

**WHERE RIVERS MEET:  
Landscape, Ritual, Settlement  
and the Archaeology of River Gravels**

**CATHOLME RITUAL LANDSCAPE GROUND TRUTHING PROJECT 2004**

**INTRODUCTION TO THE REPORTS**

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**Background**

The *Where Rivers Meet* project is an ALSF-funded project that is studying the archaeological resource at the confluence of the Trent and the Tame rivers in south-eastern Staffordshire. This is one of the most intensively quarried landscapes for aggregates extraction in the country. It also contains a remarkable archaeological record, beginning with well-preserved megafauna from the Late Pleistocene and including a Neolithic/Early Bronze Age ritual landscape, an Iron Age and Romano-British settlement landscape, and an extensive Anglo-Saxon settlement and cemeteries. Most of our knowledge of these landscapes has arisen as a consequence of archaeological work carried out in the context of aggregate extraction.

The overall study area of the project measures 6km by 12km (72 square kilometres) – this is termed the ‘Full Area’. Within the Full Area a smaller ‘Focus Area’, covering some 235ha of land, has been designated at the physical confluence of the Trent, Tame and Mease Rivers, at Catholme Farm. The Focus Area contains an important concentration of monuments, revealed as cropmarks through aerial photography and believed on morphological grounds to comprise a complex of ritual monuments of Neolithic/Early Bronze Age date. These monuments include a ‘Woodhenge’ type monument consisting of multiple rings of postholes, a ‘Sunburst’ monument consisting of a central ring ditch with radiating pit-alignments, and a very large ring ditch with apparently associated linear features. These monuments, together with a series of smaller ring ditches, a possible cursus and a series of pit alignments, are collectively termed the ‘Catholme Ceremonial Complex’.

The principal monuments of the Catholme Ceremonial Complex are afforded statutory protection as scheduled ancient monuments (SAMs). No previous excavation has taken place within the scheduled areas and the monuments have not been directly affected by sand and gravel extraction. However, extensive quarrying has taken place in adjacent areas, accompanied by archaeological investigations, which have, for example, revealed further Neolithic/Early Bronze Age ritual monuments and a major Anglo-Saxon settlement.

The main phase of the *Where Rivers Meet* project was completed in March 2004. The project comprised a number of elements, each of which has resulted in a report:

- Palaeofluvial analysis of the confluence zone (Davies and Sambrook-Smith 2004)
- Hydrogeological modelling of the confluence zone to assess the potential effects of dewatering caused by aggregates extraction on archaeological deposits (Bunch and Riley 2004)
- A gazetteer and synthesis of the archaeology of the Full Area (Buteux and Hewson 2004)
- GIS-based digital landscape modelling and analysis of the Full Area, including LiDAR data (Wilkes and Barratt 2004)
- Multi-technique geophysical survey of the monuments in the Focus Area (Watters 2004)
- A draft research design and management plan for the future management of archaeology within the study area (Buteux 2004).

It was part of the original design of the project that the geophysical survey of the monuments in the Focus Area should be followed up by a ‘ground truthing’ exercise with the principal aim of attempting to understand the sub-surface origins of the surface geophysical anomalies. The reports contained herein describe the results of this exercise and include recommendations for further research and analysis.

### **Summary of project aims**

The principal aim of the Catholme Ground Truthing Project was to:

1. Further understand the relationship between the remote sensing survey data collected by the project and below-ground archaeology and soil properties as a means to enhance the interpretation of survey results and as a guide to future practice.

The results of this research were intended to be applicable in both the *Where Rivers Meet* study area and comparable landscapes affected by aggregates extraction. Secondary project aims were:

2. Evaluation of alternative geophysical techniques and methods (including data processing) to those employed in the initial Focus Area survey.
3. Characterisation of the archaeology of the Focus Area in terms of preservation, date and significance.
4. Isolating factors which have affected preservation of archaeological remains in the past and assessing the effects of future land-use regimes on preservation (particularly in relation to hydrology).
5. Obtaining appropriate samples for scientific dating and palaeoenvironmental reconstruction.
6. Using all of the above to contribute to the existing GIS-based geoarchaeological model of the Focus Area.
7. Using all of the above to contribute to an archaeological research strategy and historic environment management plan for the Full Area. This plan will include

recommendations on appropriate methodologies (sampling strategies, etc) for future work in the Full Area (and further a field) and will assist in the preparation of briefs.

## **Outline of methods**

The methods employed to achieve the aims of the ground truthing project are described in detail in the four reports contained herein. Here a brief outline of the methods is provided for orientation.

Four monuments were selected for examination. These were:

- A pit alignment
- The woodhenge monument comprising multiple rings of postholes
- The sunburst monument comprising a ring-ditch with radiating rows of pits
- The large ring ditch with associated internal and external pit and linear features

A combination of 10m x 20m and 10m x 10m areas was located over these monuments, positioned to encompass a representative sample of the feature types comprising each monument and to investigate different types of geophysical anomaly recorded in the extensive geophysical surveys carried out prior to the ground truthing project.

