

Centre for Archaeological Fieldwork
School of Archaeology & Palaeoecology
Queen's University
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Geophysical Survey Report: No. 002

Undertaken in conjunction with the
School of Archaeology & Palaeoecology
Excavation Module
Killyglen, Co. Antrim





Killyglen, Co. Antrim

Geophysical Survey Report

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CAF GSR 002

1. Introduction

1.1 General

1.1.1 The following report details the results of a resistivity survey undertaken at Killyglen in July 2004. The geophysical survey was completed in conjunction with an excavation of the site led by Dr Tom McNeill on behalf of the Environment and Heritage Service: Built Heritage. The fieldwork programme was undertaken as part of the School of Archaeology and Palaeoecology (QUB) excavation module.

1.1.2 The geophysical survey was completed using a Geoscan FM4 Resistance Meter (Appendix One). The survey data was processed and interpreted using a Beta 0.8 software programme.

1.2 Background

1.2.1 The complex of monuments at Killyglen (SMR No. ANT 035:022), three kilometres west of Larne (Figure One), consists of a partially destroyed motte, a derelict church (SMR No. ANT 035:023) and a series of earthworks (Figure Two). The mound and associated ditch survive to a 20.0 metre radius. However, the site has been truncated through its centre by an east – west aligned 8.0 metre trench. The ruined church of St John of Kilglen is situated to the west of the mound and is partially surrounded by a rectangular earthwork, cut by a field boundary on its eastern side (Figure Two). To the west of the church are a number of earthworks, the largest of which is a probable house platform, set within a sub-rectangular enclosure. The motte stands at 125 metres above sea level, with the church remains 130 metres above sea level. The monuments are set on the edge of a terrace, with the ground falling sharply to the south and east (Figure Three).

1.2.2 The earliest historical reference to the site is in the 1333 Inquisition, held after the death of William de Burgh, Earl of Ulster. The enquiry listed "...at Kylglen 2 carucates, 15 acres let for £2.15.10" (Orpen 1913, 138). Two free tenants and a fortnightly court for external suitors suggest that this may have been part of a small manorial centre.

1.3 Geology

1.3.1 The bedrock of the site is white limestone of the Ulster White Limestone Formation. Residual weathering of the limestone over a prolonged period resulted in a deposit of

'clay-with-flints'. Below the white limestone are deposits of sandstones, marl and conglomerate which comprise the Hibernian Greensand Formation. North and west of the site the chalk is overlain by basalt flows, the most dramatic feature of which is now the Sallagh Braes. The coastal area to the east of the site comprises a complicated sequence of earlier deposits which have been further disturbed by faulting. These deposits are mainly of Permian mudstone. These rock deposits could potentially show up on the processed geophysical data as large outcrops – this was the main reason why resistivity was chosen over a gradiometer survey.

1.4 *Credits and Acknowledgements*

1.4.1 Assistance during the course of the survey and the preparation of this report was kindly provided by: Dr Colm Donnelly, Nicholas Beer, Ruth Logue and Keith Adams (CAF); Dr Tom McNeill and John Davison (QUB); Samuel Moore (landowner).

1.4.2 The student excavation team consisted of: Ross Bailey, Naomi Berry, Zandra Bill, Kieran Coghlan, Rebecca Enlander, Matthew Gamble, Jonathon Glover, Seana McAuley, Emma McCleary, Laura McCool, Ray Mitchell, Fiona Moore, Joanna Preston, Emma Smyth and Ross Stevenson.

2. Geophysical Survey

2.1 General

2.1.1 The geophysical survey was undertaken in the field to the west of the motte and to the east of the church (Figure Four). This area was selected to investigate the potential location of a settlement between the two upstanding monuments. Excavation trenches were to be placed over geophysical anomalies in order to ground-truth the results. The resistivity method was preferred as the presence of basalt boulders in the sub-soil would have disrupted and affected any gradiometer survey (see section 1.3). Ten 20 x 20 metre grids were laid out to the south a known field boundary 'A' (Figure Four).

2.2 Results

2.2.1 The results of the resistivity survey can be seen in Figure Five. Due to an obstruction, 4.7 metres of the two grids at the western extremity of the survey area had to be 'dummy logged' – this is where a zero reading is given (represented by the red areas on the survey data). Five major anomalies were recorded, with analysis of each anomaly given below.

