mitigation works relating to ploughzone data where the evaluation shows suitable potential.

4.4.2 D does not have much rural development and where it occurs fieldwalking is often not required, except for long distance linear developments, such as cable trenches. They see this technique as being more suitable for community groups. While E sees fieldwalking as useful, it tends not to be required to inform development control due to timescales and seasonality issues.

4.4.3 In the case of A they tend not to issue briefs for fieldwalking for development control archaeology anymore, even though extensive fieldwalking has been required by them in the past. Now they tend to specify geophysics, as do F, both citing the fact that geophysics is cheaper and quicker and doesn't result in the need for finds to be processed and archived. B tend not to specify fieldwalking in briefs, and if they do it will be as a second evaluative technique.

4.4.4 Three counties (A, C and E) identified a role for ploughzone archaeology in modelling settlement distribution patterns and to help predict the frequency of sites within the landscape. F are actively looking at commissioning a project looking at evaluation techniques in their county and their effectiveness in informing development control decisions, and this will include ploughzone techniques.

4.4.5 There is a perception that requiring fieldwalking to be used as a tool for decision making has reduced dramatically over the last 20 years. Generally, fieldwalking is now confined to community groups rather than being carried out as part of commercial projects, with geophysics preferred for the later. However fieldwalking and metal detecting, as well as bucket sampling and test pits, are employed, particularly in C and F depending on the nature of the site. It was intimated that generally in the commercial field of archaeology, the importance of topsoil layers is not often appreciated.

4.4.6 All recognised that the high cost and long timescales involved in fieldwalking, in comparison with other non-intrusive survey methods, is an important factor in its declining use in developer-funded projects. As pointed out by E, the timescales involved are greatly affected by seasonal factors. Artefact visibility is only possible when crop growth is at a very low level and is greatly improved if the field surface has weathered for a period of several weeks after ploughing. This results in a narrow optimum survey window within the agricultural year, which may vary from field to field if different crops are sown. It can therefore be difficult to mesh fieldwalking survey requirements with the urgency of the development planning process. In some

cases the only way around this would be to plough the land specifically for the survey, which may not be feasible if access is by negotiation with individual landowners and tenant farmers. In comparison geophysical survey is less sensitive to ground and crop growth conditions and is much more likely to be completed in a single phase.

4.5   *Contribution of community fieldwalking projects to ploughzone archaeology*

4.5.1   The perceived quality of recording and reporting of results to the HER varies considerably. Quality appears to correlate with the level of community involvement through HLF funded projects, training sessions provided by LPA archaeologists and public access to the HER. In some cases this involvement has been actively resisted, for example in F there was a long-standing resistance from traditional societies to council influence in their projects, leading to poor levels of recording and deposition. However, this has now largely been overcome and the LPA are now working with newer groups to ensure consistent results.

4.5.2   C has a long history of community links including the 40 years of work the local archaeology field group have undertaken surveying *c* 14,000 hectares of land. Its work with community groups includes attending metal detecting rallies and staff provide ongoing training in fieldwork techniques and recording. In D, most fieldwalking is now undertaken by local societies. The LPA archaeologists have close links to some of these groups but not all.

4.5.3   E on the other hand do not have a tradition of outreach and involving themselves with fieldwalking groups and this shows in the varying quality of the recovery (especially of flints) and results of these surveys. They are taking steps to address this now. B also does not have a tradition of outreach and here it is known that a whole series of fieldwalking projects are ongoing with no input from the LPA archaeologists. It has been 30 years since any results were passed to the HER from this work. OA's detailed case study here showed that for one parish, local society fieldwalking would have notably enhanced the HER.

4.5.4   Quality of reporting by community groups is therefore very variable, with the lack of reporting cited in several counties as being responsible for underestimating the archaeological potential of an area during development control decisions. Community groups and metal detectorists are also often unaware of the importance of reporting negative results from surveys.