In each area the method of investigation proceeded broadly as follows:

- Intensive geophysical surveys, with close sample intervals, employing magnetic susceptibility, magnetometry, resistivity and ground penetrating radar (GPR) techniques, were carried out over the surface of each area (i.e. the surface of the ploughsoil) prior to any excavation.
- The ploughsoil was removed mechanically (but with small samples removed by hand in order to characterise the artefact content of the ploughsoil) to the surface of the underlying fluvioglacial sands and gravels. This surface was manually cleaned, revealing the archaeological features (ditches, pits, postholes, etc) as colour, material, texture and moisture contrasts against the fluvioglacial deposits into which they were cut. The intensive geophysical surveys carried out at the ploughsoil surface were replicated at this new surface. This repeat geophysical survey had the primary purpose of investigating the part played by the ploughsoil in the geophysical survey results.
- Following the repeat geophysical surveys, the archaeological features were wholly or sample excavated according to conventional archaeological method. Numerous soil samples were taken for palaeoenvironmental analysis and radiocarbon dating. This excavation enabled the archaeological features and their fills to be characterised, and their properties to be compared to the geophysical 'response' to them.

- In some of the areas, a small 5m x 2m sub-area was excavated through selected archaeological features and surrounding fluvioglacial deposits. These boxes were excavated in 20cm 'spits' down to below the depth of the archaeological features, with geophysical measurements taken at the surface of each spit. The purpose was to systematically record the geophysical properties of the deposits within each box, both the deposits contained in archaeological features and the fluvioglacial deposits into which the archaeological features had been dug. The geophysical properties measured, using various instruments, were magnetic susceptibility, electrical resistance and dielectric permittivity. These three geophysical properties of deposits 'cause' (in part) the 'response' which is measured by, respectively, magnetometers, resistance meters and GPR in conventional archaeo-geophysical survey conducted at the ground surface. The overall aim of this exercise was to attempt to quantitatively model the geophysical properties of the deposits and relate this modelling to the results of the surface geophysical surveys, thus achieving a better understanding of the geophysical survey results.
- Geoarchaeological study of the natural and archaeological deposits was undertaken in order to elucidate the origins of these deposits and the relationships between the origins of deposits, their geophysical properties and their bulk geophysical behaviour as detected by survey at the surface. This involved field study of deposits and laboratory analysis of selected column samples, including thin-section analysis. Measurement of the magnetic susceptibility of the column samples was undertaken and the composition of the samples was characterised.
- A detailed study was undertaken of the magnetic properties of the deposits. This involved systematic sampling of representative deposits and laboratory measurement of their magnetic properties, enabling cross-calibration with field results. A particular question related to the relative contribution of induced magnetisation (magnetic susceptibility) and remanent magnetisation to the control of the size and form of the magnetic anomalies detected in the magnetic surveys. A second question concerned the variation of magnetic susceptibility with particle size in the various types of archaeological feature.

## Reports

Four reports are contained herein:

- A site narrative and post-excavation assessment (by Kate Bain, Emma Hancox and Mark Hewson). This is essentially concerned with the 'conventional' archaeological reporting of the excavations and includes an Updated Project Design (UPD) for the further work required (e.g. radiocarbon dating) to produce a published report.
- A report on the geophysical survey aspects of the project (by Meg Watters)

- A report on the geoarchaeological studies (by David Jordan)
- A report on the analysis of the magnetic properties of the deposits (by Mark Hounslow and Vassil Karloukovski).

A very large amount of data was collected during the course of the project and a substantial amount of analysis has been carried out, with important results. All the reports include recommendations for further work, both short term and longer term. In the short term it is proposed that three tasks are necessary to fulfil the primary aims of the project:

- The archaeological excavation of the four monuments (three of which are scheduled ancient monuments) is of much importance in its own right and proper publication is required. Further research and analysis is required (principally on the ceramics and radiocarbon dating) and a report needs to be drawn together for publication in an appropriate archaeological journal. This report would be limited to the archaeological results insofar as they advance our understanding of prehistory and would not deal with the wider aspects of the project except to provide necessary context. The work required to achieve this is outlined in the UPD element of the site narrative and post-excavation assessment.
- The results of the ground truthing exercise and associated analyses are likewise of much importance and should be published. It is proposed that the four reports contained herein are integrated and summarised, with limited additional analysis, for publication, ideally as a paper in the journal *Archaeological Prospection*. This paper would be authored by the authors of all four primary reports. However, it is proposed that the lead author would be David Jordan, who would take primary responsibility for integration and editing.
- The results of the work at Catholme as a whole should be integrated into the draft research design and management plan for the *Where Rivers Meet* study area. This work should be carried out by Simon Buteux, Ian Wykes (Staffordshire County Council) and Andy Richmond (Phoenix Consulting) to produce a finalised research design and management plan.

It is proposed that further application is made to the ALSF grants scheme for the limited resources necessary to complete these three tasks.