



Geophysical Survey Report 19

The O'Connor's Stronghold, Co. Armagh





The O'Connor's Stronghold, Co. Armagh

Geophysical investigations at the site of a 17th century outshot chimney stack

SMR No.: ARM 002:001

Grid Ref: H 9299 6425

On behalf of

Northern Ireland Environment Agency (NIEA)

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CAF GSR 19

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1.0 Summary

1.1 Site Specific Information

Site Name: The O'Connor Stronghold

Townland: Maghery

SMR No.: ARM 002:001

The remains of the O'Connor stronghold and its immediate vicinity are in state protection.

Grid Ref.: H 9299 6425

County: Armagh

Dates of Survey: 24th-25th April 2012

Surveyors: Sapphire Mussen and Cormac McSparron, Centre for Archaeological Fieldwork, Queens University Belfast.

Size of area surveyed: 0.16 hectares

Weather conditions: Inclement, high winds

Geology: Bedrock geology of clay, sand and lignite with alluvium deposits

Current land use: Grazing fields

Survey type: Electrical resistance

1.2 Abstract

A limited geophysical survey was carried out in April 2012 which covered the area immediately surrounding the upstanding chimney stack. This revealed a number of definite linear anomalies of both high and low resistance levels which appear to be consistent with boundaries, ridges and paths which can be viewed in aerial photographs of the site. A number of amorphous high resistance spreads and linear features around the site may be indicative of garden features, surfaces or walls associated with the 17th century house, or remains of earlier structures on the island. There appears to be a superimposition of anomalies of contrasting resistance levels which would be suggestive of successive periods of use and alteration of the site. Unexpectedly, the area immediately surrounding the chimney stack gave very little in terms of positive earth resistance readings although this could be indicative of a lack of sunken foundations which would be typical of houses of the period. Interpretation and comprehension of the anomalies present has been greatly compromised by the size of the area surveyed. To attempt to establish a clear understanding of this site from such a small survey area is almost futile and it is advisable that future survey work be carried out on a greater area to add to and enhance our current understanding of the site.

2.0 Introduction

This report details the results of an investigative geophysical survey carried out at the site of O'Connor's Stronghold in County Armagh. It is identified in the Northern Ireland Sites and Monuments Record (NISMR ARM 002:001) as the remains of a 17th century fortified house. Only an outshot chimney stack now survives and the surrounding land is used for grazing purposes. Wide ridges and furrows encountered when walking over the site provide evidence of a period of lazy bed cultivation. The site occupies an area of raised land on the northern coast of Derrywarragh Island which is situated on the south-western tip of Lough Neagh, a short distance from Coney Island and cut off from the mainland by the River Blackwater and the Maghery canal (figure 1). Detailed information regarding the O'Connor's Stronghold is scant and it was proposed that through limited investigative geophysical research of the area immediately surrounding the upstanding chimney stack (figure 2), enough evidence would be uncovered to determine the extent of the house foundations and thereby provide an archaeological assessment of the site with a view to informing its future management strategy. This research was carried out in April of 2012 and a discussion of the results is provided in Section 8. Recommendations for further work are given in Section 9.

3.0 Background to the survey

- 3.1 The 2012 geophysical survey was carried out in an attempt to investigate the extent of the remains of O'Connor Stronghold. Written references to the monument are scant as it seems to have received very little academic attention. In 1837 the Ordnance survey memoirs refer to a ruin on the island that was known as 'the chimney's' (Day & McWilliams 1991, 121). Details of the original structure, its form, erection and destruction are all unclear, as are details regarding the origins of the name 'O'Connor's Stronghold'; In a letter written by T.G.F Paterson¹ in 1927 it is stated that the ruin is known locally as 'O'Neill's castle' and "Nobody in the district knows of O'Connor's Stronghold".
- 3.2 The surviving architectural evidence of the out-shot chimney stack at O'Connor's Stronghold suggests that it is the remaining section of a fine early 17th century house, having direct parallels with a number of other buildings from this period (Donnelly *et al.* 2004, 127).
- 3.3 During the first quarter of the 17th century, the land in which O'Connor's Stronghold is situated was owned by an English army captain by the name of Sir Toby Caulfield. Caulfield erected his principle residence at Ballydonnelly-now Castlecaulfield in County Tyrone and it has been suggested that the building on Derrywarragh Island may have been constructed by Caulfield as a

second residence either for himself, for his family, or as residence for one of his tenants in the period after 1607 (Donnelly *et al.* 2004, 127).

- 3.4 Thomas Philips' plan of 1685-86 of a proposed new artillery fort on Derrywarragh Island indicates that the new fort would have overlain the position of Caulfield's building with the inference being that the house had been abandoned by the 1680's or was viewed as being of such limited value that it might be demolished to enable the occupation of its site by the new fort. As such it can be suggested that the O'Connor's Stronghold had become ruinous or been destroyed by the end of the 17th century (Donnelly *et al.* 2004, 128). It is likely that work for the proposed new fort was never carried out and certainly never saw completion, perhaps Derrywarragh Island itself proved too uninhabitable.