4.6   *How does the HER (and associated LPA) use ploughzone archaeology to inform land management advice, such as agri-environment schemes?*

4.6.1   It appears that the only effective, widespread opportunity to effectively manage ploughzone sites is through agri-environment schemes. However, the level of involvement with Stewardship varies between the case study counties, from very high in E to low in B. F states that finds data have been used occasionally to support management options in Environmental Stewardship applications, but that Natural England requires firm evidence for below ground archaeology before management options are considered (eg cropmarks). However, they also state that ploughzone archaeology is often the only evidence they have of below ground archaeology, especially in areas of the county with heavy clay soils, or which have had limited aerial reconnaissance. As a result such areas are being overlooked for these schemes.

4.6.2　The use of ploughzone data within SHINE records is also very variable as is the understanding of how it can be used in this context. B and F state that finds data cannot be used to create or inform SHINE records, although F does use HER Events data to support management decisions.

4.6.3　Other HERs use ploughzone data for SHINE records to a greater or lesser extent. A manipulates SHINE records to incorporate finds data by, for example, constructing a polygon around areas of dense finds. They state that they use ploughzone archaeology more actively for management purposes than for development control purposes. E uses finds data to verify the complexity and substantiate the nature of an already identified site, and state that for a site to be included as a SHINE record it needs to be closely mappable and represent complex, substantiated archaeology. D also believes that finds scatters recorded in the HER can make a useful contribution to SHINE records. C do include records of find spots and artefact scatters where relevant, but only in addition to sites with records that are substantive and verifiable and can be closely mapped.

4.6.4　One of the reasons given for not including finds data within SHINE is that there is no point, as there are no changes in management regimes that would protect artefacts and sites which exist solely within the ploughsoil. This is of course incorrect as such changes are possible, and in any case many sites discovered by fieldwalking do not solely exist within the ploughsoil. For example, agri-environment schemes include reversion to pasture which would protect ploughzone sites and E actively use agri-environment schemes to restrict damaging fieldwalking and metal detecting over sites where the removal of material would remove the site itself.

4.7　*Enhancement of data sets*

4.7.1　Overall the ArcGIS digitisation of the Lower Kennet Valley Fieldwalking Survey offers a successful method of converting old paper-based archaeological surveys into useable GIS datasets. This methodology undoubtedly offers a superior end-product in comparison to, often, single point entries within existing HERs. Even though the end results in this case did not instantly offer much new interpretation of the archaeology, the layers themselves have become a staple part of the workflow employed by the HER. A definite value can therefore be seen in making an old archaeological resource into an accessible, analytical resource.

4.7.2　The HERs were variously asked whether they had thought about enhancing their own datasets with backlog ploughzone projects, if they exist, or whether other enhancement projects could be effectively undertaken. As discussed above, most counties regard the enhancement of the HER with a fully integrated and interpreted PAS dataset as valuable but realistically impossible due to current resource levels. On a similar theme A would like to enhance the main HER monument/event system with their fieldwalking data layer, thereby allowing full integration, but again limited resources have prevented action. Similarly E would like to polygonise and integrate its local society fieldwalking results. These enhancement projects could be carried out along the lines of the West Berkshire project, using it as a guide to scope and resource these further projects. F are already in the process of instigating two enhancement projects, one of which will assess the effectiveness of evaluation techniques in the county.

4.7.3　Both C and D have no backlog projects but C do have a series of aspirational enhancement projects to be carried out by volunteers. Most HERs mentioned that FLOs need more resources to manage both outreach and finds recording.

4.8 *Other issues raised*

4.8.1 The use of the word 'ploughzone' and what it should cover was often discussed at the meetings. In particular, should a specific word - 'ploughzone' - be added to the HBSMR to specifically record this archaeological resource. The response was mixed. Several counties pointed out that up until now no-one had ever asked just for ploughzone archaeology, and the term has never come up in a search request. In some planning authorities the term is used in briefs and in planning advice but not recorded in the HER as such. It was also pointed out that just to be able to pull out ploughzone archaeology is not useful for development control purposes, as the archaeological evidence as a whole is needed to judge an area's archaeological potential. It was suggested that the only reason that such data would need to be specifically extracted is for academic purposes; for research on specific issues and site types. However, regardless of whether it would be possible to pull out just ploughzone archaeological records, the information from this source should be recorded within the HER in such a way that it is accessible and can be retrieved along with data from other sources.