2.2.2 Anomaly i

This feature was a curvilinear area of low resistance. This would indicate that this was a negative feature, approximately 10 metres in width. The position of this feature correlates with the position occupied by the ditch associated with the motte. Given its large width, it is reasonable to assume that the ditch has silted significantly. The motte is a scheduled monument and the ditch lies within the scheduled area. Given this, excavation of the feature was not possible.

2.2.3 Anomaly ii

This feature was an area of high resistance. This would indicate the presence of a positive (upstanding) feature approximately 25 metres in length, with a varying width between 7 to 10 metres. Subsequent excavation revealed a stone feature, and it is likely that this anomaly represents the collapsed remains and foundation cut for the enclosing wall that once surrounded the churchyard (Plate One).

2.2.4 Anomaly iii

Anomaly iii was characterized by an irregular area of high resistance approximately 30 metres (east – west) by 15 metres (north – south) in scale. This area was not archaeologically investigated. However, given the large size and type of reading this feature gave, it is likely that it represents a geological phenomenon, rather than an archaeological feature.

2.2.5 Anomaly iv

Anomaly iv was recorded as a single area of low resistance (indicating a negative feature), approximately 2 metres in width to the immediate east of Anomaly iii. Subsequent excavation revealed a single curving gully (Plate Two), and several post-holes.

2.2.6 Anomaly v

Anomaly v consisted of five sub-circular areas of low resistance surrounded by an area of high resistance (di-polar readings). These results suggested that there would be material (for example stones or rubble), within another feature (for example a gully or series of pits). Excavation revealed a series of stones situated within a negative cut feature (Plate Three).

3. Conclusion

- 3.1.1 Of the five main anomalies recorded during the course of the resistivity survey, ground-truthing investigated and verified three of them as archaeological features and deposits (Anomalies ii, iv and v). Anomaly ii is likely to represent the remains of the enclosing churchyard wall. Excavation recorded Anomaly iv as a negative feature; however, its exact function is unclear. Anomaly v has been interpreted as a cut feature containing a stony deposit. Given its location, shape and size, Anomaly i almost certainly represents the remains of a silted ditch surrounding the motte.
- 3.1.2 The survey set out to investigate the possibility that settlement remains might exist between the upstanding remains of the motte and St John's Church. The geophysical survey and subsequent excavation has shown that this is not the case. Therefore, if any settlement is associated with Killyglen, it is located elsewhere in the fields surrounding the scheduled site.

4. Bibliography

Orpen, G.H., 1913: "The Earldom of Ulster". *Journal of the Royal Society of Antiquaries of Ireland* 43, 30-46; 133-143.



Plate One: Foundation cut and stone remains of the enclosing wall (Anomaly ii).



Plate Two: Area identified as Anomaly iv after excavation.



Plate Three: Anomaly v after excavation.