4.0 Cartographic evidence

A proposed but never realised layout for an artillery fort to be constructed on Derrywarragh Island is depicted on a plan of the peninsula made in 1685-86 by Sir Thomas Philips² (figure 3). The location of this proposed fort overlies the location of the current ruins which could infer that at this stage, the early 17th century house had been either already abandoned or plans to demolish it were underway to allow for construction of the new fort. Subsequent maps of 1765 and 1785 depict a tower on the island (Brett 1999 cited in Donnelly *et al* 2004, 124). The 1st edition ordnance survey map of 1829-1835 denotes 'ruins' and the peninsula named as 'Derrywarragh Island' (figure 4). It is not until the revised 1857-1932 3rd edition ordnance survey map that the title of 'O'Connor's Stronghold' is first marked 'in ruins' (figure 4). Field divisions which run northeast to southwest across the site are shown on maps from 1857 onwards (figure 4). These divisions are now only evident on the ground in the form of earthen ridges.

5.0 The Survey Site

- 5.1 The scheduled monument of O' Connor's stronghold is sited on an area of raised grassland at the north-eastern tip of Derrywarragh Island, on the south-western shores of Lough Neagh (figure 1). The surveyed area covers 0.16 hectares in the immediate vicinity of the still standing out-shot chimney-stack (figure 2). The land rises in the form of a low mound to the southeast of the structure and is wholly furrowed by evidence of lazy bed cultivation ridges running along the same alignment as what appear to be earthen field boundaries (southwest to northeast). What appears to be an earth cut route way bounds the aforementioned mound of the site from southeast to northwest, skirting around the western edge of the survey site and ending at the north-eastern point of the island. To the northeast of the monument the island drops off in steep slopes to the shores of the Lough. The edges of Derrywarragh Island are delineated by rough hedge and thorn bushes. The land surrounding the monument is currently used as rough pasture for grazing and is fairly open to the elements. The strong winds which often come off the shores of Lough Neagh may be in part accountable for the deterioration of the monument itself.
- 5.2 The current upstanding structure consists of an out-shot chimney-stack of mortared basalt rubble with flues and fireplace hoods lined with red sandstone, standing to a height of approximately 10m. The fireplace hoods have collapsed on the north-eastern face to reveal an internal tiered flue system that would have served fireplaces on the ground, first and second floors within the now demolished main section of the building (Donnelly *et al.* 2004, 123). The decorative chimney shafts which crown the chimney stack are of red brick. The location of three fireplaces in the north-eastern face of the structure, along with a number of put-lug holes for floor and ceiling supports would suggest that the now demolished house stood on the north-eastern side of the surviving chimney stack.
- 5.3 Rapid deterioration of the structure during the 20th century can be gauged when a comparison is made between a photograph taken around 1910 from the south of the ruin and photographs taken during a survey of the structure in 2004 (Donnelly *et al.* 2004, 124). Such photographic evidence shows that the decorative brickwork shaft which was intact not so long ago, has since deteriorated and mostly collapsed leaving only a fragmented portion of brickwork in situ.

6.0 Survey specific information:

6.1 Details of equipment and methodology employed;

Survey type	Earth Resistance
Instrumentation	Geoscan RM15 resistance meter and MPX15 multiplexer
Probe/sensor configuration	Parallel twin (3-probe)
Probe/sensor spacing	0.5m
Grid size	20m x 20m
Traverse interval	0.5m
Sample interval	0.5m
Traverse pattern	Zig-Zag
Spatial accuracy	Grids set out using a Leica TPS 705 series total station

6.2 The Survey

6.2.1 As stipulated in the research design, only a small area of the site was investigated for the purpose of determining the direction and extent of structural remains associated with the upstanding chimney stack. Thereby four survey grids (figure 2) were set out to cover a total area of 40m by 40m immediately surrounding the chimney stack.

6.2.2 An earth resistance survey of the gridded area was carried out on the 25th April 2012 using a Geoscan RM15 meter and MPX15 multiplexer. All grids were surveyed using a traverse interval of 0.5m and sampling interval of 0.5m. The results of the resistance survey are graphically presented in figures 5-8 and an interpretation of these results is given in table format (section 7), which should be read in conjunction with figure 8 which gives an interpretative illustration of the resistance survey data.

6.2.3 A brief discussion of the survey results is outlined in section 8 and recommendations for further work based on the results of the survey are set out in section 9.

7.0 Earth resistance survey results

Code	Description	Interpretation
r1	<p>Linear high resistance anomaly of regular width (approximately 2m) running in a shallow curve from northwest to southeast along the north-eastern edge of the survey grid. Runs directly between the current upstanding out-shot chimney stack and the steep north-eastern edge of the island.</p>	<p>The regular appearance and high resistance readings of this anomaly could suggest that it is a hard-core pathway the date of which is unknown as any evidence of a path here is absent from the Ordnance Survey maps of the island. The results indicate that it truncates all other detected features suggesting it is much later in date. The fact that it does not show up on any of the maps suggests that it may never have been officially surfaced.</p>
r2	<p>Banded high and low resistance anomaly running north to south across the north-western corner of the survey area, approximately 2.5m in width.</p>	<p>This anomaly represents a section of what appears to be a path or route way running from north to south along the break of the hill before curving off in an easterly direction across the site. The nature of the resistance suggests it is a path which has been dug out rather than trampled in. The low resistance area would represent the pathway itself and the finer bands of high resistance which flank it would represent the cast up material and cleared stone from the formation of the path. Whilst heavily denuded in places and overgrown this path is clearly visible on the ground and in aerial photography of the site. Its form on the ground with a flat area flanked by uneven ground on either side suggests that it has been purposely formed and possibly intended for use over a long period of time. As this feature does not make an appearance on any of the Ordnance Survey maps it could be suggested that it is much earlier in date, possibly early Christian.</p>
r3a-f	<p>Banded linear anomalies of high and low resistance running from southwest to northeast along the south-eastern edge of the site. r3a is fairly straight and regular</p>	<p>The banded appearance of these anomalies is likely a remnant of their formation. Linear earthen ridges of up to 0.6m and furrows are easily visible on the ground surface in this area of the site. They are also visible in aerial</p>