4.8.2 In most cases the introduction of an additional term 'ploughzone' into the HER Thesaurus does not appear to be welcomed by the majority of LPAs. It would certainly not be practical to include it retrospectively in existing records unless further resources were available. The majority of those involved in the interviews considered that the range of existing terms, both for Monuments and Events, is sufficient to extract all of the relevant information out. However, the technique should be easily identifiable in the Event Record, as for all techniques used.

4.8.3 Several HERs did feel that adding 'land-use' as an option to the HER would be of benefit, and would help to identify specifically artefacts that had come from arable fields. D mentioned that having better communication with landowners would be beneficial given that they are most likely to pick up artefacts as they walk over their fields.

4.8.4 While not part of the definition for ploughzone archaeology defined in the project brief, cropmarks can also be seen as ploughzone archaeology, given that their visual evidence lies within this layer including finds relating to features below. A was the only HER who considered this resource as relevant in their searches, and other potential sites were identified by OA searching for cropmarks in the unfiltered data provided by the other HERs. B also considered cropmarks as part of the ploughzone resource but none were returned in the searches.

5 RECOMMENDATIONS

5.1 *HER data management*

5.1.1 Through this sample of HER responses we can see that ploughzone information is very much present within the HER databases. Overall the role of ploughzone data is seen by most of the HERs as a useful resource, with several wishing that a better system was in place to deal with it. It is also clear that the HERs have sufficient understanding of the topic to ensure that they can search for this data. However, OA's search of the unfiltered data suggests that not all of the potential ploughzone data was captured by the searches carried out by the HERs for this project. There are also issues with the received data not being refined enough, containing much non-ploughzone data. Often the only way to remove these sites would be to search manually through the associated PDFs.

5.1.2 Currently the HERs use different combinations of Event and/or Monument searches to retrieve ploughzone data. This produces different layers and data formats for each county, making consistency of results difficult, even between adjoining counties. To obtain consistency, rather than let the HERs choose which search terms to use, a list could be provided to them, specifying exactly what Monument and/or Event type searches are required, with all the refinements necessary to bring up all records, using all the relevant keywords in the thesaurus.

5.1.3 The terms considered to be relevant for Ploughzone searches in Monument records should include:
- Monument / Artefact Scatter
- Monument / Findspot
- (option of a search for cropmark if thought relevant)

5.1.4 The terms considered to be relevant for searching Event records should include:
- Field Survey / Field Walking / Unsystematic Fieldwalking Survey
- Field Survey / Fieldwalking Survey / Systematic Fieldwalking Survey
- Field Survey / Geophysical Survey / Metal Detector Survey
- Non Archaeological Intervention / Metal Detector Use

5.1.5 This would only produce all relevant records if ploughzone archaeology is recorded consistently within the databases, and would also produce false positives leading to a further manual refinement. It would be advantageous if the HERs themselves had internal recording manuals to ensure consistency within their own dataset, although this would still not address the inconsistencies between counties.

5.1.6 With the co-operation of FISH and the ALGAO, it might be possible to agree a set of standard terms for recording ploughzone archaeology within the HER, or create a new high-level term within the Event Type Thesaurus which would make it easier to search and would produce consistent results across the different counties. In the case of Monument records the evidence fields could also be used to record whether evidence came from the ploughzone. It is possible that the new search terms would need to relate to an additional searchable field if the system is not to conflict with the way a particular HER organises its existing records to meet its local requirements.

5.1.7 One other way to address the issue perhaps would be to tighten up monument type definitions. For example, the terms artefact scatter/findspot are currently used but perhaps it would be worthwhile specifying some distinction in terms to be used for purely ploughzone sites and those likely to be indicative of buried archaeology. This might be largely a question of tightening up definitions so 'artefact scatter' might be used in the former but 'possible settlement' with evidence type 'ploughzone' for the latter.

