10
A critique of Northamptonshire's NMP project

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This final chapter assesses the methodology that evolved during the course of implementation of the National Mapping Programme in Northamptonshire between 1994 and 2001, and considers its impact on data creation and subsequent data manipulation, interrogation and dissemination. It also compares some aspects of the NCC approach with that employed for contemporary and subsequent NMP projects in other areas, discussing the lessons that can be learned now that this large project has been completed. This analysis draws heavily upon the Management Report for the Northamptonshire NMP Project, available online from the Archaeology Data Services (ADS) (http://ads. ahds.ac.uk), which provides essential background information, explains in detail the development of the methodology and documents the sources and timescale of the work.

Data creation

The direct acquisition of aerial photographic data through aerial reconnaissance, discussed in chapter 2, was integral to the NCC approach to aerial archaeology. From the start of the intensive reconnaissance programme in 1977, long before the inception of the NMP project, NCC employed a rolling programme of examination, SMR record creation, rectification (first manually and then, from the early 1980s, by computer, using Aerial software) and reporting of the results of the NCC aerial reconnaissance programme (Foard 1979a, 1980a, 1980b, 1981, 1982a, 1983; Deegan 2002, 19–20). This rolling programme was intended both to enable the results to influence further reconnaissance and also to be available for resource management purposes. Thus, the archaeological data were quickly assimilated into the SMR and, although the rectification was unable to keep up with rate of new discovery, a considerable quantity of data had already been interpreted, rectified and some data entered into the SMR for all sites when the NMP project began in 1994. As a consequence, it is not easy, nor indeed useful, to quantify the results of the reconnaissance programme and the NMP project in terms of the numbers of sites identified through NMP that were new to the SMR, a standard that is often used to measure the contribution of many other NMP projects. However, the analyses and results reported in the preceding chapters of this volume provide a more effective definition of the contribution of this project than do simple statistics based on the previous shortcomings of the SMR.

From the beginning the Northamptonshire NMP Project was conceived as a wholly digital project, drawing upon experience gained in GIS mapping of the county's historic environment since 1993, and exploiting the digital rectifications that had been retained from previous years of mapping using AERIAL. Although at that time it was NMP policy not to use or produce large-scale (1:2 500) mapping. RCHME made an exception for the Northamptonshire project because the efficiency of the process could be demonstrated, and, using a large-format computer plotter, the project was able to generate the high-quality hard copy quarter-sheet output then required by the RCHME (Northamptonshire Heritage 1994, 21).

An effective methodology and efficient implementation had been achieved through the NCC IT advisor's careful choice of leading GIS software (MapInfo) and their provision of ongoing high-quality specialist support, largely by Phil Sydee. It was also a result of careful design of the data structure to facilitate the intended objectives, building upon the principles of analysis of historic environment data, initially developed in 1979, which underpinned the design of the whole SMR and its associated GIS datasets (Foard 1978). As far as practicable, this methodology was further enhanced over the lifetime of the project. The use of MapInfo

Professional (versions 2.1–6.0) as a common platform for most aspects of data creation and manipulation was critical. Most internally-derived datasets were created or, if created in other software, delivered in MapInfo. This included SMR point data, the index of air photographs, AERIAL transcriptions, base map data (including both modern OS Landline and georeferenced OS First Edition 1:10 560 mapping) and supplementary datasets such as the BGS geological mapping, contour data, land use mapping, and mineral plans, all of which have been used in the analyses in the preceding chapters. Even the complex morphological data entered into the original RCHME MORPH2.2 database was retrieved and linked to the relevant individual graphic objects in the MAPINFO tables. Each dataset was linked through consistent reference numbering to enable automated concordance between different datasets. This obviated many of the data migration problems that are still regularly experiences by other NMP projects where no common platform is employed.