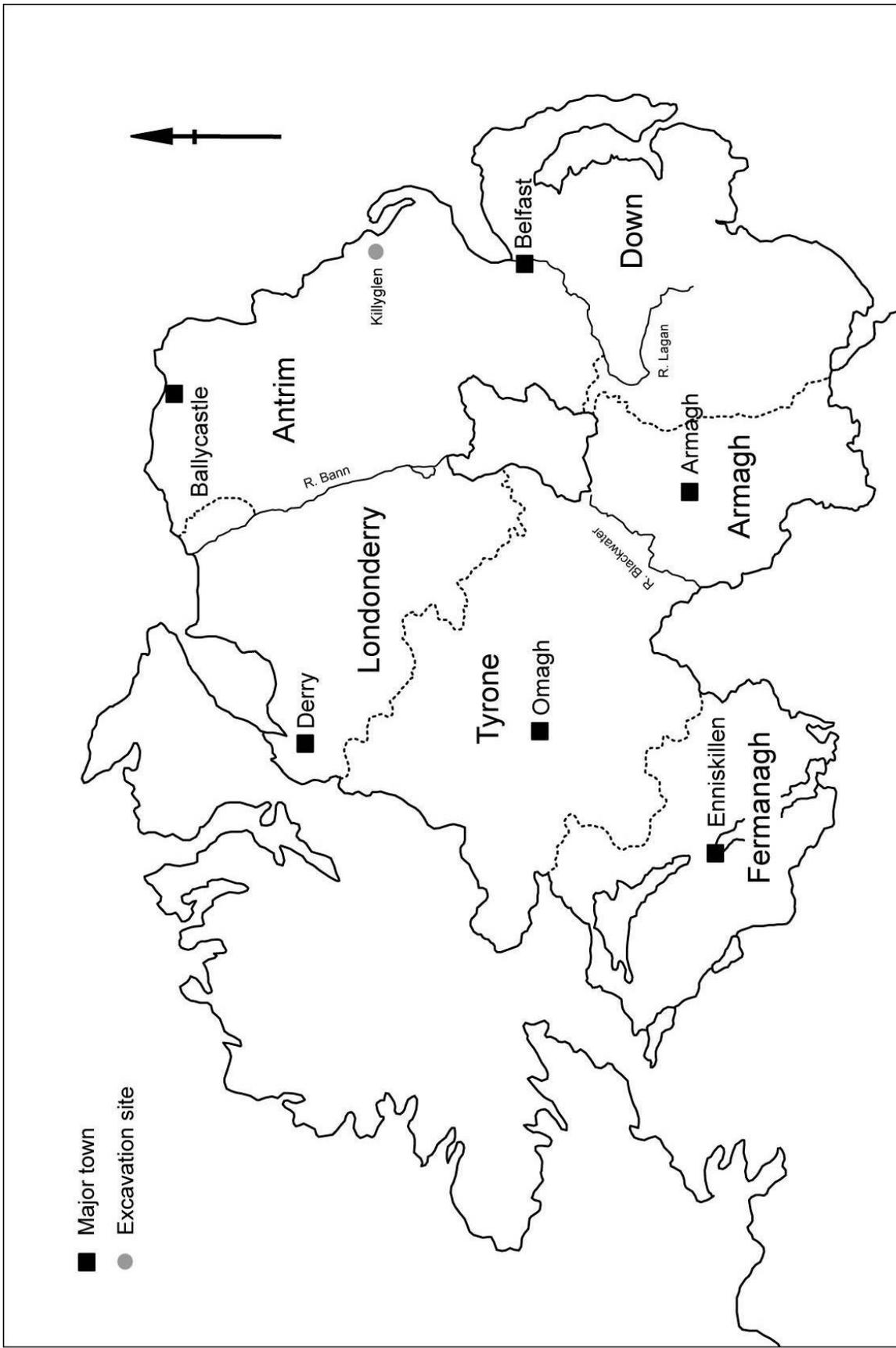


Figure One: Site location map.