5.1.8 With some changes to the database output template, definitions, terminology, search criteria and/or more versatile supplementary documentation, it would be possible to alleviate some of the search issues raised by this survey. Alternatives, or additional changes, could include the addition of a land-use field, which could be used in searches and/or to add the term 'ploughzone' to the thesaurus and flag these sites accordingly when entered into the HERs. It is likely that, given current levels of resourcing, any such changes would be difficult to carry out retrospectively. Some LPAs may need convincing that there is any genuine need for change and that there is sufficient demand for ploughzone data to support it. However, any changes should be proportional, given that ploughzone archaeology only forms part of the jigsaw of information about an area, and should be readily incorporated into existing systems.

5.2   *General*

5.2.1   Event records are key to searches. It is important that where multiple techniques are employed, these should be entered as separate Events, rather than a blanket term being used for the whole project to allow ploughzone archaeology and techniques to be identified.

5.2.2   Community groups and individuals are currently the major source of information on ploughzone archaeology, given that fieldwalking and metal detecting surveys are currently dominated by the volunteer and community sector. Resources need to be found, whether through HLF funding or alternative strands, to ensure that training in recognition and recording is available in all areas, perhaps using the C (eg where a large-scale community project is ongoing) and F approaches as models. It would be useful to have both a toolkit or website which pulls together all relevant advice as well as experts who were prepared to give time to train local groups in survey techniques and finds recognition.

5.2.3   HERs/Local Authority archaeologists should do more to encourage local groups to deposit reports and information with them, even when the groups are not guided by professional organisations, and to make groups aware of the best way of recording and transferring this information. There is little point being concerned that nobody lets the HERs know if the HERs do not publicise that they need to know. If development money was available, a purpose-built website could be built to allow the collection of such data in the format required. Technological solutions to recording artefact locations should assist in improving recording standards, as hand-held GPS devices become steadily more accurate, cheaper to obtain and simpler to use.

5.2.4   EH should continue to review the Class Consents regime and seek opportunities to reduce their impact on cultural heritage. Approaches to protection of ploughzone archaeology where agricultural practices are taking place outside designation or grant-aided supervision also need further consideration. Further guidance should be issued to HERs to clarify exactly how and when ploughzone archaeology can be used in a SHINE record and the fact that ploughzone archaeology can be managed within Stewardship Schemes through reversion to pasture to restrict damage from field walking and metal detecting on vulnerable sites. It may be that more of an emphasis on artefacts could be provided in SHINE guidance to take into account their potential significance and to offer a joined-up approach on the usefulness of this data.

5.2.5   The potential of finds from metal detecting and other activities that lead to PAS recording is enormous. However, more FLOs are needed to enable them to have time to build the links with detectorists and other members of the public, which will result in a more comprehensive record and to help record negative evidence.

5.2.6   Several respondents suggest that FLOs need more resources to both record data and perhaps introduce some level of analysis and synthesis of the raw PAS data, perhaps initially through a basic GIS cluster analysis. This would both be informative and perhaps also get around the issues of supplying this data to third parties and could also be carried out by the HER. It is suggested here that consideration be given to upgrading the PAS. Given its huge potential to inform development control, such a project would ensure that the PAS is not just a recording and research tool for artefacts, but could be more immediately accessible and useful to HERs. At the least a working party could be set up to see how the PAS could be made more useful to HERs and how the download process could be improved and to discuss how the PAS and its relationship with the HERs can be improved in areas where problems lie. As an interim way forward, as discussed in relation to the B HER, procedures could be

introduced so that the FLO can rapidly scan data for key finds as instructed by the HER, to identify sites which may have an influence on assessing the archaeological potential of an area.

5.2.7 Funding could be provided to support enhancement projects relating to ploughzone archaeology and the HER. This might include analysis of PAS data and historic field walking data so that significant clusters and sites can be identified and added to the HER. Other project could also be carried out to review historic data and look at further digitisation of backlog projects, along the lines of that undertaken by West Berkshire.