Analysis of the timescales of past and present NMP projects suggests that the Northamptonshire approach was highly efficient. The average time spent on each quarter sheet (5km ? 5km area) in the Northamptonshire project was 11.5 days (Deegan 2002, table 9). The average times spent per sheet on a contemporary non-digital project in Lincolnshire was more than 16.5 days (Kershaw 1997). More recent digital projects with which one of the authors has been involved: Till-Tweed, Lower Wharfedale, and Thornborough Henges have taken on average 24, 21, and 24 days respectively (Deegan 2003, 2004, 2005). Direct comparison between these projects is not possible: the Northamptonshire project did not record all ridge and furrow features, and had the benefit of access to existing plots. However, we believe that the methodology and processes employed by the Northamptonshire project were far simpler to apply and, most importantly, to check, than the Auto CAD-based strategy used by most current NMP projects.

Data interrogation

One of the important principles of the Northamptonshire NMP dataset is the one-to-one relationship between the smallest recording unit, which is the MORPH2.2 site, and the map object. For example the data entry for a single ring ditch has a unique relationship with a single graphic object in the map data. Although there are some exceptions to this rule, these can be easily be accounted for within any GIS query. The result is that the data can be searched on any of the MORPH2.2 fields and the results accurately quantified, and distributions analysed. It is worth noting that GIS can automatically generate accurate grid references from mapped objects and, importantly, almost without exception will actually be positioned on part of the object, which is preferable to the practice of manual reading and input used by most current NMP projects. Detailed quantifications and distributions cannot be automatically generated from the data produced by recent and current NMP projects because the unique one-to-one relationship was abandoned along with the MORPH2.2 database in favour of the National Monuments Record standard database (currently known as AMIE). Moreover, although some morphological recording is still practised by some current NMP project, because there is no link between the record and object it is not possible to retrieve and display the map objects based on any morphological criteria. Put simply, one cannot, for example, retrieve, count and display all the ring ditches that are less than 10m in diameter, as is possible with the NCC NMP data.

Such methods of data interrogation have been fundamental to the analyses in the preceding chapters, in particular the investigations into the distribution of cropmark, soilmark and earthwork sites, and of the monuments of the Neolithic and Bronze Age. Although under the current NMP methodology similar work could perhaps be repeated on smaller projects, it is unlikely that any other county-wide projects could be tackled in this way.

Another important aspect of the Northamptonshire NMP data is the complete traceability of each mapped object back to the source photography. Mapping for each site is generated from one or more rectified plots or photographs, the information for which is stored in a separate GIS table (*see* Deegan 2002 for more information about the data structure). This not only allows users to easily return to the original photographs, but is also an important aspect of maintaining data standards, much like providing a full

bibliographic reference for a cited work. Other NMP projects have been slow to adopt this principle. The NMR record only documents the best illustrative photographs for any site or group of sites, but more recent NMP projects have started to record the source photograph within the tables attached to the AutoCAD drawing, although this is not yet a universal standard.

Project shortcomings

Some of the shortcomings to the Northamptonshire approach and its application have been discussed in previous chapters, but are worth re-iterating together here.

We have noted the effect that a lack of specialist knowledge has had on the NMP mapping of medieval, post-medieval and modern military archaeology (*see* chapters 8 and 9). The use of historic and modern oblique and vertical aerial photographs in the identification and recording of 20th-century military remains has developed considerably since the completion of the Northamptonshire project. This development has been precipitated by a general increased awareness brought about by the work of the Defence of Britain project and associated publications, improved training for NMP interpreters and the high profile of the Suffolk Coastal NMP project, which recorded a wealth of military detail (Newsome 2003). Even recent inland NMP projects, such as those at Lower Wharfedale, Till-Tweed, Thornborough Henges and the ongoing Magnesian Limestone project, have benefited significantly from the expert guidance of English Heritage's Roger Thomas and produced records of 20th-century military remains that reflect his specialist input.