	<p>in width (approximately 2m). r3b is more bowed in shape but fairly parallel to r3a and is of roughly the same width. Flanking r3a and r3b and also lying directly between them are distinct areas of high resistance; r3c-r3f. All lie to the southeast of the chimney stack and run in a southwest to northeast direction. These anomalies are less distinctive towards the north-eastern end where they appear to have been truncated by the linear anomaly r1.</p>	<p>photographs in which a distinctive bowed shape not dissimilar to that of r3b can be seen. These ridges coincide with one of the field divisions marked on Ordnance Survey maps of the area from 1857 onwards (figure 4). Without knowing the exact nature of the original field divisions a definite explanation for the bands of resistance is difficult. It can only be suggested that the field divisions may have been low dry stone walls constructed of field clearance material which later tumbled and became covered with earth which would explain the lines of high resistance. The low resistance bands may be relict of ditches or gullies dug on either side of the field boundary which may rapidly have become silted up. The absence of such field divisions on the 1832 Ordnance Survey map and their appearance on maps from 1857 onwards would suggest that they were first constructed within this time period, probably whilst the site was in use for lazy bed cultivation which is also evident in the round surface of the site and which respect to the orientation of the field divisions. Evidence of the truncation of these anomalies by r1 is also evident in the ground surface suggesting that the field divisions were already in a state of disuse by the time this potential pathway was in regular use.</p>
r4	<p>Linear anomaly of low resistance approximately 2m in width running from southwest to northeast along the north-western edge of the survey area. Appears to be flanked by patches of higher resistance.</p>	<p>Likely to be evidence of lazy bed cultivation. Much of the survey area appears to have faint traces of this form of activity; r4 represents the most distinctive evidence. Lazy bed cultivation ridges are visible in the ground surface across the entire site and are likely to have compromised the discovery of other anomalies of archaeological distinction as the ground surface has been much disturbed and reused. If cultivation of lazy beds was taking place in the early to mid-19th century, the time in which the field</p>

		divisions first made an appearance on the Ordnance Survey maps, earlier 17 th century features would have been heavily truncated and loose stone likely removed.
r5a-c	r5a is a sub-rectangular high resistance anomaly about 1m in width and measuring a maximum of 5m from northeast to southwest and 7m northwest to southeast. r5b and r5c are amorphous areas of high resistance levels comparable to that of r5a. These are positioned directly to the west and south of r5a.	These high resistance anomalies may present evidence of structures or garden features associated with the 17 th century occupation of the site, particularly that of r5a which has a particularly structural appearance. Lazy bed cultivation of the site may have completely truncated or removed any 17 th century features and it is also possible that these anomalies are merely remnants of stone clearance from such activity.
r6a-d	Mid to high resistance anomalies, vaguely linear and running along the same alignment as the still standing chimney stack. r6a presents as an area of fairly high resistance measuring approximately 8m from northeast to southwest and 7m from northwest to southeast. Its south-western edge respects the line of the south-western face of the chimney stack. r6b-d are also high resistance anomalies respecting the same alignment as the chimney stack and none extend beyond the line of its south-western wall.	Poor definition suggests that these are imaging geological responses, with their linearity being caused by the processes of lazy bed cultivation in the layers of earth above. However, their location in proximity to the 17 th century chimney stack and their orientations along the same alignment means we cannot rule out the possibility that they present evidence of associated walls, foundation features or cobbled surfaces.
r7	Amorphous area of high resistance with an apparently straight south-western edge. Maximum dimensions of approximately 7m northeast to southwest and 10m northwest to southeast.	This feature may present evidence of underlying geology although it's somewhat artificial appearing straight south-western edge throws some doubt on this and it may be indicative of hard-core surfacing or cobbling associated with the 17 th century house.

