

Environmental archaeology has much to tell us. The data its many methods produce can tell us much about both the systemic (the site while occupied) and the archaeological (the site at the time of excavation) contexts of a site, but we must use the most appropriate methods of investigation. I have chosen to examine a Roman site that produced a rich environmental assemblage and that different investigative methods within environmental archaeology were used for both recovery and analysis. In particular, the different types of environmental sampling will be examined here. These are informed by past research surrounding the site but often equally dictated by variables (over which we have varying levels of control) such as deadlines, costs, site conditions, staff availability and weather conditions.

Archaeological sites vary astonishingly; a one-size-fits-all approach does not work. Bearing this in mind, it is clear to see the importance of detailed environmental guidance from the outset of a project, typically in the Written Scheme of Investigation. The use of Historic Environment Research and Delivery Strategy (HERDS) specific research objectives for the Romano-British period (Department for Transport 2017, 267-9) informs much of the environmental investigation conducted throughout the lifespan of the site, as we will examine here.

The most commonplace method of investigation in the field of environmental archaeology is that of bulk sampling, in which samples of whole earth are taken from a context to be processed (typically through Siraf-style water flotation) and the residue sorted for further artefacts and ecofacts. Typically, this method provides a large quantity of the environmental material and data recovered from a site, although this site was unusual in this sense, as we will examine. The Written Scheme of Investigation (WSI) predicted that environmental bulk sampling would be the best method through which to achieve the HERDS specific research objectives pertaining

to the investigation of Romano-British infrastructure. Other relevant HERDS objectives are more difficult to examine via the material produced from bulk samples, yet it is not impossible. For example, “regional and cultural distinctiveness” (KC21) during the Roman period may be examined in how they may have affected changing diet and land use and settlement type in the area. Archaeobotanical materials recovered from environmental sampling provided insight into this. Unusually for a rural site, charred archaeobotanical remains were found in smaller number to archaeobotanical materials preserved through waterlogging. It is safe to assume that the charred plant remains recovered consist largely of intentionally grown or processed crops in the area. Thirty-two bulk samples were processed using Siraf-style water flotation, with around sixty-five percent of these containing at least a small number of charred cereals or seeds. Understanding a site sampling strategy can illuminate how such results can be yielded, especially with materials that may be underrepresented or easily missed otherwise. Given the sheer volume of waterlogged material on the site (and on prior works in the area), the WSI is somewhat general on sampling for charred plant remains. The WSI sampling strategy prioritises the sampling of deposits relevant to HERDS, yet it cannot specifically detail how to do so as this is dependent upon the nature of the site when it is being excavated. This puts a level of responsibility on those on site to understand and communicate this well. There is no doubt that focussing on waterlogged remains was a priority on this site, especially as specialist training was given. However, this does not mean that other forms of plant remains were ignored. The strategy for sampling non-waterlogged bulk deposits was adaptable to the deposits being excavated at a given time, using a judgement-based approach to avoid too few or too many samples; storage is a major concern of environmental

sampling. Contexts containing dateable artefacts were also prioritised, meaning that ecofacts could be easily dated alongside these artefacts. Such an approach requires a good level of communication and knowledge respectively on the part of the excavation team, and the informative materials and data recovered shows that this was the case on site.

A large amount of macroscopic plant remains, preserved both through waterlogging and charring respectively, were recovered from non-waterlogged bulk samples. While it is undoubtable that the good level of knowledge and understanding of the excavation team contributed to this rich assemblage, it should be noted that this sheer volume of environmental data is highly unusual. The amount of bulk samples processed produced results that significantly contribute to HERDS objectives. A level of Roman influence is evident on site in the abundance of spelt, widely used during the Roman period for brewing (Fulford 2014, 180). Potential malting waste recovered from bulk samples may indicate a level of Roman infrastructure, perhaps indicating where HERDS KC19 may be examined in future work. Given that the waterlogged materials of the site indicate a Roman timber river crossing, it is possible to understand how Roman infrastructure may have introduced such speciality foodstuffs to the area. To contribute towards a rich and holistic study of the site, other types of data should be examined. Gaining an understanding of archaeozoological remains would undoubtedly provide insight into possible agricultural practices or meat consumption in the area, and how “Romanised” these may be. Understanding all types of data recovered from site provides the best insight into diet and lifestyle.

This site was chosen for this assignment because of its diverse environmental data, but it is also unusual for this reason. Waterlogged materials are typically found on “well sealed” (often urban) sites (Campbell *et al.* 2011, 5), and are not often