Unfortunately this overall improvement in recognition and understanding of 20th-century military remains is not mirrored for the medieval and post-medieval periods. As discussed in chapter 8, other problems for these periods were experienced by the Northamptonshire NMP project and are not unique to this project: approaches to mapping ridge and furrow, depiction of earthwork features, and the use and integration of ground survey data. Most current NMP projects persist with recording ridge and furrow at a very simple level – an outline around the greatest visible extent with internal arrows depicting the various alignments of the furlongs. Others have attempted a more detailed approach: identifying and defining individual furlongs with a single arrow to depict the direction of ploughing (for example NMP projects for Lower Wharfedale, Till-Tweed, Thorn-borough Henges and the Magnesian Limestone in South Yorkshire). The contribution of the latter approach has yet to be tested and may never be clear from these projects alone, given the relative infrequency of surviving medieval open fields in these project areas. While recent NMP projects have reported on medieval and post-medieval themes in their relative publications, these have tended to deal with specific monument types or activities, for example salt extraction, pillow mounds and township boundaries, rather than tackle more integrated themes like the nature of settlement (Grady 1998; Harrison forthcoming; Horne forthcoming). It is important that before another NMP project is run in the heartlands of ridge and furrow survival, which includes limited areas of various counties such as Northumberland and Cheshire as well as substantial areas of the Midlands (Hall 2001a), that this issue is explored in detail in consultation with specialists in medieval landscape, taking account of related ongoing research (for example Foard *et al*, 2005), and an effective and efficient methodology established that will produce relevant data and analysis.

Distinguishing cropmarks, soilmarks and parchmarks

Neither the MORPH2.2 database nor the current NMP system of recording distinguishes between the different types of levelled sites: cropmarks, soilmarks and soilmarks. From the beginning, the NCC process of recording distinguished cropmark from soilmarks sites, and this information was included in a field that was added to the MORPH2.2 when it was exported to the GIS. The significance of the appearance of soilmarks has been discussed in chapters 3, 6 and 8. Unfortunately this practice was not extended to soilmark sites in grass, but it can now be seen that to have done so would have significantly aided the analysis of some medieval remains (*see* discussion in chapter 8). It would not be an onerous task to record such distinctions in all future NMP projects, but would require a major programming change to the NMR database.

On a related note, the various analyses employed for this publication have brought to light the difficulties met when attempting to compare different sites with differing levels of cropmark or soilmark clarity. The Northamptonshire NMP data, like other projects, are intended for use without necessitating recourse to the original photographs. The MORPH2.2 database did record for the user the quality of the original image, but not the interpreter's perception of the quality of the cropmark or soilmarks. It would have been useful if there was some measure of the perceived clarity and completeness of archaeology that is visible in the photographs, although in the absence of excavation this could only ever be a subjective statement. This would also have been an interesting adjunct to the mapping of cropmark amenable ground undertaken for chapter 3.

Project implementation

There can be little doubt that despite some of the shortcomings discussed above, the Northamptonshire approach to the NMP project and aerial photography in general was balanced and well-considered. Even as the first of the digital NMP projects, its principles and methodology have not, in the opinion of the authors, been advanced upon in more recent projects. However, the results of the Northamptonshire NMP Project reflect not only the methodology, but also the manner of its implementation. Unfortunately, although efficient and effective methodology and process is an essential prerequisite for a high-quality product, this also requires a high level of skill and consistency in implementation of the interpretation, rectification and mapping of individual sites. Substantial limitations in this can be seen in the Northamptonshire dataset. In part this has been identified above as a result of lack of appropriate training and guidance in specialist areas of interpretation, something that was recognised as a problem nationally and has been addressed over the past few years; in some themes, such as medieval landscapes, it has been seen that it also reflects a weakness in the NMP process, working as it does purely from aerial data, when extensive other datasets and contextual information is required to enable effective interpretation. As we have seen, such shortcomings have not as yet been addressed nationally. However, from the beginning of the formal Northamptonshire NMP project in 1994 until its review in 1999, there was also a failure in the Northamptonshire project to implement the processes with a consistently high level of care. This failing points up the need for closer monitoring of the fine detail of interpretation, not just the overall throughput of data, something that was not carried out with sufficient vigour either by NCC or by English Heritage/ RCHME. As a result, the preparation of this publication had to be preceded by extensive data tidying, which helped to resolve some of the recording issues, but there remain within the project dataset some poor graphic representations and weak interpretations; and in certain important cases information is absent.

