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Journal article

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Introduction

A programme of magnetic gradiometry survey was undertaken on two areas of land west of Fonmon Castle centred at ST038680 and ST044680. The project was instigated following an invitation to develop a programme of research and training. The aims are to enhance understanding of the environs and long-term historical context of Fonmon Castle by identifying and characterising evidence for multi-period activity, settlement, and land-use within the castle estate. To these ends, a programme of non-invasive, landscape-scale geophysical survey was undertaken on an area of known archaeological potential to the west of the castle. It is anticipated that this will become the first phase of a wider programme of research.

Fonmon Castle has been continuously occupied since the 13th century and was originally a ringwork with a stone tower keep, now incorporated into an impressive 18th century mansion (Moore 1985; RCAHMW 2000; Thomas 1999). The castle estate lies within a rich archaeological landscape and is adjacent to a cluster of valley-edge defended enclosures of probable late prehistoric and/or Romano-British date (Davis 2017). Enclosures and ring ditches have been identified from crop/parch marks on oblique aerial photographs within the survey area, but their proximity to Cardiff Airport means they are not regularly monitored (Driver 1995; Toby Driver *pers comm.* 2021). Little archaeological investigation has previously been undertaken within the survey area, although it was included within a limited programme of fieldwork undertaken as part of the Cadw-funded *Romano-British South East Wales Settlement Survey* (Evans 2001a; 2001b). Excavation is restricted to a single trench cut across the ditch of Castle Wood enclosure (PRN: 02411s; Evans 2001b: 161-64). Evans' excavation was supplemented by a programme of field walking that identified low densities of Romano-British and medieval pottery across the survey area (Evans 2001b: 13-16).

The survey area is bound on the north and west by the southern edge of the Kenson valley, by the B4265 to the south, and the castle grounds and the valley of the Ffwl-y-mwn beyond to the east (see Figure 1). The eastern part of the survey area is a relatively flat and exposed plateau of c. 30MOD that dips slightly as it approaches the valley edge to the north. The western part rises from the margins of a dry valley at c. 15MOD to the plateau. The bedrock geology is formed from the Porthkerry Member of the Blue Lias Formation, which is covered by thin, free-draining soils of the Ston Easton association. The survey focuses on part of what was the demesne of the medieval castle which included a rabbit warren (Davies 1955). This area was enclosed by the early 17th century and analysis of historic maps show that with the exception of the construction of the B4265 there is been comparatively little post-medieval landscape change.

Methods

The fieldwork took place between July 5th – 16th 2021 and was undertaken in accordance with ClfA (2008) and EAC (Schmidt *et al.* 2016) guidelines. The survey area was divided between eastern (Area 1) and western (Area 2) zones that were surveyed separately. A standing crop in the field between Areas 1 and 2 prevented it from being surveyed (see Figure X). The low ground cover in most parts of Areas 1 and 2 presented few obstacles, but a standing crop of wildflowers along with fenced enclosures and installations associated with the castle grounds prevented complete survey of parts of Area 1 (see Figure 2).

The magnetic data were collected using a SensYS MX PDA 5-channel cart system. Positional referencing was provided by a Carlson RTK GNSS Smart Rover. The cart was mounted with 5 FGM650 probes which were set to 0.5m spacing. Data points were recorded every 0.2m. Data were collected by traversing the fields along the longest possible lines in a zig-zag fashion. The in-built navigation system and flags were used to ensure that adjacent tracks were parallel and spaced correctly. There were few technical issues with the survey, but maintaining straight and parallel tracks could be difficult on sloping or uneven ground and some tracks in Area 1 appear to have been affected by ferrous contamination on the operator. The data were downloaded to a laptop and synched with coordinates in *DLMGPS*. The assembled data were then exported to *MAGNETO* for initial imaging and data checking. The final data were exported as ASCII files for processing in *Terrasurveyor*. The data were clipped and destriped, but no additional processing or filtering has been applied. The data were then imported into *Surfer* where it was interpolated to a 0.2m node spacing.

Results

The data are generally of a good quality, but it has not been possible to remove all of the ‘tracking’ effect produced by the survey cart. Nevertheless, a range of anomalies can be identified (see Figures 2 and 3). The anomalies include features of geological and post-medieval/modern origin, and an area of disturbance created by powerlines. These are described discussed in the full report (Seaman 2021).