5.2.8 As all HERs are aware of the usefulness of ploughzone archaeology it is not proposed here that there be a campaign to raise awareness of the issues. However, each use this data differently and to a greater or lesser extent, both in determining development control decisions and in the level of ploughzone survey required in briefs. It may be worth suggesting that different terminology be used for finds from the ploughzone so they are no longer referred to as 'residual finds' or 'stray finds' which suggest that they are somehow less important than if more positive terminology is used.

5.2.9 Archaeological evaluation techniques have changed substantially in recent years: New techniques (such as Lidar) have been developed, whilst others (including fieldwalking) have declined substantially. The wealth of data provided by the PAS has quantitatively and qualitatively changed the data available to planning archaeologists. It may therefore be useful to revisit the issues analysed in Planarch (Hey and Lacey, 2001) by re-examining the wider evaluation process and considering how ploughzone archaeology is retrieved, recorded and used. It would also be an opportunity to look at the pros and cons of fieldwalking, and see if its decline as an evaluative tool is justified.

5.3 *Summary of recommendations*

5.3.1 To summarise the above:
- Terminology to search HERs for ploughzone archaeology needs to be consistent and effective across the HERs.
- Within HERs internal manuals should be used to record how searches are undertaken for internal consistency
- FISH and ALGAO should agree a standard set of terms for recording ploughzone archaeology and to tighten up the definitions used for it
- Resources should be found to provide guidance and training to community and metal detecting groups on recording and finds definition and develop a toolkit and/or website pulling advice together and a list of willing experts to call upon
- HERs should publicise more widely the need for community groups to inform them about results from work undertaken
- EH should continue to review the Class Consent system to reduce its impact on ploughzone archaeology
- Consideration should be given as to how to manage ploughzone archaeology where agricultural practices are taking place outside designation or grant aid.
- Further guidance should be issued to HERs about how ploughzone archaeology can contribute to SHINE and how this resource can be managed through agri-environment schemes
- FLOs should be allocated more resources to liase with metal detectorists on accurate recording and reporting, especially the benefits of recording negative evidence
- Consideration should be given how PAS data could be better integrated into the HERs and how it can better inform the development control process.

- Prioritised funding could be made available to support enhancement projects using ploughzone archaeology so that the information is more useful to the HER and planning process
- Revisit the Planarch 1 project to judge the effectiveness of different evaluation techniques given the changes that have occurred over the last 15 years

6   CONCLUSION

6.1.1   The study has looked at the HERs of six counties to assess how they deal with ploughzone archaeology and how retrievable it is. The methodology included assessment of the HERs themselves, through analysis of filtered and unfiltered data and comparing its content with original survey data. It has also sought the opinions of the LPA staff themselves for these areas through both questionnaires and interviews. Many relevant points and interesting issues were raised during this process, some of which were more relevant to the main aim of the project than others.

6.1.2   In general HERs and LPAs do see ploughzone archaeology as an important element in the data available for assessing an area's archaeological potential, both for development control and management purposes, with some using inventive ways to ensure that artefacts are considered within SHINE records. They all recognise that in some cases ploughzone archaeology may be the main source of evidence for a site or activity area, or the only evidence left in heavily ploughed areas. Some saw that the use of this data could be taken further: for use in predictive modelling, to date when a site is first ploughed, to date cropmarks and provide guidance as to a site's character and condition below ground.

6.1.3   The value that an HER places on ploughzone data is not necessarily a reflection of how well this data was recorded in field surveys, or how easily retrievable it was from the HER. The correlation with the raw data from fieldwork surveys, where OA was able to review the raw/published data, was generally good, suggesting that the data when entered was good data. In terms of the extraction of this data from the HER, the results were variable. Some HERs are aware of these problems and maintain some or all ploughzone data outside the actual HER, through the use of a separate layer recording fieldwalking results and/or finds data. The intent is often to incorporate these into the wider HER, but until the time and budget permits these exist as ancillary layers designed to inform internal decisions.