8.0 Discussion of survey results

- 8.1 At a first glance the survey results are rather puzzling as the area immediately surrounding the supposedly 17th century upstanding out-shot chimney stack is almost completely featureless. The lack of resistance in this area would suggest that the area is completely waterlogged which would not be surprising given the fairly marshy nature of the site. However, as the remainder of the survey area is brought into view it can be seen that a number of high and low resistance anomalies are clearly being detected overlying a fairly homogenous background of low resistance. The low background readings are likely a result of the fairly waterlogged nature of the site however this proves to be of an advantage as any solid features or areas of hard standing within the site are presented in the form of very stark areas of high resistance. Through further processing of the raw results, particularly through the application of High Pass Filter to dilute some of the more broad background trends, some of the fainter resistance anomalies become somewhat clearer and may be separated from the background geology of the site.
- 8.2 Among the most obvious features detected in the survey are the paths or route-ways (r1 and r2). These were effectively imaged using the survey techniques employed and appear as definite linear features running across the western corner of the site and from northwest to southeast across the north-eastern edge of the survey area. They present as regular in width and can be seen quite clearly in aerial photographs of the site. The high resistance nature of r1 suggests that it is likely to consist of rough hard-core surfacing whilst r2 appears to consist of a shallow cutting along the break of the hill slope and possibly much earlier in date. r1 appears to truncate all other features within the survey area and as such probably post-dates the 17th century occupation and early 19th century cultivation of the site. Where r1 runs off the island to the northwest of the site a number of steps can be found leading down to the shore which supports the suggestion that this was once a well-used path or route way. Neither of these possible route-ways are depicted on the Ordnance Survey maps which could suggest that they were either not deemed substantial enough to be mapped, or that they predated the Ordnance Survey mapping of the area.
- 8.3 The resistance anomalies r3a-f can clearly be seen as features in the ground surface of the site and probably represent what is most likely one of the field divisions of the site as depicted on Ordnance Survey maps of 1857 onwards (figure 4). Their appearance as bands of high and low resistance may be indication that these were low stone walls constructed from field clearance material which later tumbled and became covered by a sod layer. Whilst r3c and r3f may represent tumble from this field boundary it is also likely that they are remnants of stone clearance during periods of lazy bed cultivation, the latter flanking the field divisions very closely on each side in order to allow for maximum land usage. The bands of low resistance r3a and r3b may be suggestive of narrow silted up ditches or drainage gullies along the length of the

field division. These anomalies likely predate the anomaly r1 which appears to truncate r3a-f at the north-eastern end.

- 8.4 Much of the survey area shows traces of lazy bed cultivation which can be seen in the form of wide ridges and furrows across the ground surface of the site. Anomaly r4 presents the most distinctive evidence of such activity within the resistance survey data. It is likely that any such activity has compromised the discovery of any other anomalies of archaeological distinction within the survey as the ground surface has been much disturbed and reused. The lazy beds seen across the site seem to be placed with respect to the field divisions (r3a-f) which once crossed the area suggesting that they are contemporary and that lazy bed cultivation was taking place in the early to mid-19th century. This could also mean that any earlier 17th century features would have been heavily truncated and loose field stone likely removed.
- 8.5 Substantial evidence for the 17th century house or associated features is lacking in the survey data. The most likely evidence is found in anomalies r5 through to r7. The high resistance anomalies of r5a to r5c may present evidence of structures or garden features associated with the 17th century occupation of the site, r5a in particular is of interest due to its almost rectangular form suggestive of building remains. However, none of the r5 anomalies are along the same alignment as the upstanding chimney stack which would throw some doubt on their association with the 17th century structure, perhaps instead, being the remnants of earlier occupation of the site or of stone clearance from lazy bed cultivation of the site.
- 8.6 Anomalies r6a-d are lacking in definition and have a vague linearity to them which may be effects of the underlying geology coupled with the processes of the lazy bed cultivation above. However this linearity and their close proximity to the 17th century chimney stack could also be taken as evidence of associated features, perhaps as the remains of walls, foundation features or cobbled surfaces. This suggestion can be reinforced if the location of these anomalies to the north and east of the upstanding structure is taken into account as its three fireplaces open onto its north-eastern face where the now demolished structure is most likely to have once stood.
- 8.7 The high resistance of anomaly r7 may be representative of underlying geology although the somewhat artificial appearance of its fairly straight south-western edge throws some doubt on this and it may be indicative of hard-core surfacing or cobbling associated with the 17th century house.
- 8.8 Overall, a specific lack of clarity in the resistance survey results is probably resultant from the waterlogged nature of the site and extensive ground surface disturbance in the area, mainly

through stone clearance for use elsewhere and through lazy bed cultivation. However, evidence for activity associated with the 17th century occupation of the site cannot be completely discounted as there are a number of anomalies which present potential occupational evidence for the site, knowing for certain whether these are 17th century or earlier would require further investigation.

9.0 Conclusion

The earth resistance survey was undertaken at this site in order to shed some light on the nature and extent of any structural remains or features associated with the upstanding, presumably 17th century out-shot chimney stack of Derrywarragh Island, otherwise known as 'O'Connor's Stronghold'. It was hoped that surveying a small gridded area of its immediate surroundings would provide indication of the original orientation and lie of the associated house. The results provided little conclusion as to this matter with a distinct lack of findings in the area immediately surrounding the upstanding structure. A plausible explanation for the lack of structural remains in its vicinity may be that the area has seen much use and disturbance, namely through cultivation. Substantial dug foundations are likely to have been absent from a 17th century house such as this, thereby aside from the chimney stack, the only remains of the ruinous building would have been its lower courses which were most probably robbed out for clearance purposes and for reuse of stone elsewhere. It is worth consideration that further understanding of the site and the features located during the course of this survey can only be achieved through further investigative work, in particular through further surveying of a wider area surrounding the structure. Whilst this may not necessarily provide further solid evidence of the 17th century house, outlines of earlier structures may be located and a better understanding of the use and occupation of the site within a wider context may be provided.

10.0 Bibliography

Donnelly, C, Moore, P, & McGranaghan, C, 2004. O'Connor's Stronghold, Derrywarragh Island, Maghery, County Armagh. *Ulster Journal of Archaeology*, Vol. 63, 123-129.

