

The role of geophysical survey in managing the **Historic Environment Scotland** Estate

Stefan Sagrott ACIfA (7498), Senior Cultural Resources Advisor (North), Historic Environment Scotland

There are 336 Properties in Care (PICs) that form the Historic Environment Scotland (HES) estate, ranging from Mesolithic settlements and Bronze Age cairns through to medieval castles and 18th-century forts and industrial sites.

With most properties designated as Scheduled Monuments, non-invasive geophysical survey plays an important part in providing the information required for the Cultural Resources Team to deliver positive asset management supporting conservation work and visitor infrastructure improvements at the sites.

Despite what might be thought, many of the PICs have not been subject to extensive archaeological excavations. As monuments came into state care, the various predecessor organisations to HES undertook superficial clearance works, removing overburden and often chasing wall lines to make sites

presentable to the public. Because of this, many of our sites remain archaeologically sensitive and archaeologically significant, with much more to learn about them from the archaeological deposits and features that survive below the ground surface. A number of the aims within the HES



Geophysical Survey being undertaken at Threave Castle, Dumfries & Galloway. Credit: Historic Environment Scotland

... many of our sites remain archaeologically sensitive and archaeologically significant, with much more to learn about them from the archaeological deposits and features that survive below the ground surface.

Archaeological Principles, Standards and Operational Plan for Properties in Care align tightly with geophysical survey and what it offers:

- To enhance our baseline understanding of the significance of the Estate and the risks to it
- To align the archaeological work with other programmes of work
- To facilitate positive asset management of the monument from an evidence-based perspective
- To facilitate increased activity and audience engagement at PICs through achieving better understanding of the parameters imposed by the archaeological evidence so increasing opportunities, for example, events, filming and outreach.

The first geophysical survey at an HES site that we have a record of was carried out in 1972 but it was not until the mid-1990s that it really took off, with surveys being commissioned by the then Inspectorate,

and being carried out by university departments for research projects. This trend continues to the present day, although coverage of both individual properties and the estate remains relatively low, with only around 20 per cent of the PICs having had some form of geophysical survey, although this has greatly increased in recent years.

The information we gain from geophysical survey allows us to provide accurate advice on the archaeological sensitivities and ensure that the archaeology and cultural significance of the PIC is conserved. Further, the information contributes towards our understanding of the cultural significance of the properties, which is expressed through our Statements of Significance programme, and to the interpretation and visitor experience offered at our properties.

The relatively low cost, ease of deployment and rapid nature of results being available means geophysical survey is an ideal tool for heritage managers. For

HES it is affordable and allows us to form a baseline for each property, gelling with the HES Conservation Principles, and this means that all work across the estate follows best practice whilst being underpinned by evidence-based decision making.

In 2018 we commissioned Rose Geophysics to undertake a geophysical survey at St Andrews Cathedral to develop a baseline understanding of the cathedral precinct and understand the early development of the site in the later 1st millennium AD. Gradiometer, resistance and Ground Penetrating Radar (GPR) surveys were all carried out. The latter revealed extensive burials of potentially two different phases and two possible structures of archaeological interest. One of these, to the northwest of the 12th-century St Rules Tower, is a rectangular structure some 20m by 8m on an east–west alignment at a depth of between 0.75m and 1.75m. The structure is especially intriguing as it located in a similar area and at a similar depth to likely



Geophysical survey being undertaken at Kilchurn Castle, Argyll & Bute. Credit: Historic Environment Scotland

... the information contributes towards our understanding of the cultural significance of the properties.



The relatively low cost, ease of deployment and rapid nature of results being available means geophysical survey is an ideal tool for heritage managers.

Gradiometer survey being undertaken at Doon Hill, East Lothian Credit: Historic Environment Scotland

Pictish sarcophagus discovered by grave diggers in 1833.