6.1.4   The HERs are confident in most cases that they can extract all relevant ploughzone data either using Monument Type or Event Type searches or a combination of both, although often unrelated records were also returned. However, whilst partially justified, this confidence may be overly optimistic, as when the filtered data supplied was compared with the unfiltered data, in all cases extra potential ploughzone sites were identified that had not been picked up by the HER's search.

6.1.5   All of the HERs involved used different search term combinations to retrieve ploughzone data, with differing levels of success. The differences in effectiveness was partially due to how ploughzone archaeology had been recorded in the HERs and partially due to the effectiveness of the different search terms used. Beyond the discussed technical issues the main reason for the search discrepancies lay in the conflicting understanding of ploughzone archaeology and where all of this information can be accessed within the HERs. Our singular search request produced a variety of datasets and search terms. Only two HERs considered cropmarks to be of importance, and others placed different emphases on Monument or Event data. Even within the structure of the HBSMR different key terms were included in the search.

6.1.6   These issues can mostly be addressed through more consistency in the terms used when recording ploughzone archaeology, especially when recording all events in a multi-event survey, and by following an agreed set of search criteria. With co-operation of FISH and ALGAO it may be possible to agree a standard set of terms for recording ploughzone archaeology and/or to tighten up monument definitions so making them more indicative of their origin. The inclusion of 'land-use' and the word 'ploughzone' in the records was also discussed, although whilst the majority of HER staff consulted thought that inclusion of 'land-use' may be a useful enhancement, the same was not true of the use of the term 'ploughzone'. For any solution to be totally effective in retrieving all relevant data, retrospective changes would have to be made in how ploughzone archaeology is recorded in the HER. The cost of such changes may prove prohibitive.

6.1.7   Other related issues raised during this project, of relevance to the quality of the ploughzone data within HERs, include problems with the inclusion of PAS data and field walking surveys carried out by local societies/community groups. Often the results of these community surveys are of a poor quality and in many cases over the results are not reported to the HER, with one HER saying that no information from this source had been passed to them for 30 years. More outreach needs to be undertaken to guide local societies in this type of survey work, as is seen in some counties where there is a tradition of outreach and funding to back it up. More could also to be done to publicise the need for the results of any archaeological work to be passed to HERs to maximise the information available when making decisions. In several of the case studies, lack of reporting of data had led to key sites being omitted from consideration during decisions on proposed developments.

6.1.8   Similarly ways forward need to be agreed to deal with the data that the PAS is providing, which in its current format is proving difficult to manage and integrate with HER systems. The HERs are consequently unable to pass on accurately located data to clients. The potential of this resource for informing the decision-making process is huge, but the HERs are finding it difficult to cope with the data in its current format. This data can be downloaded (although there are technical issues with this) but its format, whilst fine for its original purpose of finds research, is not helpful to HERs. In its current form either the HER officer or FLO needs to trawl through the data manually to identify finds which are significant, or clusters of finds which could indicate a site, and then enter this data onto the HER. Very few FLOs and HERs have time for this. In some cases the data may be quickly scanned, but its full potential is still not realised. It is suggested that perhaps the PAS could be taken to a second stage of development, to make it useful for a wider purpose, with funding available to turn it into a more useable tool for the decision making process. Other interim measures have been suggested which could be taken forward on a county by county basis, to ensure that key data from the PAS is incorporated into the HER.

6.1.9   The analysis of the West Berkshire digitisation project showed that large paper datasets can be effectively digitised to provide an enhanced resource of use to the HER. This results of the project were highly valued by the HER and widely used. The methodology offers an effective way to provide a superior end product, capable of being analysed and searched, in comparison with single point entries within an HER. The majority of the counties consulted had backlog fieldwalking projects, some recorded digitally and some not, which could be used to positively enhance HERs in this way. Once again time and resources were the main obstacle to including this backlog data and any potential projects would need to be prioritised with reference the significance of the results and the level of potential risk of disturbance and development.