Day, A & McWilliams, P (eds) 1991. *Ordnance Survey Memoirs of Ireland: Parishes of County Armagh I, 1835-38*. Institute of Irish Studies, Belfast.

Notes

- 1 Letter written by T.G.F. Paterson, addressed to Dr Chart on 31st October 1927. Referenced from NISMR SM7 file; ARM 002:001.
- 2 Edited version of Thomas Philips map taken from a copy held in the NISMR SM7 file; ARM 002:001. Original held at the Public Records Office; PRONI/T/1720/1.



Figure 1: Map showing the location of 'The O'Connor's Stronghold' on Derrywarragh Island

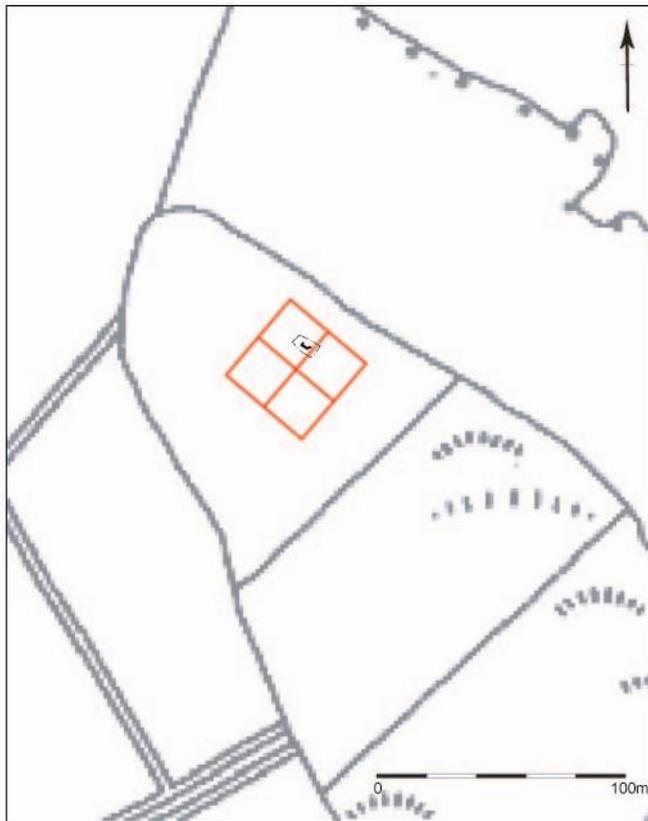


Figure 2: Location and outline of the gridded survey area

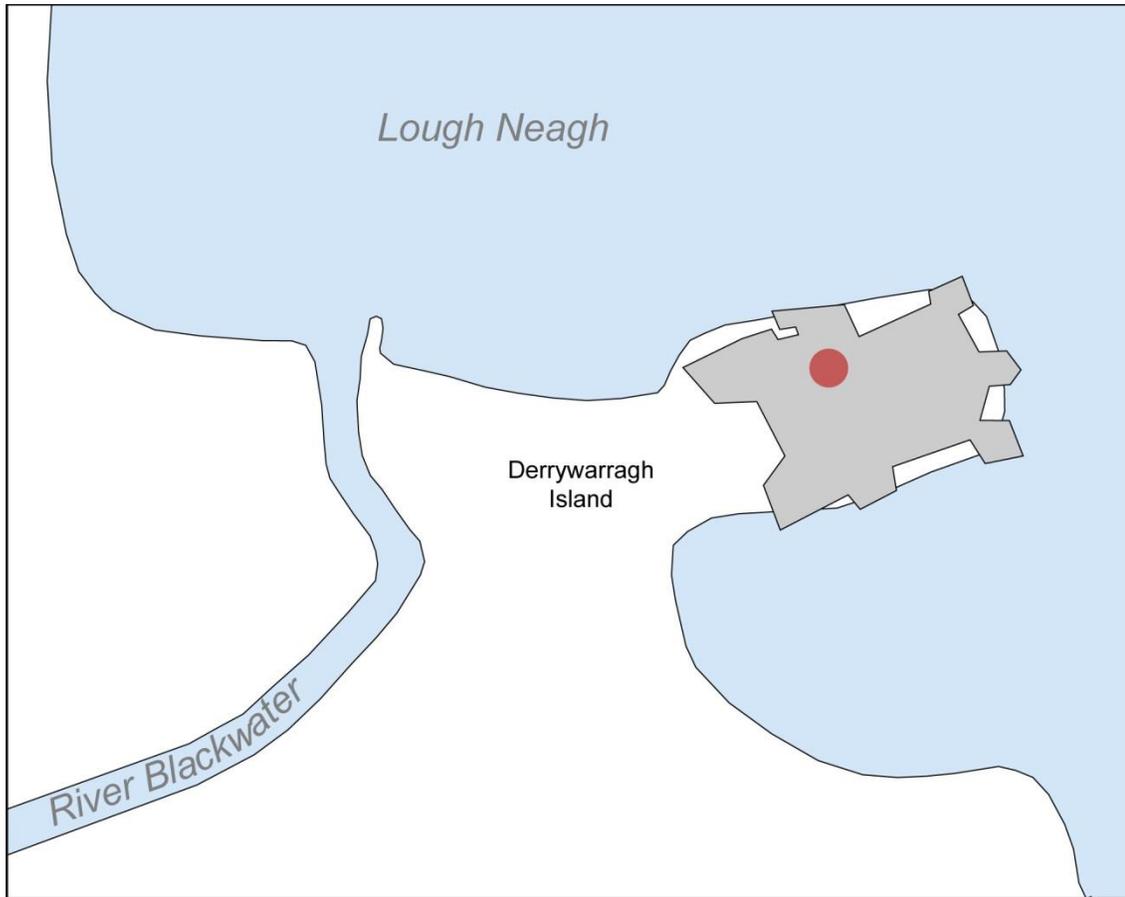


Figure 3: Edited sketch based on Thomas Philips map of 1685-86 (PRONI/T/1720/1-see Note 2)

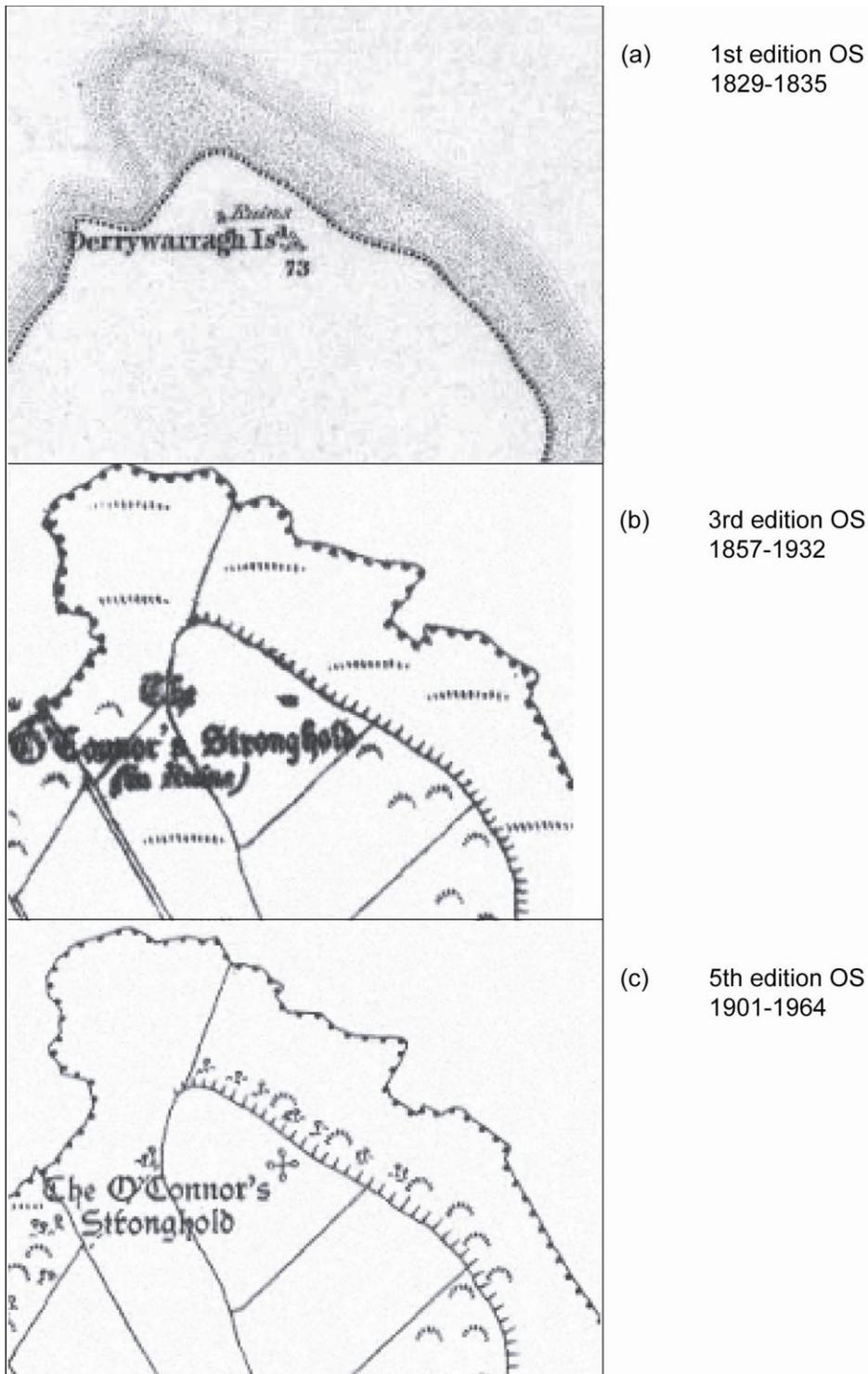


Figure 4: Comparison of cartographic representations of the survey area from 1829 to 1964