As demonstrated recently at the Earl's Palace, Kirkwall, geophysical survey can provide information rapidly where archaeological information and understanding is lacking. Here the survey was used to assess whether an area of the site earmarked to temporarily hold a portacabin for staff welfare was of archaeological significance. Previous investigations in the wider area following the removal of a modern tennis court had indicated that garden and landscaping deposits related to the main occupation of the palace lay at a shallow depth, but nothing was known about this specific location. Rapid resistivity survey was undertaken in one day by Rose Geophysics with the results made available the day after. Indicating that the specific area was not sensitive and that the portacabin installation could go ahead, the survey also 'tentatively suggested that more distinct anomalies have been noted which may be archaeologically significant,

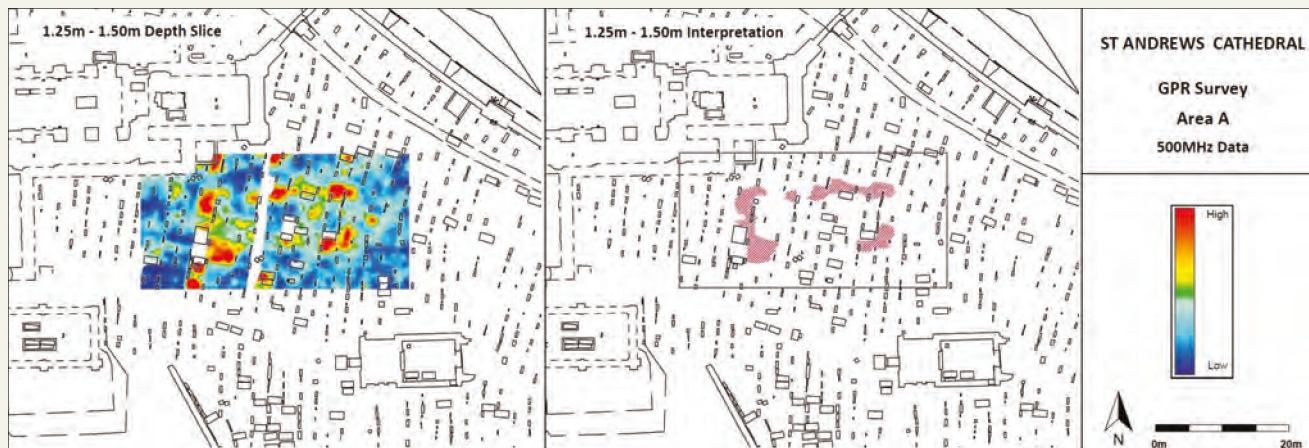
potentially indicating structures and walls associated with the former garden', providing us with baseline information and future research objectives.

Geophysical survey has an important role in engaging with communities, and in

developing interest in STEM (Science, Technology, Engineering, Maths) amongst school pupils. In 2019 Historic Environment Scotland was approached by the recently reinvigorated Historic Hilton Trust (HHT) to develop a project around the spectacular carved stone and chapel site in Easter



GPR survey being undertaken at St Andrews Cathedral, Fife. Credit: Historic Environment Scotland



Depth Slice from GPR survey at St Andrews Cathedral. Credit: Historic Environment Scotland



Results of the resistance survey at Earl's Palace, Kirkwall. Credit: Historic Environment Scotland

Ross (the original stone is on display in the National Museum of Scotland). The site, which is an HES Property in Care, is owned by the HHT, who also look after the base of the Hilton of Cadboll stone following its excavation in 2001. There is a strong interest in archaeology and history amongst the local community, who have a deep connection with the site and are very proud of it. Initiatives include outreach with

the local school and fundraising activities such as Picts in the Park, which was held in 2019.

A joint project by HES and HHT planned to start in April 2020 has been postponed because of Covid-19. A geophysical survey of the entire site is planned, involving local school pupils, to be followed up with some small-scale

investigations. Working with the HES Learning and Inclusion team, the project hopes to develop its Junior Guide scheme with local children. At the heart of it is engagement with the local community, as they value the site highly and want to see it better understood and appreciated. We hope to be able to start the project later in 2021 once the Covid-19 situation has become clearer.

Stefan Sagrott

Stefan is an archaeologist in the Cultural Resources team at Historic Environment Scotland, where his work contributes towards the management and conservation of the archaeology and cultural significance of the HES estate. His job necessitates him having a broad range of research interests across many periods and he is particularly keen on the use of geophysics, airborne laser scanning and photogrammetry for cultural heritage survey and protection. Stefan is Treasurer of the ClfA Scottish Group.