Features that are particular archaeological interest are shown on Figure 4 and discussed below.

Site Name	National Grid Reference	HER: Primary Reference Number	National Primary Record Number	Description
Castle Wood	ST 04456 68235	02411s	89372	A single ditched enclosure, c. 75m x 29m (0.16ha). A simple gap entrance c. 6m wide faces the SW. No evidence for a bank, palisade or internal features is clearly visible. The area of high magnetism within the enclosure is produced by a modern installation. The ditch is likely to run beyond the survey area to the E and N. The enclosure may have been built against the edge of the valley to the N, but there is sufficient space for a complete enclosure. This site has previously been considered by Driver (1995) and Evans (2001b).
Castle Wood II	ST 04297 68252	-	-	Three segments of a ditch forming an oval enclosure. The enclosure is bisected by a field boundary and dense ground cover prevented survey of the SW corner. The enclosure is c. 90m x 71m (0.54ha). Satellite imagery suggests there is a W-facing entrance that is now obscured by the field boundary, but a curving flanking ditch is visible to the on its N side. The E side of the enclosure ditch is partly obscured by a series of strong positive anomalies interpreted as a 1940s bomb crater that was backfilled in the 1970s (<i>pers comm.</i> Alun Taylor). No evidence for a bank is clearly visible; some areas of enhanced magnetism and dipolar anomalies may represent internal features.

Castle Wood III	ST 04201 68225	-	-	Four segments of ditch forming part of the E, N, and W sides of a sub-rectangular enclosure. The anomalies are noticeably weaker than those of the other enclosures. The enclosure is c. 28m x 47m (0.12ha). Some of the gaps may represent entrances, but this cannot be confirmed. No evidence for a bank or internal features is clearly visible.
Llancadle South A	ST 03774 68049	02406s	89366	Two segments of ditch forming the S side of an enclosure. The ditch rises from the edge of the Kenson valley and curves SE for c. 30m before running E for c. 75m along the break of slope. It then turns N before running into an area of magnetic disturbance. After this its course is not discernible. A simple gap entrance of c. 4m faces south. Possible internal features are considered below, but include a sub-rectangular enclosure (Llancadle South II), ditches, and dipolar anomalies possibly associated with occupation. No bank is clearly visible, but the E end of the ditch appears to kink around an area of enhanced magnetism. It is not clear from neither the gradiometer data nor the aerial photography whether the ditch continues further N to the valley edge (thus forming an enclosure of c. 0.9ha). It could therefore be incomplete. This site has previously been considered by Driver (1995).
Llancadle South II	ST 03792 68100	02943s	-	A sub-rectangular enclosure c. 27m x 26m (0.06ha) centrally positioned within Llancadle South A. Possibly double-ditched on the W side. No entrance is clearly discernible, but there may be a c. 2m gap in the NW corner. An area of enhanced magnetism in the S and E part of the enclosure may represent internal features associated with occupation, but no house structures are clearly discernible. A series of linear anomalies aligned broadly NNE to SSW intersect with and lie to the W of the enclosure. These are less clearly defined and appear to be segmented. They may represent an interrupted-ditch enclosure built against the valley edge to the W, but other interpretations are possible, including the accumulation of anthropogenic material from the enclosure within lineations in the bedrock.
Llancadle South III	ST 03933 68066	-	-	A complex consisting of three sections of ditch. Potentially forming an enclosure of at least 51m x 13m). The NW ditch curves to the NE, whilst the W and S section is straight sided with a 90° turn. The notional enclosure is bisected by a third ditch. The ditches