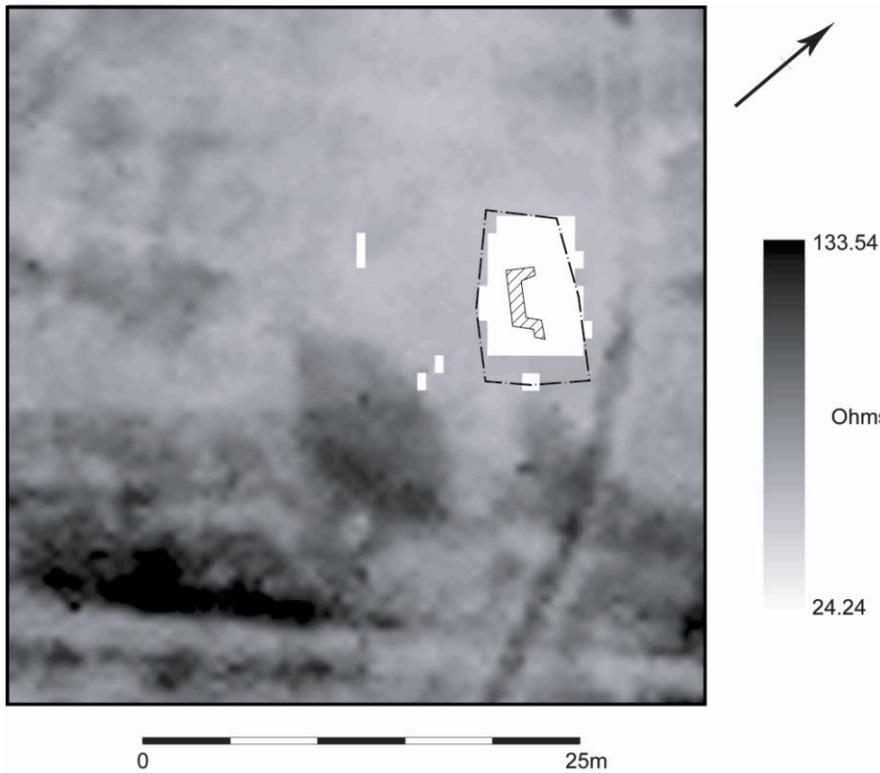


Figure 5: Shade plot of raw resistance data

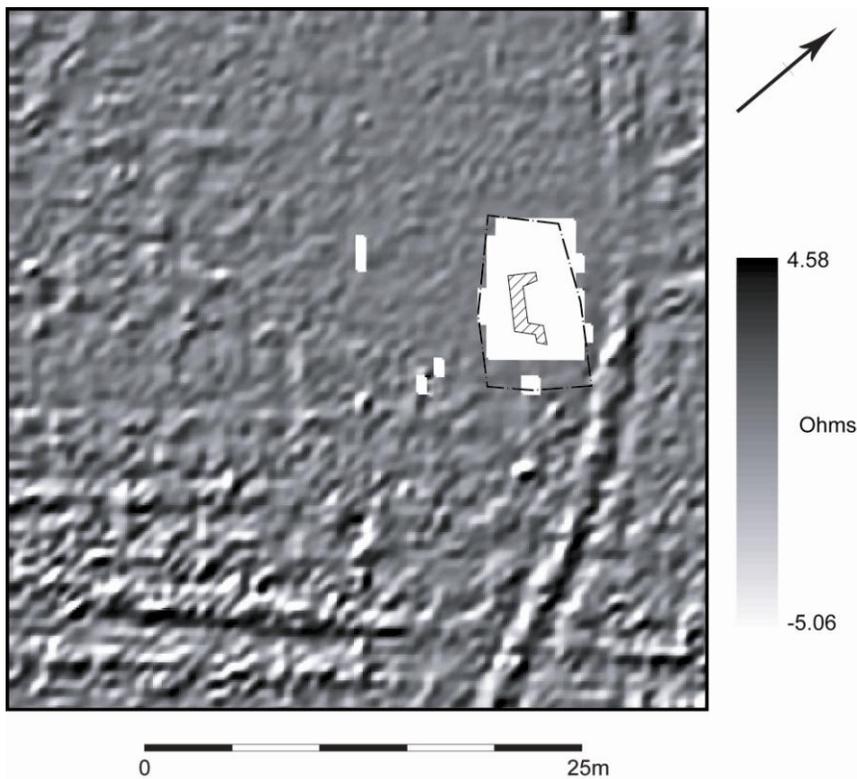


Figure 6: Shade plot of raw resistance data following the application of High pass filter. This has the effect of filtering out broader trends