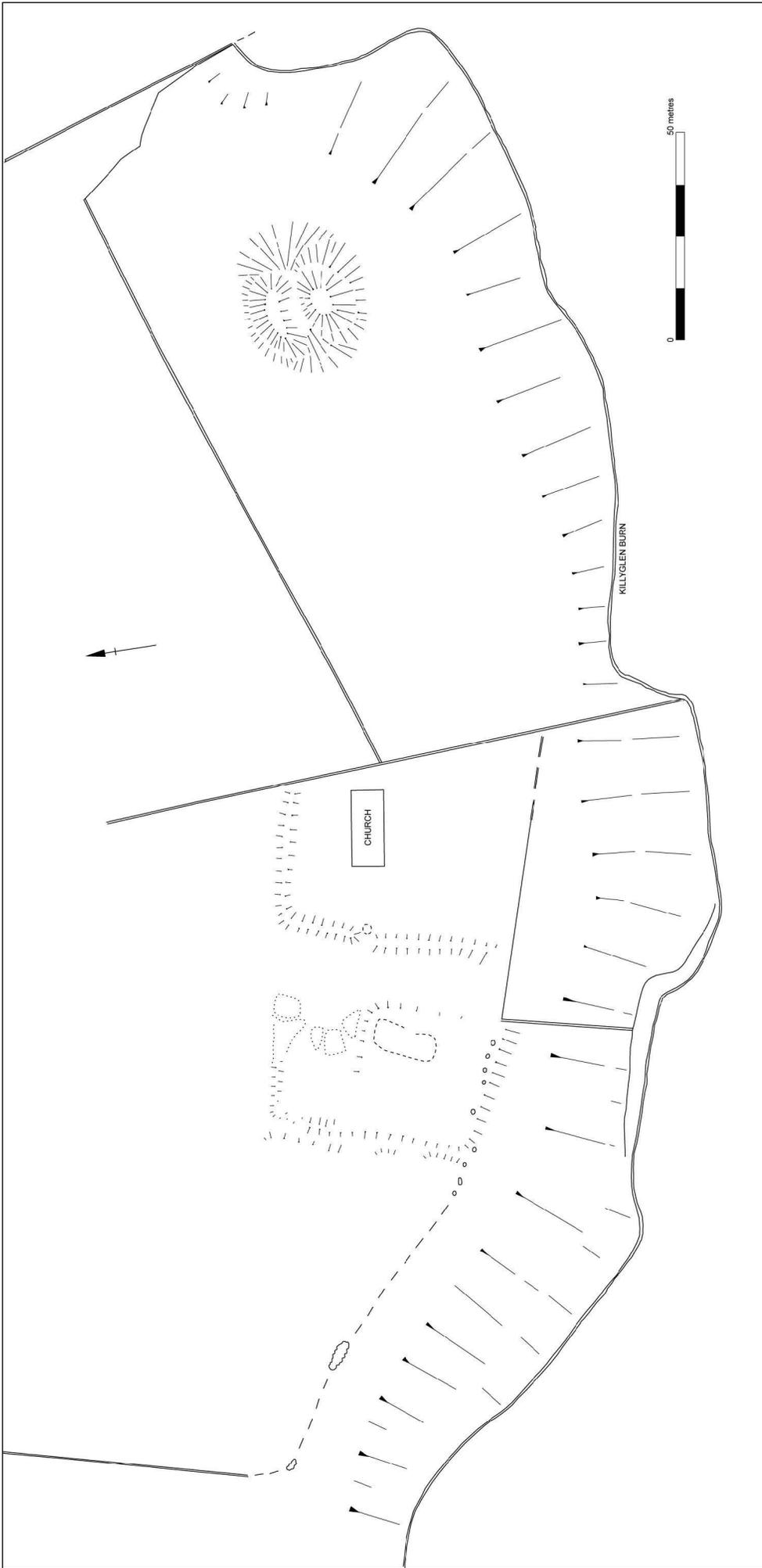


Figure Two: Survey of Killyglen