				<p>appear to converge on a c. 3m wide gap on the W side. The ditch fills are noticeable magnetically enhanced around this gap. An area of enhance magnetism in the S of the enclosure may represent evidence for internal activity. The ditches appear to extend under the field boundary to E. This field could not be surveyed, and any continuations of the ditches are not clearly visible on the satellite imagery.</p> <p>A series of positive and dipolar anomalies lie between Llancadle South A and III. These include short sections of ditch, possibility associated with dipolar anomalies. Two sections of ditch to the S run on an NW-SE alignment for 70m, and appear to be cut by a modern drainage channel and late/post medieval field boundary.</p>
Llancadle South B	ST 03714 67980	02417s	89365	<p>Two ring ditches. C. 8m and 12m in diameter. The S part of a third ring ditch (at least 9m in diameter) may lie immediately to the N. The ring ditches could represent round houses or barrows, but their slight irregularity might support the former. Both have SE-facing gaps, but no unambiguous entrances are visible. A series of positive anomalies could represent domestic features including hearths and corn drying kilns. There is a notable cluster of dipolar anomalies in this area and to the N.</p>
Castle Field	ST 04421 67941	-	-	<p>Two parallel sections of ditch, potentially forming part of a trackway. The ditches run SSW – NNE for c.35m and then turn N-S for a further c. 20m. The ditches are on a different alignment to the later field boundaries and drains. They are c. 8m apart and whilst segmented appear to represent a unitary feature. The W ditch may extend a further c. 25m to the S. Positive features extending to the E and W of the N section may represent associated enclosures. Further sections of ditch lie to the E.</p>

Table 1: Anomalies associated with earlier archaeological features. See Figure 4.

Discussion

The use of a cart system gives the potential for landscape-scale geophysical survey. The data provide abundant evidence for archaeological activity within the survey area and significantly improves our understanding of settlement and land-use in the castle estate. Archaeological features include: six enclosure sites, a possible roundhouse or barrow complex, a section of track way, and a possible segmented ditch enclosure. Evidence for fields systems associated with these is limited, but the trackway may be associated with the enclosure sites. Some of the features identified in the geophysics have been previously detected as crop/parch marks, but the gradiometry data has identified new sites and provides a greater level of detail. Consideration should therefore be given to expanding survey to other parts of the estate, particularly the field between Areas 1 and 2.

Castle Wood II and Castle Wood III occupy a field that contained a warren in the late/post-medieval period, but the enclosures are unlikely to be associated with rabbit farming. It can be suggested that the enclosure sites were used for settlement activity, but evidence for internal structures are limited and other interpretations, such as stock enclosures, are possible. The central position of Llancadle South II within Llancadle South B might suggest contemporaneity and/or deliberate re-use, but it is not possible to say whether the latter is complete. The possible alignment of the entrances of Castle Wood II and III may also suggest an association. Dating evidence for all sites is limited. The roundhouse/barrow complex is likely to be Bronze Age or Iron Age. Curvilinear and sub-rectangular enclosures are generally interpreted as Iron Age and/or Romano-British, but Bronze Age and early medieval activity is also possible (Davis 2017; Driver 1995; Evans 2001a). The single sherd of Black Burnished Ware from the upper fill of the ditch of Castle Wood I and occasional surface finds of flints and Roman pottery identified through fieldwalking tentatively support late prehistoric or Romano-British activity, but further dating evidence is needed. Nevertheless, the survey data supports previous observations that enclosure sites in the Vale of Glamorgan favour valley-edge locations and that settlement evidence is sparser on the lias plateaus that were presumably the focus of agricultural activity (Evans 2001a: 32).

The sites identified in this survey present significant opportunities for further research. Targeted excavation and further survey could resolve interpretive ambiguities, allow for assessment of levels of preservation, and provide evidence on dating, use and function. The limited excavations at Castle Wood I suggested that preservation of charred plant remains was good and so there is also potential for recovery of environmental and economic data (Caseldine 1999). It is rarely possible to examine clusters of sites within a single study area and systematic examination through a focused programme of excavation and dating could yield data of national significance.

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Captions for Figures

Figure 1: Location map (OS MasterMap® Ordnance Survey (GB), Using: EDINA Digimap Ordnance Survey)

Figure 2: Survey Area 1. Scale in nT (OS MasterMap® Ordnance Survey (GB), Using: EDINA Digimap Ordnance Survey)

Figure 3: Survey Area 2. Scale in nT (OS MasterMap® Ordnance Survey (GB), Using: EDINA Digimap Ordnance Survey)

Figure 4: Interpretation of archaeological features. (OS MasterMap® Ordnance Survey (GB), Using: EDINA Digimap Ordnance Survey)