6.1.10 Further guidance perhaps needs to be provided to LPA archaeologists on the use of artefacts to create and inform SHINE records. The use of ploughzone data for this varied enormously between HERs. In some cases there is a feeling that agri-environment schemes cannot be used to positively manage ploughzone data. However, management options include reversion to pasture, which would offer suitable protection, and schemes can be used to prevent unwanted fieldwork which would remove ploughzone evidence. Management in extreme cases can also be through preservation by record, by removing and recording ploughzone archaeology, such has been carried out at Rendlesham in Suffolk.

6.1.11 It was also recognised that the circumstances of the retrieval of ploughzone data had changed over the recent past, with fieldwalking now mostly carried out by local societies and community groups. In the past fieldwalking was a technique recommended much more as part of the raft of evaluation techniques available to inform development control. Various reasons for not recommending fieldwalking were given, and many regret its passing as an information tool. The consideration of other ploughzone techniques across the HERs is also variable. Some counties ensure that evaluation methods fully consider ploughzone archaeology when issuing briefs or approving WSIs, whereas others do not. This, coupled with an increase in geophysical survey, the development and use of Lidar data, and the massive collection of finds data recorded by the PAS, has made the process of evaluating sites prior to development very different from when evaluation techniques were assessed in the Planarch project carried out in 2001. It is therefore suggested that now may be the time to revisit this work and the guidance it provided regarding the role that ploughzone archaeology can play in this process.

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Appendix 1: Letter and questionnaire sent to HERs

Sample of letters sent – Italics are where changed for each HER

Dear …….

Re: English Heritage funded study looking at the representation of ploughzone archaeology within HERs

You may or not be aware that OA have been commissioned by EH to look at how Ploughzone Archaeology is represented in HER records. Review of EH's own records suggest that it is poorly represented and not easily accessible, and this project looks to see if the same is true within HERs. The project therefore aims to select a sample of Historic Environment Records and Local Planning Authorities and examine how ploughzone archaeology is represented, managed and used by them.

The methodology will be in four stages:
- A) Request that the HER answers a series of questions (see enclosed)
- B) Request the HER undertakes a search of records in an agreed study area (see below) and send to OA so OA can assess accessibility and comprehensiveness in a consistent and objective manner
- C) Meet with members of the LPA, eg county archaeologist, HER officer and whoever else may be interested, to discuss wider issues on the use of ploughzone data eg how it is used in development control, within discussions about management of sites, to inform Natural England and English Heritage for agri-environmental schemes etc.
- D) Use a sample from the original source data if possible for comparative purposes

Each case study has been chosen to represent a certain situation. *E has been chosen because ……[different for each case study area]. I am not sure where would be a good area to base the case study on? Perhaps a road scheme where field walking has been carried out or perhaps an area which has been fieldwalked/systematically metal detected by a local group which is recorded on the HER?* You will be in the best position to identify an area. It may be that the size of the area in question will be influenced by the money we have available to pay for your involvement. To provide some guidance we have an approximate budget per HER of *c* £***.

In addition to the search mentioned in B) above we would also like to be able to compare the data on the HER with at least a sample of the actual results using reports or raw data supplied from the surveys recording ploughzone archaeology (Stage D above).

If you are happy to be involved with this, the first stage would be for us to agree an exact study area for the case studies, then for you to provide us with a quote to do the stages above, summarised here as:
- Answer the questions on the enclosed questionnaires
- Carry out searches and provide OA with data for the case study areas based on the instructions at the end of the questionnaire (by 21st of February if possible)
- Interested individuals meet with OA at your offices
- If possible provide OA with either the source reports or references so OA can compare the HER with a sample of the original data

Please let me know if you would like further details on the project. I look forward to hearing from you on this matter.

Yours sincerely
Klara Spandl, Head of Heritage Management Services Department, Oxford Archaeology

Ploughzones – Stage A - questionnaire

Please enter your name and position

Please fill in digitally – feel free to add as much or as little text as you like. A definition of Ploughzone archaeology has been enclosed below.