encountered by the rural archaeologist, such as those who would have worked on this site. It is undoubtable that a level of over-sampling took place, especially as organic material would have been obviously rich. Under-sampling may have taken place in the rare occasions that communications did breakdown. Many new members of staff have not been taught when to take a bulk sample and may find asking a superior intimidating. However, it appears that this was managed, and an informative level of bulk samples were returned to the post-excavation team. We frequently had to reevaluate cold storage for waterlogged samples and finds (leather, wood, peat, etc.), being careful to not run out of room. As was expected from this site, slightly fewer than half of the samples taken were flagged as waterlogged. Upon further examination by the post-excavation team, it became apparent that further samples were waterlogged when they had not been previously flagged as such. Waterlogged deposits can vary in appearance and may thus be insufficiently sampled, even on a site where particular care and attention has been given to their sampling. This was anticipated in post-excavation and handled appropriately, thoroughly checking each sample by composition and colour before partial processing. We agreed upon a system whereby we processed samples that were obviously not waterlogged first, then checking and processing samples likely incorrectly labelled as waterlogged (for example the “reason for sampling” given not being typical of waterlogging), before moving on to wet sieve obviously waterlogged samples. Using this judgement-based approach allowed me to stop or change processing method if it became apparent that a sample was not being processed correctly. A lot of samples comprised of multiple buckets so, even if one bucket had been processed incorrectly, we could continue to process the remaining bucket using

the most appropriate method or send it for specialist processing (such as paraffin flotation).

Waterlogged bulk samples were processed via the method of wet-sieving instead of Siraf-style water flotation, which can destroy delicate plant remains. Wet sieving is reliant upon effective sampling to ensure a representative sample as only a small fraction of the sample is processed (often a two-litre subsample). When wet-sieving these samples, I occasionally found medium-sized discrete pieces of waterlogged wood which I bagged and stored separately. This strained our local cold storage capabilities, with much of the material sent elsewhere for external cold storage.

Further examination of this material, alongside the other pieces of wood that were collected by hand, would help to contribute towards HERDS KC19. Given that they may have been grown in close proximity of the site, waterlogged plant remains can provide valuable insight into the surrounding environment and change over time.

HERDS objective KC2 acknowledges the possibility of reconstructing past environments using such materials. Examination of waterlogged plant remains is an excellent means to do so, particularly as different examples of the same types of plant remains surviving through charring and waterlogging were evident. This, alongside the presence of wetland taxa wild seeds, would indicate that the site has always seen a level of waterlogging. As a result, it is likely that cultivated cereals were grown elsewhere and transported to the site, indicating a level of infrastructure to do so. Comparing this evidence to geoarchaeological samples can assist in the understanding of environmental change on the site throughout time.

Samples of materials other than bulk whole earth were taken, yet the amounts varied somewhat. A small amount of Kubiena and monolith samples were taken either by a specialist (a geoarchaeologist) or under the careful supervision of one. It is difficult to

explain how to take these samples, and they require specialist knowledge; as a result, a geoarchaeologist is deployed dependent upon their availability. It is possible that more of these specialist samples may have been taken if site conditions had been better; the wet and gravelly nature of the site made it difficult to secure sampling tins. Of the five monolith and Kubiena samples successfully taken, two were recommended for further analysis. Doing so would be wise, informing the rich assemblage of waterlogged material discussed above. Further analysis of Kubiena and monolith samples would provide insight into past climates through the analysis of diatoms and soil formation. Given the self-contained stratigraphy within the monolith sample, malacological data is often analysed from them. Such evidence could have provided insight into past climates yet were lacking in these samples. Snail shells collected from sorting the residues of bulk samples were analysed for this, although this was an insignificant amount.

Waterlogged wood was present in large number on the site. Large amounts were excavated and retrieved to be processed and sent for analysis. As aforementioned, the volume of waterlogged wood recovered is undoubtedly due to its unusually frequent occurrence on site and the emphasis placed on recovering it from the outset. Specialist training for the excavation team on how to excavate waterlogged wood likely implied it as a priority, particularly in its relation to HERDS KC19. It is undoubtable there would have been a bias towards contributing towards this objective. If the site had not been so rich in other types of environmental data, they may have easily been ignored. Large, discrete pieces of waterlogged wood would have been easy to recover and store during excavation, proving more robust than smaller pieces such as off-cuts. Larger pieces were also likely valued for their dendrochronological potential as the method requires sufficient rings to prove

successful (Historic England 2010, 18). Despite this, smaller pieces of waterlogged wood and worked wood were recovered and analysed, allowing for a relatively balanced analysis of the wood recovered from site. Higher than usual levels of hand-collected charcoal were also recovered, likely due to many pieces being larger than usual. Ordinarily, the environmental team tends to discourage hand collection of charcoal, instead hoping that this can be collected as part of a bulk sample so that we can understand why charcoal is present in a context. Regardless, samples containing both waterlogged wood and charcoal were collected and processed appropriately.

The diverse nature of methods of investigation within environmental archaeology is exemplified well by this site. Although it can appear that the different methods of investigation are similar, they can produce a variety of results and information. However, they are undoubtedly limited by the site which they are applied to. The site examined here is highly unusual for its waterlogged material; typically, a lot more emphasis would be placed on non-waterlogged material. The site one encounters in commercial archaeology is often a luck of the draw scenario; the possibilities are endless. As a result, it serves us well to be prepared and able to process different materials correctly, especially in environmental archaeology. The likes of HERDS objectives help to guide our investigative methods so that we can understand the work that precedes us. The environmental methods of investigation deployed at this site were used well and effectively, producing the best results that they could. It is clear to see that continuing to support accessible training and education for all members of staff (not just the specialists) leads to the best results, both in excavation and post-excavation.

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