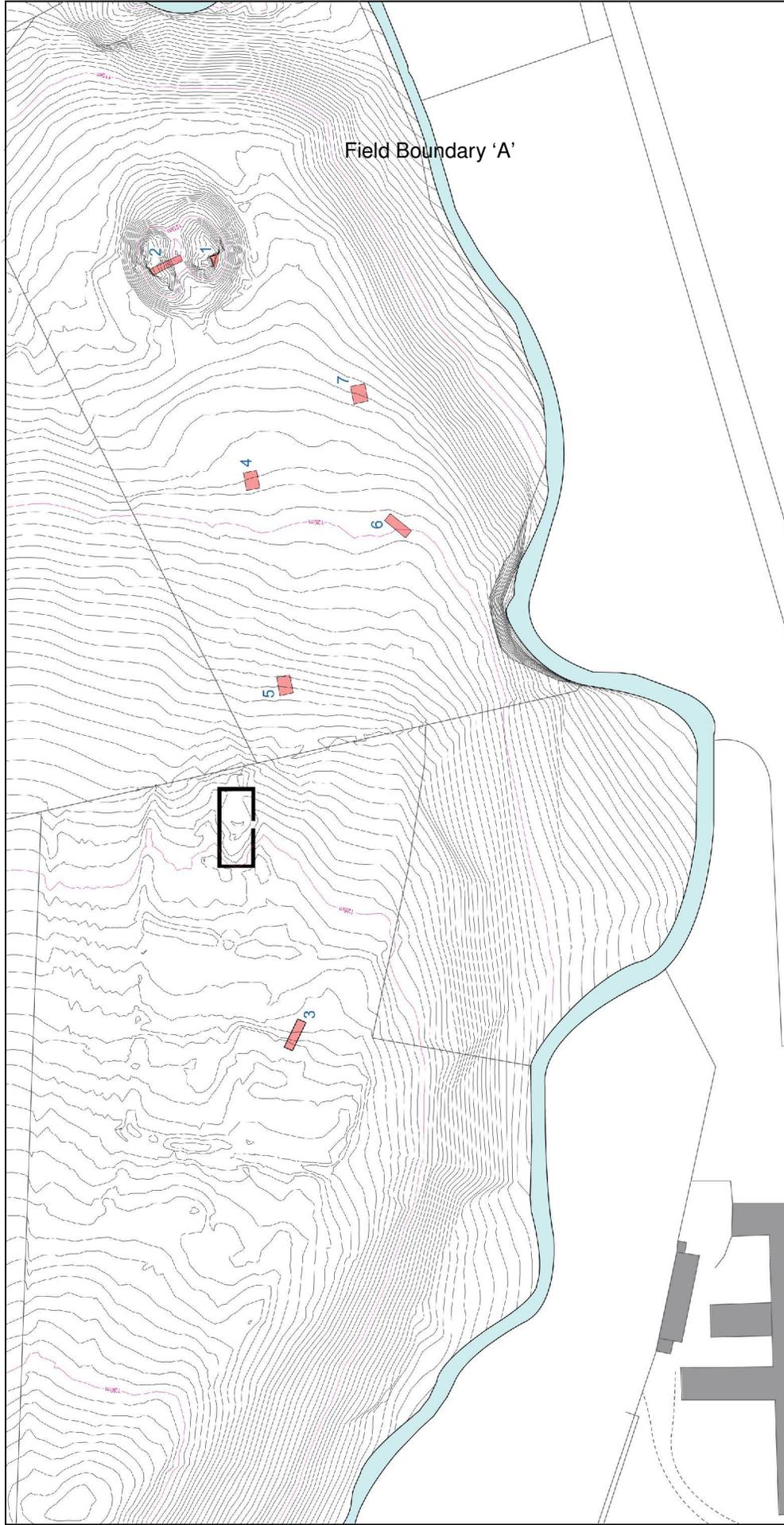