Conclusion

Despite its limitations, the Northamptonshire NMP should be assessed above all on the degree to which it has advanced understanding and accessibility of aerial data. The effective implementation of GIS technology has made aerial data in high resolution digital map form an integral part of the historic environment record of the county since the early 1990s. This has enabled that evidence to significantly influence both practical day-to-day management of the historic environment as well as facilitating intensive analysis as part of the definition of research agenda for the county (Tingle, 2004; http://www.le.ac.uk/archaeology/research/projects/eastmidsfw/index.html). A great deal has been achieved in the present volume in the analysis of both spatial pattering and the analysis of plan form, at both the landscape and the individual element level. However, wider potentials remain in the Northamptonshire NMP dataset for computer-based analysis, to fully exploit the way in which the individual graphic objects have been created and indexed in GIS.

The Northamptonshire NMP shares many of the successes and failings of the NMP process nationally. Rather like the first Ordnance Survey 1-inch mapping of the contemporary landscape in the early 19th century; 200 years on the NMP is producing the first national mapping of the pre-medieval landscapes. Like its predecessor, although the overall product is broadly consistent nationally, the work of different surveyors is being undertaken according to slightly different methods and so producing a slightly different end

product. Just as with the Ordnance Survey mapping it will be necessary to improve and enhance the datasets in future decades, not only to improve consistency, but also integrate new data and, building upon the lessons learned, to tackle issues like that of the medieval landscape not adequately dealt with in this initial programme of work.

It is often said that the NMP product is intended for use without necessitating recourse to the original photographs. This is valid, but only to a degree, for such mapping can only ever represent an initial guide to the evidence. There will often be additional non-aerial data that can be brought to bear on any individual site, which it was not practicable to exploit in NMP, while another interpreter with more time or different experience will often bring new insights to the primary aerial data itself. The Northamptonshire project has thus, from the outset, saved all the digital data it created, including all the rectified images, to make them available not just for individual reference, but also to enable the images themselves to be integrated fully into a future enhanced mapping system. Using GIS technology, it should be possible in the near future to effectively integrate the digital images themselves within the system, thus going far beyond the system implemented in the Northamptonshire NMP. In such ways it is to be hoped that this project, for all its limitations, has shown the importance of both exploiting to the full the current potentials of information technology and attempting to identify and facilitate longer-term research opportunities.

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Aerial reconnaissance and the National Mapping Programme project in Northamptonshire have recovered and mapped evidence of archaeological activity of widely varying character, from field systems through settlement remains to funerary monuments, and ranging in period from the Neolithic to the 20th century.

This volume presents research and analyses of the project's results. The introduction is followed by two chapters that consider the reasons for the biases in the distribution of aerial photographic evidence in terms of reconnaissance and the impact of soils, geology and past and present landuse on the survival and visibility of earthworks, cropmarks and soilmarks. The subsequent analyses of the project's results are presented primarily by period. The monuments and landscapes of the Neolithic and Bronze Age are discussed in the context of results from archaeological excavations, in particular the Raunds Area Project, followed by a review of the wider evidence for these periods in Northamptonshire and the Midlands. For the Iron Age and Roman period there is an attempt to characterise the settlements, boundaries and com-munications across different landscape zones. The three chapters on the Anglo-Saxon, medieval and post-medieval landscapes and on 20th century military remains review the contribution of the aerial archaeological evidence and consider whether this was maximised by the project.

The final chapter assesses the methodology that evolved during the course of the project and its impact on data creation and subsequent data manipulation, interrogation and dissemination.

Front cover: Panoramic view of the Nene Valley looking north-east. Floods reveal the extent of the Nene floodplain and in a few places show the course of now abandoned river channels. (NCC colour slide SP9776/10 22nd October 1987 NCC copyright)

Back cover: Detail of the buried stone walls of medieval buildings and structures along one street in Blatherwycke, brought into sharp contrast by the parching of the grass during a very dry summer. (NCC colour slide SP9795/23 July 1995 NCC copyright)

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