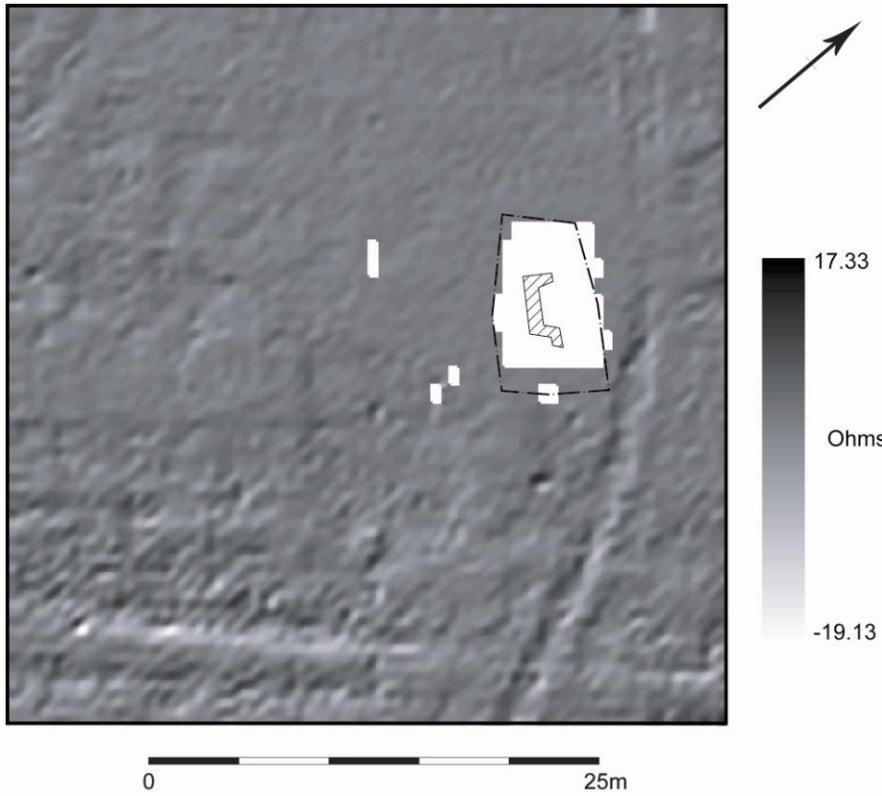


Figure 7: Shade relief plot of resistance data. Here the most prominent anomalies can be most clearly seen

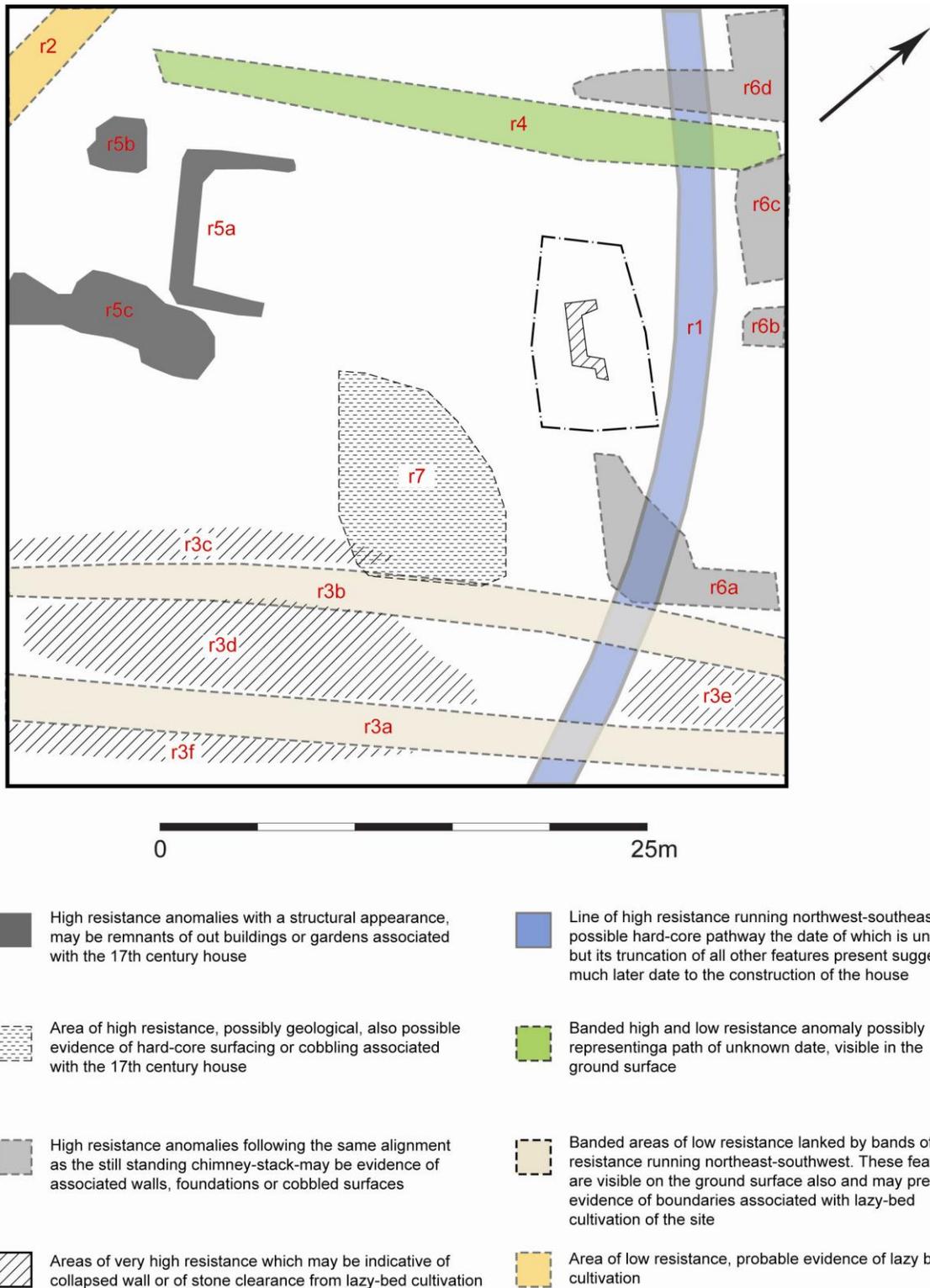


Figure 8: Graphic summary of earth resistance anomalies; to be read in conjunction with the interpretative results given in Section 7.0