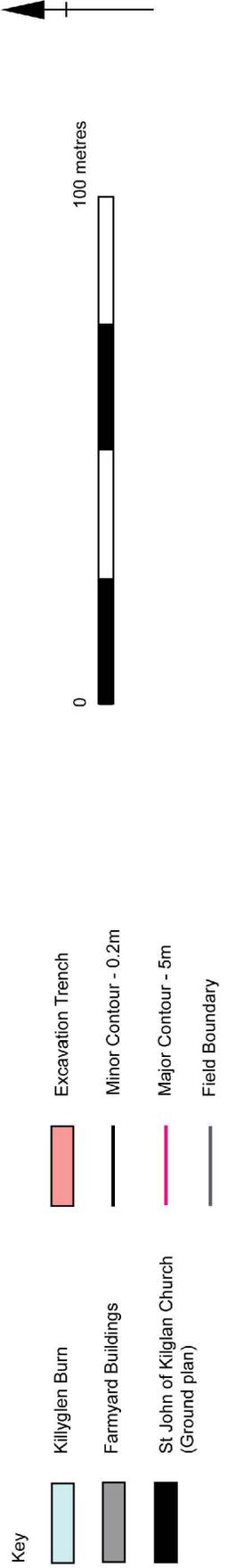
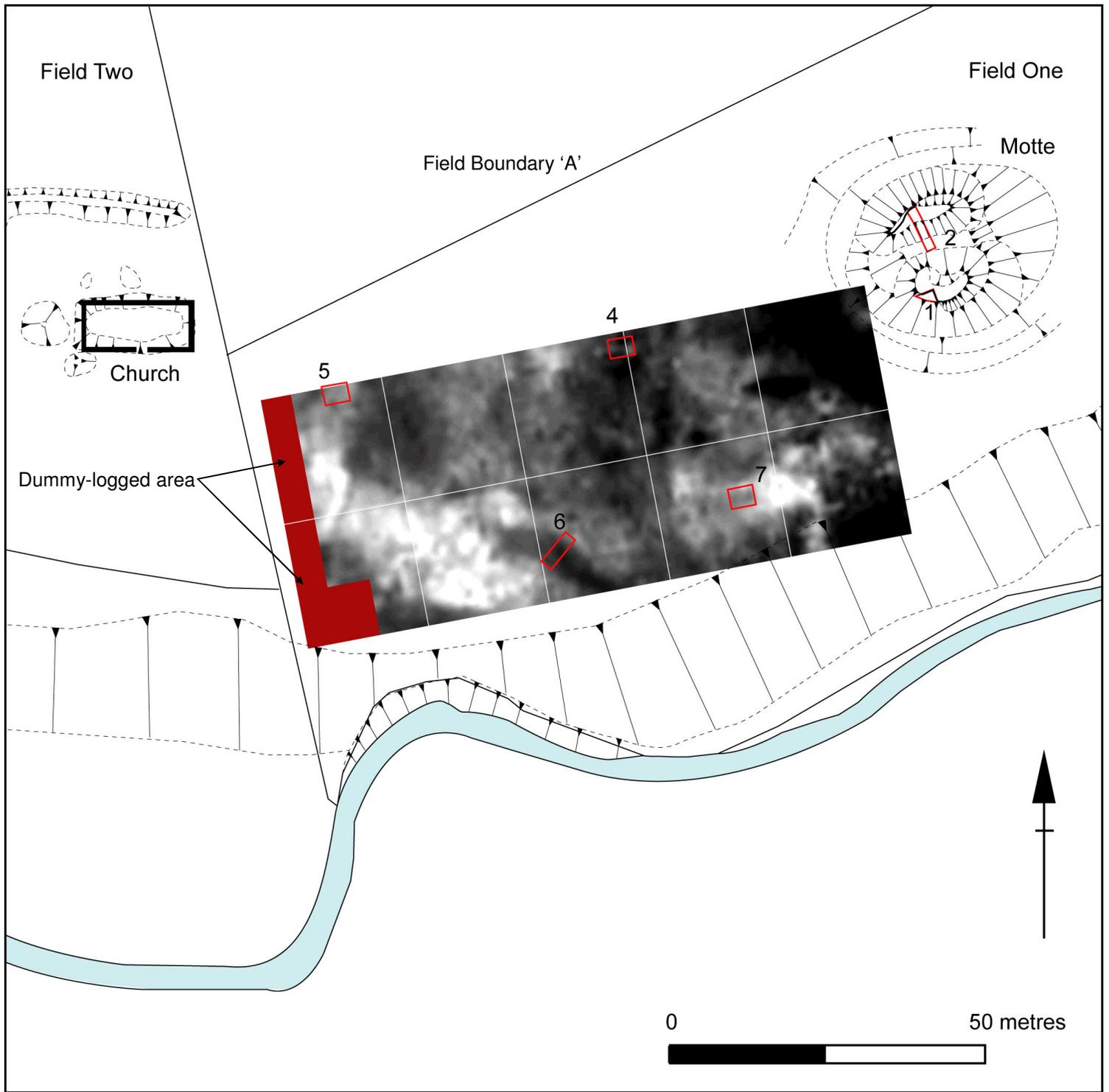