Section 1 – Technical Background

2.1 Which HER system do you currently use?
- HBSMR
- Other

1.2 If Other then please provide details

1.3 Does your system conform to the MIDAS Heritage Data Standard?
- Yes
- No
- Partially

1.4 What is your understanding of the MIDAS Heritage Data Standard?

Section 2 – Understanding Ploughzone data

2.1 Do you have any existing partnership links to help awareness of ploughzone finds e.g. with museums, local groups?

2.2 To what extent are 'ploughzone' techniques specified in briefs for archaeological work?

2.3 Does the information in the SHINE records include specific references to 'ploughzone' archaeology?

2.4 What, if any, guidance documents do you have to help in the recognition and entry of 'ploughzone' records?

2.5 Do you feel that ploughzone archaeology is useful? In terms of a) its place in the records, or b) what it actually says about past activity?

2.6 Has your recording of ploughzone archaeology changed over time – for the better or worse and how?

Section 3 – Recording Ploughzone data

3.1 What types of 'Event' might you consider as likely to include ploughzone archaeology?

3.2 If you are recording the following activities as 'Events', what terms might you use to describe:

a) field walking
b) metal detecting from a systematic survey
c) metal detecting from hobbyists
d) test pits

e) sieving/monitoring of topsoil removal during investigative works
f) geochemistry?

3.3   In general, are Events/monuments represented in the GIS by
a) points
b) polygons
c) by land parcels
d) by fields
e) varies by entry
f) grid square (define extent)

3.4 If a project comprises several phases of archaeological intervention, are these:
a) entered as separate events
b) entered as a single event
c) mixed?

3.5 If you answered b) or c) for Q3.4, what term would you have used for the multiple activity?

3.6 Do you use the term 'ploughzone' at any point in recording HER records?

3.7 How do you relate ploughzone archaeology events to monuments?',

3.8 What term(s) would you generally use to define an associated 'Monument' e.g. findspot, lithic scatter, interpretative term such as settlement?

3.9 How useful do you find Ploughzone data in terms of
a) capacity to detect patterns?/archaeological sites
b) accuracy of location

3.10 Do you record PAS data:
a) from the PAS downloads
b) as supplied by museum/individual/group
c) double entry system, where both a PAS and a local record are generated?

3.11 How useful is the PAS data is in terms of the issues already raised?

Stage 4 – Searching for ploughzone data

Using the study area agreed conduct a search for ploughzone related records. From this search, please answer the following questions:

- Which keywords did you use to search the data;
- Did you feel the keyword search was sufficient to find all the records that might contain ploughzone archaeology data? Yes / No

    If No then…

- What other means did you use or could potentially be used to find the requested records?

- Overall, are you confident the dataset you will provide fulfils the request of the client?

Please provide us with the unfiltered and filtered data from the study area.

**If there is anything else that you would like to comment on in
relation to Ploughzone archaeology please feel free to do so here,
especially if you think we have missed anything of significance
from our questions.**

Definitions

The ploughzone:

The upper layer of soil modified by agricultural activity, by being physically broken up (i.e. ploughed) and the addition of organic material (i.e. manure) and/or other fertilisers, thereby altering its physical and chemical structure. The modern ploughzone is typically up to about 30cm in depth and known as topsoil or ploughsoil.

In geomorphological terms, it is the 'A-horizon', though this includes soils that have been naturally enriched (through humic accumulation for example).

The project focuses on the threat to archaeology from modern agriculture, primarily ploughing itself. We therefore exclude ancient ploughsoils (buried deposits and upstanding earthworks such as ridge and furrow) and areas ploughed in the past but not currently of in the foreseeable future.

This would appear to be equivalent to the 'land available for cropping' in Defra statistics, and made up of land under crops, uncropped arable land and temporary grass under 5 years old.

Ploughzone archaeology:

Broadly, the study of evidence for past human activity located within the ploughzone. This evidence can consist of durable artefacts such as lithics, pottery, metalwork, and some building materials, as well as less obvious remains such as the structure of the ploughsoil itself or geochemical signatures.