Figure Four: Topographic Survey of Killyglen, showing excavation trenches, motte and ground plan of St John's Church.





Key

- | | | | |
|---|--|---|-------------------|
|  | Killyglen Burn |  | Excavation Trench |
|  | St John of Kilglan Church
(Ground plan) |  | Field Boundary |

Figure Four: Location of survey area with subsequent excavation trench positions.

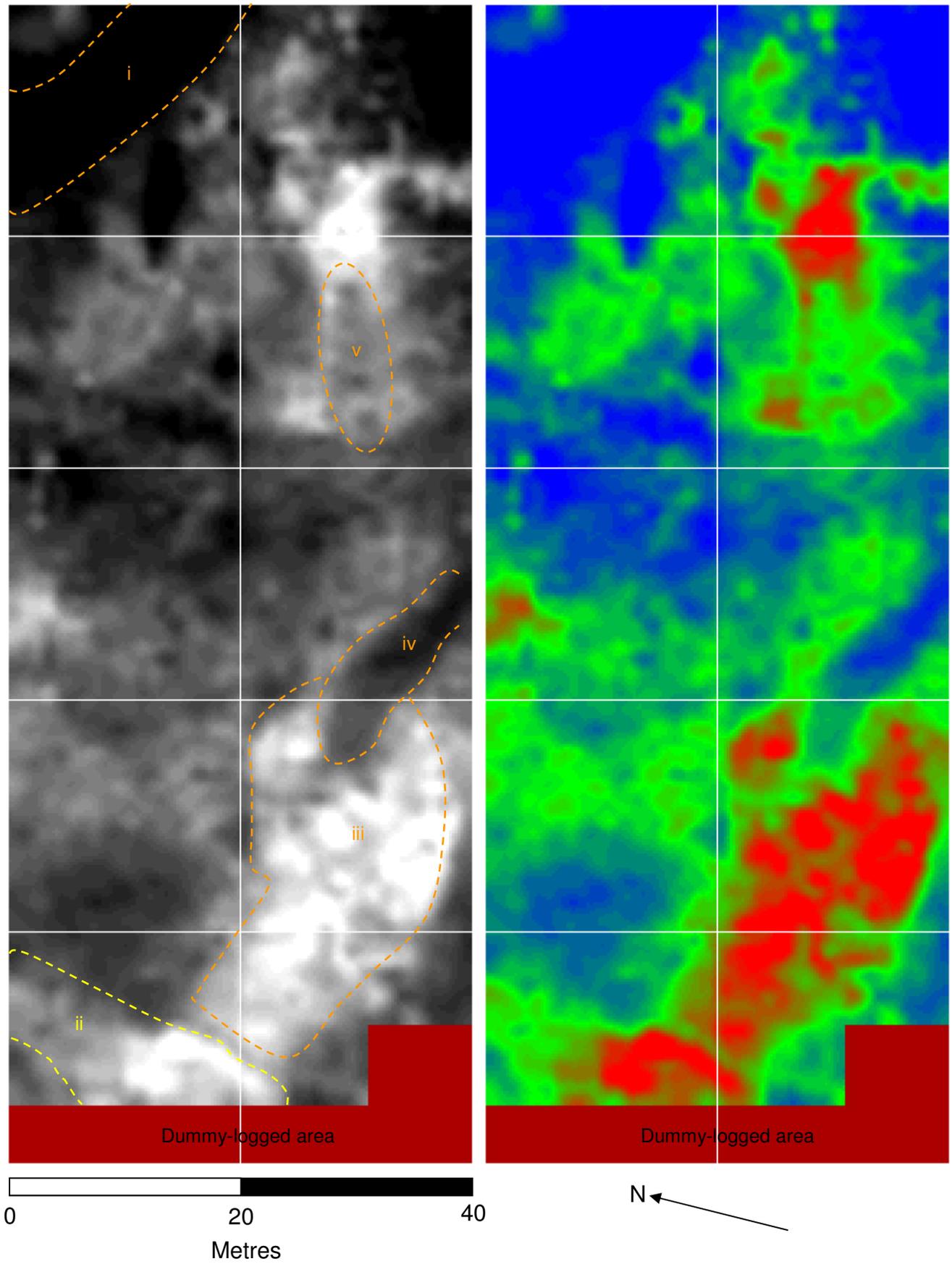


Figure Five: Greyscale (interpreted) and coloured plots of the geophysical data gathered from Killyglen.

Appendix One: Hardware Specifications

Transmitter

Output voltage: 40 V

Constant current ranges: 1 mA (0.33mA - HCR mode)

Max. contact resistance: 40 Kohm (120 Kohm - HCR mode)
< 0.6%, plus < 0.2 ohm +/- 1 digit

Receiver

Resistance ranges: +/- 20 ohm +/- 200 ohm +/- 2000 ohm
(x3 in HCR mode)

Resolution (ohms): 0.01 ohm 0.1ohm 1ohm
(x0.33 in HCR mode) < 1% / V

Power supply sensitivity: 137.5 Hz

Operating frequency: 100 Mohm in parallel with 1000 pF

Receiver input: 13 Hz to 700 Hz, -3dB points

Impedance: Approx. 1 second for 0.5 % accuracy

Bandwidth: Approx. 2 seconds for 0.5 % accuracy

Response time-Rural Filt: + / - 2 V

-Urban: + / - 2 V fsd each range

Filt: Logic levels 1 = - 0.7 V wrt battery +ve

0 = - 4.7 V wrt battery +ve